ARTICLE

Proportionality Decision Making in Targeting:
Heuristics, Cognitive Biases, and the Law

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Lieutenant Commander Luke A. Whittemore[*]

Abstract

Proportionality is one of the core principles of international humanitarian law (IHL). Described in Additional Protocol I to the Geneva Conventions (AP I), the proportionality principle directs commanders to "refrain from deciding to launch any attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated." While a number of nations are not a party to AP I, the proportionality principle is almost certainly a part of customary international law.

However, the question is not whether the proportionality principle exists, but how to apply it in practice. The principle is susceptible to broad ranges of judgment and is therefore left to the good faith and common sense of military commanders. Much of the struggle with proportionality comes from weighing the fundamentally dissimilar values of military advantage gained to the harm to civilians and civilian objects. Additionally, the commander has to make proportionality decisions under significant uncertainty, with a lack of complete information, and within narrow timelines. All this points to a decision making environment that is much less than optimal.

Some international tribunals and commentators have suggested that the proportionality decision be judged through the eyes of a "reasonable military commander." However, what does this mean? More has been written about proportionality than perhaps any other IHL principle, but few writers have sought to explain and predict how those commanders actually make decisions as human beings limited by their cognitive capacities in a suboptimal decision making environment, thus a descriptive decision theory analysis of the proportionality principle. Scholarship often focuses on a normative decision theory analysis, looking at what decision makers should do and how they should apply the principle. Normative analysis is essential in a field like IHL, but equally important is understanding how and why human cognitive processes may result in decisions that appear to deviate from what is expected by rational choice theory.

The field of descriptive decision theory and law has dramatically expanded in the last few decades, particularly in the field of behavioral economics and the law. However, there are almost no publicly available studies of heuristics, cognitive biases, and IHL principles in targeting decision making. This Article explores how heuristics and cognitive biases might affect the IHL proportionality decision. The Article also aims to be interdisciplinary, providing an overview of both IHL targeting principles and heuristics programs. Additionally, by placing the proportionality decision in the actual context of a detailed deliberate targeting cycle, this Article intends to better inform future theoretical and empirical research in this area. Finally, the Article suggests some ways that cognitive processes might influence the proportionality decision. This is a critical area for

future interdisciplinary research and this Article hopes to inform and encourage that research.

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Introduction

During the North Atlantic Treaty Organization (NATO) Operation Unified Protector (OUP) in Libya from March to October 2011, NATO and partner nation aircraft flew more than 9,600 individual strike missions, using more than 7,600 precision-guided air-to-surface weapons, and damaged or destroyed almost 6,000 military targets.[1] For every target, NATO forces followed a rigorous review process, which included assessment of all available intelligence, use of politically approved targeting standards, rigorous application of the requirements of *jus in bello*—also known as the law of war, law of armed conflict, or international humanitarian law (IHL)[2]—and specific approval by a high-level military or civilian official.[3] While only about ten percent of the daily strike missions during OUP were pre-planned to strike a specific designated target before the launch of the aircraft[4] (known as deliberate targeting), this still represents almost 1,000 pre-planned targeting decisions made by senior NATO leadership during OUP. Almost 1,000 times over seven months, a senior leader in the chain of command for OUP had to determine whether IHL principles were satisfied before approving a deliberate strike.

NATO's OUP is only one of many recent situations involving deliberate targeting decisions. While this Article was written, the United States was leading a multinational operation known as Operation Inherent Resolve (OIR) to degrade and defeat the Islamic State of Iraq and the Levant (ISIL).[5] As of March 15, 2016, U.S. and coalition forces had conducted a total of 10,962 airstrikes since the

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[1] Ivo H. Daalder & James G. Stavridis, *NATO's Success in Libya*, N.Y. TIMES (Oct. 30, 2011), http://www.nytimes. com/2011/10/31/opinion/31iht-eddaalder31.html?_r=0; Letter from Peter Olsen, NATO Legal Adviser, to Judge P. Kirsch, Chair of the International Commission of Inquiry on Libya, OLA(2012)006, 3 (Jan. 23, 2012), http://www.nato.int/nato_static/assets/pdf/ pdf_2012_05/20120514_120514-NATO_1st_ICIL_response.pdf; NORTH ATLANTIC TREATY ORGANIZATION, NATO AND LIBYA, FACTS AND FIGURES (Mar. 28, 2013), http://www.nato. int/cps/en/natohq/topics_71652.htm# (last visited Mar. 5, 2015).

[2] Different sources use different terms to describe *jus in bello* or the law applied in situations of armed conflict. Military publications and some academics refer to the *law(s) of armed conflict* or the *laws of war*, particularly in the United States. Some authors use those terms to clearly distinguish specific law applying in armed conflict (*lex specialis*) from international human rights law. Reflecting the general use in academic scholarship and by many international and non-governmental organizations, this Article uses international humanitarian law (IHL).

[3] Olsen Letter, *supra* note 2, at 3.

[4] Christian F. Anrig, *Allied Air Power Over Libya: A Preliminary Assessment,* AIR & SPACE POWER J., Winter 2011, at 89, 99.

[5] U.S. DEPARTMENT OF DEFENSE, OPERATION INHERENT RESOLVE, http://www.defense.gov/home/ features/2014 /0814_iraq/ (last visited Mar. 5, 2015).

operation began in August 2014.[6] As with OUP, the OIR coalition follows a deliberate process of precise targeting approval to avoid civilian casualties.[7]

Past U.S. and NATO operations have also involved careful review and approval of thousands of military targets. In Operation Allied Force (OAF)—the NATO aerial campaign in Kosovo in 1999—each of the nearly 2,000 fixed targets that were reviewed "received an independent evaluation within the requirements of the law of war."[8] Most of these targets were approved at the military operational level in U.S. European Command, but a small subset of those targets—those with a high potential for collateral damage[9]—went back to the U.S. Department of Defense and potentially the U.S. President for final approval.[10]

One common aspect for all these decisions is that the application of IHL principles and target approval was by a *human*. A human with limited cognitive capacities and imperfect memory. A human that is constantly trying to process and compare uncertain information and weigh unknown risks to achieve the "best" outcomes. And, a human that uses cognitive shortcuts, or heuristics, to make decisions in the face of such external uncertainty.

However, like much of the law, IHL proportionality decision making is typically considered only from a *normative* decision theory perspective. In other words, "what decision makers are *rationally required*—or *ought*—to do" under

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[6] U.S. DEPARTMENT OF DEFENSE, OPERATION INHERENT RESOLVE, http://www.defense.gov/News/Special-Reports/0814_Inherent-Resolve (last visited Mar. 25, 2016).

[7] *See* U.S. Department of Defense, Press Briefing by Lieutenant General James L. Terry, Commander, Combined Joint Task Force-Operation Inherent Resolve (Dec. 18, 2014), http://www.defense.gov/Transcripts/Transcript. aspx?TranscriptID=5559.

[8] Tony Montgomery, *Legal Perspective from the EUCOM Targeting Cell*, 78 INT'L L. STUD. 189, 195 (2002).

[9] Here, and throughout the Article, the term "collateral damage" is defined as: "Unintentional or incidental injury or damage to persons or objects that would not be lawful military targets in the circumstances ruling at the time." U.S. DEPARTMENT OF DEFENSE, JOINT CHIEFS OF STAFF, JOINT PUBLICATION 3-60, JOINT TARGETING, II-1, (Jan. 31, 2013) [hereinafter JP 3-60]. The use of this term (and others such as collateral concerns) is prevalent in many publications (academic and governmental), and as U.S. joint targeting doctrine still uses the term collateral damage, this Article will do the same. However, the author recognizes that use of the term may be viewed as ignoring the significance of the impact to civilians of warfare. This is particularly the case as collateral damage includes both injuries and deaths to civilians and noncombatants and damage or destruction of civilian objects. Because of the significant difference in moral importance attached to civilian lives over property, some authors do not use the term "collateral damage," instead favoring "collateral casualties and damage" or "civilian casualties." *See* Dwight A. Roblyer, *Beyond Precision: Issues of Morality and Decision Making in Minimizing Civilian Casualties*, ACDIS OCCASIONAL PAPER SERIES, 3 (University of Illinois at Urbana-Champaign, Apr. 28, 2003). Like Roblyer, the author acknowledges the tragic incidental loss of civilian life that IHL permits in some circumstances, and in no way intends to diminish the significance of this loss.

[10] Harvey Dalton, *Commentary*, 78 INT'L L. STUD. 199–201 (2002). Note that NATO officials also had to approve the targets before they were struck in Operation ALLIED FORCE. Montgomery, *supra* note 9, at 194.

the law.[11] Described further in Section III, proportionality is focused on balancing the protection of civilian life and property against the value of destroying an enemy military target. The most common definition comes from Additional Protocol I to the Geneva Conventions (AP I).[12] An attack that violates the IHL principle of proportionality is one "which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated."[13] One of the most frequent criticisms of this standard is that it is extremely vague and requires the commander to conduct the extraordinarily difficult task of comparing two unlike things—military objectives and human lives.[14] Despite the vagueness of this standard, the principle still purports to impose limits on the commander's discretion. This is often reflected in a "reasonable military commander"[15] or a "reasonably well-informed person in the circumstances of the actual [commander]"[16] approach, which fits squarely within normative decision theory.[17] The law thus asks how some theoretical human being *ought to* weigh civilian life and property against military advantage.

However, normative decision theory has a problem—its approach often does not accurately reflect how human beings *actually* make decisions. This is the focus of *descriptive* decision theory. In seeking "to explain and predict how people actually make decisions," descriptive decision theory is an empirical discipline with its basis in psychology.[18] This discipline treats the human being as he or she actually is: limited in cognitive capabilities, confronted with substantial complexity, relying on scarce and incomplete information, and surrounded by uncertainty in the environment. In these circumstances, the decision maker is not paralyzed, but relies on certain intuitions, habits, and rules of thumb to find solutions.[19] These strategies of decision making in uncertainty and complexity are

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[11] *See* Martin Peterson, An Introduction to Decision Theory 3 (2009).

[12] Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts, *opened for signature* Dec. 12, 1977, 1125 U.N.T.S. 3 (entered into force Dec. 7, 1978) [hereinafter AP I].

[13] *Id.* art. 51.5(b). Note that the principle of proportionality does not apply to attacks that will *only* affect combatants or military objects.

[14] *See* Michael Newton & Larry May, Proportionality in International Law 17 (2014); Gary D. Solis, The Law of Armed Conflict: International Humanitarian Law in War 273–74 (2010).

[15] International Criminal Tribunal for the former Yugoslavia (ICTY), Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia, n.d., http://www.un.org/icty/pressreal/nato061300.htm [hereinafter Final Report].

[16] *Prosecutor v. Galić*, Case No. IT-98-29-T, Judgment, ¶ 58 (Int'l Crim. Trib. for the Former Yugoslavia Dec. 5, 2003).

[17] However, as described *infra* Section IV, the "reasonable" military commander is not necessarily the "rational" military commander.

[18] PETERSON, *supra* note 12, at 3.

[19] Christoph Engel & Gerd Gigerenzer, *Law and Heuristics: An Interdisciplinary Venture*, *in* HEURISTICS AND THE LAW 1, 3 (G. Gigerenzer & C. Engel eds., 2006).

called heuristics.[20] Explained more in Section IV, there are different definitions and applications of heuristics in the social sciences.[21] There are also different views as to whether heuristics are viewed as the solution to the problem when optimization is not possible or practicable; the problem itself, where heuristics are viewed as second-best strategies to optimization arising out of people's cognitive limitations and resulting in cognitive biases; or a bit of both.[22]

Whether the principle of proportionality is considered part of customary international law or treaty law, it is still vague and open to wide discretion. Thus, its actual application in the real world—at least several thousands of times in the past decades—might inform how the principle of proportionality is interpreted in international law.[23] If we are to believe the "reasonable military commander" standard for applying proportionality, we must ask whether this standard should take into account heuristics and cognitive biases.

Empirical research might indicate that apparent biases and heuristics matter little in the area of IHL proportionality decision making, particularly during deliberate targeting; however, this does not mean the question should be left unexplored. But, this is where scholarship is at the moment. There are studies on decision making in complex military environments that consider heuristics,[24] studies on cognitive psychology and other areas of the law,[25] and studies on the principle of proportionality.[26] But, the author has found very little scholarship directly addressing the intersection between descriptive decision theory and the

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[20] *Id.* at 2–3.

[21] Gerd Gigerenzer, *Heuristics*, *in* HEURISTICS AND THE LAW 17, 17 (G. Gigerenzer & C. Engel eds., 2006).

[22] *See id.* at 17–18.

[23] For customary international law, *see*, *e.g.*, Statute of the International Court of Justice art. 38 para. 1.b., 59 Stat. 1055 ("The Court . . . shall apply . . . international custom, as evidence of *general practice* accepted as law"). For treaty law, *see*, *e.g.*, Vienna Convention on the Law of Treaties art. 31 para. 3(b), *opened for signature* May 23, 1969, 1155 U.N.T.S. 331, art. 31, para. 3(b) (entered into force Jan. 27, 1980) ("There shall be taken into account, together with the context: . . . any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation.").

[24] *See, e.g.*, DECISION MAKING IN COMPLEX ENVIRONMENTS (Malcolm Cook et al. eds., 2007); U.S. Army, *Cognitive Biases and Decision Making: A Literature Review and Discussion of Implications for the US Army*, White Paper, 2007); HUMAN DIMENSION CAPABILITIES DEVELOPMENT TASK FORCE CAPABILITIES DEVELOPMENT INTEGRATION DIRECTORATE MISSION COMMAND CENTER OF EXCELLENCE (Jan. 2015), U.S. ARMY, COGNITIVE BIASES AND DECISION MAKING: A LITERATURE REVIEW AND DISCUSSION OF IMPLICATIONS FOR THE US ARMY, White Paper, (Jan. 2015), https://wss.apan.org/s/HD/Shared%20Documents/HDCDTF_WhitePaper_CognitiveBiases_Final_2015_01_09.pdf.

[25] *See, e.g.*, HEURISTICS AND THE LAW (G. Gigerenzer & C. Engel eds., 2006); BEHAVIORAL LAW AND ECONOMICS (Cass Sunstein ed., 2000).

[26] *See, e.g.*, NEWTON & MAY, *supra* note 15.

IHL principle of proportionality.[27] This Article builds off that scholarship, but provides a more in-depth examination of that intersection.[28]

It is important to highlight what this Article is *not*. First, it is not an in-depth study of the psychology of decision making. The Article is focused only on a few potential heuristics at a level of generality intended to reach all readers. Those with expertise in descriptive decision theory and the law will likely think of other heuristics that could be of critical relevance in this area. And, they might devise future experiments that can replicate as closely as possible the military targeting decision making environment described below—so as to better confirm or deny the theories expounded here.

Second, this Article does not focus on all proportionality decision making in warfare. First, the focus is on *jus in bello* or IHL proportionality and not *jus ad bellum* proportionality dealing with the type and degree of force that state-actors can use under the United Nations Charter or customary international law. Second, the Article focuses on deliberate targeting decisions—those targets that are planned, considered, and approved for strike in the future.[29] As can be seen in the case of the NATO Libya operation described above, deliberate targeting can represent a minority of targets struck, the majority being through more immediate response dynamic targeting. However, dynamic targeting still requires a proportionality determination, so many of the concepts discussed here could still apply, but on a much shorter time scale. Third, this Article limits its focus to the targeting process and proportionality decision making primarily from a U.S. and NATO perspective.[30]

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[27] Tomer Broude, *Behavioral International Law*, 163 U. PA. L. REV 1099 (2015); Ashley Deeks, Cognitive Biases and Proportionality Decisions: A First Look, n.d. (unpublished draft manuscript) (citing with permission of the author): http://law.huji.ac.il/upload/6_AshleyDeeks_p.pdf.

[28] Recent scholarship is beginning to bring in cognitive theories and targeting more broadly. *See, e.g.,* Craig Martin, *A Means-Methods Paradox and the Legality of Drone Strikes in Armed Conflict*, 19 INT'L J. OF HUMAN RIGHTS 142 (2015) (describing the potential application of cognitive biases and misperceptions to decision making surrounding drone strikes).

[29] JP 3-60, *supra* note 10, at II-1.

[30] NATO doctrine on targeting is similar to the U.S. joint doctrine on targeting; however, the NATO Allied Joint Doctrine for Joint Targeting (AJP 3.9) is a NATO UNCLASSIFIED document. This does not mean AJP 3.9 is available for unrestricted public release. Therefore, while some academic works directly cite AJP 3.9, to comply with NATO directives on release of NATO UNCLASSIFIED information (e.g., The Management of Non-Classified NATO Information, C-M(2002)60) this Article will rely only on the publicly-released U.S. doctrine on joint targeting. Additionally, while the author focuses on U.S. targeting doctrine, this Article does not precisely reflect the official positions of the U.S. government as to IHL/Law of War. For example, while the author uses Additional Protocol I to the Geneva Conventions (AP I) as the basis for IHL principles, the U.S. is not a party to AP I. As another example, while the author cites "precautions" as a principle of IHL, the U.S. does not consider this a separate principle. *See* OFFICE OF GENERAL COUNSEL, U.S. DEPARTMENT OF DEFENSE, DEPARTMENT OF DEFENSE LAW OF WAR MANUAL, ch. 2 (June 15, 2015) [hereinafter DOD LAW OF WAR MANUAL].

Finally, this Article does not make a judgment on whether the use of these heuristics in proportionality decision making is normatively a good or bad thing. What is important is first to identify how *actual* proportionality decision making may occur in a way that converges or diverges with the normative rational or reasonable military commander.

The sections of this Article are divided topically. Section II presents an overview of the IHL principles applicable to a deliberate targeting decision and describes the aspects of those principles that might make descriptive decision theory analysis of their application relevant.

Section III presents an overview of the IHL proportionality principle and places proportionality decision making in the context of the military deliberate targeting process. This helps identify how and what type of information gets to the decision maker before the specific target is approved for strike. Without this context, it is difficult to determine where and what heuristics and biases might enter into the proportionality decision.

Section IV first gives an overview of the heuristics and cognitive biases research programs, highlighting different approaches to the descriptive analysis of decision making and some shortcomings of the common heuristics-and-biases approach. The section then highlights previous work on this topic and focuses on two cognitive processes or effects that could influence the proportionality decision. Finally, the section suggests a possible experiment that could test for the influence of one of those effects.

The conclusion asks what this research could tell us about the law and what reactions there could be from governments and international law to this area of study.

II. IHL Targeting Principles

A. *Introduction*

Why focus only on the proportionality principle in the IHL law of targeting? All of the IHL targeting principles are susceptible to a great amount of discretion on the part of the military decision maker. However, the proportionality principle is perhaps the most susceptible and provides a good starting point for a descriptive decision theory analysis of IHL application in targeting. To place the proportionality principle in the context of the other relevant IHL principles, this Section provides an introduction to the other law of targeting principles and then Section III covers proportionality in more detail.

Many government, non-governmental organization (NGO), international organization (IO), and academic publications provide perspectives on how IHL is and should be applied to lethal targeting operations in armed conflict.[31] For simplicity, this Article uses the principles as they are reflected in AP I, when applicable. While the principles existed in treaties and customary law prior to AP I and are reflected in current customary law in similar form,[32] AP I provides a modern expression for all of the primary IHL targeting principles but one, the principle of military necessity, which is found in customary international law. Some nations like the U.S. are not a party to AP I; however, the U.S. treats most of those relevant sections of AP I as reflecting customary international law and applies IHL targeting principles similar to those contained in AP I.[33]

B. *The Law of Targeting Overview*

As this Article is grounded in how targeting decisions are made in the context of U.S. joint operations, definitions from U.S. joint doctrine are relevant. By 'target,' this Article means: "an entity (person, place, or thing) considered for possible engagement or action to alter or neutralize the function it performs for the adversary."[34] In particular, this Article is focused on those targets selected for neutralization or destruction, as those effects are most likely to implicate the proportionality principle.

By 'targeting,' this Article means: "the process of selecting and prioritizing targets and matching the appropriate response to them, taking into account operational requirements and capabilities."[35] Importantly, the targeting decision considered here is *not* the actual use of force on the target (or "mission planning and force execution" phase in U.S. doctrine).[36] The targeting cycle is detailed more in Section III, but the targeting cycle itself *does* include this phase of execution and IHL principles must also be followed at the moment of the

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[31] For an overview of some of those sources, *see, e.g.*, Michael N. Schmitt, *Targeting in Operational Law*, *in* THE HANDBOOK OF THE INT'L LAW OF MILITARY OPERATIONS 245 (Terry D. Gill & Deiter Fleck eds., 2010); IAN HENDERSON, THE CONTEMPORARY LAW OF TARGETING: MILITARY OBJECTIVES, PROPORTIONALITY AND PRECAUTIONS IN ATTACK UNDER ADDITIONAL PROTOCOL I, ch. 2 (2009).

[32] See, e.g., Schmitt, Targeting, supra note 32.

[33] *See* Comments of Mr. Michael Matheson, then U.S. Dept. of State Deputy Legal Advisor, presented to the Sixth Annual American Red Cross-Washington College of Law Conference on International, Humanitarian Law: A Workshop on Customary International Law and the 1977 Protocols Additional to the 1949 Geneva Conventions, reported in 2 AM. U. J. INT'L L. & POL'Y 419 (1987). *See also* DOD LAW OF WAR MANUAL, supra note 31, Section II, at 50-69.

[34] JP 3-60, *supra* note 10, at vii. The NATO definition of target is: "The object of a particular action, for example a geographic area, a complex, an installation, a force, equipment, an individual, a group or a system, planned for capture, exploitation, neutralization or destruction by military forces." NATO, NATO GLOSSARY OF TERMS AND DEFINITIONS, AAP-06, 2-T-2 (2014) [hereinafter AAP-06].

[35] JP 3-60, *supra* note 10, at I-1. NATO Doctrine uses the same definition for targeting. AAP-06, *supra* note 35, at 2-T-3.

[36] JP 3-60, *supra* note 10, at II-20 to II-30.

strike. Additionally, heuristics may play even more prominent a role in the sometimes split-second proportionality decisions that must be made right before the release of a weapon. However, this Article only focuses on the more deliberate decisions made earlier in the targeting cycle on which targets to strike and how and when to strike them. This phase of the targeting cycle ("Commander's Decision and Force Assignment" in U.S. doctrine),[37] in its focus on methodical decision making, provides a better contrast between what proportionality decision the reasonable military commander should make under normative decision theory and what decision heuristics and cognitive biases actually leads the commander to make. And the commander *must* make those decisions as IHL is doctrinally a part of targeting: "Targeteers and planners must understand and be able to apply the basic principles of international law as they relate to targeting."[38]

This Article will provide an overview of the IHL principles of military necessity, distinction, humanity, precautions in attack, and proportionality.[39] These principles can be applied sequentially, with a target only satisfying IHL criteria if it meets every sequential step. As each principle is important in itself, different sequences in applying the principles are possible and some publications and governments combine parts of these principles;[40] but the following is one common order of application:

(1) <u>Military Necessity</u>: Does the action have the objective of weakening the enemy forces? In other words, is the use of force tied to the successful conclusion of the military operation? If no, then not a lawful target. If yes, go to (2).

(2) <u>Distinction</u>: Is the target a combatant, a civilian directly participating in hostilities, or a military objective?[41] If not, then not a lawful target. If yes, go to (3).

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[37] *Id.* at II-16 to II-20.

[38] *Id.* app. A, A-1.

[39] For resources that cover the overall application of IHL in military targeting operations in greater detail, *see, e.g.*, AGNIESZKA JACHEC-NEALE, THE CONCEPT OF MILITARY OBJECTIVES IN INTERNATIONAL LAW AND TARGETING PRACTICE (2015); MICHAEL N. SCHMITT, ESSAYS ON LAW AND WAR AT THE FAULT LINES, ch. 5, 175-205 (2012); Schmitt, *Targeting*, *supra* note 33; SOLLIS, *supra* note 15, ch. 7; Geoffrey S. Corn & Gary P. Corn, *The Law of Operational Targeting: Viewing the LOAC Through an Operational Lens*, 47 TEX. INT'L L.J. 337 (2012); Michael N. Schmitt & Eric W. Widmar, *'On Target': Precision and Balance in the Contemporary Law of Targeting*, 7 J. NAT'L SECURITY & POL'Y 379 (2014).

[40] *See, e.g.*, HENDERSON, *supra* note 32, at 234-38; SOLIS, *supra* note 15, at 250-86; SCHMITT, *Essays*, *supra* note 40, at 176. As an example, the U.S. incorporates parts of the third principle (precautions in attack) into the principle of proportionality. *See* DOD LAW OF WAR MANUAL, *supra* note 31, para. 2.4.2 and section 5.14.

[41] Military objective is discussed further in Section III.4.

(3) <u>Precautions in Attack</u>: Has the commander done everything *feasible* to verify that the target is lawful (i.e., meets the distinction requirement above) *and* applied all *feasible* precautions to avoid, or at least minimize, collateral damage (incidental civilian casualties or damage to civilian property)? If not, then consider whether further precautions could be applied before approving the target. If yes, go to (4).

(4) <u>Proportionality</u>: If collateral damage is nonetheless expected from an attack, is the collateral damage excessive in relation to the concrete and direct military advantage expected to be gained from the attack? If yes, then the strike is not lawful and must either be cancelled or modified in a way to be proportional (or an alternative target selected). If collateral damage is not excessive under the balancing, then go to (5).

(5) <u>Humanity/Unnecessary Suffering</u>: Are the type of weapon system (means) and type of tactics (methods) lawful and not calculated to cause unnecessary suffering? If no, then modify the means or methods of attack before the strike. If yes to this and to (1) through (4) above, then the target and proposed strike on the target satisfies IHL.

This is a simplification of the IHL considerations in targeting. However, these basic questions must be asked by the military commander in some form during the targeting decision. Some of these principles focus on "what" may be attacked (military necessity, distinction), some on "how" that attack should be conducted (precautions in attack, unnecessary suffering), while proportionality focuses on both the what and how of the attack. Each principle lends itself to decision making under significant complexity, uncertainty of probabilities and risk, and incomplete information, and therefore heuristics and possible cognitive biases could play a role in application of all of the IHL targeting principles.

C. *Military Necessity*

The principle of military necessity is not defined in the 1949 Geneva Conventions or in AP I. However, it is understood to be a fundamental norm in customary international law.[42] First clearly articulated in a set of wartime conduct instructions drafted by Franz Lieber and signed by President Abraham Lincoln to Union forces in 1863 (the Lieber Code),[43] military necessity was codified by

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[42] *See, e.g.*, Charles H.B. Garraway, *International Humanitarian Law in Self-Defence Operations*, *in* THE HANDBOOK OF THE INT'L L. OF MIL. OPERATIONS 215 (Terry D. Gill & Dieter Fleck eds., 2010); SOLIS, *supra* note 15, at 258–59.

[43] U.S. War Department, General Orders No. 100, (24 Apr. 24, 1863). [hereinafter Lieber Code] ("Military necessity, as understood by modern civilized nations, consists in the necessity of those

international treaty in 1907: "It is especially forbidden . . . to destroy or seize the enemy's property, *unless* such destruction or seizure be imperatively demanded by the *necessities* of war."[44] This is a proscriptive definition, imposing an initial check on action, requiring that those actions be tied to the weakening of the enemy forces to enable successful conclusion of the military operation.[45] If an action is not necessary under this definition, then it should not be conducted.

The modern formulation of military necessity also makes it clear that this concept is not broadly permissive in nature and does not permit *any* action that might help weaken the enemy. The restrictive standard is reflected one of the enumerated war crimes in the Rome Statute of the International Criminal Court (ICC): "Destroying or seizing the enemy's property unless such destruction or seizure be imperatively demanded by the necessities of war." [46] The NATO definition states that military necessity is "[t]he principle whereby a belligerent has the right to apply any measures which are required to bring about the successful conclusion of a military operation,"[47] and these measures must not be "forbidden by the laws of war."[48]

Therefore, descriptions of military necessity recognize both an internal and external limitation. The internal limitation relates the proposed military actions to the objectives of the military campaign and asks whether those actions are necessary to achieve the objectives. Thus, even if an action is legal under the other IHL principles, this does not mean it is necessary.[49] For example, dropping a small bomb on an abandoned military barracks building that has been unoccupied for several years and that is far removed from the area of the armed conflict could satisfy the principles of distinction, precautions in attack, proportionality, and unnecessary suffering, but would not contribute much, if anything, to the weakening of the enemy and thus not likely satisfy the principle of military necessity.

In this way, military necessity might not practically be a significant limitation. This internal check should be satisfied in most modern "effects-based" targeting decisions. Modern joint targeting doctrine seeks to "create desired effects with the least risk and least expenditure of time and resources."[50] One of the fundamental principles of warfare is "economy of force," which is reflected in

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measures which are indispensible for securing the ends of the war, and which are lawful according to the modern law and usages of war.")

[44] Conventions Respecting the Laws and Customs of War on Land, ann. art. 23, Oct. 18, 1907, 36 Stat. 2277, 207 Consol. T.S. 277 (1907) (emphasis added) [hereinafter Hague IV].

[45] *See* SOLIS, *supra* note 15, at 259.

[46] Rome Statute of the International Criminal Court art. 8.2.(b)(xiii), Jul. 17, 1998, 2187 U.N.T.S. 90 (entered into force Jul. 1, 2002).

[47] AAP-06, *supra* note 35, at 2-M-6.

[48] Id.

[49] Garraway, *supra* note 43, at 215.

[50] JP 3-60, *supra* note 10, at viii.

modern U.S. joint doctrine.[51] It is likely that an action deemed to violate the IHL principle of military necessity would also not be an efficient use of force, as it would not be aimed at achieving the end state of the operation. If in practicality almost all deliberate targeting decisions meet the military necessity standard, heuristics and cognitive biases might not have as much relevance to the standard's application.

The external limitations on military necessity are the application of the rest of the IHL targeting principles. Strongly rejecting the doctrine of *Kriegraison*, which claims that necessity in war overrides the laws of war,[52] the principle of military necessity can never be used to justify actions otherwise prohibited by IHL, particularly because IHL already takes military necessity into account in permitting certain extreme measures in limited circumstances.[53]

Seen this way, the military necessity determination is of a different character than the other principles.[54] At the outset, the military necessity decision is similar to the other principles in that it requires evaluation of information available to the commander to make this determination (e.g., military intelligence, media sources), and the judgment of the reliability and truth of that information likely implicates several heuristics and cognitive biases described in Section IV.[55] However, once the given information is evaluated and weighed, the military necessity decision is more like a categorical decision: "Does this action fit in category A (weakens the enemy forces in some degree) or category B (does not weaken the enemy forces at all)?" The *degree* to which the action helps or accomplishes the military objectives is relevant here, but it is not a significant limitation—rather the action must only be *reasonably connected* to "the overcoming of the enemy forces."[56]

Heuristics and potential cognitive biases are still relevant to the military necessity decision, as determining in which category to place an action ('helps us'

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[51] *See, e.g.*, Headquarters, Department of the Army, Operations, FM 3-0, A-2 (Feb. 2008).

[52] Garraway, *supra* note 43, at 215. *But see* SOLIS, *supra* note 15, at 269 (agreeing that military necessity is not a defense to law of war violations, but noting the import of the International Court of Justice's 1996 advisory opinion regarding nuclear weapons).

[53] *See* SOLIS, *supra* note 15, at 268–69.

[54] Some literature combines military necessity with other IHL principles, *see, e.g.*, Lieber Code, Art. 16 (combining military necessity with unnecessary suffering); U.S. AIR FORCE, TARGETING, AIR FORCE DOCTRINE DOCUMENT 3-60, 88 (June 8, 2006) (combining necessity with distinction); Nobuo Hayashi, *Requirements of Military Necessity in International Humanitarian Law and International Criminal Law*, 28 B.U. INT'L L.J. 39 (2010) (including in military necessity the requirement to comply with IHL generally). For this Article, the principle of military necessity is considered separate from the other principles as it helps understand the different types of decision making required for each of the principles.

[55] This topic is not the primary focus of this Article, but a more detailed descriptive decision theory analysis of human evaluation of military intelligence in targeting and its relevance to IHL targeting principles would be a critical contribution to this area of the law.

[56] SOLIS, *supra* note 15, at 259.

or 'does not help us') involves uncertainty as to the predicted effect of the action on the objectives of the military campaign. Normative decision theory might tell us there exists a certain threshold for determining military necessity that a rational and reasonable decision maker should apply in a given circumstance, and descriptive decision theory would then illustrate how and why the decision making process may depart from that model. However, the nature of the single categorical decision means there is less relevance of alternatives, of balancing of risks, and of probability of outcomes than in the other IHL principles.

D. *Distinction*

The principle of distinction sees its modern definition in Article 48, AP I:

> In order to ensure respect for and protection of the civilian population and civilian objects, the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives.[57]

This principle is generally accepted as being a fundamental part of customary IHL,[58] and is directly reflected in U.S. military targeting doctrine.[59]

The principle of distinction is divided into several parts, thus requiring several different decisions for the commander. The first decision deals with whether the intended target is a human or an object. Then, under each of those categories, the commander must look at different criteria in determining whether the human or object is a lawful target. Thus, this principle is fundamentally more complicated than the military necessity decision. Relying on the AP I framework and customary international law, the basic decision matrix for the principle of distinction is shown in Figure 1, with the check marks indicating that the principle has been satisfied and a cross indicating a target violating the principle.[60]

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[57] AP I, *supra* note 13, art. 48.

[58] *See, e.g.*, Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, ¶ 78 (July 8); JACHEC-NEALE, *supra* note 40, at 39; JEAN-MARIE HENCKAERTS AND LOUISE DOSWALD-BECK, CUSTOMARY INT'L HUMANITARIAN LAW, VOL. I: RULES, 3 (2005).

[59] JP 3-60, *supra* note 10, at A-2 to A-4; AF DOCTRINE 3-60, *supra* note 59, at 89–90.

[60] Figure 1 provides an overview of the distinction decision making process, but each step involves greater detail in definition and application. *See, e.g.*, Schmitt, *Targeting*, *supra* note 32, at 247–55 (outlining the application of the principle of distinction in greater detail). For example, if a combatant is *hors de combat* (e.g., incapacitated by injury), that individual is not a lawful target.

Figure 1: Principle of Distinction Decision Chart
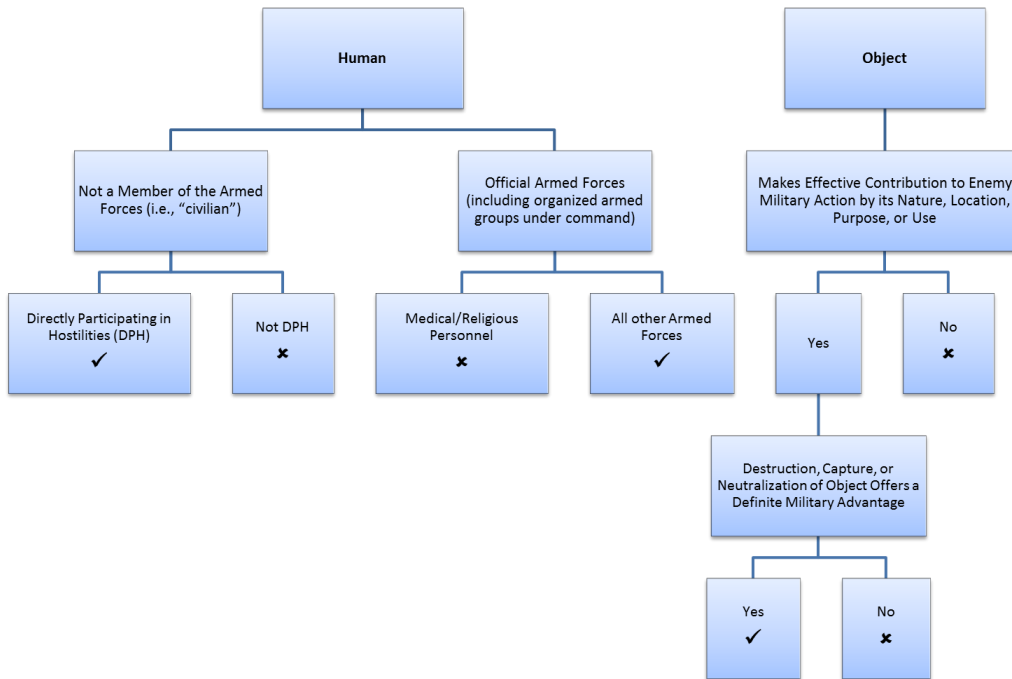
The general overview chart shows the complexity and uncertainty inherent in applying the principle of distinction. At each step, the commander must weigh probabilities to fit something into one category or the other. Couple this uncertainty with the vagueness of the terms, and human decision making under the principle of distinction also is likely to rely on heuristic principles to assess probabilities and predict outcomes.

However, like the principle of military necessity, the principle of distinction is more about categorization than balancing. Degree matters more here than in the military necessity principle (e.g., degree of contribution to military action, degree of military advantage by the use of force, degree of participation in hostilities); however, there is no balancing between like or unlike values.[61] Proportionality *does* involve this internal balancing, a balancing that heightens the relevance of optimization in the face of uncertainty and thus makes proportionality perhaps a better starting point for descriptive decision theory analysis than the principle of distinction.

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[61] *See id.* at 36.

E. *Precautions in Attack*

The principle of precautions in attack is focused on *how* to attack a lawful target and not the categorization of *what* is a lawful target. The modern definition of this principle is found in AP I Article 57; however, the principle is a series of requirements and guidance relating to the lawful means and methods of attacking a target. As with the rest of the IHL principles, there is much written on precautions in attack.[62]

First, the commander must "do everything feasible to verify that the objectives to be attacked are neither civilians nor civilian objects and are not subject to special protection but are military objectives . . . ."[63] This first requirement is about target identification—using all available information to make a good-faith assessment that the target would satisfy the principle of distinction.[64] The relevance of heuristics and cognitive biases here would seem to be in the evaluation of available information to complete the verification. In analyzing this step of the principle alone, this verification must be separated from the legal determination being made under the principle of distinction. In other words, the first step of the precautions in attack analysis must take a given interpretation on what legally qualifies as a combatant or military objective and apply available intelligence to that standard of interpretation. The uncertainty in the standard itself is a question for the principle of distinction in that the decision maker must evaluate all the information before her to determine whether a certain objective is a civilian or civilian object, and thus could not be targeted under the principle of distinction. Under the present step, the decision maker's uncertainty relates to whether the available intelligence is enough to verify that the distinction standard is satisfied for a given target. This is still potentially a great deal of uncertainty, and in many cases that commander has to make probability judgments that the information regarding a certain proposed target places that target in a certain category (e.g., combatant, military objective).

Second, the commander must "take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing, incidental loss or civilian life, injury to civilians and damage to civilian objects."[65] This part is about avoiding collateral damage and is directly linked to the principle of proportionality, but this requirement is applied *before* the proportionality consideration. Thus, the commander must first do everything

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[62] See generally HENDERSON, supra note 32, at 157-96; Schmitt, Targeting, supra note 32, at 259–62; Geoffrey S. Corn, War, Law, and Precautionary Measures: Broadening the Perspective of this Vital Risk Mitigation Principle, 42 PEPP. L. REV. (forthcoming 2015), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2485624.

[63] AP I, *supra* note 13, art. 57.2(a)(i).

[64] *See* HENDERSON, *supra* note 32, at 165.

[65] AP I, *supra* note 13, art. 57.2(a)(ii).

feasible to avoid or minimize collateral damage, and then when all feasible precautions have been taken, the proportionality principle is considered.[66]

The key concept for both the first and second steps is "feasibility," meaning "that which is practicable or practically possible, taking into account all circumstances prevailing at the time, including humanitarian and military considerations."[67] Feasibility is therefore heavily context dependent and relies on considerations such as the availability of certain weapon systems, the training and capabilities of the force, the location of the military targets in relation to civilians and civilian objects, the capabilities of the opposing force, the weather conditions (e.g., clear skies, fog, high winds, rain), and the time of day.[68] Feasibility decision making in IHL is another area where descriptive decision theory analysis would be particularly relevant. This is because the feasibility standard "requires attackers to take those measures to avoid civilian harm that a reasonable attacker would take in the same or similar circumstances" based upon reasonably available information.[69] As described in Section III, determining what is reasonable might involve combining the rational decision maker possessing complete information with a decision maker constrained by her environment, cognitive abilities, and lack of complete information.

Much more detail is also written about this second step of precautions in attack,[70] but for the purposes of identifying decision points, reducing collateral damage involves (1) information gathering and processing and (2) weaponeering.[71] Information gathering involves decisions regarding what information to collect, what information to trust, when the information is enough, and how to weigh different types of information for reliability in determining target location and civilian/civilian object presence. However, the second category—weaponeering—offers just as much for a decision theory analysis.

Weaponeering is "the process of determining the quantity of a specific type of lethal or nonlethal means required to create a desired effect on a given target."[72] For the purposes of lethal targeting, weaponeering is the selection of the type of weapon and the method of that weapon's delivery to the target. This process considers factors such as what type and extent of damage needs to be

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[66] *See* HENDERSON, *supra* note 32, at 168.

[67] Schmitt, *Targeting*, *supra* note 32, at 260.

[68] *See, e.g.*, Schmitt, *Targeting*, supra note 32, at 260; Schmitt & Widmar, *supra* note 40, at 19.

[69] Schmitt & Widmar, *supra* note 40, at 400–01.

[70] *See, e.g*., HENDERSON, *supra* note 32, at 168–80; Schmitt & Widmar, *supra* note 40, at 400–04.

[71] *See* MATTHEW WAXMAN, INTERNATIONAL LAW AND THE POLITICS OF URBAN AIR OPERATIONS xiv (Project AIR FORCE, RAND Corporation, 2000); HENDERSON, *supra* note 32, at 171–72. Waxman breaks these two broad categories into four factors considered in the reduction of collateral damage: (1) location information (i.e., identifying the precise location of the target); (2) civilian and civilian object information (i.e., determining whether and what civilians and civilian objects are present in the vicinity of the target); (3) weapon precision; and (4) weapon effects.

[72] JP 3-60, *supra* note 10, at GL-11.

applied to achieve the desired effect on the target, the available platforms to deliver the weapon (e.g., manned aircraft, drone, ship, artillery), the available weapons and their relative supply, the fusing of the weapon (e.g., when and where it detonates relative to the target), and the timing of the strike (e.g., night versus day).[73] These and other factors help targeteers and the commander select the specific weapon and how it is delivered to minimize risk to civilians and civilian objects while still achieving the desired military effect. In decision process terms, this step necessarily requires a weighing of different factors, the generation of alternatives (e.g., alternative means and methods of attack), and a comparison of those alternatives for feasibility and risk of collateral damage.

The fundamental difference between this second step of the precautions in attack analysis and the proportionality decision relates to the desired outcome of the decision. This step is about minimizing collateral damage while still accomplishing the goals of the strike, not about determining whether that collateral damage is excessive, which is the proportionality consideration and the next step of the precautionary principle.[74] Under the second step, IHL directs the commander to do everything feasible to reduce collateral damage, but does not require the commander to select the means and method of attack that causes the *least* amount of collateral damage, nor does it require the commander to cancel or suspend an attack that is expected to cause collateral damage of any level.

In the third step of precautions of in attack, the commander must apply the principle of proportionality and refrain from launching an attack if it violates that principle.[75] It is important to note that proportionality appears twice under the heading "Precautions in Attack" under AP I. The second appearance is in requiring an attack to be cancelled or suspended if the attack is expected to violate the principle of proportionality.[76] This third step is the focus of Section III.

The fourth step of precautions in attack is the requirement to cancel or suspend attacks under certain conditions, including an expected violation of the principle of proportionality. The other reasons to cancel or suspend an attack are "if it becomes apparent that the objective is not a military one or is subject to special protection . . . ."[77] This fourth step is focused primarily on those who are actually carrying out attacks (e.g., the pilot, the drone operator, the artillery officer);[78] however, it is possible that the commander approving the strike or someone else in the chain of command gains additional information prior to the strike that requires a cancellation or suspension.

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[73] *See* HENDERSON, *supra* note 32, at 20; Schmitt & Widmar, *supra* note 40, at 20–21.
[74] See HENDERSON, *supra* note 32, at 168.
[75] AP I, *supra* note 13, art. 57.2(a)(iii).
[76] *Id.* art. 57.2(b).
[77] Id.
[78] HENDERSON, *supra* note 32, at 182.

The fifth step, and perhaps the one applied with the most variation,[79] is the requirement to give "effective advance warning . . . of attacks which may affect the civilian population, unless circumstances do not permit."[80] Note that there are several sub-decisions involved in this step. First, this only applies when the *civilian population* might be affected; therefore, there are potentially many targets where even consideration of advance warnings is not required.[81] For example, a strike against a runway on a military airfield used only for military purposes would not likely implicate any requirement to consider warnings. Second, even if the civilian population may be affected, warnings are only required when circumstances permit. This is where much of the inconsistency in application may arise — many circumstances may be used to explain a lack of advance warnings (e.g., requirement for surprise, risk to the attacking force from giving warnings).[82] Third, what qualifies as an *effective* warning is not clear under the law,[83] permitting some further discretion in decisions under this requirement.

The sixth and final step under the principle of precautions in attack relates to the consideration of alternatives: "When a choice is possible between several military objectives for obtaining a similar military advantage, the objective to be selected shall be that the attack on which may be expected to cause the least danger to civilian lives and to civilian objects."[84] This part of the principle is directly related to proportionality in that the commander is essentially asked to conduct multiple proportionality balancing tests and compare them when the military advantage will be similar for several targets.

This sixth step is important in forcing the decision maker to compare alternatives and think more deeply about collateral damage consequences, but it likely has a limited practical effect on targeting decisions. This is because it asks the decision maker to assign a particular value to the military advantage anticipated from an attack on each of several targets *and* asks the decision maker to make a potentially impossible determination on what constitutes the "least danger to civilian lives and civilian objects" among the several targets.[85] For example, if the commander could find that two targets gave a similar military advantage but there was not a good reason to strike both, then the commander

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[79] *See id.* at 185-89.

[80] AP I, *supra* note 13, Art. 57.2(c). U.S. targeting doctrine states: "Warnings must be given when circumstances permit (e.g., any degradation in attack effectiveness is outweighed by the reduction in collateral damage because advanced warning allowed the adversary to get civilians out of the target area."). JP 3-60, *supra* note 10, at A-5.

[81] *See* HENDERSON, *supra* note 32, at 188 (stating that *affect* "should be interpreted narrowly to mean directly affected in the sense of injured or killed, as well as property damage").

[82] *See id.* at 185–87.

[83] *See id.* at 188.

[84] AP I, *supra* note 13, art. 57.3. Note that the U.S. explicitly does not recognize this sub-provision of AP I as customary international law. *See* DoD LAW OF WAR MANUAL, *supra* note 31, at ¶ 32, para. 5.11.5. However, as described below, this provision likely has limited practical effect even if considered a part of Customary International Law.

[85] *See, e.g.*, HENDERSON, *supra* note 32, at 189–90.

might have to compare unlike collateral damage possibilities. One strike might result in the expected incidental death of ten civilians and destruction of two homes. The other strike might result in the expected incidental death of two civilians and destruction of three homes and a church. Which one of these causes the "least danger"?[86] The intractability of this decision and low likelihood of limiting decisions except in the clearest of circumstances makes descriptive decision theory analysis here less worthwhile.

F. *Humanity/Unnecessary Suffering*

The final IHL principle relevant to lethal targeting decisions is the principle of unnecessary suffering, also known as the principle of humanity. Recognized by the International Court of Justice (ICJ) as one of the two cardinal principles of IHL (the other being military necessity),[87] the modern principle is found in Article 35(2) of AP I: "It is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering."[88] The principle of unnecessary suffering applies to lawful targets (e.g., combatants) and not civilians or civilian objects. Thus, it is designed to protect combatants from suffering that is unnecessary or superfluous to the achievement of military objectives.[89] There are two key issues with this principle relevant to decision making.

The first issues deals with the vagueness of definitions in this principle. The ICJ defines "unnecessary suffering" as "a harm greater than that avoidable to achieve legitimate military objectives."[90] The U.S. review of weapons under international law balances the concept of military necessity with unnecessary suffering, stating in one review that: "In determining whether a weapon causes *superfluous injury*, a balancing test is applied between the force dictated by military necessity to achieve a legitimate objective vis-à-vis injury that may be considered superfluous to the achievement of the . . . objective . . . . [T]he suffering must outweigh substantially the military necessity for the weapon . . . ."[91] IHL provides no easily-applied objective test for determining what satisfies the principle of unnecessary suffering.[92] From a decision making perspective, this means that the principle is applied on a case-by-case basis depending on the type of weapon used and the method of its use.

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[86] *See id.* at 190.

[87] Legality of the Threat or Use of Nuclear Weapons, *supra* note 59, ¶ 78. *See also* Schmitt, *Targeting*, *supra* note 32, at 270.

[88] AP I, *supra* note 13, art. 35.2.

[89] *See* SOLIS, *supra* note 15, at 270; Schmitt, *Targeting*, *supra* note 32, at 270.

[90] Legality of the Threat or Use of Nuclear Weapons, *supra* note 59, ¶ 78.

[91] W. Hays Parks, *Joint Service Combat Shotgun Program*, THE ARMY LAWYER (Oct. 1997), 16, 18, cited in SOLIS, *supra* note 15, at 271.

[92] *See* SOLIS, *supra* note 15, at 272.

The second issue deals with the timing of the principle's application. Because the principle applies only to lawful targets, the author includes the principle at the end of the decision making process. After the commander has fully determined that the target and the means and methods of the strike lawful under the first five IHL principles, the commander must determine whether the means or methods used on the lawful target would cause superfluous injury or unnecessary suffering. However, this principle can be applied earlier in the targeting process, and in practice it can be and is often decided well before the military campaign. The principle of unnecessary suffering has been primarily used to limit what types of weapons can even be used on the battlefield.

This limitation prior to development and use of weapons comes from specific treaties and from a general requirement in AP I. Many treaties, such as the Chemical Weapons Convention,[93] Convention on Anti-Personnel Land Mines,[94] Conventional Weapons Convention,[95] and Biological Weapons Convention[96] limit or prohibit the use of certain types of weapons because the treaty signatories believed that certain uses of those weapons—or any use at all in some treaties—would violate fundamental IHL principles. Many of these treaties deal with the limitation of weapons on the basis of unnecessary suffering.[97] AP I Article 36 then codified a requirement to review new weapons for compliance with IHL.[98] Several states, including the U.S., have put into place formal internal review mechanisms to ensure compliance with this review requirement.[99] One of the fundamental parts of that review is to determine whether a particular weapon system would cause "unnecessary suffering disproportionate to the military advantage reasonably expected to be gained from its use."[100] This means that the critical decisions regarding the principle of unnecessary suffering, particularly in

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[93] Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction, Sept. 3, 1992, 1974 U.N.T.S. 45 (entered into force Apr. 29, 1997).

[94] Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction, Sep. 18, 1997, 2056 U.N.T.S. 211 (entered into force Mar. 1, 1999).

[95] Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which may be deemed to be Excessively Injurious or to have Indiscriminate Effects, Oct. 10, 1980, 1342 U.N.T.S. 137 (entered into force Dec. 2, 1983).

[96] Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Apr. 10, 1972, 1015 U.N.T.S. 163 (entered into force Mar. 10, 1975).

[97] SOLIS, *supra* note 15, at 270.

[98] AP I, *supra* note 13, art. 36: ("In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party.").

[99] See ICRC, A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1977, 88 INT'L REVIEW OF THE RED CROSS 931, 934 fn. 8, (Dec. 2006).

[100] U.S. Dep't of the Navy, Secretary of the Navy Instruction (SECNAVINST) 5000.2E, 1-37 (Sep. 1, 2011).

the context of deliberate lethal targeting, are made at the weapon development, approval, and acquisition stages and not by the commander approving the strike. All the weapons available for the U.S. commander have been through this review. Additionally, the weapons used by many of the coalition partners of the U.S. have likely been through an AP I Article 36-type review.[101]

III. Proportionality Decisions and the Targeting Cycle

A. *The IHL Proportionality Principle*

As highlighted in the previous section, proportionality is one of the core principles of international humanitarian law. One of primary sources for defining the principle is AP I,[102] which states that the proportionality principle directs commanders to "refrain from deciding to launch any attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated."[103] While a number of nations are not a party to AP I, the proportionality principle is a part of customary international law.[104]

The IHL proportionality principle is only applied when *civilians or civilian objects* might be affected by the proposed strike.[105] The principle therefore does not apply to attacks that will only affect combatants or military objects. This is the case even if 1,000 enemy combatants lose their lives in the sinking of a warship.[106] This might seem "excessive," but the proportionality principle is not meant to protect combatants or military objects—targets that are

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[101] ICRC, A Guide to the Legal Review of New Weapons, supra note 107100107, at 934, fn. 8; see. See also ICRC, CUSTOMARY IHL, Practice Relating to Rule 70. Weapons of a Nature to Cause Superfluous Injury or Unnecessary Suffering, https://www.icrc.org/customary-ihl/eng/docs/v2_rul_rule70 (last visited Mar. 30, 2016).

[102] AP I, *supra* note 13, arts. 51.5(b), 57.2(a)(iii), 57.2(b).

[103] AP I, *supra* note 13, art. 57.2(a)(iii).

[104] *Prosecutor v. Kupreškić* et. al., Case No. IT-95-16-T, Judgment, ¶ 524 (Int'l Crim. Trib. for the Former Yugoslavia Jan. 14, 2000). For an overview of the U.S. perspective on the principle of proportionality, *see* DOD LAW OF WAR MANUAL, *supra* note 31, at Section 5.12.

[105] This Article uses the term "strike" as it is a common term in U.S. targeting doctrine; however, the AP I uses the term "attack." They are meant to be the same in this Article. Whether "strike" or "attack" is used, this Article adopts the interpretation advanced by SCHMITT, ESSAYS, *supra* note 40, at 188 ("the term 'attack' logically includes all acts that cause violent consequences, i.e., death or injury to civilians (including significant human physical or mental suffering) or damage to, or destruction of, tangible civilian objects.").

[106] An example is from the 1982 sinking of the *General Belgrano*, an Argentine warship, during the Falklands War. Over 300 Argentine sailors lost their lives after the ship was sunk by torpedoes from a British submarine. Some commentators have indicated that this attack might have been disproportionate to the threat posed by the warship. *See* NEWTON & MAY, *supra* note 15, at 164. However, setting aside what is essentially a question of military necessity, there was no violation of the *jus in bello* proportionality principle in the targeting and sinking of the *Belgrano*. *See* SOLIS, *supra* note 15, at 280.

part of the legitimate goals of weakening the enemy force and achieving the end of the armed conflict.[107]

The problem with the proportionality principle "is not whether or not it exists but what it means and how it is to be applied."[108] Proportionality is more subjective and susceptible to broad ranges of judgment than perhaps any other core IHL principle[109] and is left to the "common sense and good faith [of] military commanders."[110] However, this is of little comfort to military commanders when breaching the principle is considered a war crime in international law[111] that could be prosecuted in international[112] or national tribunals.[113]

Much of the struggle with proportionality comes from weighing the fundamentally dissimilar values of military advantage gained to the damage to civilians and civilian objects.[114] Of importance, the term "proportionality" itself might indicate that some *quantitative* amount of harm to civilians and civilian objects might fail the test; however, this is not the standard. First, the word "proportionality" is nowhere to be found in the AP I formulation of the principle, rather the text uses "excessive in relation to" as the relevant balancing consideration.[115] And, "excessive in relation to" is fundamentally different from "extensive" or "severe" or other words not used in AP I that indicate some level of harm that can be measured without comparison to another value. The incidental harm from a strike might still be quite severe in terms of the number of civilian lives lost and civilian structures destroyed, but such a strike might not violate the proportionality principle if the collateral damage still is not excessive in relation to the concrete and direct military advantage gained from the strike.[116]

The principle therefore requires a balancing. Some international law sources, judges, and academics have suggested that this balance be seen through

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[107] *See* SOLIS, *supra* note 15, at 274. *But see* Gabriella Blum, *The Dispensable Lives of Soldiers*, 2 J. OF LEGAL ANALYSIS 115 (2010) (acknowledging the inapplicability of the proportionality principle to enemy combatants, but proposing a least-harmful-means test as a feature of the principle of military necessity and a narrower conception of combatants under the principle of distinction as providing more protections to combatants).

[108] *Final Report*, *supra* note 16, ¶ 48.

[109] *See, e.g.*, SOLIS, *supra* note 15, at 278–79; (2010); International Committee of the Red Cross, *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949*, ¶ 2210 (1987) [hereinafter *Commentary*]; Michael N. Schmitt, *Precision Attack and International Humanitarian Law*, 87 INT'L REV. RED CROSS 445, 457 (2005); Broude, *supra* note 28, at 1151.

[110] *Commentary*, *supra* note 110, ¶ 2208.

[111] AP I, *supra* note 13, art. 85.

[112] *See, e.g.*, Rome Statute, *supra* note 47, art. 8(2)(b)(iv).

[113] *See, e.g.*, 10 U.S.C. § 818 (2012); UNITED KINGDOM MINISTRY OF DEFENCE, JOINT SERVICE MANUAL OF THE LAW OF ARMED CONFLICT ¶¶ 16.30.2, 16.30.3 (Joint Service Publication 383, 2004).

[114] *See, e.g.*, *Final Report*, *supra* note 16, ¶ 49; Schmitt, *Precision Attack, supra* note 110, at 457.

[115] *See* SOLIS, *supra* note 15, at 280.

[116] See id.

the eyes of a "reasonable military commander." [117] For example, a former President of the Israeli Supreme Court said: "The court will ask itself only if a *reasonable military commander* could have made the decision that was made."[118] In the *Galić* opinion, a Trial Chamber of the International Criminal Tribunal for the Former Yugoslavia (ICTY) stated: "In determining whether an attack was proportionate it is necessary to examine whether a reasonably well-informed person in the circumstances of the actual perpetrator, making reasonable use of the information available to him or her, could have expected excessive civilian casualties to result from the attack."[119] However, what might be unreasonable to one commander might be reasonable to another, making it extremely difficult to potentially impossible to successfully prosecute anyone for a disproportionate attack alone.[120]

More has been written about proportionality than perhaps any other principle of IHL,[121] but this breadth of writing has not always led to a clear and consistent application of the principle. Additionally, the application of the principle depends not only on external factors[122] but also fundamentally "on the background and values of the decision maker." [123] This means that human character of the decision maker is of critical relevance to describing proportionality decision making.[124] The same heuristics and cognitive effects that shape human decision making regarding economic risks and probabilities may also have critical relevance to decisions regarding the proportionality principle.[125] When the ICTY says "reasonably well-informed" and "reasonable use of information available," how close does this come to the mythical perfectly rational and omniscient military commander? Does this standard account for heuristics and resulting cognitive biases or does it assume a certain rational decision making process?

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[117] E.g., Prosecutor v. Galić, supra note 17, ¶ 58; Final Report, supra note 16, ¶ 50.

[118] NEWTON & MAY, *supra* note 15, at 179 (quoting Aharon Barak, President (ret'd) Supreme Court of Israel, Address at the Jim Shasha Center of Strategic Studies of the Federmann School for Public Policy and Government of the Hebrew University of Jerusalem (Dec. 18, 2007)), cited in NEWTON & MAY, *supra* note 15, at 179.

[119] Prosecutor v. Galić, supra note 17, ¶ 58.

[120] *See, e.g.*, *Prosecutor v. Gotovina et al.*, Case IT-06-90-A, Appeals Chamber (Int'l Crim. Trib. for the Former Yugoslavia (Nov. 16, 2012)) (invalidating attempt by Trial Chamber to establish a standard for determining disproportionate and indiscriminate strikes).

[121] *See* Jens David Ohlin, *Targeting and the Concept of Intent,* 35 MICH. J. INT'L L. 79, 86 (2013).

[122] *Commentary*, *supra* note 110, ¶ 2212.

[123] *Final Report*, *supra* note 16, ¶ 50.

[124] *See* Broude, *supra* note 28, at 1151-56.

[125] *See* Sarah Lichtenstein & Paul Slovic, *Introduction*, THE CONSTRUCTION OF PREFERENCE: AN OVERVIEW IN THE CONSTRUCTION OF PREFERENCE 1 (Sarah Lichtenstein & Paul Slovic eds., 2006).

B. *Proportionality Decisions in the Targeting Cycle*

Understanding how heuristics and cognitive biases might affect proportionality decision making in deliberate targeting requires a basic understanding of the deliberate targeting process and how the proportionality decision fits into that process. The military commander is confronted with a large amount of information relevant to a decision whether to strike a target. While important, international law is only one of many considerations in the commander's analysis. Under the U.S. joint targeting doctrine:[126]

> Targeting systematically analyzes and prioritizes targets and matches appropriate lethal and nonlethal actions to those targets to create specific desired effects that achieve the joint force commander's (JFC's) objectives, accounting for operational requirements, capabilities, and the results of previous assessments. The emphasis of targeting is on identifying resources (targets) the enemy can least afford to lose or that provide him with the greatest advantage . . . , then further identifying the subset of those targets which must be acquired and engaged to achieve friendly success . . . . Targeting links the desired effects to actions and tasks.[127]

What this all means is that the military commander must (and does) consider much more than just the principles of IHL in making a decision regarding the strike of a target.

However, the law is still critical to this decision. IHL considerations are scattered throughout the targeting doctrine and are the exclusive focus of a seven-page appendix.[128] Those considerations are a part of the primary function of targeting "to efficiently achieve the JFC's objectives through target engagement within the parameters set by the concept of operations (CONOPS), the operational limitations within the plans and orders . . . the rules of engagement (ROE), the law of war, and agreements concerning the sovereignty of national territories."[129]

To understand how heuristics and cognitive biases might be relevant to the proportionality principle in deliberate targeting decisions, it is important to understand the steps of that targeting process. Drawing from the U.S. doctrine, the basic outline of the U.S. joint targeting process is described below. Different nations use different doctrines for targeting; what is important here is not the exact process the U.S. or other nations follow but rather how and at what points the proportionality principle might factor into a targeting process. Understanding

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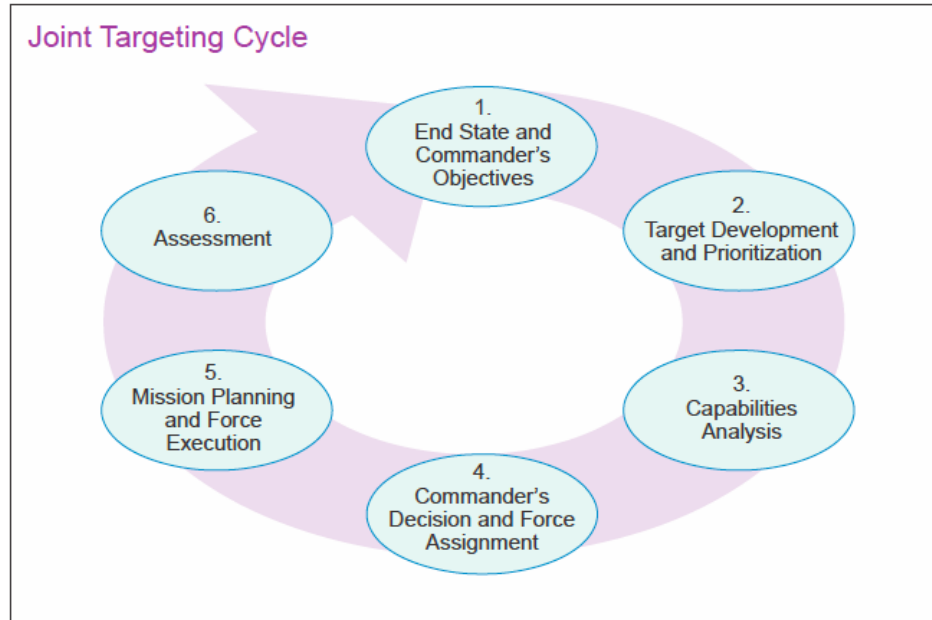[126] JP 3-60, *supra* note 10.
[127] *Id*. at vii-viii.
[128] *Id.*, app. A.
[129] *Id.* at viii.

this context would help design experiments to test the applicability of heuristics and cognitive biases.

In U.S. doctrine, the joint targeting cycle consists of six phases proceeding in a sequential cycle as depicted and defined below:[130]

Figure 2. Joint Targeting Cycle[131]

Phase 1 – End State and Commander's Objectives: Understanding the military end state and the commander's intent, centers of gravity, objectives, desired effects, and required tasks for the overall military effort.

Phase 2 – Target Development and Prioritization: In this phase, potential targets are identified that, when successfully engaged, would support the achievement of the commander's objectives.

Phase 3 – Capabilities Analysis: Evaluating all available capabilities against targets' critical elements to determine the best options available to the commander for target engagement.

Phase 4 – Commander's Decision and Force Assignment: The commander's decision in phase 4 is to either approve the list of approved and prioritized targets (known as the Joint Integrated Prioritized Target List or JIPTL), approve targets to be added to or

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[130] *Id.* at xi-xii (containing detailed descriptions of each phase).
[131] *Id.* at II-4.

removed from the JIPTL, or approve a particular way or ways of engaging a particular target or targets.

Phase 5 – Mission Planning and Force Execution: This is the detailed planning that must be performed for the execution of a strike or strikes.

Phase 6 – Targeting Assessment: This phase is a continuous process that assesses the effectiveness of the activities that occurred during the first five phases of the joint targeting cycle.

In most circumstances, the actual decision of the commander to approve a target, and therefore the commander's application of the proportionality principle, occurs in Phase 4. This phase is where all the information is presented to the commander for a decision to place the target on a list of approved targets (the JIPTL referenced above). However, other phases are also relevant to the proportionality decision.

Phase 1: End State and Commander's Objectives

In Phase 1, the selection of the military end state and related objectives form the baseline for determining the military advantage side of the proportionality balance. To understand what type of military advantage a particular strike will provide, the commander needs to place that strike in the context of the campaign objectives and the end state. While a single strike might weaken the enemy in some way, if that strike does not contribute to the pre-planned objectives and end state, it might have questionable military advantage.

Phase 2: Target Development and Prioritization

Phase 2 is where specific targets are analyzed and selected for recommended lethal strike (or another type of action). The detailed target analysis in Phase 2 helps identify the specific parts of an enemy target system that will provide the most military advantage by being degraded or destroyed. By definition, target systems are "broad set[s] of interrelated functionally associated components that generally produce a common output or have a shared mission."[132] Examples of target systems are enemy air defense systems, ballistic missile systems, and command and control systems.[133] The target system analysis in Phase 2 considers the components of each of those systems and identifies the best individual components to strike to create the desired effect on the overall target system.[134]

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[132] *Id.* at II-5.
[133] *See id.* at II-8 to II-9.
[134] *Id.* at II-9.

For example, in operations to destroy or degrade enemy air defenses (known as Suppression of Enemy Air Defenses or SEAD), targeteers will identify those individual components that enable effective operation of the enemy air defenses, such as command and control centers, surface-to-air missile sites, radar systems, missile storage bunkers, and air defense operators and maintenance personnel.[135] Destroying or degrading each of these components has a distinct military advantage in that those targets are integral component to the enemy air defenses. During Phase 2, the targeteers would identify the criticality[136] and vulnerability[137] of each of those components to determine the value of each and "how much its engagement will contribute to the targeting strategy."[138]

The key point here is that in Phase 2, the targeteers are already contributing to the proportionality decision process by selecting targets that bring the greatest military advantage. The targeteers are doing this without a specific reference to IHL principles, but the analysis in Phase 2 means that the targets seen by the commander in Phase 4 have already been analyzed in part for their importance. The commander approving a target for deliberate strike understands at least the basics of the targeting process and knows that this analysis of target value has already occurred before they are presented to him for decision.

Phase 3: Capabilities Analysis

Phase 3 of the targeting cycle consists of four steps, none of which is covered in detail here,[139] but important for the proportionality decision, this Phase focuses "on matching specific capabilities [e.g., weapons] against identified target vulnerabilities and estimating the effects."[140] It is in this Phase that the weaponeering described in Section III occurs, determining what weapon(s) and what method of weapon delivery will create the desired effects on the target. More importantly, the fourth step of this Phase (Effects Analysis) includes an evaluation of estimated collateral damage.[141]

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[135] *See* U.S. Department of Defense, Joint Chiefs of Staff, Joint Publication 3-01, Countering Air and Missile Threats, IV-12 (Mar. 23, 2012).

[136] JP 3-60, *supra* note 10, at II-9 ("Criticality measures a target's contribution to a target system's larger function and its relative importance within the target system.").

[137] *Id.* at II-10 ("A target's vulnerability refers to the physical susceptibility to damage, disruption, intrusion, interference, or other desired effect. Vulnerability affects the size and types of action required to damage, disrupt, or otherwise affect a target, in addition to such factors as munitions and fuzing requirements.").

[138] *Id.* at II-9.

[139] Target Vulnerability Analysis, Capabilities Analysis, Feasibility Assessment, and Effects Analysis. *Id.* at II-13 to II-14.

[140] *Id.* at II-14.

[141] *Id.* at II-14 and II-16.

The process of estimating collateral damage in the U.S. is itself governed by detailed procedures, systems, and techniques.[142] This process, known as the collateral damage estimation methodology ("CDE methodology" or "CDM") is now standardized across all U.S. Department of Defense operations,[143] and the basic U.S. CDE methodology is also common to NATO operations.[144] CDM is grounded in extensive theoretical and experimental analysis of weapon effects,[145] physics-based computer modeling, and direct combat observations.[146] While detailed discussion of the CDM is beyond the scope of this Article,[147] there are three aspects of CDM that are directly relevant to the proportionality analysis by the commander.

a) Collateral Damage Methodology: Tool for Determining Proportionality

First, the overarching purpose of CDM is to assist "commanders in weighing risk against military necessity and in assessing proportionality within the framework of the military decision-making process."[148] While the final products of the CDM process are not meant to be a substitute for the commander's judgment and consideration of many other factors in the proportionality balancing,[149] those products are meant to be "an estimate to assist a commander in the decision making process relying on informed data and sound judgment."[150] Thus, CDM and its products are meant to be only one tool for the decision maker in determining proportionality, not the sole answer on whether a certain strike satisfies the principle.

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[142] *See* CHAIRMAN OF THE JOINT CHIEFS OF STAFF, INSTRUCTION 3160.01, NO-STRIKE AND THE COLLATERAL DAMAGE ESTIMATION METHODOLOGY (Oct. 12, 2012), https://www.aclu.org/files/ dronefoia/dod/drone_dod_3160 _01.pdf [hereinafter CJCSI 3160.01]. As part of a Freedom of Information Act request, the ACLU also obtained a set of U.S. Joint Staff PowerPoint slides on the targeting process and collateral damage estimation methodology. *See* Joint Staff Targeting, *Joint Targeting Cycle and Collateral Damage Estimation Methodology (CDM)*, Slides (Nov. 10, 2009), https://www.aclu.org/files/drone foia/dod/drone_dod_ACLU_DRONES_JOINT_STAFF_SLIDES _1-47.pdf (last accessed Apr. 13, 2015) [hereinafter Joint Staff Slides].
[143] JP 3-60, *supra* note 10, at II-16; AF Doctrine 3-60, *supra* note 59, at 72.
[144] *See* Rui Romao, *Targeting and Adaptation in Combat: Examining the Libya Case*, 15 BALTIC SECURITY & DEFENCE REV. 5, 26 n.54 (2013).
[145] *See, e.g.,* MORRIS R. DRIELS, WEAPONEERING: CONVENTIONAL WEAPON SYSTEM EFFECTIVENESS (2d Ed., 2013), http://www.weaponeering.com/TOC.pdf; Amanda Humphrey et. al., *A Methodology to Assess Lethality and Collateral Damage for Nonfragmenting Precision-Guided Weapons*, 29 INT'L TEST & EVALUATION ASS'N J. 411 (Dec. 2008) (describing a methodology to assess lethality and collateral damage for a specific weapon system).
[146] CJCSI 3160.01, supra note 145, at D-1; Joint Staff Slides, *supra* note 145, slide 20.
[147] *See generally* Gregory S. McNeal, *Targeted Killing and Accountability*, 102 GEO. L. J. 681 (2014) (providing more detailed description of how CDM is applied in targeting).
[148] CJCSI 3160.01, supra note 143, at D-1.
[149] *Id.* at D-2.
[150] Id.

b) Collateral Damage Methodology: Limitations

Second, CDM has limits when applied to certain aspects of the proportionality principle. CDM is meant to be simple and consistently repeatable across all military commands in the DOD.[151] Because of this goal, CDM must make some critical assumptions and cannot account for certain factors relevant to collateral damage. Relevant to this analysis are three qualifications.[152] First, CDM assumes that weapons will function as designed and be delivered as planned, and therefore, does not account for weapon malfunctions, errors in weapon delivery, or delivery methods that have to be changed based on operator judgment (e.g., pilot having to change the direction in which the weapon is dropped because of hostile fire).[153] Second, CDM does not account for "unknown transient civilian or noncombatant personnel and/or equipment in the vicinity of a target area."[154] This second qualification means that if the projected area of collateral damage from a strike includes a road and sidewalk, the CDM will not account for possible pedestrian or vehicle traffic that might be passing through the area when the weapon strikes. This does not mean that the commander can ignore this transient traffic; rather, the commander must consider this factor, among others, in *addition* to the results of the CDM process. Finally, CDM does not adjust for the specific environment into which the weapon is delivered and therefore does not account for conditions that might change weapon effects and result in potential second- and third-order effects.[155] For example, dropping a bomb in a forested area might result in a forest fire that causes much more damage than anticipated by the CDM, but CDM does not account for that potential secondary damage.

c) Collateral Damage Methodology: CDE Levels

The third aspect of CDM may make that tool loom larger than other considerations. This is because one of the final "products" of CDM is a number— the number designating a CDE Level from 1 to 5 in the final CDE assessment.[156] That CDE Level in the final assessment tells the commander in one glance the risk of collateral damage, the relative risk to the operational mission, and the risk to his or her own forces (in the amount of restrictions that have to be applied to minimize collateral damage).[157] CDM is a detailed sequential methodology that tries to reduce collateral damage from a strike while still achieving mission success and minimizing risk to forces.[158] At each CDE Level, the number of restrictions on the type of weapons used and the method of their employment

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[151] *Id.* at D-A-1.

[152] There are more assumptions and limitations discussed in CJCSI 3160.01. *Id.* at D-4 to D-5.

[153] *Id.* at D-4.
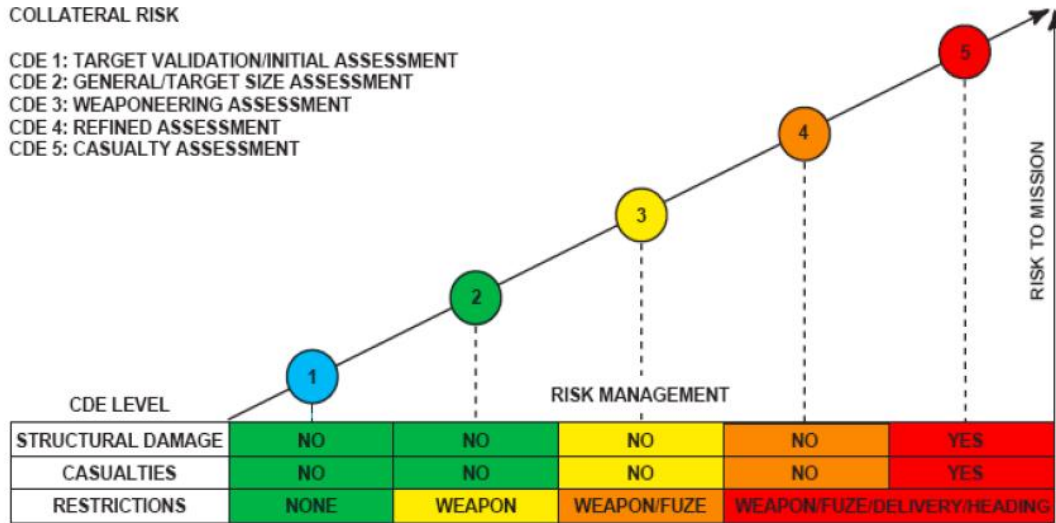
[154] *Id.* at D-4 to D-5.

[155] *Id.* at D-5.

[156] *Id.* at D-A-2.

[157] *Id.*

[158] *Id.*

increases to decrease collateral damage.[159] An illustration of this is seen in Figure 3.

Figure 3. Risk and the Collateral Damage Methodology[160]

Each CDE Level has two fundamental elements that help determine the progression between the levels: (1) collateral effects radius ("CER") and (2) collateral hazard area ("CHA").[161] The CER "is a radius representing the largest collateral hazard distance for a given warhead, weapon, or weapon class considering predetermined, acceptable collateral damage thresholds that are established for each CDE Level."[162] Determining the CER at each CDE Level is a detailed process conducted during Phase 3 of the targeting cycle and is described further in CJCSI 3160.01.[163] The CER is then used to form the CHA, which is formed by measuring the CER from the proposed target.[164] In many cases, the CER is depicted as a circle surrounding the target and the CHA is everything inside that circle.[165] See Figure 4 for that depiction.

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[159] *Id.*

[160] *Id*. at D-A-3 (Figure 3 is Figure D-A-1 in the reference).

[161] *Id.* at D-A-3.

[162] *Id.*

[163] *Id.* at D-A-1 to D-A-35. *See also* JS Slides, *supra* note 143, slides 31–34.

[164] CJCSI 3160.01, *supra* note 143, at D-A-3.

[165] The CER and CHA may also be depicted as a rectangle or square, but in his experience, the author most commonly saw circle depictions from designated aim points. *See id.* at D-A-4.

Figure 4. Depiction of Collateral Hazard Area (CHA) and Collateral Effects Radius (CER)[166]

CHA measured from an aimpoint:
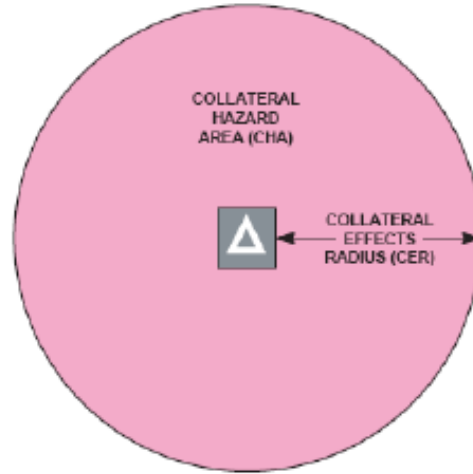
Inside that circle, the collateral hazard area shows "an unacceptable probability for damage or injury to collateral concerns, which include persons and objects."[167] If that CHA includes any noncombatants or civilian objects at a certain CDE Level, then the targeteers will attempt to employ further weaponeering restrictions to reduce the size of the CHA and place those collateral concerns outside the CHA.

At the highest CDE Level 5, "all reasonable and known mitigation techniques [for means and methods of the strike] have been exhausted and some level of collateral damage appears unavoidable."[168] This means that there is minimal risk of collateral damage occurring at CDE Levels 1 through 4 (but not a zero risk) once the amount of weapon restrictions for each level are accounted for (see Figure 3). CDE Level 5 is the only level where the CDM process considers the risk of collateral damage high enough to be unavoidable despite those restrictions; thus, the CHA at CDE Level 5 will include collateral concerns.

Once a proposed strike reaches CDE Level 5, the targeteers and other relevant staff must then conduct a "casualty assessment."[169] As with the rest of CDM, "the casualty assessment is not an exact science."[170] With current capabilities, it is impossible to factor in all the unique demographic factors of the

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[166] *Id.*

[167] *Id.*

[168] *Id.* at D-A-29.

[169] *See id.* at D-A-30.

[170] *Id.*

population surrounding the target.[171] In this way, the casualty assessment is only an estimate and should never be treated by a decision maker as a precise prediction of how many noncombatants will be severely injured or killed by the effects of a particular strike.[172]

d) Collateral Damage Methodology: Link to Phase 4

In Summary, the most important part of Phase 3 of the Targeting Cycle for the proportionality decision is the CDE analysis that is presented to the commander during Phase 4. This is partly because CDE is a critical tool to the commander in the proportionality analysis and partly because conduct of CDM is required on every target in accordance with U.S. ROE.[173] Additionally, the relevant ROE in effect for the military operation will likely set the level of authority within the chain of command that can approve targets with certain CDE Levels.[174]

Phase 4: Commander's Decision and Force Assignment

In Phase 4, the commander makes the actual decision on whether to approve the proposed strike on the target. This phase is where the relevant commander conducts the proportionality balancing for each target. The commander decides in this Phase is whether to approve an entirely new list of targets, add a target to the list, remove a target, or approve a particular means and method of engaging a target.[175] Depending on the ROEs in place for the military operation and the level of collateral concerns, the Secretary of Defense or President may need to approve the decision.[176]

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[171]*See id.* ("No precise means exists to predict noncombatant demographics and this effort is limited to the knowledge of the unique characteristics and cultural behaviors of the region and country as well as the population distributions, customs, and cultural practices, as well as particular habits unique to a region.").

[172] *See id.* The casualty assessment is the product of three important factors: (1) the size of the CHA; (2) the estimated population density in the CHA (or the actual population if known from pattern of life analysis); and (3) a casualty factor. Joint Staff Slides, *supra* note 145, slide 35. The casualty factor is a multiplier applied to the estimated population density in the CHA that accounts for the type of collateral concerns (i.e., indoor, outdoor, or dual-use). CJCSI 3160.01, *supra* note 145, at D-A-32. The precise methodology for casualty assessments is detailed in CJCSI 3160.01, but the final output of the casualty assessment is a number of estimated casualties at three different times: day, night, and episodic events. CJCSI 3160.01, *supra* note 145, at D-A-34 and D-A-35. Episodic numbers are relevant for targets that might have times where more people could be present during certain events (e.g., spectators at a stadium event). CJCSI 3160.01, *supra* note 145, at D-A-31.

[173] Joint Staff Slides, *supra* note 143, slide 15.

[174] *Id.* slide 44.

[175] JP 3-60, *supra* note 10, at II-19.

[176] *See* CJCSI 3160.01, *supra* note 143, at D-A-35.

Phases 5 and 6: Mission Planning, Force Execution, and Targeting Assessment

After the commander's approval of the target and the means and methods of its strike in Phase 4, the JTF or other appropriate authority drafts orders to the relevant subordinate command(s) that will execute or assist in execution of the strike.[177] This is where Phase 5 (Mission Planning and Force Execution) begins. As this Article is focused on the commander's decision in Phase 4 and the preparation to get to that decision, Phases 5 and 6 (Assessment) are not as relevant here. However, there are several key points about these phases that affect the proportionality balancing in Phase 4.

In Phase 5, the actual mission is planned and executed, meaning that the target is struck as ordered. The subordinate commands and the person(s) carrying out the strike are required to apply IHL before and during the strike. The final proportionality decision must be made by the weapon operator (e.g., pilot dropping the bomb) just prior to strike. If conditions have changed regarding collateral concerns from those understood and approved by the commander in Phase 4, the weapon operator may have to suspend or cancel the strike.[178]

If the strike goes forward, an "initial assessment of the physical or functional status of the target takes place . . . [and] the assessment confirms impact of the weapon on the target and makes an initial estimate of the damage."[179] This early battle damage assessment (BDA) of the strike in Phase 5 can confirm whether the target was hit and potentially provide initial information on collateral damage. This BDA is then further developed in Phase 6, where the effectiveness of all the targeting actions in the military campaign is continually assessed.[180] Throughout the military operation, the commander continually reviews assessments developed in Phase 6, helping determine whether targets are being struck effectively and consistent with IHL and whether the right targets are being struck to help achieve the campaign objectives and end state. This assessment information can be critical to the commander's proportionality balancing in two important ways. First, the relative military value of strikes against a particular target or category of targets may change based on that assessment, therefore potentially changing the military advantage side of the proportionality balancing. Second, as discussed further in Section IV, the success or failure of strikes—and whether the actual collateral damage from those strikes match the estimates produced through the CDM process—might affect how the commander views future success and collateral damage estimates.

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[177] JP 3-60, *supra* note 10, at II-20.
[178] *See id.* at II-28 to II-29 (particularly Figure II.15).
[179] *Id.* at II-30.
[180] *Id.* at II-31.

IV. Heuristics, Cognitive Biases, and Proportionality

A. *Overview of Heuristics and Decision Making*

As described in the Introduction, heuristics are the simplifying strategies, or rules of thumb, that human beings use in making decisions.[181] These strategies help people deal with the limitations imposed by their cognitive capacities and the complexity of an environment that does not permit optimization in a normative or rational sense.[182] In some cases, the use of these heuristics may result in outcomes that deviate from some version of the expected utility principle (e.g., the products of normative decision theory or rational choice decisions).[183]

1. Heuristics-and-Biases Approach

Heuristic deviations from rational choice theory are often cast as errors and called cognitive biases.[184] Under this approach to heuristics, these biases are often thought of either as second-best outcomes[185] or just plain "severe and systematic errors,"[186] where optimization given full knowledge would result in the best outcomes.[187] This approach is grounded in one theory of bounded rationality and heuristics put forward by Herbert Simon in the last half of the 1950s.[188] The bounded rationality framework was an early descriptive decision theory, suggesting that individual judgment is bounded in rationality and that it would be better to study the actual decision making of individuals rather than normative decision processes.[189] Reasons for that bounded rationality could include, *inter alia*, a lack of information on the problem and potential options, time and cost constraints, and limited cognitive capacities (e.g., memory, computational skills).[190] Under a common descriptive decision making approach, bounded rationality is seen as the study of "cognitive illusions"—essentially focusing on limitations in human cognitive capacities.[191] This "heuristics-and-biases" approach to heuristics[192] primarily focuses on heuristics as a problem and human

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[181] Max H. Bazerman, Judgment in Managerial Decision Making 7 (6th ed., 2006).

[182] *See, e.g.*, BAZERMAN, *supra* note 182, at 6-7; Engel & Gigerenzer, *supra* note 20, at 3.

[183] For a good foundation on the expected utility principle and normative decision theory in general, *see* PETERSON, *supra* note 12.

[184] *See, e.g.*, BAZERMAN, *supra* note 182, at 7; C. Engel & Gigerenzer, *supra* note 20, at 4; Amos Tversky & Daniel Kahneman, *Judgment under Uncertainty: Heuristics and Biases*, *in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 3, 3 (Daniel Kahneman et al. eds., 1982).

[185] Gigerenzer, *supra* note 22, at 19.

[186] Tversky & Kahneman, *supra* note 185, at 3.

[187] *See* Gigerenzer, *supra* note 22, at 19–21.

[188] *See, e.g.*, Gigerenzer, *supra* note 22, at 22.; Herbert A. Simon, *Rational Choice and the Structure of Environments*, 63 PSYCHOL. REV. 129 (1956).

[189] BAZERMAN, *supra* note 182, at 6.

[190] *See* BAZERMAN, *supra* note 182, at 6; Gigerenzer, *supra* note 22, at 22.

[191] Engel & Gigerenzer, *supra* note 20, at 2-3; Gigerenzer, *supra* note 22, at 22.

[192] See Chris Guthrie, Law, Information, and Choice: Capitalizing on Heuristic Habits of Thought, in HEURISTICS AND THE LAW 425, 432 (G. Gigerenzer & C. Engel eds., 2006); Douglas A. Kysar

judgment as an error deviating from the optimal and rational solutions.[193] In this way, rational choice theory is seen as the normative model of decision making, implying that individuals should make decisions according to rational choice theory; but because of bounded rationality and biases, they often do not.[194]

Both Tomer Broude and Ashley Deeks focus on this first theory of heuristics and bounded rationality in their works covering cognitive psychology and the IHL proportionality decision. This is a natural result of their reliance on Amos Tversky and Daniel Kahneman's early works regarding the intersection of cognitive psychology and decision research.[195] Tversky and Kahneman explain that this this early research was concerned with "internal processes, mental limitations, and the way in which the processes [of decision making] are shaped by the limitations," and their work was motivated by "strategies of simplification [e.g., heuristics] that reduce the complexity of judgment tasks, to make them tractable for the kind of mind that people happen to have."[196] Deeks's draft paper identifies several cognitive biases "and explains how those biases might result in systematically skewed decisions." [197] Broude's article asks whether military commanders are "susceptible to the same distortions of rationality" exposed in Tversky and Kahneman's research. [198] In this approach, the real military commander might be compared to an omniscient, rational military commander. That rational commander makes "optimal" decisions under rational choice theory while the commander constrained by bounded rationality and affected by cognitive biases makes errors and second-best decisions.

The heuristics-and-biases approach remains a dominant approach in legal theory, particularly in the fields of law and economics, behavioral economics, and negotiations.[199] Popular books on individual and government decision making with intended broad appeal focus on this heuristics-and-biases approach.[200] And the approach is attractive in that it remains anchored in the familiar normative theory of expected utility maximization.[201] Although this Article will focus on the

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et al., Group Report: Are Heuristics a Problem or a Solution?, in HEURISTICS AND THE LAW 103, 105 (G. Gigerenzer & C. Engel eds., 2006).

[193] Gigerenzer, *supra* note 22, at 22.

[194] *See id.*

[195] *See, e.g.*, Daniel Kahneman & Amos Tversky, Subjective Probability: A Judgment of Representativeness, 3
COGNITIVE PSYCHOL. 430, 430-54 (1972); Kahneman & Tversky, *Judgment under Uncertainty*, *supra* note 185.

[196] Daniel Kahneman, Paul Slovic, & Amos Tversky, *Preface*, in JUDGMENT UNDER
UNCERTAINTY: HEURISTICS AND BIASES xiii (Daniel Kahneman et al. eds., 1982).

[197] Deeks, *supra* note 28, at 2–3.

[198] Broude, *supra* note 28, at 1153.

[199] *See* Kysar et al., *supra* note 193, at 105–06.

[200] *See, e.g.*, Dan Ariely, Predictably Irrational (2009); Max H. Bazerman & Margaret A. Neale, Negotiating Rationally (1992); Richard H. Thaler & Cass R. Sunstein, Nudge: Improving Decisions about Health, Wealth, and Happiness (2009).

[201] *See* Kysar et al., *supra* note 193, at 107.

heuristics-and-biases approach to proportionality decision making, it is important to recognize some shortcomings of this methodology.

2. Heuristics-and-Biases Approach: Shortcomings

As a first shortcoming, the heuristics-and-biases approach takes optimization and rational choice as theoretically achievable and normatively desirable. This approach is reflected in the steps of a "rational" decision making process and the assumptions that accompany those steps. Under the rational decision making process, the individual: defines the problem, identifies the criteria, weighs the criteria, generates alternatives, rates each alternative on each criterion, and computes the optimal decision.[202] For rational decision making, "decision makers are assumed to (1) perfectly define the problem, (2) identify all criteria, (3) accurately weigh all of the criteria according to their preferences, (4) know all relevant alternatives, (5) accurately assess each alternative based on each criterion, and (6) accurately calculate and choose the alternative with the highest perceived value."[203] The heuristics-and-biases approach takes those assumptions as the basis from which cognitive biases deviate.

However, this ignores the real world where there often is no optimal solution possible because of the nature of the problem or the characteristics of the decision making environment. Problems may have "unknown, vague, or incalculable criteria," or criteria where an adequate weighing function cannot be determined.[204] Some problems also "cannot be solved optimally in light of time, resource, or other constraints imposed on the actual decision-making environment in which the problem must be confronted." [205] In circumstances where optimization is impossible, focus on a rational choice benchmark may mean that some cognitive processes treated as biases or illusions could instead be well-adapted to a particular set of problems or environment.[206]

This first shortcoming seems to have direct salience to the IHL proportionality balancing test. Both sides of the proportionality balancing contain criteria—military advantage on one side and collateral damage on the other.[207] And, rational choice theory might say that there is an optimal solution for balancing these criteria that furthers the goals of the military campaign to the maximum extent possible while preserving civilian life and civilian objects to the maximum extent possible. However, both because of the nature of the proportionality principle and the context of the environment in which the proportionality decision is made, optimization in proportionality decision making is potentially impossible.

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[202] BAZERMAN, *supra* note 182, at 4.
[203] *Id.* at 4–5.
[204] *Id.* at 108.
[205] *Id.* at 118.
[206] *See id*. at 109.
[207] HENDERSON, *supra* note 32, at 204.

Impossibility of optimization from the nature of the proportionality principle arises from the vague and incalculable nature of the two criteria and the lack of an adequate weighing function to compare those criteria. As discussed in Section III, the proportionality principle is not about precise measuring of numbers and values of military advantage and collateral damage—it is *not* about *extensive* incidental losses and damages.[208] Rather, the criteria and the relevant balancing are about 'excessiveness'—permitting a range of solutions as long as one criteria (collateral damage) is not excessive[209] in relation to the other criteria (military advantage). Proportionality in this context is about "reasonableness" and not "rationality" or "optimization," because the principle recognizes the impossibility of placing concrete values on the criteria and the impossibility of precisely weighing those dissimilar criteria.[210] This should be the first caution in applying the heuristics-and-biases approach to proportionality decision making.

The context of the proportionality decision making environment is another deviation from an optimal rational choice-based approach. While a proportionality decision in the context of deliberate targeting at the Joint Task Force level permits more time for consideration than a proportionality decision by a pilot or weapon systems officer releasing a weapon, it is still a decision severely constrained by time and resources.[211] NATO Operation Unified Protector forces conducted almost 1,000 deliberate strikes over seven months. Even if decisions on each of those strikes were evenly spread over those seven months (which they were not),[212] this would be four or five targeting decisions made per day. The commander who approves the placement of deliberate targets on targeting lists has many other duties and meetings on an extremely wide variety of topics throughout a military campaign. Target approval is only one of those topics and the commander may only have a one-hour timeframe in which to consider all the available intelligence, listen to relevant staff advisors, and make decisions on potential targets. In some cases, decisions might need to be made in minutes. Additionally, not only is the commander limited in time but also the targeteers, intelligence analysts, and advisors are constrained in the time they have to prepare

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[208] SCHMITT, ESSAYS, *supra* note 40, at 190–91.

[209] Indeed, under the Rome Statute of the International Criminal Court, "*clearly* excessive." Rome Statute, *supra* note 51, art. 8.2(b)(iv).

[210] *See* SCHMITT, ESSAYS, *supra* note 40, at 190.

[211] Some heuristics research also highlights a difference between "fast, automatic, effortless, implicit, and emotional" decision making (called System 1 thinking) and "slower, conscious, effortful, explicit, and logical" decision making (called System 2). BAZERMAN, *supra* note 182, at 5. The heuristics-and-biases approach and the general purpose heuristics (e.g., representativeness, availability, and anchoring and adjustment) are more likely to fall in the System 1 thinking. Kysar et al., *supra* note 193, at 109. The proportionality decisions made by commanders in the deliberate targeting cycle might contain a bit of both System 1 and System 2 thinking depending on the timescale permitted the commander. However, some have highlighted that it is not clear that this categorization of thinking is helpful or correct. *See* Kysar et al., *supra* note 193, at 109-110.

[212] As with many military operations, deliberate strikes were concentrated during the earlier phases of the operation, with dynamic strikes making the majority of strikes later in the campaign. *See* Romao, *supra* note 145, at 16.

information and advice for the commander. Add to this the limited resources and time a military force has for intelligence gathering regarding the targets,[213] and the deliberate targeting environment is not one that permits optimization.

The second relevant shortcoming of the heuristics-and-biases approach follows from the first—in mostly ignoring the external environment in which decision making takes place and focusing primarily on internal cognitive limitations, cognitive processes and heuristics in this approach may be (mis)applied at too general of a level.[214]

3. Heuristics Program Approach

Under a second view of bounded rationality, human behavior is shaped both by cognition *and* the environment.[215]

> 'Human rational behavior is shaped by a scissors whose blades are the structure of the task environments and the computational capabilities of the actor.' Just as one cannot understand how scissors cut by looking only at one blade, one cannot understand human behavior by studying cognition or the environment alone. As a consequence, what looks like irrational behavior from a logical point of view can often be understood as intelligent behavior from an ecological point of view (e.g., as a response to a social environment or a legal institution).[216]

Under this view, a second model of heuristics, sometimes called the "fast and frugal heuristics program,"[217] or simply the "heuristics program" by those who advocate for that approach,[218] focuses on heuristics as the *solution* in a world where optimization is impossible.[219] This heuristics program has the goal not only of more precisely describing decision making heuristics in different environmental or institutional contexts but also of determining in which environments certain heuristics succeed or fail.[220]

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[213] *See, e.g.*, Romao, *supra* note 145, at 15; FLORENCE GAUB, THE NORTH ATLANTIC TREATY ORGANIZATION AND LIBYA: REVIEWING OPERATION UNIFIED PROTECTOR, THE LETORT PAPERS, 16-18 (June 2013), http://www.strategic studiesinstitute.army.mil/pubs/display.cfm?pubID=1161.

[214] Kysar et al., *supra* note 193, at 114, 118.

[215] Gigerenzer, *supra* note 20, at 22.

[216] *Id.* (quoting in the first sentence, H. A. Simon, *Invariants of Human Behavior*, 41 ANN. REV. PSYCHOL. 1, 7 (1990)).

[217] Guthrie, *supra* note 193, at 431 ("[T]he fast and frugal theorists claim that individuals can, do, and should use simple heuristics because these heuristics will generally produce good outcomes in a fast and frugal manner.").

[218] Kysar et al., *supra* note 193, at 105.

[219] *See* Gigerenzer, *supra* note 20, at 17.

[220] *Id.* at 23.

As compared to the heuristics program, the heuristics-and-biases approach to "general-purpose heuristics" might fail to account for the specificity of the context in which they are applied, leading to contrary predictions of behavior from the same general-purpose heuristic in different contexts.[221] This shortcoming should be kept in mind when looking at the applicability of certain heuristics and cognitive biases in the proportionality decision making context. Before theoretical or empirical analysis, one should ask what is unique about the environment in which IHL proportionality decisions are made during a deliberate targeting cycle and whether that uniqueness informs a different interpretation or application of a particular heuristic.

4. What Heuristics are Not

Finally, it is important to understand that not everything deviating from the rational decision maker is the result of a heuristic. Heuristics are decision making strategies, whether performed consciously or unconsciously, but are not states of mind.[222] Thus, heuristics do not include moods, attitudes, or personality traits.[223] These aspects of an individual could vary based on longer-term factors such as individual's education, religion, and culture and short-term factors such as present disposition, weather, stress, and amount of sleep. Those aspects could still result in deviations from the optimal decision making process, but are not heuristics.

As an example of the above, consider our aversion to killing another human being. This aversion is covered in detail in Dave Grossman's book *On Killing*.[224] Grossman's research illuminates the fundamental subconscious resistance that humans have to killing other humans, a resistance so strong that "the majority of men on the battlefield would not attempt to kill the enemy, even to save their own lives or the lives of their friends."[225] This resistance might fundamentally affect proportionality decision making, but it is not a cognitive process for solving intractable problems and not a simplifying strategy or rule of thumb, thus not a heuristic. Additionally, for the subject of this Article— deliberate targeting decisions made at extreme distance—the internal human resistance to killing becomes significantly attenuated at distance and may have little influence, if any, on the commander's proportionality balancing.[226]

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[221] *See* Kysar et al., *supra* note 193, at 120–21 (Highlighting an example where the representativeness heuristic— described further in this section—produces contrary interpretations and inconsistent applications because of its failure to account for the specific nature and environment in which decisions are made).

[222] Gigerenzer, *supra* note 20, at 20.

[223] Id.

[224] DAVE GROSSMAN, ON KILLING (Revised Ed., 2009).

[225] *Id.* at 4.

[226] *See id.* at 97–110.

With these considerations in mind, the next sub-section focuses on several cognitive processes, whether called heuristics or cognitive biases, that might have an effect on a commander's proportionality decision during deliberate targeting.

B. *Examples of Heuristics and Biases in Proportionality Decisions*

In her draft manuscript, Deeks covers some of the most commonly highlighted heuristics and biases: the availability heuristic and its related biases; source, confirmation, information order, and overconfidence biases; framing and prospect theory; and hindsight and outcome biases.[227]

For example, Deeks hypothesizes how the availability heuristic might have impact on targeting decisions.[228] The availability heuristic states that "people assess the frequency, probability, or likely causes of an event by the degree to which instances or occurrences of that event are readily 'available' in memory … [and] [a]n event that evokes emotions and is vivid, easily imagined, and specific will be more available than an event that is unemotional in nature, bland, difficult to imagine, or vague."[229] Deeks's idea that the availability heuristic could play a

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[227] *See* Deeks, *supra* note 28, at 3–11. While these concepts are covered in depth across literature, Deeks provides concise summaries of these biases. "The *availability heuristic* describes a method by which people "judge probabilities based on the ease with which instances of the phenomenon in question come to mind, based on familiarity, vividness, salience, or emotional impact," regardless of whether such events constitute a representative sample of the universe of those kinds of events." *Id.*, at 3 (citing Jack S. Levy, *Daniel Kahneman: Judgment, Decision, and Rationality*, PSOnline, www.apsanet.org). "The *source bias* tells us that an individual processing data makes simple yes/no decisions about the source's reliability. If he rejects the source, the data plays no further role in his calculations. If he deems the source somewhat reliable, he tends to process the data as though it were wholly reliable, even if he knows that it is not perfectly so." *Id.*, at 5 (citing Richards Heuer, *Strategic Deception and Counterdeception*, INT'L STUDS. Q. 306 (hereinafter Heuer, *Strategic Deception*), https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/psychology-of-intelligence-analysis/index.html). The *confirmation bias* is grounded in a theory that "[o]nce we form an impression about an event or situation, we are biased toward perceiving it the same way, and we interpret subsequent information in a way that confirms our pre-conceptions. Often an impression persists even after the evidence that created the impression is fully discredited." *Id.*, at 5 (citing Heuer, *Strategic Deception* at 306). The theory behind the *information order bias* is that "[w]e are quick to form perceptions and slow to change them, and we give greater weight to the first piece of information that we receive than to subsequent pieces of information." *Id.,* at 5–6 (citing Philip Tetlock, *Accountability and the Perseverance of First Impressions*, 46 SOC. PSYCHOL. Q. 285-92 (1983)). "[T]he *overconfidence bias* can exacerbate mis-judgments of probability; experts have shown that people are overconfident of their judgments, particularly when accurate judgments are hard to make and when individuals possess some expertise." *Id.,* at 6 (citing Christina Wells, *Questioning Deference*, 69 MO. L. REV. 903, 923 (2004)). "The *hindsight bias* tells us that people overstate the predictability of past events." *Id.*, at 8 (citing Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571 (1998)). The *outcome bias* "refers to the tendency of individuals to assess the quality of a decision in view of its outcome or consequences." *Id.,* at 8 (citing Rachlinski, *Judging in Hindsight*, at 581). Framing and prospect theory are already covered in this Article.

[228] *See* Deeks, *supra* note 28, at 3–5.

[229] BAZERMAN, *supra* note 182, at 8–9.

role in the commander's judgment of the probability of a mistake in an attack seems critically relevant here.[230] Relatedly, this heuristic could also influence the weight a commander places on intelligence information and collateral damage estimates. For example, in a hypothetical targeting scenario, the outcome of recent targeting decisions and a recent report of civilian casualties from a coalition strike might play a role as to how the military commander judges her staff estimates of civilian presence and collateral damage for a strike. Even if coalition aircraft were consistently striking targets with high accuracy throughout the entire military campaign, recent mistakes might weigh more heavily in the commander's mind than rational choice theory would say those mistakes should.

Deeks also writes about other biases that could affect the way a commander uses the information from previous strikes to judge the probability of success or accuracy of information for a future strike. For example, possible biases such as the source, confirmation, information order, hindsight, and outcome biases could make certain future probabilities or risks seem more or less certain than a normative, rational choice decision theory approach would estimate.[231] This could directly affect the proportionality balancing by altering the weight or value that the commander gives to one side of the balancing, particularly in regard to military advantage. For example, a combination of the confirmation and outcome biases could lead a commander to look at past successful strikes where an objective was achieved with little to no collateral damage, surmise that the proportionality balancing must have been correct in that case (as a result of the outcome bias), form an impression about a future similar strike scenario proportionality balancing based on that outcome, and then be resistant to change that impression regardless of conflicting information on the new strike (as a result of the confirmation bias).[232]

For his section on proportionality decision making, Tomer Broude's work discusses framing effects.[233] As framing effects and prospect theory are the common topic of Broude and Deeks's works, this Article provides further detail at how framing effects might be placed in the context of deliberate targeting. This Article then also highlights the endowment effect, which is related to framing and could have an effect on real-world proportionality decision making. However, discussion of these issues represents a small amount of cognitive processes that may be present in the decision making environment of deliberate targeting.[234]

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[230] *See* Deeks, *supra* note 28, at 5.

[231] *See id.* at 5–11.

[232] *See id.* at 5, 8.

[233] *See* Broude, *supra* note 28, at 1152–56.

[234] *See, e.g.*, BAZERMAN, *supra* note 182, at 39–40 tbl. 2.2 (Summarizing thirteen biases and their associated heuristics where relevant, all of which could impact the commander's proportionality decision making process: Ease of Recall, Retrievability, Presumed associations, Insensitivity to base rates, Insensitivity to sample size, Misconceptions of chance, Regression to the mean, The conjunction fallacy, Anchoring, Conjunctive and Disjunctive events bias, Overconfidence, The confirmation trap, and Hindsight and the curse of knowledge).

1. Framing, Prospect Theory, and the Reversal of Preferences

a) Overview of Framing and Prospect Theory

Framing and prospect theory is perhaps one of the most well-known subjects of descriptive decision theory. The underlying idea of this theory is that "the relative attractiveness of options varies when the same decision problem is framed in different ways."[235] This reversal of preferences is counter to rational choice theory because the underlying information is objectively the same, but a simple alternative presentation or wording of that information can significantly alter the ultimate decision or preference.[236] The reason proposed for this behavior is that individuals are risk adverse when making decisions regarding gains and risk seeking when making decisions regarding losses.[237] One of the most cited examples of this theory directly from Tversky and Kahneman's research on prospect theory showed that "choices involving gains are often risk averse and choices involving losses are often risk taking."[238] In this experiment involving a program to combat a disease expected to kill 600 people, Tversky and Kahneman found that individuals were much more likely to select a program that saved a definite number of lives (200) over one that had a one-in-three chance to save all 600 lives and two-in-three to save no one. However, when the same choice was phrased as a loss, individuals were much more likely to select the risky program that had a two-in-three probability of that 600 people would die and a one-in-three that no one would die over one that would result in 400 deaths.[239] The number

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[235] Amos Tversky & Daniel Kahneman, *The Framing of Decisions and the Psychology of Choice*, 211 SCIENCE 453, 457 (1981).

[236] BAZERMAN, *supra* note 182, at 43.

[237] *See* Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision under Risk*, 47 ECONOMETRICA 263 (1979).

[238] Tversky & Kahneman, *The Framing of Decisions*, *supra* note 236, at 453.

[239] The full experiment description follows: "[A first group of respondents was given] Problem 1: Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows: If Program A is adopted, 200 people will be saved. If Program B is adopted, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved. Which of the two programs would you favor? [In that first problem set, 72 percent of the respondents selected Program A.] The majority choice in this problem is risk averse: the prospect of certainly saving 200 lives is more attractive than a risky prospect of equal expected value, that is, a one-in-three chance of saving 600 lives. A second group of respondents was given the cover story of problem 1 with a different formulation of the alternative programs, as follows: Problem 2: If Program C is adopted 400 people will die. If Program D is adopted there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die. Which of the two programs would you favor? [In the second problem, 78 percent of respondents selected Program D.] The majority choice in problem 2 is risk taking: the certain death of 400 people is less acceptable than the two-in- three chance that 600 will die. The preferences in problems 1 and 2 illustrate a common pattern: choices involving gains are often risk averse and choices involving losses are often risk taking. However, it is easy to see that the two problems are effectively identical. The only difference between them is that the outcomes are described in problem 1 by the number of lives saved and in problem 2 by the number of lives lost. The change is accompanied by a pronounced shift from risk aversion to risk

that could be definitely saved in each formulation of the problem is identical (200 individuals); however, the preferred option was different based on the phrasing of the problem. There are many other examples of empirical confirmations of framing and preference reversals in other subject areas such as negotiations;[240] however, the Tsversky and Kahneman example seems particularly apt for the proportionality balancing as it involves decisions on risks regarding human lives.

b) Framing and the Proportionality Principle's Wording

Ashley Deeks highlights the formulation of the IHL proportionality principle as balancing gains (military advantage) against losses (civilian lives and objects), and posits that the application of prospect theory might indicate the principle is framed in a way to be more protective of civilian life.[241] Under prospect theory, military commanders might be more risk-seeking when it comes to avoiding the loss of civilian lives and more risk-adverse when it comes to maximizing the gain from military advantage.[242]

However, this hypothesis could potentially run the opposite way in the proportionality balancing context. Prospect theory is about values *and probabilities* in situations of risky choices.[243] As illustrated in the example by Tversky and Kahneman above, being risk-seeking when it comes to gains means preferring the uncertain loss over the certain loss and the reverse is true for gains (preferring the certain gain over the uncertain gain). As illustrated in Section III, the collateral damage estimation given to the commander for a deliberate targeting decision is very rarely certain, particularly for situations of higher collateral damage estimates (CDE) (i.e., where weaponeering restrictions have had to be put in place to minimize collateral damage). In situations where the proportionality balancing is going to be most relevant, there are times when the losses of civilian lives and damage to civilian property will be quite uncertain. The reasons are covered in more detail above, but the lack of complete information about the target and surrounding collateral concerns, the assumptions that the collateral damage methodology (CDM) has to make, and the unaccounted potential secondary effects from a strike, all contribute to the uncertainty of collateral damage.

Conversely, the military advantage can and will often be framed concretely to the commander. Military advantage cannot be quantified into a

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taking. We have observed this reversal in several groups of respondents, including university faculty and physicians. Inconsistent responses to problems 1 and 2 arise from the conjunction of a framing effect with contradictory attitudes toward risks involving gains and losses." Tversky & Kahneman, *The Framing of Decisions*, *supra* note 236, at 453.

[240] *See, e.g.*, Bazerman & Neale, *supra* note 201, at 31-41; Margaret A. Neale & Max H. Bazerman, Cognition and Rationality in Negotiation, 44–48 (1991).

[241] Deeks, *supra* note 28, at 7.

[242] *Id.*

[243] Tversky & Kahneman, *The Framing of Decisions*, *supra* note 236, at 454.

number—the staff cannot tell the commander "this is a military advantage of a 7 on a 1 to 10 scale." However, military advantage still can often be framed with a particular certainty. Consider the following briefings to a commander on military advantage:

> "Sir, you will severely disrupt the command and control capabilities of the enemy force in this 100-mile radius for at least one week."

> Or, "You will destroy 24 aircraft and keep the enemy from using the runway for at least 24 hours."

A military commander might be able to understand those concepts more concretely (and with more certainty) than a casualty assessment that predicts a certain number of civilian lives lost by a strike but that is still grounded in a large amount of uncertainty.

There are undeniably circumstances where a military advantage could be uncertain. However, in prospect theory (as in expected utility theory), the *value* of the risky choice is still critical to a decision. Prospect theory alters the linearity of that value function, but it is not eliminated. Therefore, even in a "gain" situation of determining military advantage, the potential value of that military advantage is essential to the decision. Because of this, it is likely that in situations where military advantage is uncertain *and* the value of that advantage is low, the target might not have been struck anyway under the military principle of economy of force (see Section II). Shown in the description of Phases 1 and 2 of the deliberate targeting cycle, the targets selected for review by the commander have already been determined to have a high enough military value to make them worthy of a strike. In developing the detailed target system analysis of Phase 2, the JTF staff is defining in as precise and concrete way as possible the military advantage to be gained from a strike. This could mean that there will be many fewer "uncertain" gains (military advantage) presented to the commander than uncertain losses (collateral damage).

Under this framework, instead of being more protective of civilians, the proportionality principle might favor strikes where losses are uncertain and gains are relatively certain, which could be the majority of lethal targeting decisions. However, this is just a hypothetical application of the targeting context to framing effects and prospect theory. Until this thesis is tested in empirical studies, it is not fully clear which way the proportionality principle is fundamentally structured under a prospect theory analysis. However, if true, this might mean that the current wording of the proportionality principle could be less protective of civilian life and property instead of an alternate wording.

c) Framing the Proportionality Balancing to the Commander

Tomer Broude presents a separate way of looking at proportionality and prospect theory—that of the perspective of *how* the proportionality balancing is presented to the commander. Under Broude's hypotheticals, the framing of the collateral damage or framing of military advantage from a strike might affect the way the commander conducts the balancing.[244] In one example, Broude proposes an experiment similar to that described above by Tversky and Kahneman where the incidental effects on civilians from a strike would be either framed as the number of civilians that will survive a strike (with a certain option and an uncertain option) or framed as the number of civilians that would die from a strike (also with a certain and uncertain option).[245] Under Broude's experiment, the theory is that the commander will prefer those attacks where it is certain that a concrete number of civilians will survive over a situation where there is a substantial risk that no civilians will survive. Conversely, under Broude's theory, the commander would prefer those attacks where there is a substantial risk that all civilians might die over an attack where it is certain that a specific number of civilians will die.[246]

While the framing of the proportionality problem to the commander could have an effect on his ultimate decision as will be discussed further below, particularly in reference to the endowment effect, the experiment proposed by Broude has two shortcomings. First, it is not an accurate reflection of the phrasing of the principles of IHL. While the overall humanity goals of IHL might be phrased as *protecting* lives and property,[247] IHL is not about *saving* lives. Rather, it is fundamentally about balancing the principles of military necessity with humanity; it acknowledges that war exists and is violent but tries to reduce this violence to smallest level possible.[248] It is to "diminish the evils of war, as far as military circumstances permit."[249] Thus, IHL necessarily implies a focus on *reducing losses* of protected persons and objects. The principles of IHL are then phrased in a way that reflects this focus. The precautionary principle is about

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[244] Broude, *supra* note 28, at 1153–54.

[245] "Two groups of subjects would be presented with the following hypothetical: Imagine that the enemy has stockpiled a significant quantity of strategic munitions in the basement of an apartment building that normally houses 200 civilians. As part of a military operation your unit has been assigned the mission of eliminating this stockpile. You have two alternative plans of action to choose from, both of which will eliminate the munitions. A first group of subjects would be posed with this question: If plan A—a manned aerial attack—is adopted, 80 civilians will survive. If plan B—an unmanned drone attack—is adopted, there is 1/3 probability that all civilians will survive, and 2/3 probability that no civilians will survive. A second group of subjects would be posed with what is in essence the same scenario, but framed differently: If plan A—a manned aerial attack—is adopted, 120 civilians will die. If plan B—an unmanned drone attack—is adopted, there is 2/3 probability that all civilians will die, and 1/3 probability that no civilians will die." *Id.* at 79–80.

[246] *See id.* at 80.

[247] *See* SCHMITT, ESSAYS, *supra* note 40, at 92.

[248] See id.

[249] Hague IV, *supra* note 45, ¶ 5.

reducing collateral damage (losses) to a minimum. The principle of distinction is about causing no intentional losses of civilians and civilian objects. The proportionality principle is about balancing against losses of civilian life and property.

If proportionality balancing focused on lives saved or civilians that survive, it may fundamentally alter the intended protective nature of the principle, and not necessarily in a more protective way. In other words, while framing a problem as "civilian survivors" is attractive from an academic standpoint to explore the effects of framing in proportionality decisions, it could run counter to how IHL is structured. Broude's proposed experiment is only using surviving civilians as the inverse of lives killed in a singular context; however, if the implication is that commanders should look at how many civilians will survive from a particular strike in a proportionality balancing, then why should the commander not expand her consideration to how many civilians will "survive" in the immediate area if the target is destroyed (e.g., maybe the target was causing a threat to other civilians in the area)? Why should the commander not focus on how many civilians will survive in the entire area of hostilities if the conflict is ended more quickly because of the strike? Additionally, by focusing on those that live instead of those that die, it might make a targeting decision morally and subconsciously easier.

The second problem with the proposed experiment deals with how the targeting process and collateral damage estimations work in reality. Because the doctrines for targeting and CDM are built off of IHL as actually written, they are fundamentally structured to consider collateral damage as losses and not gains. Weapons do not save lives and their principal goal is not civilian survivors, but their effects can be studied and their effects minimized through weaponeering. The entire scientific research and analysis of weapons and weapon effects looks at the range, nature, and severity of their collateral effects (i.e., potential injury to humans and damage to objects).[250] Weaponeering, described above in Section II and III, is partly about reducing the incidental losses to civilians and civilian objects. And, the CDM is about minimizing civilian losses at each level of CDE and then phrasing the casualty assessment in terms of loss of life. The final question of CDM asks: "How many civilians and noncombatants do I think will be injured or killed by the attack?"[251]

Broude's proposed experiment could better illuminate how proportionality decision making actually works, and perhaps inform Deeks's question regarding the framing of the principle itself. However, the above discussion highlights how any empirical study of proportionality decision making must consider the actual context of how those decisions are made. If not placed in the context of a real

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[250] *See generally* DRIELS, *supra* note 146; Humphrey et. al., *supra* note 146.
[251] CJCSI 3160.01, *supra* note 143, at D-A-30.

targeting decision, results from an experiment might reveal heuristics and biases that are actually inapplicable in the specific environmental context of targeting.

2. The Endowment Effect

Given the specific context of the targeting cycle, particularly the U.S. joint targeting cycle, different presentations of the same information to a commander could result in a difference in proportionality decisions. The above subsection suggests some areas where that might occur, but one particular cognitive effect might have relevance at how targeteers actually format their presentations of information to military commanders in Phase 3 and Phase 4 of the targeting cycle. This is the "endowment effect."

The endowment effect is fundamentally about how people determine the value of certain items or ideas. Highlighted in the discussion of prospect theory versus expected utility theory above, Tversky and Kahneman proposed that individuals value choices (prospects) differently based on whether they represent a gain or a loss. This basic idea is known as loss aversion—the notion that "the disutility [negative value] of giving up an object is greater than the utility [positive value] associated with acquiring it." [252] The theory behind the endowment effect is similar—individuals place different values on choices based on their relative attachment to the item or idea underlying the choice.[253] Those subjective values differ from what would be expected in under traditional economic theory. [254] Thus under the heuristics-and-biases approach, the endowment effect results in anomalies or asymmetries of value to the choices made by a rational economic actor.[255]

Literature regarding the endowment effect contains many examples of experiments and anecdotes to provide the effect's reality in decision making. Kahneman, Knetsch, and Thaler's oft-repeated experiment involved the differing values that individuals placed on coffee mugs relative to whether they "owned" the mug or not, finding that those individuals told they "owned" the coffee mug valued the mug more than twice that of the other participants.[256] Anecdotally, Kahneman, Knetsch, and Thaler give the following example of how people

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[252] Daniel Kahneman, Jack L. Knetsch, & Richard H. Thaler, *The Endowment Effect, Loss Aversion, and Status Quo Bias*, 5 J. ECONOMIC PERSPECTIVES 193, 194 (1991).

[253] *See id*. at 194–197 (1991). *See also* BAZERMAN, *supra* note 182, at 51 ("Objectively, the valuation of a commodity should be based on its true value. However, the value that a seller places on a commodity often includes not only its intrinsic worth, but also value based on his or her attachment to the item.").

[254] *See* Kahneman, Knetsch, & Thaler, *supra* note 253, at 195–96.

[255] *See id.* at 194.

[256] *Id.* at 195–96. *See also* BAZERMAN & NEALE, *supra* note 201, at 37; BAZERMAN, *supra* note 182, at 51 (both discussing the coffee mug example).

"demand much more to give up an object than they would be willing to pay to acquire it":[257]

> A wine-loving economist … purchased some nice Bordeaux wines years ago at low prices. The wines have greatly appreciated in value, so that a bottle that cost only $10 when purchased would now fetch $200 at auction. This economist now drinks some of this wine occasionally, but would neither be willing to sell the wine at the auction price nor buy an additional bottle at that price.[258]

In his book on individual choice and behavioral economics, Dan Ariely devotes a chapter to the endowment effect.[259] One of Ariely's examples is an experiment he held among the students of Duke University regarding tickets to Duke University men's basketball games.[260] In Ariely's experiment, he asked students that won a basketball game ticket in a lottery to give a minimum price at which they would sell their ticket, and he also asked students that had not won tickets to give him the highest price they would pay to obtain a ticket.[261] Mirroring the results from other endowment effect experiments, the average selling price given was about fourteen times higher than the average buyer's offer.[262] Ariely highlighted the apparent irrationality of the endowment effect by these results: "From a rational perspective, both the ticket holders and the non-ticket holders should have thought of the game in exactly the same way. After all, the anticipated atmosphere at the game and the enjoyment one could expect from the experience should not depend on winning a lottery."[263]

3. Framing, Endowment Effect, and Presentation of Targeting Information

Could this same effect influence proportionality decision making by commanders? Ariely posits that: "Ownership is not limited to material things. It can also apply to points of view. Once we take ownership of an idea . . . [w]e love it perhaps more than we should."[264] Under this approach, the endowment effect could apply to influence the value a commander places on military advantage, civilian lives, or civilian objects depending on her relative attachment to those parts of the balancing. Each of those parts is both a tangible thing and an idea, and if, for example, a commander feels more attachment to a certain military advantage as described further below, he might be less willing to disapprove a

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[257] Kahneman, Knetsch, & Thaler, *supra* note 253, at 194.

[258] *Id.*

[259] ARIELY, *supra* note 201, at 127–38 (Chapter 7: The High Price of Ownership: Why We Overvalue What We Have).

[260] *Id.* at 127–133.

[261] *Id.* at 130–33.

[262] *Id.* at 132–33. *See also* BAZERMAN, *supra* note 182, at 52 (discussing a similar experiment performed by Richard Thaler regarding tickets to an important professional basketball game).

[263] ARIELY, *supra* note 201, at 133.

[264] *Id.* at 137–38.

strike relative to the "true" or objective military advantage of a certain target (e.g., in the eyes of a reasonable military commander in his situation) and more willing to overlook larger variations in collateral damage. This is in part because the commander might actually "own" the military equipment and personnel from a command and control perspective and that equipment and personnel are an integral part of the military advantage determination. This could also be a result of the confirmation bias highlighted by Deeks and discussed briefly above; [265] however, the framing of a targeting problem itself might influence the attachment a commander feels to one part of the proportionality balancing and thus potentially change the ultimate decision.

In Section III.2, this Article detailed the phases of the targeting cycle in relation to the proportionality decision, but perhaps as important as the substance of the phases is how that information is presented to the commander for a decision. During Phases 1 through 3 of the targeting cycle, targeteers and other staff at the commander's headquarters (and other commands) collect, analyze, and make determinations on information relating to every target that will be brought before the commander for approval. This information is often presented to the commander in the form of slides or other combination of textual and graphical depiction of the target information. Most deliberate target presentations are likely to contain information such as: the overall objectives the strike will accomplish, how it will advance the goals of the mission and move the military campaign toward the end state, the particular importance of this specific target to a larger target system, the location of the target and nature of the surrounding area, the proposed weapons, the proposed method of delivering the weapons, the estimated range of damaging effects of those weapons, the collateral concerns in vicinity of the target (e.g., civilians and civilian objects), and the estimated collateral damage from the recommended strike. It is possible that simply the order in which this information is presented to the commander could have an effect on the commander's proportionality decision.

In the author's experience as the Legal Advisor for a NATO Maritime Headquarters and as a Staff Judge Advocate for a U.S. Carrier Strike Group, the first slide that often shows up for the commander's review is some form of a target overview slide. In this overview, the elements that make up the military advantage side of the proportionality balancing often appear or are briefed more prominently (e.g., importance of the target, effect on target from the strike, contribution to military objectives and the end state). The collateral damage aspects may appear less prominently in this overview, perhaps only with the numerical CDE Level indicated. The graphical depiction of the target on the overview slide might indicate collateral concerns, but often those are left for later slides when CDE might be discussed in detail. The information making up the military advantage criteria has been developed by the staff throughout the earlier phases of the targeting cycle, and the targeting cycle is set up only to have those

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[265] *See* Deeks, *supra* note 28, at 5.

specific targets proposed that contribute to military advantage. Perhaps fundamentally affected by confirmation bias and endowment effects themselves, the briefers from the targeting section (e.g., the Chief Targeteer) or others on the joint staff focus initially on those benefits of striking the proposed target (e.g., the military advantage).

As the staff continues to brief the targeting package to the commander, the harm to civilians and civilian property likely gets discussed in greater detail. Slides regarding intelligence information may follow the target overview slide. These slides are important to allow the commander to see the sources of information that form the basis of the staff recommendations and to personally weigh that information before approving a strike on the target. This intelligence information is likely to cover both sides of the proportionality balancing, providing intelligence regarding the value of the target and regarding the nature and location of potential civilians and civilian objects.

The next slides might represent the proposed weapons and their aimpoints graphically (e.g., satellite picture overlays) and textually (e.g., names and types of weapons, GPS coordinates). This slide or set of slides might not yet contain graphical depictions of collateral concerns or effects, and is instead meant to show the commander what specific targets are proposed for strike. For example, if the overall proposed target was a large industrial plant critical to the manufacture of enemy artillery munitions, the plant will likely consist of several buildings that provide different functions to the overall manufacturing effort. As described in Section III, the targeting staff performs an analysis to determine which buildings to strike and where on those buildings to strike to achieve the desired effect(s). This targeting analysis is not focused first on collateral concerns, but rather on an efficient use of force to ensure the effect is achieved. Therefore, a briefing to the commander regarding this hypothetical third set of slides is also likely to focus on the military advantage aspects of the target—what aimpoints and weapons will achieve the goals of this proposed strike.

It is not until the fourth set of slides in this hypothetical scenario that collateral concerns might be discussed in more detail. At this point, it is likely the majority of the information in the slides and/or the briefing has been weighted toward the military advantage from striking the proposed target(s). Often only in the final set of slides does a graphical and textual depiction of the collateral damage estimate appear and, if relevant, is detailed information on the casualty assessment depicted. This ordering of information is also reflected in the nomenclature itself of "collateral damage," which indicates that this is a secondary concern after an initial decision is made to strike a target based on military necessity.

The typical sequence of applying IHL principles also places civilian lives and civilian property toward the end. Before the commander can legally target a person or object, the principles of military necessity and distinction must be

satisfied. Both of those principles focus the commander in large part on justifying the military advantage of the target. Only after a target is determined to be lawful itself are incidental civilian casualties and damage to civilian property considered in the principles of precautions in attack and proportionality.

In the author's experience, it often is not until the end of the briefing that the commander's special advisers, particularly the Legal Adviser, discuss particular concerns and make their recommendations. The commander can and does often ask questions of the advisers earlier in a target briefing, but the question of the proportionality principle is typically only discussed in detail at the end. This makes practical and theoretical sense, as the commander needs to hear and see all the information relevant to the proportionality balancing before making a decision.[266]

The ordering of the information and briefing described above is certainly not the only way to approach a target briefing or target package and it is likely that many briefings are conducted differently based on, *inter alia*, the level of decision making in the government, the particular preferences of the commander, the guiding doctrine of the relevant nation, the availability of information, and the time restraints for a decision. However, whether the ordering itself affects proportionality decision making should be explored further in both empirical and theoretical studies.

One approach to the endowment effect and framing suggest that early presentation and focus on military advantage-type information would form a particular attachment of the commander to that military advantage.[267] Hearing and seeing early in a target briefing or slide package how a particular strike on a target weakens the enemy and provides for accomplishment of campaign objectives not only makes the military advantage more concrete and certain in the commander's mind (see Section IV.2.A) but also creates a certain ownership by the commander over that idea of military advantage. Early in the target briefing, the commander might visualize in her mind the positive effects from a strike, whether it is in

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[266] Additionally, in some military operations, decision makers may desire to receive a pre-briefing on the targets before the actual meeting where the targets are approved. This pre-meeting might highlight the importance of the targets and include a brief description of the concerns to be presented by the Legal Adviser or other staff. Depending on how these pre-meetings are conducted, they could have influence on the way the endowment effect or confirmation bias works in the ultimate proportionality decision.

[267] Note that this theory focuses on the primacy, or information order, bias in the presentation of information and not necessarily the potentially better availability in the decision maker's mind of having information presented at the end of the presentation. Under the theory here, the commander's "ownership" of military advantage versus collateral damage is influenced by the ordering of that information at the beginning of the targeting presentation. This also follows the information order bias described in footnote 236, in which we give greater weight to the first piece of information received. However, as discussed further at the end of this Section, the recent availability of that information could potentially yield an opposite result in the framing of a targeting problem.

protection of the coalition forces, specific degradation of an enemy capability, or certain progress toward a military campaign objective set by higher authority. Similar to the idea of "owning" a coffee mug, bottle of wine, or basketball tickets, the commander now has a concrete "ownership" of what she will accomplish from this strike and she might overvalue the military advantage of a strike on that target as compared to a disinterested and rational commander that is able to see all the information on military advantage and collateral damage at the same time and optimize the proportionality balancing.

However, as described in Section III.1, a common approach to judging application of the proportionality principle is *not* about the rational military commander but about the *reasonable* military commander. In Section IV.1, the Article discussed some reasons why the situation presented to the reasonable military commander is not capable of optimization, and the reasonable military commander standard is based on a "reasonably well-informed" (not omniscient) person "in the circumstances of the actual perpetrator, making reasonable use of the information available."[268] This requirement does not seem to speak of perfect rationality. Someone 'in the circumstances of the actual perpetrator' would presumably come with all the cognitive biases that might be present in the circumstances of the proportionality decision. Thus, any studies looking at cognitive effects in proportionality decision making, the standard should not be a comparison to this mythical rational commander making decisions based on expected utility theory. Rather, empirical studies should test how a certain cognitive effect, when examined in different settings, with different background information, or in different frames, might result in different decisions. The question is not comparison to the rational actor; rather, it is comparison to a situation where information on collateral damage is presented earlier in the target briefing than information on military advantage.

The continuation of this approach to framing and the endowment effect is that if concrete information on civilians and other noncombatants living in the vicinity of the target and on civilian homes, vehicles, businesses, and other civilian objects were presented earlier in the briefing process, the commander might form an early attachment or ownership to the idea of such civilians and civilian property. In this presentation format, the commander might then value the collateral damage side of the proportionality balancing more than if the same information was placed at the end of the briefing. Under this framing of the target information, the briefing could describe and the commander might first visualize the potential consequences of the loss of civilian life or damage to civilian property before considering what military advantage might arise from the proposed strike. Under this hypothesis, the commander would become attached to the civilians and civilian property in her mind, placing greater value on those under the endowment effect theory.

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[268] Prosecutor v. Galić, supra note 17, ¶ 58.

4. Potential Empirical Study

Given this hypothesis, a potential empirical study would present an identical targeting scenario to a set of participants. This study would ideally be conducted with those individuals already familiar with IHL principles. However, if the participants were not already familiar with the basic concepts of IHL, they would be given a short primer on the concept of proportionality. The participants would be told to assume that a strike on the target was lawful if the proportionality principle was satisfied. The participants would be told to assume that all information regarding the advantage from strike and the estimated collateral damage from the strike is accurate. Finally, the participants would be told to assume that all weapons would be delivered as proposed and function as designed. The targeting scenario would then be presented in to the participants in two slides:

> <u>Military Advantage Slide</u>: Presents an overview of the target, with the following components on the slide:
> - Satellite image of the target with a designated aimpoint of a bomb, but with no indications of collateral concerns or collateral damage effects on the image;
> - Short description of the proposed weapon;
> - Short description of the desired effect of the weapon (e.g., destroy the target), and a more detailed (e.g., one to two paragraph) description of how destruction of the target would contribute to military goals, protect allied forces, weaken the enemy armed forces, and bring about the successful conclusion of the military operation.
>
> <u>Collateral Damage Slide</u>: Presents an overview of the incidental loss of civilian life and damage to civilian objects from the proposed strike, with the following components on the slide:
> - The same satellite image of the target in the Military Advantage Slide, but with a graphical depiction of the collateral hazard area of that weapon in one color and with collateral concerns inside and near the CHA highlighted in a different color;
> - One to two paragraph textual description of those collateral concerns;
> - A precise casualty assessment number estimating the death or serious injury of a significant number of civilian lives from the strike (e.g., five civilian casualties).

In the initial study, the participants would be divided into two groups. Each group would be presented the identical two slides, but the first group would see the military advantage slide first and the second group would see the collateral damage slide first. Participants would then be asked two questions:

> First, a yes or no question on whether they believe the proportionality principle has been satisfied in this scenario.

> Second, regardless of the answer to the first question, each participant would be asked, assuming the incidental damage to civilian objects remains constant, what is the maximum number of incidental civilian casualties he or she would permit for the proportionality principle to be satisfied.

As a control to see if participants understood the problem, the answer to the second question should be lower than the casualty assessment number (in the collateral damage slide) for those that said proportionality was not met, and it should be equal to or higher than the casualty assessment for those that believed proportionality was met. For example, if the casualty assessment on the second slide was five civilians significantly injured or killed by the strike, those respondents that believed the proportionality principle was not met should answer the second question with four or fewer civilians. Those that believe the proportionality principle was met during the strike should answer five or more civilians to the second question. The experimenter could disregard those results that do not satisfy this control.

Under this approach to the endowment effect hypothesis, those participants that were shown the military advantage slide first should be more likely to find that proportionality is satisfied than those that were shown the collateral damage slide first (i.e., there should be more "yes" answers to the first question for the group shown the military advantage slide first). Additionally, for those in each group that have the same answer on the proportionality question, the amount of civilian casualties permitted under the second question should be lower for those shown the collateral damage slide first. For example, if a respondent from each group answered "yes" to the proportionality principle question, the respondent who was shown the collateral damage slide first should provide a lower number to the second question than the respondent shown the military advantage slide first.

However, there are several reasons why respondents (and commanders) could answer exactly the opposite way. Some of these might be related to the availability bias, particularly dealing with the recency of information. As discussed in Section IV.2., the availability of information to the commander could influence how that information is weighted. Availability focuses on how readily available certain information is in the memory of the decision maker. Some of what makes information more available is influenced by how easily imagined,

specific, and vivid a particularly memory is in comparison to other memories. Another critical factor could be how recent the event or idea was received by the decision maker. A concept described one minute ago could be more "available" than a concept described ten minutes ago in a targeting briefing, and therefore that concept might have more influence on the commander's decision making.

One can imagine other empirical studies that more closely model the multiple slide presentations of the targeting cycle, but first conducting the above simple experiment might provide an initial determination of whether and how the framing of targeting problems plays a role in the proportionality decision.

Conclusion

Research and empirical studies like those above, those proposed by Tomer Broude, or those encouraged by Ashley Deeks should matter to governments and may have an effect on the development and interpretation of IHL. As Deeks writes, "It is in everyone's interests for military proportionality analyses to be as accurate and defensible as possible."[269] For Broude, the experiments could test the "rationality" of military commanders in different situations and could have "great potential to inform international humanitarian law."[270] The experiments could also test whether a change in the current wording of the proportionality principle would have any influence on the treatment of civilian casualties and civilian objects. If numerous decisions regarding proportionality are constantly being made worldwide and the content of IHL is determined in part by state practice, there could be significant value in descriptive decision theory research regarding the actual application of those IHL principles in practice.[271]

The results of this research may show that heuristics and cognitive biases, to the extent they apply in the specific environment of targeting decision making, do not have much effect at all on application of IHL principles in certain contexts. For example, it is possible that the highly structured processes of U.S. joint targeting and the advice of diverse staff and special advisors (e.g., legal and political advisors) before the commander makes a proportionality decision would reduce the impacts that any potential bias might have. Additionally, it is possible that the deliberate targeting process is on a slow enough time scale to reduce the relevance of unconsciously-applied heuristics and cognitive biases. However, based on a review of the literature cited in this Article, it is likely that the

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[269] Deeks, *supra* note 28, at 19.

[270] Broude, *supra* note 28, at 1155.

[271] An analysis of descriptive decision theory in IHL decision making, particularly regarding the proportionality decision, could also have critical importance in the debate over Autonomous Weapon Systems. See, e.g., Mark Roorda, *NATO's Targeting Process: Ensuring Human Control Over and Lawful Use of 'Autonomous' Weapons*, NATO Allied Command Transformation Publication on Autonomous Systems (own publication series) (forthcoming 2015) (manuscript at Amsterdam Law School Research Paper No. 2015-13, Apr. 13, 2015, http://ssrn.com/abstract= 2593697).

empirical research would show that some heuristics and biases have significant effects on proportionality and other IHL principle decision making.

The nature and type of the effects of cognitive processes on proportionality decision making could determine how governments, scholars, and other interested parties such as NGOs and international tribunals would react. This Article has not focused on whether heuristics produce good or bad results; they can do both depending on the frame of reference and social or legal goal to be achieved by the relevant decision.[272] Some heuristics might be ill suited to particular decision making environments, and therefore produce unreliable or undesirable results.[273]

As suggested by the discussion on framing and endowment effects, cognitive biases might cause commanders to be less consistent in their proportionality judgments based on factors unrelated to the actual underlying information. This would run counter to a social goal of consistency in the application of international law norms. In a case such as this, governments and international military organizations might respond through structural, institutional, or process changes to how targeting decisions are made.[274] For example, to achieve better consistency, militaries might begin mandating a certain format to targeting briefs, certain inputs from special advisors in target briefings, or detailed checklists of considerations before making a proportionality decision.[275] Many of these process elements are already in place in the U.S. joint targeting doctrine as described in Section III.

Another possibility is that heuristics and cognitive biases might cause commanders to be more or less protective of civilian life in proportionality decision making. Section IV.2.A provided an example of how prospect theory and the framing effect might make the current wording of the proportionality principle *less* protective of civilian life. Deeks theorized that the wording might produce the opposite effect and act to better protect civilian life.[276] If the goal of the proportionality principle, along with the other IHL principles, is to achieve a balance between military necessity and humanity and to protect the innocent victims of armed conflict, then cognitive processes that upset this balance, particularly in favor of more violence, may be undesirable. Given a better understanding of how proportionality decisions are actually made and influenced by cognitive processes, the principle of proportionality could be amended or supplemented in international law to account for any systematic biases in its application.[277]

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[272] *See, e.g.*, Engel & Gigerenzer, *supra* note 20, at 11; Kysar et al., *supra* note 193, at 119.
[273] Kysar et al., *supra* note 193, at 119–20.
[274] *See* Deeks, *supra* note 28, at 12–15.
[275] *See id.* at 14.
[276] *See id.* at 16.
[277] *See id.* at 15–17.

There is a risk to this research into the heuristics and cognitive biases that might affect commanders in proportionality decision making. As governments understand better what heuristics appear in those decision processes and how they specifically affect the proportionality balancing, governments could tailor military doctrine and procedures to enhance and emphasize those heuristics that favor potentially more aggressive and violent applications of proportionality and other IHL principles. In this case, "even well-adapted heuristics may become candidates for legal intervention if they are employed in service of a goal that society regards as illicit, wrongful, or otherwise undesirable."[278] However, without a better understanding of decision processes in application of IHL principles, it would be difficult to determine when heuristics and cognitive biases are being used contrary to social goals and even more difficult to design solutions for legal intervention if desired.

Before exploring any of those questions, it is critical to continue to study what heuristics and cognitive biases appear in the IHL proportionality decision and how they actually affect proportionality decision making.

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[278] Kysar et al., *supra* note 193, at 121.