Geographic Complex Adaptive Systems: Mapping the Ontology of Modern Mass Killing

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Abstract

What is the ontology of modern mass killing? Why does mass killing occur in some conflicts and not others? Much of the academic and policy literature uses methods that emphasize categorization that manifests as stages or discrete lists. In this paper, I argue the complexity of human systems, including mass killing systems, deserves a greater role in prevention research and post facto analysis and I posit a hybrid schematic called geographic complex adaptive systems that combine complex adaptive systems and geographies of power. They are explicitly geographic and utilize the unique ways that geographers see human systems - spatially, integrated, and constructed. I outline how the schematic could apply to the case of mass killing in Democratic Republic of the Congo during the Second Congo War. The case study offers support for the position that long-term power shifts in systems present opportunities for mass killing.
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Introduction

The mass killing of the twentieth century represents an inability of international actors, states, and communities to prevent the scourge of violence.¹ From Armenia to Liberia, large-scale political violence plagued a century popularly characterized by unprecedented progress.² In the aftermath of the genocide in Rwanda, intervention in Bosnia, and slaughter in Darfur, the international community functions in an unprecedented era of connectedness. However, ongoing conflicts in Burma, Democratic Republic of the Congo, Nigeria, Iraq, Syria, and elsewhere underscore a need for a greater understanding of the ontology of mass killing, or how these episodes come to be. With greater knowledge comes the potential for increased prevention capacity when coupled with political will and creative peacebuilding.

There is a tendency in the literature to figure out how to stop the next episode. The intention is more than curiosity or knowledge for knowledge’s sake, but rather a search for applied understandings that could stop people from dying. However, there is another tendency among scholars and advocates to focus on response. The Responsibility to Protect doctrine, an increasingly hegemonic foreign policy norm in the Northwest, is invoked as a way to respond to mass killing. Often missing from this discourse and policy is the prevention of mass killing. Despite economic advantages over response and the avoidance of potential military action, prevention is sometimes pushed to the margins likely because it requires long-term planning and a willingness to engage prior to a newsworthy crisis. A greater understanding of how mass killing comes to be might enhance the international community’s ability to practice targeted, effective prevention and, ultimately, save lives.

¹ Author’s Note: I thank the following individuals for their guidance, in various capacities, during the construction of this paper: Scott Kirsch, Patricia Sullivan, Daniel Solomon, Erin Murphy, Danny Hirschel-Burns, Shomya Tripathy, Hannah Finnie, Shannon Steel, and Jason Langberg.
This paper’s scope is social-scientific and policy-oriented. The study of mass killing is inherently multidisciplinary and has the potential to include psychology, economics, linguistics, and anthropology, among others. However, due to inevitable limitations, the paper will focus most on the politico-scientific and geographical lenses through which to view mass killing while remaining under the umbrellas of conflict studies and international relations. This selection is intentional in order to best understand the primary and secondary drivers of mass killing rather than tertiary ones, however important. It is also to keep the paper as relevant to policy as possible. Understanding ontology for research purposes is useful, but applying the lessons to tangible prevention and response policy is more important.

The three chosen lenses aim to expand the relatively limited discursive canon by exploring the “why” questions of mass killing rather than only the “how” questions, especially how global and regional changes can have local consequences. Typically, the emphasis on the processes of mass killing, especially since the inception of the Responsibility to Protect doctrine, skews political action toward response rather than prevention.

One of the primary ways the paper will challenge many of the conventional conceptions of mass killing is through geographic analysis. Geography is an underrepresented discipline in the multidisciplinary literature despite the inherent geographic nature of mass killing episodes; violence often follows predictable spatial patterns, especially in dense areas. Geographic indicators such as natural resource locations, terrain, and distance from urban centers can aid international prevention efforts and begin to “untangle webs of territory, identity and power.”

The first chapter of the paper reviews literature about political violence, dominant theories, and conflict dynamics. The second chapter outlines a systems-level schematic of mass

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killing that attempts to address some of the gaps within the literature. The third chapter tests how it could work using the Second Congo War assesses the schematic’s broader applicability. The conclusion discusses potential policy implications, particularly regarding mass killing prevention and lists areas for further research.

Defining Mass Killing

In the following analysis, I intentionally use the term “mass killing” instead of “mass atrocities,” a popular alternative. In a paper about the ontology of mass killing, defining the phenomenon is an essential yet difficult task. What makes an episode “massive” versus just killing? What makes an action killing versus simply dying? What makes mass killing different than lesser political violence? These three questions shape how this paper, and presumably others, conceptualizes what mass killing means and how it comes to be. Clearly defining mass killing is also important because different types of killing require different types of prediction, analysis, and policy response, with genocide being the outlier.

First, the “mass” qualifier in “mass killing” is meant primarily to convey a numerical threshold. For many experts, massive means 500-1000 people killed. A key departure between my definition of mass killing and other definitions of mass atrocities, is that it does not include secondary causes of death such as famine and does not include rape, another common component of war that some argue should be included. This distinction does not minimize the gravity of those events, but simply clarifies the specific phenomena the following sections refer to. While the numerical threshold tends to cause more problems than it solves, especially for qualitative researchers, it is required to understand the uniqueness of mass killing. Generally, the threshold is relatively high which is the most meaningful criteria.

Second, the “killing” is included to make a rhetorical differentiation from “atrocities.” Primarily this is meant to remove some moral judgments that could color analyses and to establish the intentionality of mass killing. Often it is the case during mass killing that the two or more sides are not morally equivalent. This lack of equivalence, however, should not bias the search for ontological answers, though tempting in extreme cases. Perpetrators and victims are rarely static or monolithic categories; power asymmetries that contribute to mass killing are situationally dependent and can shift over the course of an episode making moral judgments subject to change. The war in Syria provides is an example of a conflict where one side, the Assad regime, is widely considered to be morally bankrupt, creating an understandable impulse to support his opposition. However, as the nature of the opposition has become more radical and their willingness to kill has increased, the moral calculus has shifted from a bright boundary between Assad and the opposition to a blurred one.

The last question - what distinguishes mass killing from other kinds of political violence - is a vexing one that will be addressed throughout the paper. Some see the numerical threshold discussed above as the primary distinction, but there is more. The means of killing, networks involved, causes, responses, and outcomes are truly unique. In order to adequately reach creative conclusions about the ontology of mass killing this uniqueness must be a primary consideration.

Also, as is the case with civil wars, mass killing episodes are almost always an aggregation of individual attacks. In rare cases such as the September 2013 chemical weapons attack near Damascus, a single event may surpass the mass killing threshold. As Stanton puts it,

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“the crime of genocide...does not exist apart from [genocidal] acts.” Solomon calls this aggregation “meta-events” with examples being the “Rwandan genocide” and “Kenya’s election violence.”

Finally, the concrete definition of mass killing I will use, if one is truly necessary, is this: **mass killing is the widespread, intentional killing of noncombatants by state or non-state actors.** *Quantitatively, the scale of death must be 1,000 noncombatants in a twelve-month span.* For this paper, “civilian” is synonymous with “noncombatant,” defined as any unarmed person who is not a member of a state or non-state armed group and who does not actively participate in hostilities intended to cause physical harm to enemy personnel or property.10

This distinction - combatant versus noncombatant - is important when discussing mass killing for two reasons. First, unconventional warfare creates a blurred boundary between noncombatants and combatants because of the fluid relationship between armed groups and civilians. Civilians can enter and exit armed groups more easily than a conventional army. As a result, it is important to clarify who is fighting and who is not, especially if governments or armed groups attempt to unilaterally classify civilians as combatants or sympathizers. Second, civilians occupy a unique space in the mass killing system. They can provide safe havens, enable armed groups, take up arms, or act as agents of change and peace.11 These roles make clarifying who is interested in peace, or merely a bystander, important for prevention and response purposes.

Finally, with this definition in mind, it is important to place mass killing episodes in their proper geographic context. Mass killing, as with most political violence, happens at multiple

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11 Ibid., p. 379
interlocking scales.\textsuperscript{12} What may seem like an isolated attack on civilians in rural Uganda is affected by regional, national, and international politics and policy. Global changes might have local consequences and local changes, when aggregated, might have global consequences. Exploring the ontology of mass killing requires taking a close look at all of the scales of conflict. Why does it happen in some places and not others? Why does most modern mass killing happen in the Global South? Do certain spaces make political violence go from bad to genocidal? Ultimately, these questions lead to the primary inquiry: How does mass killing come to be?

\textbf{Chapter 1: Reviewing the Literature}

\textit{Introduction}

This chapter introduces some seminal works in the modern mass killing canon. From the Responsibility to Protect doctrine to Ulfelder’s statistical prediction modeling, the literature is diverse and multidisciplinary. The first portion reviews general prevention and response work, the two broad categories of research and policy. It then turns to critical concepts within the literature including ontological theories and attempts to identify potential gaps. It concludes with a discussion of the geographical components of mass killing.

\textit{Section 1: Studies and Foundations of Mass Killing Prevention and Response}

The literature about mass killing is relatively new, mostly emerging shortly after the Second World War as policymakers attempted to grapple with the horrors of the Holocaust and other wartime episodes of extreme violence. As with other collective thought projects about the Holocaust, research about mass killing largely subsided during most of the Cold War. It made brief appearances during the Six Day War in 1967, Vietnam War,\textsuperscript{13} and 1970s as the American

\textsuperscript{12} See O’Lear et al. (2009), p. 6

Jewry embraced Holocaust remembrance, but remained a relatively marginal topic of academic inquiry until post-Cold War conflicts in Bosnia and Rwanda.

At that point, the study of mass killing became relevant for academics and policymakers alike. Pragmatic policy questions about how to respond to violence like that in Sarajevo and Kigali and how to prevent the next episode found a niche within the foreign policy research community. The Rwandan genocide caused further specialization into genocide studies. While the majority of formal thought about genocide prior to 1994 dealt with issues of the Holocaust, Rwanda provided a landmark case study for modernizing the field. Genocide studies received another lift as Omar al-Bashir launched an assault on Darfur in the mid-2000s. Despite having the fewest episodes, relative to mass atrocities or other forms of mass killing, genocide occupies disproportionate space likely because of its unique position in a collective moral conscience.

Mass atrocity literature follows a similar pattern to the mass killing literature, but the term has entered the foreign policy community’s vernacular on a wide scale over the past decade possibly because Gareth Evans, co-creator of the Responsibility to Protect (RtoP) doctrine, widely uses the term. Moreover, “mass atrocities” is seen as a more accurate way of describing episodes of violence in the context of intrastate wars that do not reach the scale of genocide. While some pieces distinguish between mass atrocities and the more legalistic “crimes against humanity,” “war crimes,” and “ethnic cleansing,” most of the post-2001 literature uses the umbrella term “mass atrocities” or “mass atrocity crimes.”

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The novelty of the literature about mass killing means that it appears in a disparate array of sources, particularly academic blogs and think tanks. Some of the most influential pieces, particularly the ones that respond to rapidly changing conditions on the ground or propose radical shifts in thinking, initially appear on academic and organizational blogs because they garner a broad readership and the content addresses contemporary policy challenges.19

The general literature about mass killing displays two major empirical and theoretical themes that could be considered flaws. First, it is skewed toward understanding Northwestern response to mass killing instead of prevention. Despite a widespread desire to prevent the next episode, a disproportionate amount of the literature exclusively focuses on reactive actions that can be taken, often called “tools in the toolbox.”20 This disproportionality also exists in foreign policy discourse outside of the literature. Despite the widely cited fact that conflict prevention is potentially 60 times cheaper than war,21 seemingly making prevention a pragmatic policy pitch, response dominates the conversation.

The Responsibility to Protect doctrine was created and approved in the early 2000s in an attempt to establish a comprehensive plan for action regarding mass killing and to create a norm of human rights-based international security.22 It has quickly become a hegemonic idea within the Northwestern mass killing response community. The premise of the doctrine centers around three responsibilities - to prevent conflict, respond to outbreaks of violence, and rebuild after conflict ends.23 Despite the report’s plausible and creative prevention and rebuilding strategies, policy discourse and academic research remains heavily focused on responses to mass killing.

21 "Preventing war is 60 times cheaper than fighting it." Friends Committee on National Legislation.
23 Ibid., p. xi
As a result, broader mass killing policy agendas are delayed to the point where prevention becomes irrelevant or blurs into humanitarian relief.

The emphasis on response analysis can be found in major works such as Sewell, Raymond, and Chin’s “Mass Atrocity Response Operations: A Military Planning Handbook,” a landmark piece outlining U.S. Army strategy during interventions. It is also found elsewhere such as Evans’ *The Responsibility to Protect: Ending Mass Atrocity Crimes Once and for All,* and Waxman’s “Intervention to Stop Genocide and Mass Atrocities” among many others. Another way of framing response is through the language of intervention. The NATO bombings in Bosnia in 1995 were seen as ushering in a “new era” of internationalism and reliance on force to stop killing. The literature continues this theme by framing intervention in terms of humanitarianism despite the fact that it is often driven by realist geopolitics.

Moreover, intervention is often perceived as a prevention strategy simply because military force stops more widespread killing. In Bosnia, the sluggish response came after Serbs attacked and killed over 7,000 civilians in Srebrenica, yet some attribute the signing of the Dayton Accords, and therefore the prevention of future killing, to the intervention. Other pieces see prevention as wholly occurring before mass killing begins and exclusively through nonviolent means. Bennett et al. categorize these strategies into systemic and direct prevention. The “intervention as prevention” rationale can be seen in contemporary discursive

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28 Ibid, p.188
debates. In a March 2011 speech on intervention in Libya, President Obama said “In just one month, the United States has worked with our international partners to... protect civilians...prevent a massacre, and establish a no-fly zone.”\(^{30}\) In a July 2012 speech at the United States Holocaust Museum, then Secretary of State Hillary Clinton said, “When the Gaddafi regime threatened a massacre in the city of Benghazi, [the U.S.] forged an international coalition to stop the assault.”\(^{31}\) The administration supported these comments using the “responsibility” rhetoric of RtoP.

The second commonality evident in general mass killing literature is an empirical one; there is a widespread tendency to focus on a limited selection of case studies. The Holocaust, Cambodia, Rwanda, Bosnia, Sudan, and, to a lesser extent, Armenia are the most examined episodes of mass killing; often cases of genocide are prioritized over other instances of mass killing despite numerous datasets such as Ulfelder and Valentino’s which lists 120 episodes of mass killing events worldwide from 1945-2006 using a threshold of 1,000 noncombatant deaths in a period of sustained violence.\(^{32}\) Bellamy’s 2011 dataset lists 103 episodes of mass atrocities and armed conflict from 1945-2010 using a threshold of 5,000 deaths.\(^{33}\) Cases common in these expanded lists include well-known ones such as Burma as well as those rarely mentioned in the literature such as Romania, Tajikistan, and Nepal.

There is value in analyzing a broader range of case studies. First, it ensures that conceptualizations of mass killing are more generalizable. Case studies, particularly qualitative ones, inherently exist in isolation despite functioning in an open system. If conflict theories are

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to be applicable outside of a particular region or country they must either include a broad range of episodes or acknowledge empirical gaps. The emphasis on the Holocaust, Bosnia, and Rwanda is not haphazard; these cases are extreme instances of violence that garnered significant international attention and caused some type of intervention. As is shown above, those characteristics seem to make for more morally appealing and actionable analysis than smaller scale episodes. For instance, Scherrer’s 1999 theory of a modern genocide, proposes a “scale of degree of variability” for cases of mass killing from mass murder to full-scale genocide, but he focuses on the latter cases - Armenia, Holocaust, Cambodia, Rwanda - and simply lists others.34

The second advantage of focusing on a wider array of case studies is that it begins to make the analytical transition away from genocide toward the broader concept of mass killing. The moral outrages that genocides cause are unparalleled, but they are rare because of a deliberately exclusive definition. Mass killing at-large is more common historically and today - typically considered over 100 cases since 194535 - and therefore lends itself to relevant contemporary policy discussions. Also, the uniqueness of genocide means that how it begins, sustains itself, and ends is also unique and, as a result, genocide analysis is often not applicable to pressing mass killing crises. For instance, frameworks such as Campbell’s Weberian ideal-type classification looks at unique processes of social control, via pure psychology, that might contribute to the onset of genocide.36 However those processes are less often applicable to lesser forms of mass killing.

The literature is beginning to make a transition. Mass atrocities and mass killing are becoming more popular in multiple spheres of discourse. Staub distinguishes between mass

35 See Ulfelder and Valentino; Bellamy datasets (2008; 2011)
killing and genocide in his analysis of the psychology of violence;\textsuperscript{37} Fjelde and Hultman call episodes “civilian atrocities” as they parse out the role of ethnicity,\textsuperscript{38} a topic that typically lends itself to genocide cases. In the non-academic literature, Ulfelder’s and Valentino’s work uses mass killing datasets; Bellamy’s Stanley Foundation reports feature cases of mass atrocities; and, in a landmark move, the Obama administration created the Atrocities Prevention Board, an executive-level interagency panel charged with developing long-term strategy.\textsuperscript{39}

The transition is a bottom-up and top-down one. The Responsibility to Protect is changing the way experts and advocates talk about mass killing by focusing on cases other than genocide. Simultaneously, the context of mass killing continues to shift from peacetime to wartime.\textsuperscript{40} Wartime “atrocities” are a departure from popular conceptions of mass killing such as concentration camps in Europe or torture centers in Cambodia. Mass killing in places such as Democratic Republic of the Congo, Sri Lanka, and Nigeria now deserve attention. In turn, these changes to conflict, in non-theoretical terms, cause the literature to shift away from genocide discourse.

Section 2: Critical Concepts and Theoretical Gaps in the Mass Killing Literature

Political violence provides the context for modern mass killing. Before the 1980s, killing on the largest scales could happen as despotic leaders attempted to make and remake states - Young Turks of Armenia, Hitler of Germany, Zedong of China, Stalin of Russia, Pol Pot of Cambodia, and so on.\textsuperscript{41} However, wartime atrocities look somewhat different. During the

\textsuperscript{40} Bellamy, Alex. "Mass Atrocities and Armed Conflict: Links, Distinctions, and Implications for the Responsibility to Prevent." Stanley Foundation, Feb 2011.
\textsuperscript{41} Ibid.
decade prior to the fall of the Soviet Union political violence opened space for killing and continues to do so. Therefore, understanding the ontology of mass killing means understanding the ontology of political violence.

Dumouchel asks an important definitional question - how and why is political violence different from a bar brawl? His answer is straightforward - “political violence is committed in the context of political conflict, or that can be related, either through its cause or through its motive, to political motives.”

However, as he notes, the last clause means that almost any violence can feasibly be considered political violence.

Mars provides a more specific definition consisting of six components - activities must be carried out by a group or collective movement; activities must be organized as opposed to spontaneous; activities challenge the legitimacy of the governing regime or political system; activities must be directed toward the governing regime or political system; activities that will likely cause a coercive reaction from the governing regime; and activities must involve a high degree of risk of in to the participants and opponents of political violence.

However, this does not cover political violence that is not directed at regimes or decentralized political systems. Secondary and tertiary goals of political violence may be directed toward civilians or other armed groups in order to establish a hegemony over regime resistance narratives. Hibbs’ mass political violence concept is useful with regards to mass killing. His taxonomy of mass political violence includes “armed attack events” which could include all mass killing episodes.

Kalyvas develops a compelling theory that highlights the complexity and ambiguity of

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political violence while analyzing the processes of civil wars. In a political geographic sense, Kalyvas includes conflict’s driving, or “master,” cleavage and local disputes in the list of war’s causes. Furthermore, he notes that local, or “private” actors can use the war to settle conflicts that have little relation to the master cleavage. These points of analysis lead him to question whether all violence that occurs during civil wars is actually political violence. Similarly, it is plausible to assume that not all political violence that happens during episodes of mass killing, a meta-event, is connected to the master cleavage and therefore is not political violence. As Kalyvas notes, this debunks conceptions of binary civil wars, or two sides fighting each other. Rather there are a myriad of actors - local, regional, national - operating under the umbrella of a master cleavage, but with differing motives.

This paper will use a conception of political violence that resembles Dumouchel’s, Mars’, and Kalyvas’. A definition with limited constraints on what can be considered political violence, yet includes clear component is necessary because not all killing is political, but all mass killing is. Moreover, the complexity and ambiguity of Kalyvas’ civil war theory has important implications for mass killing theories because, as meta-events, mass killing episodes are inherently diverse and multi-faceted. Due to the complexity, the ontology of political violence is clearly unclear, beyond a few minor definitional boundaries that make the ontology of mass killing equally ambiguous.

There is a wide variety of theories about how and why mass killing begins and sustains itself: Krain’s political opportunity structure, Staub’s hardship and structuralism thesis,

47 Ibid., p. 479
48 Ibid., p. 487
Bauman’s modernity principle, Rummel’s lack of cross-cutting cleavages, and so on. In order to explore the literature’s understanding, explanations of genocide are an essential first step because they are widely available. Stanton’s framework provides one of the most common ways that advocacy organizations, especially ones with a degree of emphasis on prevention, understand genocide. Stanton says there are eight stages of genocide - classification, symbolization, dehumanization, organization, polarization, preparation, extermination, and denial.

Cases such as the Holocaust, Rwanda, and potentially Burma are compelling instances that illustrate a stepwise process. Stanton is careful to point out the often ignored “or in part” clause of the U.N.’s definition of genocide, presumably in an attempt to expand his framework. However, a post on Genocide Watch, Stanton’s organization, compares violence in Syria to genocide. It goes on to clumsily fit the Syrian civil war into the eight step framework. Whether Syria’s “massacres have become genocidal” or not, the post shows that genocide theories often cannot be applied to other forms of mass killing.

The popularity of Stanton’s stages indicates that a stepwise conception of mass killing has broad appeal. The literature’s tendency to develop categorizations, stages, taxonomies, and typologies is understandable, especially considering the complexity of meta-events. However, a stepwise process often does not provide an adequate lens through which to view mass killing, partially because it pervades a teleological understanding of conflict.

Aristotle understood biology to be teleological - people go from being eggs to adults and even the universe will someday end. However, Bacon and Descartes rightly advocated for an

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50 See Staub (1999)
end to teleological language, even for human behavior, because they believed that life did not end at adulthood and human behavior is always evolving. A similar idea applies to mass killing. de Waal, Meierhenrich, and Conley-Zilkic outline the common understanding when they write the “teleological assumption that the occurrence of attacks against civilians will, unless halted or deterred from outside, inevitably escalate towards genocide.” They attribute this assumption to the hyper-focus on the Holocaust and Rwandan genocide. In both cases, mass killing ended with a forceful overthrow of the regime, nicely fitting into Stanton’s teleological model. What they call “essentialist logic of violence” implies that “perpetrators are seen as desiring the destruction of the target group more than anything else.” McDoom proposes an analytical alternative - genocide, and other forms of mass killing, should be conceptualized as a continuous process rather than a discrete event. This is similar to Solomon’s aggregation and meta-event idea; mass killing is not a single event, but a series of killings that, when taken in sum, form a discernable whole.

There are several tangible policy implications for having teleological and non-teleological perspectives. If teleological, policy debates simply revolve around when to intervene and end the violence processes. In Libya, for instance, 2011’s “Unified Protector” only came about as hate speech emerged from the Royal Palace and it became clear that the opposition was not going to overthrow Gaddafi. Moreover, after Gaddafi was murdered, the international coalition quickly disengaged because the conflict was seen to have reached its end.

In reality, violence and instability continues in different forms in different spaces across Libya. de Waal et al. attribute the over-reliance on military intervention, rhetorically referred to as humanitarian intervention, to this type of teleological policy thinking.\textsuperscript{60}

By waiting for a “stage” that immediately precedes or follows a mass killing event, policymakers leave themselves few options other than military intervention. This is reflected in the international community’s reception and utilization of the Responsibility to Protect and the high level Genocide Prevention Task Force report\textsuperscript{61}. The focus is heavily on the military intervention component because it provides an easy and moral sounding rationale - intervening in mass killing processes will stop the inevitable march to high death tolls. In reality, international coalitions get involved in non-linear conflicts that do not follow a model ending in peace.

Most recently, this played out regarding Syria with the Obama administration’s “red line.” The only conflict development significant enough to solicit significant bureaucratic movement, was the use of chemical weapons.\textsuperscript{62} Despite lackluster attempts at a negotiated settlement and the Russian government’s steadfast support of Bashar al-Assad, the Obama administration proposed a plan to bomb Syria in October 2013. There was little talk earlier in 2013 about other preventative action that could be taken; the debate was solely about when to intervene. Ultimately, only a last minute multilateral weapons deal stopped the bombing.

Other analysts are developing more complex frameworks. For instance, the Sentinel Project for Genocide Prevention has developed a “risk factor list” which they divide into four

\textsuperscript{60}See de Waal et al.’s “How Mass Atrocities End: An Evidence-Based Counter-Narrative”


categories - political, economic, sociocultural, and conflict and upheaval. Some of the factors it includes are common ones such as degree of political freedom and economic status of the ruling regime, but others are less common. Whether or not the outgroup, or persecuted people, is viewed as an obstacle to economic progress is an important consideration when analyzing the risk of mass killing. That risk factor does not necessarily fit into one of Stanton’s stages, but plays a major role in how some conflicts, such as Darfur, develop.

Clearly, some of the Sentinel Project’s risk factors will matter more in different countries. For instance, the economic status of the Assad regime likely affects the degree to which the Syrian military attacks civilians whereas in Burma, the degree of speech and press freedom largely determines the ability of ethnic minorities to express grievances. Certainly, Stanton’s stages and the Sentinel Project’s risk factors differ in many ways - notably exclusively genocide versus genocide and mass atrocities - but both have a goal of prevention and, therefore, are comparable.

The two systems along with many others such as Ulfelder and Valentino’s and Straus try to understand human interactions through categorical systems - a noble and common goal of academia. This systemization mirrors an important and often repeated trope in the literature - killing is logical. The horrors of the worst conflicts often seem senseless and often are called so in non-academic literature. However, upon further examination, all killing functions based on various logics. The torchbearer of this position is Benjamin Valentino, but there are many others such as DeMeritt and Chirot and McCauley.

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64 “Burma falters, backtracks on press freedom.” Committee to Protect Journalists, 13 Jun 2013.  
65 See Ulfelder and Valentino (2008)  
66 See Straus (2012)  
Valentino’s compelling premise begins by challenging the plural society theory, a major theme in the mass killing literature. The theory states that deep divisions between different groups living in the same society are a central cause of killing, particularly genocide. The theory, popularized by Leo Kuper, primarily focuses on political, ethnic, cultural, religious, and other forms of de facto discrimination that lead to prejudice based on those divisions. As Valentino notes, other scholars believe those social divisions polarize society to such a high degree that they cause mass killing.

While social divisions certainly play a role in the onset of mass killing, Valentino argues that there is little evidence that social cleavages are “more intense in societies that have experienced genocide or mass killing than in those that have not.” Mass killing in the Soviet Union, China, and Cambodia supports the argument because members of the same class and ethnic group killed each other, not necessarily because of any specific social cleavage. This goes against much a dominant strain of media coverage of recent conflicts such as those in Darfur (Arab vs. “Black African”), Southwest Asia (Sunni vs. Shia), and across sub-Saharan Africa (Christian vs. Muslim) where the main conflict driver is thought to be the deep social divisions presented in the plural society theory. Valentino also contests other common threads in the literature such as the scapegoat theory, common in Holocaust studies, and the causal relationship between national crises, political opportunity spaces, and mass killing. Ulfelder

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70 Ibid., p. 17
71 Ibid., p. 18-20
72 Ibid., p. 22-26
supports a similar idea about elections’ capacity for triggering killing.\textsuperscript{73}

Valentino’s alternative is an elite-driven theory. Many of the approaches outlined above rely on an understanding that mass killing campaigns depend on the support of larger societies; mass killing is a type of contract between elites and perpetrators to conspire against a marginalized group. Instead, Valentino says mass killing is initiated by a small group of elites in particular political situations.\textsuperscript{74} Initiating killing is not a first resort, but it is also not always a last resort; it depends on the situational logics. Leaders might consider whether the killing will accomplish their goals - to eliminate a population in the case of genocide, or crush dissent, in many other mass killing cases.

In his typological analysis, Valentino identifies six motives - communist, ethnic, territorial, counterguerrilla, terrorist, and imperialist.\textsuperscript{75} The ethnic, territorial, counterguerrilla, and terrorist motives are arguably most relevant to conflicts in the 21st century. A terrorist motive, despite having a few unique analytical factors, is much like a counterguerrilla motive with inverse logics. The book’s Guatemala and Afghanistan case studies are the most useful for determining the ontology of mass killing in non-genocidal cases because they are representative of modern conflicts that pit a fragile state against opposition groups. While the logics of each of these categories varies, the central contention remains - mass killing is situationally dependent and driven by elite actors.

Demerit's work supports the logical killing idea, specifically when a government decides to kill its citizens. Her foundational question is similar to Valentino’s - if the conditions and incentives to kill are found in a wide variety of places, why do only some result in mass killing,

\textsuperscript{73} Ulfelder, Jay. "Do Elections Trigger Mass Atrocities?" Dart-Throwing Chimp. 14 Jan 2014.
\textsuperscript{74} See Valentino (2005), p. 2
and further, why are some more deadly than others? Her game-theoretic model shows that death tolls are determined in part by the communicative processes that occur between elites and perpetrators; what elites ask, perpetrators will do.\textsuperscript{76} Again, this logic-based theory goes against, if not explicitly, the idea that mass killing campaigns rely on larger societies. Demeritt says that “one-sided killing is a policy option that brings the government closer to a political or military objective”\textsuperscript{77} with similar reasoning applying to non-state perpetrators. This idea does not rest on a theory of deeply divided societies that are transformed into masses willing to exploit ethnic or other differences.

Finally, understandings of the geography of mass killing are chronically under-addressed in the literature. There are two initial geographic aspects of mass killing studies worth noting - physical location of violence and how location affects the severity and longevity of conflict. McDoom understands mass killing as a kind of disease; he thinks violence is contagious and that “violence is endogenous to itself.”\textsuperscript{78} He goes further by saying violence spreads in spatially adjacent areas. McDoom’s case study, Rwanda, almost certainly confirms his idea. Violence diffused throughout the country, albeit unevenly, in just over 100 days. However, the wider applicability of a contagion concept, especially in cases other than genocide, is problematic because violence may not operate strictly in adjacent areas in other cases of mass killing.

In a different capacity, Buhaug et al. investigate the relationship between geography and the duration of civil conflicts, which make up most modern mass killing episodes. They found that conflicts occurring at great distances from the government stronghold, typically a country’s or region’s capital, and conflicts along international borders, particularly near natural resources,

\textsuperscript{76} See Demeritt (2009), p. 79
\textsuperscript{77} Ibid., p. 11
\textsuperscript{78} McDoom, Omar. "Predicting Violence within Genocides: Meso-level evidence from Rwanda." United Nations University. 16 Sep 2013. 25.
last longer. Conflicts in Burma and Togo, respectively, illustrate this difference. They also posit that the strength of opposition forces in remote areas affects the longevity of conflict; a very weak or very strong force near a government center contributes to a shorter conflict while a relatively evenly matched force in a remote area contributes to a longer conflict. They offer a broader principle called “geographic opportunities” meaning that “conflicts in areas favorable to guerrilla warfare last longer” and will presumably wreak more havoc on civilians. As a corollary, they underscore Boulding’s loss of strength concept - power decays as it is projected across larger spaces.

The Holocaust, a mechanized killing episode, presents an opposite logic in some ways because of the fact that almost all violence was state-led. In the early part of the war, Einsatzgruppen killing initially took place in towns and cities located on the main highways; death squads could reach those places most easily which made them easy targets. Boulding’s principle remained true in an inverse way as it applied to Buhaug et al. because military power originated from the state rather than disparate opposition centers. Later in the war, the squads diffused throughout the Soviet Union’s rural areas.

The concept of space also plays an especially important role in understanding mass killing. Tyner’s 2008 book, The Killing of Cambodia, inverts Lefebvre’s conventional understanding that spaces are produced by saying that the Khmer Rouge attempted to erase spaces; the regime wanted to take spaces shaped by indigenous society and French colonialism

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80 Ibid., p. 545
and rewrite them according to a new narrative of state-centric progress.\textsuperscript{83}

Internment and isolation are nefarious spatial tactics seen throughout the history of mass killing, particularly during genocides. Jews were transported to concentration and extermination camps from Jewish ghettos, another distinct space, to be killed and contained. The U.S. government’s campaign against Native Americans provides a particularly interesting example of spatialized mass killing. Not only was state policy to kill natives whenever necessary, but it also implemented a far-reaching forced relocation program, gruesomely illustrated by the Trail of Tears massacre.\textsuperscript{84} The result was a reserve system, a lasting form of spatial isolation, similar to apartheid-era South African townships.

The plural society theory discussed above also often has a spatial component, if not always recognized. Iraq is a case that could feasibly fall under the theory’s premise that deeply divided societies are a precursor to mass killing. Commonly, the current violence there is attributed to ancient, or at least historical, religious feuds between Muslim sects. Kurds live in the north, Sunnis in the center, and Shia in the southeast, roughly.\textsuperscript{85} The plural society theory would rightly assume that violence primarily occurs in the central northern area where Sunnis and Shia live together.\textsuperscript{86} However, spatiality and social divisions cannot stand alone. Other factors such as the power of urban areas in the region and the U.S. invasion and occupation are relevant considerations. The area provides several geographic opportunities - it contains the national capital, high visibility of occupying forces, and so on.

Finally, the spatiality of mass killing explicitly plays out in a policy sense during conflict

\textsuperscript{85} "Map: People and Politics." \textit{Beyond Baghdad}. PBS.
resolution efforts. Partition is one of the primary outcomes that domestic and international policymakers seek when facing secessionist movements, particularly in what is perceived to be a deeply divided society. From 1900-1996, 42 states became independent through partition with South Sudan joining the group in 2011. It is worth noting that only a handful of these cases occurred after the dissolution of the Soviet Union in 1991, either indicating that it will be a less common outcome in the future or that partitions come in waves as results of major geopolitical changes. Partitions offer limited empirical evidence about the ontology of mass killing, but the international community’s tendency to resort to them offers insight into what it is perceived to be. The logic of partition is to separate two or more groups because there is not a feasible scenario in which they could coexist; one aspect of identity, whether it is ethnicity, religion, or something else, overrides all other benefits of unified statehood. It is largely essentialist logic with imposed geographic consequences that often does little to solve long-term conflict.

Conclusion

This chapter introduced a portion of the mass killing literature that aims to answer difficult questions regarding how mass killing begins. It discussed some conventional ways of viewing mass killing such as Stanton’s stages and potential shortcomings of those approaches. It also included a discussion of Valentino’s typology of political violence that informs the contexts in which mass killing occurs. A concern about the potential of oversimplification of conflicts emerged. The next chapter introduces geographic complex adaptive systems as an analytical tool.

Chapter 2: Theorizing the Ontology of Mass Killing

Introduction

This chapter begins with a discussion of risk factor lists, one of the dominant ways that analysts use to pinpoint where mass killing will occur. The discussion includes some potential weaknesses of those lists particularly in the context of targeted prevention. The chapter then turns to complex adaptive systems and related key concepts such as strength and strain, subsystems, and delays. It also outlines many of the components needed to apply complex adaptive systems to conflict. The final section discusses geographies of power as a concept and illustrates how they can bolster ontological analysis.

Section 1: Potential Limitations of Risk Factor Lists

The gaps and insufficiencies of the conceptions outlined in the previous chapter highlight the urgency of charting different courses for the understanding of mass killing. In order to begin this enterprise it is worth exploring the roots of the dominant literature. Many of the conventional ways of thinking about mass killing are founded upon modern analytical assumptions. These assumptions include cause-and-effect relationships, wholes can be understood by analyzing parts, and that knowledge of the past will always create the capacity for prevention. These principles are said to be “so deeply embedded in these cultures' education and worldview, that one is not even generally aware of them.” As a result, social sciences notoriously struggle to grasp the complexity, adaptability, and intangibility of human systems.

This tension is evident in the historiography of scientific research spaces. The perhaps unwarranted binary between “the laboratory” and “the field” shows that some spaces of knowledge are considered controlled and some wild, even chaotic. For Keith Richards, a natural scientist, the site of social sciences is the laboratory “‘out there’ in the world, uncontrolled, even

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89 This section will focus on the “list” component of risk factor lists rather than the concept of risk, which is an integral component of GCAS.
91 Ibid.
uncontrollable” while physical sciences “define their own rules” and “narrow the field of view, and allow deliberate exercise of control to facilitate prediction and explanation.” 92 In the majority of conflict studies, the site of knowledge production and study is, of course, “the field” where researchers define relatively arbitrary limits on what is studied in an attempt to replicate the control of the laboratory.

In conflict studies, particularly the genocide studies subfield, the tendency to rely on modern analytical methods combined with a desire to produce the control of the laboratory leads to problematic explanations for the ontology of mass killing. Human systems research requires fundamental assumptions that often go modern analytical ones. Stanton’s framework is a good example. His eight steps imply that the processes that lead to genocide display cause-and-effect relationships and follow a stepwise pattern. Classification leads to symbolization which leads to dehumanization and so on until the process matures into the extermination of a particular group.

However, the consequences of the tendencies of those studying mass killing extend beyond simple explanations like Stanton’s. Even the U.S. Agency for International Development’s (USAID) Conflict Assessment Framework, a relatively robust system, relies on “certain contextual factors [that] have been proven to increase the risk for conflict.” 93 Risk factor lists are a common analytical tool used throughout the literature to identify when and how mass killing will occur. They fall into the tradition of discrete categorization and, therefore, present three potential problems.

First, lists give a name to processes, but often fail to explain why the social, economic, and political processes are happening. For instance, exclusionary or antagonistic ideologies are

often cited as a factor that can lead to mass killing. However, beyond identifying ideology as a problematic component of political and social leadership, it serving as a risk factor does little for analysis. Second, risk factor lists sometimes attempt to reduce the complexity of human systems down to a discrete series of indicators of conflict. There is a risk of missing factors that are less clear such as long-term processes operating beneath the surface. An intersectional, context-specific phenomena like mass killing likely cannot be explained by the current lists of risk factors; an episode in Sri Lanka will have vastly different causes than an episode in Guatemala.

Third, and perhaps most importantly, many of the risk factors on high-profile lists are not necessarily unique to mass killing. For example, USAID’s list, produced in part by the Political Instability Task Force, consists of anocratic regimes, a recent history of conflict, “bad neighborhoods,” low levels of social development, state discrimination, and poverty. While these conditionals undoubtedly make it more likely that killing will occur, they are not unique to the phenomena. In other words, a lot of countries are led by autocratic regimes, have a history of conflict, exist in bad neighborhoods, have low social development, experience state discrimination, and have high levels of poverty, not all at the same time, and do not experience significant conflict. Poverty is another particularly illustrative example of a popular, perhaps increasingly so,\(^4\) risk factor. However, dozens of countries have poverty rates of over 30%,\(^5\) yet killing happens in only a fraction of those places. As a result, the logic goes that no one risk factor is causal, but when aggregated, the chance of conflict increases.

Identifying risk factors for genocide is easier and arguably more accurate than the litany of conflict risk factor lists because of its uniqueness outlined in the official definition. Unlike the more general “mass killing” category outlined above, the U.N. definition of genocide includes


the “intent to destroy, in whole or in part” clause\textsuperscript{96} which makes identifying genocide risk factors more feasible. The U.N.’s genocide risk factors list includes “compulsory identification of members of a particular group” and “targeted elimination of community leaders”\textsuperscript{97} which, if present, provide a relatively clear indication that the “in part” clause is likely to apply, at least. However, two familiar problems persist - first, genocide risk factors sometimes give names to correlating processes, but often do not fully answer ontological questions and, second, they risk reducing the complexity of the processes.

\textit{Section 2: Mapping an Alternative Through Complex Adaptive Systems}

Complex adaptive systems (CAS) combined with institutional geographies of power could provide a plausible method of understanding the ontology of mass killing. More broadly, CAS are a tool for social scientists to understand human systems, in this case mass killing systems. The historical utility of CAS lies in natural systems prediction.\textsuperscript{98} The specifics of weather systems, hurricanes for example, are clearly difficult to predict, but they do follow a few general rules such as rotating counterclockwise in the northern hemisphere,\textsuperscript{99} forming an eye, and so on. However, beyond these basic rules, hurricanes are unpredictable, hence the range of paths shown during news coverage. As a result, the area of study of systems such as hurricanes was known as “chaos,” but is now a field of thinking called complexity science.\textsuperscript{100} It offers an alternative to some kinds of analytical thinking by acknowledging the limitations of the scientific method and the complexity of systems, particularly human systems.

Complexity science also offers key insights into how conflict, particularly mass killing,
comes to be. It provides a unique lens through which to view conflict that overcomes typical pitfalls displayed in the literature. In Stephen Gray and Josephine Roos’ conference paper about dynamical systems, a very similar concept to CAS, in a post-civil war South Sudan, they write “an advantage of this approach is that it ‘not only captures the multiple sources and complex temporal dynamics of such systems, but it can help identify central nodes and patterns that are unrecognisable by other means.’”  

Alternatively, analyzing the entire mass killing phenomenon as a system that changes temporally is a supplement, at least, to individual risk factor understandings. As a result, systems thinking promotes a holistic picture of mass killing that begins to see not only risk factors, but the relationship between those factors that provide space for killing to grow. As a matter of terminology, this paper will refer to dynamical systems and “ecology of violence” simply as CAS.

Gray and Roos define CAS, in the context of conflict studies, as “a set of interconnected elements that influence one another over time to promote the emergence of a global state (such as war or peace), which in turn provides common meaning for the elements.” Similarly, Jones defines a system as “an assembly of elements hooked together to produce a whole in which the attributes of the elements contribute to a behavior of the whole.” These definitions begin to mark the differences between different types of systems and, therefore, what it means to be both complex and adaptive.

There are two important distinctions that make complex adaptive systems unique. First, is determined versus adaptive. Determined systems are those where inputs and outputs are

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103 Gary and Roos, p. 5
104 Jones
directly causal. A car, for instance, is a determined system because when the driver turns the wheel, the tires move accordingly in a determined way. Adaptive systems, however, are where elements of the system, often called agents, are connected to each other and follow a few basic rules. The difference is that the system may not act in a predictable manner despite the agents acting relatively predictably. According to Jones, “this is where the limitations of modern Western thinking hamper our imaginative capacity.” The potential disconnect between the actions of agents and the system-level outputs defies some aspects of modern analytical thinking.

The second important distinction is between complex and complicated systems. Complicated systems are those where agents and the connections between agents are equally important. Using the car analogy, all four tires, the gas pedal, and axle are equally necessary for acceleration as are their connections to each other. The tires, gas pedal, and axle are also given no agency to function as they wish. In complex systems, the connections between agents are more important than the agents themselves. The agents have agency, but continue to follow simple system-wide rules. These rules, however, do not entirely determine outcomes and in (CAS, “huge inputs may mean little or no output.” Unlike complicated determined systems, CAS can lead to outcomes that might not be evident if only the agents are analyzed.

The outcome of agents interacting as a whole within a system is called emergence, or emergent properties. Midgley, as cited in Gallo, defines emergent properties as “one that results from the interaction of a system as a whole rather than from one or two of its parts in isolation.” Similarly, Hughes defines emergent behavior as “that [which] resides only in the

\footnotesize{\begin{itemize}
  \item \textsuperscript{105} Ibid.
  \item \textsuperscript{106} Ibid.
\end{itemize}}
system as a whole and not in any of the constituent pieces.”\textsuperscript{109} More concretely this means that if actors in a conflict system - armed groups, politicians, peacekeepers, etc. - act in what seem like silos, their interactions are likely to produce a result different from simply the sum of those parts.

There are five other key concepts in complexity science that aid an understanding of the ontology of mass killing. First, are \textit{system boundaries}. Just as researchers in “the field” have to make a decision about the physical extents of their studies, analysts using CAS have to define the boundaries of the system. Obviously CAS do not exist in isolation and the size of a system could feasibly increase to a global scale, but for the purposes of conflict systems there have to be limits. Physical, temporal, symbolic, and ethical dimensions factor into how these lines are drawn.\textsuperscript{110} Defining the system is important because it “shapes a conflict and has deep effects on how we tackle it.”\textsuperscript{111}

Second, are \textit{interconnected subsystems}. CAS do not exist as monolithic entities, but rather as aggregations of agents and agent-based subsystems.\textsuperscript{112} These subsystems might exist at different scales or geographical regions, but, crucially, the subsystems interact with each other similar to agents. These subsystem relationships are also partially responsible for creating emergent behavior.

Third, are \textit{causal loops}.\textsuperscript{113} These lie at the heart of what makes CAS unique. As outlined above, the relationships between agents are as important as the agents themselves meaning that the causal loops and feedback inherent in those relationships contribute to the behavior of the system. One agent’s actions can cause other agents within its subsystem to react, setting off a

\textsuperscript{109} Hughes, p. 685
\textsuperscript{110} Gallo, p. 160
\textsuperscript{111} Ibid.
\textsuperscript{112} Ibid., p. 164
\textsuperscript{113} Ibid., p. 162
cycle of behavior that may affect the system at-large.

Fourth, are delays. According to Gallo, there are two types of delays - material and information.\textsuperscript{114} Material delays happen when physical objects travel throughout a system and, inherently, there is time between departure and arrival. For example, the deployment of UN weapons inspectors from New York to Damascus. Information delays happen when on-the-ground data such as attitudes or conflict developments is transmitted to a news organization, politician, regional organization, etc. These attitudes and decisions “take time to affect the state of a system”\textsuperscript{115} and therefore make predicting the system’s behavior more challenging. Delays are one reason that temporal flexibility is important for CAS analysis. If an agent changes at one part of the system, it takes time for the change to reach other parts of the system if it does at all. Moreover, a change might affect other parts of the system in disproportionate ways because of delays and the nonlinearity of CAS.\textsuperscript{116}

Fifth, is strength and strain. Strength is what holds a system together and strain is what begins to tear or alter it. It might be logical to think that conflict erupts when the strain of a system overwhelms its strength, but as Gall writes, “[strength and strain] in social systems, are so interwoven historically that it is very difficult to separate them.”\textsuperscript{117} This means that the ties that bind communities like religion and politics can be the same ones that tear them apart. The key is to find what transforms intra-institutional or intra-communal relationships from those of strength to those of strain. Typically, as strain grows within a system it adapts or becomes more resilient in order to avoid a slide into a state of conflict.\textsuperscript{118}

\textsuperscript{114} Ibid., p. 165
\textsuperscript{117} Gallo, p. 168
\textsuperscript{118} Ibid.
With these five principles in mind, the task of CAS becomes relatively clear. Coleman et al. conceptualize the analyst’s purpose as “specify[ing] the nature of [the] rules and the system-level properties and behaviors that emerge from the repeated iteration of these rules.” In other words, finding the emergent properties of agents, relationships between agents, and the rules that govern them - dynamical minimalism - in order to understand the system’s dynamics, potential outcomes, and predictability is the primary task for an observer of CAS. In this way, analysts of conflict and mass killing can begin to understand ontological questions and prepare for practical, concrete prevention.

CAS can apply to mass killing in a variety of ways. A conflict system can exist in multiple timescales - before the killing, during the killing, after the killing, or during all three. The goal of placing mass killing within the context of a CAS is to see how the killing could begin and, as a result, build resilience or strength in order to avoid an episode.

There are three primary guidelines for applying a conflict to CAS according to Coleman et al., who focus on so-called intractable conflicts. First, an analyst must see the system. This is an obvious yet important first step because it lays the groundwork for the rest of the analysis. It also ensures, if done correctly, that the conflict is not over-simplified which is one of the primary reasons to use CAS. To see a system is to “identify and work through key elements of the system...in a manner that is informed by the complexities of the situation.” Notably, this stage only identifies key elements and does not map them across a system yet.

Gallo’s system boundaries principle factors heavily into how a conflict system is seen. For example, an analyst must choose whether the Darfur genocide CAS has limits in Sudan, East

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119 Coleman et al., p. 2
120 Gary and Roos, p. 10
122 Coleman et al., p. 9
Africa, Africa, and so on. The broader the system, the more complex it is if all relationships are identified correctly. Moreover, the system grows as the time period studied lengthens. A pre- and post-conflict system can include actors such as educators, judges, and aid workers that might be excluded from systems specifically designed to help answer ontological questions.

Second, an analyst must “map the dynamic ecology of the conflict.” This process involves placing the actors in a logical place in the conflict system. For example, grouping regional organizations and armed groups with similar ideologies, or countries that support a ruling regime. One strategy for beginning to understand the relationship between agents, developed by Margorah Maruyama, sees complex systems as a series of loops and attempts to identify the nature of those loops. The essence of this method lies in discovering the way components are linked in mutually “causative loops.” For each loop, or connection between two or more agents, the analyst can decide whether it is equilibrating (negative feedback), or escalating (positive feedback). In a conflict system, this can be conceptualized as relationships that facilitate a balanced system called a “normal state” and relationships that facilitate an unbalanced system called an “at-risk” state. However, in a mass killing system “normal state” can mean maintaining conflict without mass killing. “At-risk” state means that mass killing is likely to happen, not just conflict in general.

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123 Ibid., p. 10
125 Gary and Roos, p. 10-1
126 For more about conflict opportunities specifically related to resources see, Korf, Benedikt. "Resources, violence and the telluric geographies of small wars." *Progress in Human Geography*. 35.6 (2011): 733-56.
127 The “normal” versus “at-risk” distinction is a blurred boundary. The trajectory of the system is more important than classifying the system as one or the other.
Figure 1: A system can be visually represented using a chart showing the agents and relationships between them.

Third, an analyst must apply “network analysis”\textsuperscript{128} to the map created during the second step.\textsuperscript{129} This involves assessing positive and negative relationships, which aids in understanding the components that help stabilize the system and those that destabilize the system. Unlike a lot of complex systems, however, conflict and mass killing systems can have many components that simultaneously stabilize and destabilize or do either one at different times. Crucially, this type of analysis can begin to “manage the anxiety associated with the overwhelming sense of complexity of the system.”\textsuperscript{130} Network analysis begins to answer inevitable utility questions that arise when using CAS. In other words, the question becomes “what if we see conflicts and mass killing as a

\textsuperscript{128} Coleman et al., p. 11
\textsuperscript{130} Coleman et al., p. 11
complex adaptive system?”

The identified loops and articulation of the relationship between agents and subsystems add applied value to CAS. Ultimately, with time and trial and error, it may be possible to identify “leverage points”[^131] or places in the system that might have more explanatory power than others. In Syria, for example, the relationship between the Assad regime and Israel potentially matters more, either in negative or positive ways, than the regime’s relationship with the United Kingdom. However, the United Kingdom’s close relationship with the U.S. might form another leverage point. According to Coleman et al., leverage grows over time and only then does it become apparent.

The nature of relationships can be thought of in four categories - primarily normal-state (PN), primarily at-risk (PA), simultaneous (S), and insignificant (I).

![Diagram of Agent Relationships](image)

**Figure 2:** An example diagram that identifies the nature of relationships between agents using PN, PA, S, and I distinctions

[^131]: Ibid.
**Figure 3:** When the system map and network analysis are combined, it can be visually displayed using the PN, PA, S, and I distinctions.

The other three components, beyond system boundaries and loops, apply to conflict systems as well. First, delays affect conflict systems in concrete ways when they are material-based and in more abstract ways when they are information-based. Material delays could consist of peacekeeper or inspector deployments, weapons trades, aid workers, ambassadors, and so on. This often manifests itself in the public perception of the U.N. After the U.N. passes a resolution, sometimes there is an expectation that tangible results will immediately follow, but material delays cause lag. This can have ripple effects throughout the system and cause delays in unexpected places. Information delays can affect everything from battlefield commands to distant media coverage. The results of this type of delay are often harder to predict. Information on the ground must reach a messenger who then relays it to an agent in the system such as a media outlet or government which, when broadcasted, can have an affect on the ground, in other
words, creating a loop. As information disseminates throughout the system, attitudes and behaviors might change relationships between agents and therefore changing the system at-large.

Second, interconnected subsystems can apply to various components of systems at various levels. Subsystems involve grouping can occur geographically, institutionally, functionally, etc. These distinctions can also overlap. For instance, the U.S. can act as a Global North agent, an international community agent, a humanitarian agent, and a military agent perhaps all at the same time. Depending on the conflict, the analysis might benefit from having a military powers subsystem, but not a humanitarian aid subsystem. Some reasonable ways to group actors are by geography, function, and type of institution - where the agent is, what they do, and the nature of their existence.

Third, is strength and strain within conflict systems. Conventionally these are understood as diametrically opposing forces - as strength grows, strain fades and vice versa. This means that systems are either on a trajectory toward a conflict state, if strain is dominant, or a normal state, if strength is dominant. However, Gall’s distinction - strength and strain are difficult to untangle in social systems - is crucial for analyzing mass killing. Repeatedly, institutions have shown that they can either be sites of peacebuilding and togetherness or sites of conflict and division. For instance, churches, mosques, and temples are frequently places where a diverse cross-section of a community gathers for worship. As conflicts in Central African Republic, Nigeria, and Sudan, among others, show, places of worship can also serve as centers of conflict. The massacre of hundreds of civilians at Nyarubuye church mere days after the start of the Rwandan

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genocide famously showed how sites could be immediately transformed.

Using Gall’s distinction, it is also reasonable to see certain sites as places of peace and conflict simultaneously. Mosques in Cairo were used during the early 2010s as places of worship and organizing, but were also attacked by opposing political forces. Sites of organizing can also promote strength and strain at the same time; actors can act as protectors of their group and perpetrators toward another group. These sites can exist everywhere in mass killing systems - homes, community centers, sports fields, political party offices, and so on. In other words, mass killing systems, inherently social systems, require seeing agents and sites as both potential places of strength and strain depending on the time and place in which they exist. They may not be either promoting or restraining killing, but perhaps doing both.

Section 3: Geographies of Power and GCAS

Placing conflict within the context of CAS is not a novel idea. This paper extends that analytical framework to mass killing as well. In order to understand the critical ontological questions that lie at the heart of prevention work, however, another component is necessary. What transforms a normal state mass killing system into an at-risk state system? How does this transition happen? Some analysts have proposed the idea of triggers - one cataclysmic event that immediately causes killing.

This paper posits an alternative argument - mass killing systems do not alternate between poles of normal state and conflict state, but rather represent long-term shifts in power that cause an escalation of violence. The key to understanding these shifts is creating a geography of power within a CAS.

136 The material cited from authors in this section is used for isolated purposes. Many of the authors hold contrasting conceptions of geographies of power and geography more broadly.
137 Again, this dichotomy is only meant to illustrate an aggregate picture of the system. Functionally, the trajectory matters more than a clear distinction between normal state and at-risk state.
Geographies of power aid in understanding the contested “construction of places and spaces” and how “power relations [may] manifest in violence.”\textsuperscript{138} Darfur and Al Anbar, for instance, are not intrinsically conflict spaces, but are made so through attacks, occupation, and media narratives. Bosco summarizes the meaning that geographies of power provide when he writes, “power is enmeshed in networks of relations and has different expressions” and “places should also be seen as solidifying intricate entanglements of power.”\textsuperscript{139} In other words, power resides in the relationships between agents, making the network analysis component of complexity studies particularly important to understanding how systems will behave.

While GCAS do not use a geography of physical space, they do represent how power is distributed across landscapes.\textsuperscript{140} Power flows through systems just like other resources as it is “continually renegotiated in place-specific contexts.”\textsuperscript{141} Similarly, Allen popularized the notion that “power is enacted and resisted by an interaction between actors, an interaction that is mediated across and within spaces and places.”\textsuperscript{142} Rather than provide a static representation of power such as an index, geographies of power allow understandings to evolve temporally and spatially as circumstances change. For instance, armed groups in DRC gained substantial power in the 1990s as the strength of the state declined because of a crumbling economy and aging dictator; power shifted from the capital in the west to border provinces in the eastern part of the country.

Geographies of power also take into account the concept of territoriality or “behaviour
that uses a bounded space, a territory, as the instrument for securing a particular outcome. Agents such as a U.N. peacekeeping mission or non-state armed group may aim to militarily control a certain province as a way of increasing their overall power. Some territories such as a lucrative mining area or strategic transit route provide more power than other territories and agents might be likely to use violence to secure them. For example, anti-Rwanda groups seized Goma, a key economic center in eastern DRC, during the Second Congo War because control of the city brings significant political power. Capturing the territory later allowed the groups to attack Tutsis and Rwandan soldiers.

Agents may also enter into “security agreements” in order to gain territory and craft new sovereign spaces. Radil and Flint contend that alliances between states and sub-state groups, such as armed groups, that attempted to “reterritorialize” parts of central Africa contributed to escalating conflict during the Congo wars. Geographies of power grapple with shifting territoriality by mapping how institutional control over spaces change.

Geographies of power give GCAS utility that would not exist with CAS alone. They provide insight into the location of a system's leverage points and sites of strength and strain. Tangibly, this means that locating power might mean locating where violence might begin. Lohman and Flint, in a study about insurgency, identify “situate[ing] power within nodes in a spatial network” as an emerging trend in the social sciences. GCAS continue this theme by exploring ontological questions about mass killing by identifying how power flows through systems and which power shifts could lead to extreme violence. By locating centers of power,

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147 Lohman and Flint, p. 1162
it might be possible to locate potential spaces of killing and peace. In a mass killing context this could mean identifying institutions or individuals that influence whether a country or region militarizes and slides into violence. In DRC, the U.S., Yoweri Museveni, and Jean-Pierre Bemba are examples of agents who affected the outcome of the war and onset of mass killing.

Geographies of power are often used in economic geography, especially of the critical sort, to investigate how global economic policy is made. They are also used for more conventional geopolitical analyses to answer questions about zones of policy influence. Economists map how institutions shape income disparities, financial markets, and global wealth distribution. Conflict analysts could do the same with institutions that affect the likelihood of mass killing. They could be as large as the U.N. or as small as a local pastor. In Peet’s *Geography of Power: The Making of Global Economic Policy* he writes that “‘a new kind of economic power system has arrived on the world scene’ in which a few spaces control others at the global scale.”

Similarly, mass killing systems have spaces, agents, and relationships that matter more than others and shape the trajectory of the system. The key is mapping how much power each institution or agent has and how much their relationships affect their respective subsystem or system at-large. This can be represented using a table with a specific type of power (political, social, economic, etc.) on one axis and an agent on the other. Each agent can be ranked, from 0-2 as an example, for each type of power and then totaled to get an idea about how powerful they:

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are in the system at-large. The totals can then be applied to the mapped system.

<table>
<thead>
<tr>
<th>Power Type 1</th>
<th>Agent 1</th>
<th>Agent 2</th>
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**Figure 4:** Estimates of power can be shown by ranking each agent based on specific types of power

**Mass Killing System: Levels of Power**
(Example)
**Figure 5:** The total power calculated for each agent in Figure 4 can be applied to the system map

CAS, in isolation, are effective in explaining how a variety of systems operate. Geographies of power explain which institutions affect outcomes the most. This paper posits that combining CAS and geographies of power could offer a new method for answering ontological questions about mass killing that addresses some of the shortcomings and limitations addressed in the literature review and first section of the second chapter. It accounts for complexity that other methods sometimes undervalue; it expands analyses beyond episodes of genocide; it applies to a wide range of cases; it relies on more than risk factors and triggers; and, perhaps most importantly, it begins to answer questions that can lead to tangible prevention policy. The analytical process involves seeing the system, mapping the system, identifying relationships, creating a geography of power, and overlaying the two components.

Overlaying the two components - CAS and geography of power to create what this paper will call a geographic complex adaptive system (GCAS) - is the final, arguably most important, and difficult stage of the proposed theory. Visually, it may be thought of as follows. First, the CAS consisting of agents, relationships, and integrated subsystems is laid as an initial plane, oriented horizontally. Then, the geography of power is laid atop the CAS as the second plane, oriented vertically. Together, the two planes form a three-dimensional schematic with the CAS acting as the x and y-axes and the geography of power acting as the z-axis. It can be visually imagined as a model of an urban landscape - the plots of land being agents, roads being relationships, boroughs being subsystems; and buildings being the power that agents and institutions have. The taller the building is, the greater the power. This can be represented two-dimensionally using shading to represent power.
Figure 6: The complete GCAS will represent agents, relationships, and levels of power

After the schematic is created, the analysis turns to the temporal components. Mass killing systems can transform rapidly including who the agents are and how much power they have; subsystems, systems, and their emergent behaviors change as well. A system may be called a mass killing system, but may not produce mass killing; in CAS terms, it remains in a normal state. There will be cases that do evolve into mass killing. This paper, in its quest for ontological answers, only considers systems in transition from a normal state to a conflict state. However, the transition is not sudden or discrete. As mentioned earlier, the proposed schematic conceptualizes a transition to mass killing as slow changes in institutional power.

Moreover, some systems are more clearly in a conflict state that produces mass killing than others. For instance, Syria during 2012 experienced mass killing system by many definitions, including this paper’s. Burma, however, is an example of a system that often
fluctuates between latent violence and manifest violence.\textsuperscript{153} As a result, analysts can focus on
collection systems and the respective geography of power, but be prepared to transform the
analysis if mass killing occurs. Selecting the conflicts suitable for analysis can be done using the
plethora of watchlists generated by NGOs such as Jewish World Watch\textsuperscript{154}. Simply because these
countries are on a watchlist, however, does not mean they should automatically be considered
within a mass killing system. A watchlist placement almost certainly means the country should
be in a conflict system, but is not necessarily a mass killing system. For prevention purposes,
analysts could use the watchlists to monitor key power shifts.

This paper asserts that mass killing occurs when power shifts within a GCAS in a way
that promotes inequity. Shifts could be a change in a peacekeeping mandate, an eroding of the
state monopoly over force, defections, legislative changes, arms shipments, international
interventions, and so on. When these shifts occur, it opens space for mass killing to develop,
called mass killing opportunities. Crucially, shifts in power do not always result in mass killing;
hence it is an opportunity, not a commitment. For example, the 2012 elections in Kenya were an
opportunity for mass killing to occur. Post-election violence in 2007 that killed approximately
1,500\textsuperscript{155} people and “difficulties...symptomatic of larger political and institutional questions
related to democratic change”\textsuperscript{156} could have spelled disaster, but little violence resulted. In other
words, the shift in institutional power that occurred as a result of the election presented an
opportunity for mass killing, but it failed to actualize. This example shows that it can take
several shifts in power at similar times to allow for mass killing.

\textsuperscript{154} “High Risk Country Watch List." \textit{Jewish World Watch}. <http://www.jewishworldwatch.org/conflicareas/world-
crises/high-risk-country-watch-list>.
\textsuperscript{155} “Deal to end Kenyan crisis agreed." \textit{BBC News}. 12 Apr 2008.
\textsuperscript{156} Mueller, Susanne. "Dying to win: Elections, political violence, and institutional decay in Kenya." \textit{Journal of
Visually, it may be conceptualized as a stack of Swiss cheese, with each slice representing agents, rotating in different directions at different rates. As the slices rotate, power shifts and agents adapt. However, in the few circumstances when holes in the cheese align top to bottom, a mass killing opportunity arises; space is made available to agents looking to gain power. If an agent or institution capitalizes on this opportunity, mass killing occurs.

There are several important theoretical outcomes of using GCAS. First, it clearly separates mass killing from all other kinds of conflict using a clear definition of the phenomenon - widespread, intentional killing of noncombatants by state or non-state actors. Quantitatively, the scale of death must be 1,000 noncombatants in a twelve-month span. Second, GCAS present a non-teleological conception of mass killing. Unlike some models, often focusing on genocide, outlined in the first chapter, GCAS do not represent mass killing as the final stage in a linear sequence.

The medium- and long-term power shifts in CGAS occur relatively gradually and are intertwined with history, politics, and social relations as shown by the complexity. Mass killing can wax and wane over time, gradually becoming more or less intense. In other words, the trajectory of a GCAS - whether it is moving toward mass killing or away from it - matters more than a defined teleology. Similar to Whitehead’s theory of democratization that asserts a regime should strive toward “a stable institutional structure that realizes the liberty and equality of citizens,”atrocity prevention practitioners could attempt to drive systems away from mass killing toward positive peace.

Conclusion

This chapter identified risk factor lists as one of the most popular ways to assess the onset of mass killing and also critique their utility given the complexity of conflict systems. It

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proposed a schematic that combines complex adaptive systems, a tool used in many disciplines, and geographies of power. The complex adaptive systems allow analysts to identify which people, groups, and institutions are involved in mass killing systems. They also clarify how those agents interact and whether those relationships promote a trajectory that tends toward mass killing. The chapter concludes with a discussion of geographies of power which are essential to understanding when opportunities for mass killing present themselves. The next chapter applies the geographic complex adaptive system schematic to the Second Congo War.

Chapter 3: Geographic Complex Adaptive Systems in the Second Congo War

Introduction

This chapter begins with background information about conflict in Democratic Republic of the Congo beginning with Belgian king Leopold II and continuing through the Second Congo War. The war is unique because of its historic death toll and tremendous complexity. The second section begins to situate the war within an abbreviated geographic complex adaptive system using tools such as a relationship typology and power ranking. The geography of power is particularly useful in determining how long-term changes affect the ontology of mass killing.

Section 1: Beginnings of the “Great War in Africa”

The Second Congo War, also called the Great War in Africa, was one of the deadliest conflicts in history. Some estimates say that 5.4 million people have been killed since 1996 while others place the death toll at 3.9 million from 1998-2004. It is notoriously known as one of the world’s most complex conflicts, but as noted Democratic Republic of the Congo (DRC) expert Jason Stearns wrote, “[The] dismal picture is misleading. Congo’s problems are complex,

but certainly not beyond repair.”¹⁶¹ It is not uncommon to read reports from high-level organizations that begin with a simple assertion - “DRC is a very complicated place” under the subheading “the paralysis of complexity.”¹⁶²

GCAS could be a way to begin to tackle the unique challenges posed by DRC’s “alphabet soup of acronyms”¹⁶³ representing armed groups, U.N. agencies, and government policies. Coleman et al.’s reasoning for using CAS - “manag[ing] the anxiety associated with the overwhelming sense of complexity of the system”¹⁶⁴ - applies near perfectly. GCAS can break down the complexity, place agents in an orderly way, illuminate networks, demonstrate power differentials, and, ultimately, explain how and why mass killing occurred during the Second Congo War.

The background to the war could feasibly date to when King Leopold II of Belgium colonized the territory for personal gain in the 1880s. Leopold enslaved the native population and created a harsh forced labor system to collect sap to create lucrative rubber reserves. The state of Belgium took over the territory in 1908, but many of the exploitative practices continued. After Belgium granted independence in 1960, the U.S., United Kingdom, and Belgium assassinated the first prime minister, Patrice Lumumba, fearing that he was sympathetic to the Soviet Union. After five years of political turmoil, Mobutu Sésé Seko came to power with the support of the U.S. and Belgium.¹⁶⁵

The havoc wreaked by Leopold during the late 19th century, Belgium during the early 20th century, the U.S. the Cold War, and others during the 20th century is widely considered to

¹⁶² Mahony, Liam. "Non-military strategies for civilian protection in the DRC." Fieldview Solutions, Mar 2013.
¹⁶⁵ "The History of DR Congo: An Interactive Timeline." Independent Lens. Public Broadcasting Service
be a contributing factor to not only the conflict in DRC, but also the genocide in Rwanda. Each of them used Congo either as a source of riches or as a geopolitical proxy and none of them cared about the wellbeing of the people living there. The war was preceded by the First Congo War, beginning in 1996, that replaced Mobutu Sésé Seko, in power since 1965, with armed group leader Laurent-Désiré Kabila, the current president’s father. The main causes of the war were Mobutu’s weakening cult of personality, a crumbling economy in Zaire, and, perhaps most importantly, instability in the eastern part of the country partially caused by spillover from the Rwandan genocide two years prior.

The Second Congo War began in August 1998 when a group of Banyamulenge, or ethnic Tutsis living in eastern DRC, erupted into mutiny in Goma, a major mining city and the center of conflict in North Kivu province. Rwandan and Ugandan forces quickly seized North Kivu and South Kivu. Soon, non-governmental soldiers affiliated with Uganda (Movement for the Liberation of Congo, MLC) and Angola (União Nacional para a Independência Total de Angola) as well governmental soldiers from Angola, Namibia, Zimbabwe, Libya, Chad, Sudan, and Central African Republic were fighting and killing. Additionally, Zambia, Tanzania, and South Africa were providing some type of support for Kabila’s efforts to save his

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172 See Figure 7

173 Williams, p. 89
The motivations for getting involved in the war were diverse, ranging from protecting family mining interests the case of Namibia to eliminating long-standing rebel groups in the case of Angola.

Figure 7: Map of DRC and surrounding region

Ugandan and Rwandan collaboration began to fracture as missions clashed and interests diverged. In August 1999, groups backed by both countries fought in Kisangani, the third

largest city in the country. In February 2000, the U.N. authorized a peacekeeping mission, MONUC, now called MONUSCO, to address the violence. Laurent-Désiré Kabila was killed in January 2001 and his son, Joseph, replaced him as leader of a weak state with foreign forces at every corner. In 2002, Rwanda’s role in the killing decreased as their proxy forces grew resistant to unending violence and control from Kigali. Simultaneously, Kabila’s fresh leadership, despite his youth and inexperience, proved to be successful in securing parts of western DRC. He proved to have sharp diplomacy skills and control over his military leaders that was unseen under his father.

Kabila signed a series of piecemeal peace agreements throughout 2002 as Rwanda’s military presence crumbled and Uganda felt the need to remove its troops. The Sun City Agreement, Pretoria Accord, and the Global All-Inclusive Agreement established a fragile peace between Kabila, Rwanda, Uganda, MLC, RCD, and others. A transitional government led by Kabila and consisting of a mosaic of interests carried over from the war assumed power in July 2003 and Kabila was officially elected in 2006 and remains in power today. There was significant violence even after the peace agreements were signed as groups struggled to give up ideologies and logics of violence. Foreign involvement in the violence decreased, but Rwandan proxies remained a persistent problem for Kinshasa. Conflict in North Kivu, South Kivu, Ituri, and Katanga continued to kill thousands of civilians.

179 See Figure 7
During the height of the war from 1998-2001, approximately 350,000\textsuperscript{180} people were killed directly by violence\textsuperscript{181} with many more being killed after the 2002 peace treaties. In total, over 3 million people were killed because of the direct and indirect causes of the war. This paper is only concerned with the war’s mass killing episodes,\textsuperscript{182} which were quite frequent. The episodes that killed the most civilians consisted of raids on villages, battles in residential areas, and disorganized violence between untrained soldiers. For example, as Rwandan and Ugandan soldiers approached Kinshasa in August 1998, Laurent-Désiré Kabila called for normal citizens to arm themselves. This resulted in mob-like groups roaming the city killing people who they suspected of being sympathetic to outside forces.\textsuperscript{183}

As outlined above, DRC exists in a conflict system. Peace treaties did not end the violence and even during times of relative peace such as 2010, there is a reasonable threat of violence, the rise of the M23 in 2011 for instance. At times, such as during the height of the war, DRC existed in a mass killing system. The definition of mass killing outlined above applied for a significant period of time. GCAS can begin to explore how a war became a context for mass killing.

Section 2: The Second Congo War as a Geographic Complex Adaptive System\textsuperscript{184}

The process of analyzing the ontology of mass killing in DRC during the Second Congo War is similar to analyzing other conflicts using a GCAS: see the system, map the dynamics of...
the conflict, apply network analysis, and overlay a geography of power. Additionally, the analysis must define the system’s boundaries and identify potential delays, subsystems, and places of strength and strain. This process and conceptualization has the potential to lend insight into how the Second Congo War’s mass killing began by identifying the rules governing behavior, emergent properties, and transformative power shifts.

The Second Congo War is an unusually large system even by conservative conceptions of the conflict. The system, as this paper sees it, largely exists within Africa, from Tripoli to Pretoria, but it also includes critical agents outside of the continent such as the U.N. The system boundaries at-large extend to an international level, but simultaneously exist at local and regional levels as well depending on the agent in each subsystem. There are six groups of key agents. First, the countries involved on the side of Kabila. Angola, Namibia, and Zimbabwe provided a significant amount of military support for Kabila’s forces as they battled a variety of opponents, primarily in the eastern part of the country. Libya, Chad, Sudan, Central African Republic, Tanzania, Zambia, and South Africa provided Kabila with either logical, minor military, or political support.

Second, are armed groups that explicitly opposed the Kabila regime or fought against Kabila-aligned forces for other political reasons. While there were “at least 20 different armed groups” operating at various times, this paper will focus on the RCD, Banyamulenge, MLC,

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186 These groups were chosen because they are directly related to the mass killing that occurred during the war. There are many other agents that could and should be included in a fuller GCAS.
Mai Mai groups, and their individual leaders such as Jean-Pierre Bemba.\textsuperscript{190} Third, and related, is Rwanda and Uganda. They necessitate a separate category because of their integral role in the invasion and perpetration of mass killing throughout the war. This will also include the effects of the Rwandan genocide in eastern DRC.

Fourth, is the Kabila regime, including his familial successor, and the Forces Armées de la République Démocratique du Congo (FARDC), DRC’s official fighting force. This will be an especially important agent given the political power that Kabila wielded as well as the FARDC’s chronic inability to combat outside forces on its own. Fifth, is the international system including the U.N., MONUC, the U.S., France and so on. Sixth, are civilians in multiple capacities - purveyors of divisions, promoters of reconciliation, civil society leaders, and so on. In a conflict or mass killing system, the non-combatants can be overlooked as agents, but they are the targets of the violence, and sometimes the perpetrators.

Using these key agents, the dynamic ecology of the mass killing system may be mapped by placing the agents in a logical space within the system and identifying the relationships between them, not necessarily the nature of those relationships. For the Second Congo War, the interconnected subsystems are largely based on the groupings listed above - pro-Kabila regimes, Rwanda and Uganda, various armed groups, the Kabila regime, the international system, and civilians - in various capacities. The connections between these subsystems are relatively clear, despite the complexity of the system at-large. The pro-Kabila regimes and the Kabila regime itself collaborated in the fight against Rwanda, Uganda, and various armed groups but, the bulk

\textsuperscript{190} For a fuller list of these groups see Stearns’ 2010 compilation. Stearns, Jason. "List of armed groups in the Kivus." Congo Siasa. 9 June 2010.
of the combat rested with the FARDC. Zimbabwe provided modern air support,\textsuperscript{191} Angola focused on southern DRC where there were UNITA mining operations, and Namibia provided more general support to protect family interests in the mining sector.\textsuperscript{192}

The international system, most notably the U.N., had significant relationships with the Kabila regime, anti-Kabila armed groups, and Rwanda and Uganda. Following the Lusaka Ceasefire Agreement in 1999, the first of many such agreements during the war, the U.N. deployed 90 liaison personnel to support the agreement.\textsuperscript{193} In 2000, one of the most important shifts in the war happened with the deployment of MONUC, a peacekeeping force tasked with maintaining some type of order. The U.N.’s relationship with Rwanda and Uganda was more complicated as it attempted to maintain a sense of neutrality while also fighting armed groups supported by those regimes.

The U.N. and MONUC, however, cannot be viewed as a monolith for they are nothing without contributions and leadership from member states. For instance, the first commander of MONUC was Senegalese Major General Montago Diallo\textsuperscript{194} and some of the biggest troop contributions came from Bangladesh, India, and Pakistan.\textsuperscript{195} In other words, in addition to being a global force, the U.N. can be conceptualized as a package of other countries with varying interests. The U.S., as an example, contributed 25\% to the U.N. budget in 2000 and chaired the Security Council,\textsuperscript{196} but had limited participation in MONUC, likely because the Clinton

\textsuperscript{191} Johwa, Wilson. "Zimbabwe/DRC: The war that might not have been." \textit{Norwegian Council for Africa}. 10 Sep 2004.
administration did not see DRC as a security or moral priority\textsuperscript{197}. Alternatively, France, a permanent member of the Security Council, encouraged Chad to send troops to support Kabila as a way to regain some influence in a region that France withdrew from after the genocide in Rwanda.\textsuperscript{198}

The armed groups opposing Kabila’s forces and MONUC have a relatively clear connection with Rwanda and Uganda. As mentioned above, the RCD and Banyamulenge were aligned with and directly supported by the Rwandan government. Meanwhile, the Ugandan government directly supported the MLC. As a result, there was a tense relationship between the Kabila regime, President Kagame of Rwanda, and President Museveni of Uganda. These armed groups also have clear relationships with the Kabila regime and international system because of the direct combat between them.\textsuperscript{199}

Assessing the relationships between civilians in the system is far less clear because the line between noncombatant and combatant can be blurry; nobody is born a combatant, which means there is a transition into and out of violence. For example, Mai Mai, or community-based armed groups in eastern DRC, quickly mobilize and demobilize as threats evolve.\textsuperscript{200} Civilians can not only evolve into perpetrators of violence, but also are the targets of violence. This means that similar to the U.N., civilians cannot be seen as a monolith. Some of their relationships might promote a normal state while others might promote an at-risk state.

Figure 8: The war’s six key agents and the relationships between them

With the system mapped, it is possible to apply network analysis that assigns normative identities to the relationships between agents, identifies leverage points, points of strength and strain, and possible delays.\textsuperscript{201} As noted earlier, these relationships can simultaneously promote a normal state and at-risk state meaning that no relationship is purely one or this other. As a result, this paper will use four categories to evaluate relationships as a way to grapple with the complexity: primarily at-risk (PA), primarily normal (PN), simultaneous (S), and insubstantial (I), for the relationships that likely do not affect emergent behavior.\textsuperscript{202}

\textsuperscript{201} Figure 2 uses aggregate-level analysis of relationships during the war rather than focusing on individual interactions between the agents.
\textsuperscript{202} Categories such as these used throughout the paper serve to grapple with the GCAS complexity only, not to categorize the entire conflict such as such.
Figure 9: The nature of the relationships between the key agents using PN, PA, S, and I distinctions

While the “primarily at-risk” relationships might seem most relevant for analyzing the ontology of mass killing, all of them affect the system in different and important ways.
Delays exist throughout the system, but the delays inherent in three of the relationships are particularly important. First, between the international system and anti-Kabila armed groups. At the most basic level, the operationalization of MONUC took time. The resolution authorizing the force was passed in February 2000 and it took until July 2001 for the force to surpass 2,300 personnel. More importantly, it takes time for the effects of the force to be felt by the anti-Kabila armed groups, especially because of the defensive nature of its mandate. Second, between Rwanda, Uganda and anti-Kabila armed groups. Information takes time to go from Kampala or Kigali to the MLC or RCD. This affects how quickly battleground realities change which can affect the broader system. Third, is between civilians and Rwanda and Uganda. Much of the violence at the beginning of the war, and arguably throughout it, was

driven by genocide spillover as well as ethnic politics and competing nationalisms. The information that informs the ideologies driving local hatred and violence takes time to evolve and disseminate via politicians, media networks, and informal social networks and it takes even longer for those changes to affect behavior.

There are several sites of strength and strain in this system that can affect the transition to mass killing. Most obvious are sites of direct violence, primarily in North Kivu and South Kivu. These are places of great strain that result in deaths and displacements of combatants and noncombatants. Less obvious places of strain are those such as village political centers led by elders or local politicians. Some of these places produced Mai Mai groups to defend the territory under their control. There are few clear sites of strength, but the clearest example might be health clinics, hospitals, and other places devoted to rebuilding and reconciliation even as the conflict is happening. MONUC bases might seem like places of strength, but they can attract attacks such as the one in Kirumba that killed three peacekeepers.\(^{205}\) Clearly, most places are simultaneously sites of strength and strain. From individual houses to the Congolese parliament, the role of places shifted throughout the conflict as armed groups came and went and peace treaties faltered.

Identifying leverage points within the system is challenging because one agent alone has little explanatory potential. However, it can be seen in relativity - which agents might provide more insight into the ontology of mass killing than others. Rwanda, Uganda, and the anti-Kabila armed groups have clear importance because they were the ones supporting and perpetrating most of the mass killing. Also, the spillover from the Rwandan genocide holds explanatory potential. However, the Kabila regime and international system should also be included.

\(^{205}\) “3 Indian peacekeepers killed in Congo." *The Times of India*. IndiaTimes, 19 Aug 2010.
Kabila’s polarizing, violent rise to power during the First Congo War set the stage for future violence and his leadership during the Second Congo War based heavily on geopolitical strategy promoted, perhaps out of necessity, a divided region. The international system also affected mass killing. While engagement, particularly from the Northwest, with the war was relatively low given the death toll, the international system’s actions remained important. MONUC is an obvious example, but the sheer scale and legitimacy of the U.N. and U.S. are significant. $15 million in U.S. arms sales to DRC, for instance, during the decade prior to the war and the U.S.’ militarization of Africa more broadly after the conclusion of the Cold War\textsuperscript{206} could feasibly be considered factors that contributed to the killing.

With all of the CAS components in place, the geography of power may be mapped and applied. In this abbreviated model, the geography of power will be similar to the leverage points outlined above. However, it will also aim to identify shifts in power that led to the mass killing during the war. The six key agents - Kabila regime, international system, anti-Kabila armed groups, civilians, pro-Kabila regimes, and Rwanda and Uganda - represent different sorts of power during the war that each carried different weight. The Kabila regime held obvious political power as the leader of the country, but it also possessed the power to coordinate; it was able to coordinate, albeit with mixed results, FARDC, the international system, and pro-Kabila regimes to work on its behalf.

The international system held power, as mentioned above, because of its scale and degree of legitimacy. MONUC was a persistent force on the ground while numerous aid agencies tried to address the humanitarian crisis. They also held power remotely as the U.N. passed resolutions condemning the violence, the U.S. supplied weapons and condemning rhetoric, and France

\textsuperscript{206} Hartung and Moix, 2000
encouraged Chad to join the fight, as examples. In other words, similar to the Kabila regime, they were powerful in political and military ways. Rwanda, Uganda, and the anti-Kabila armed groups, as well as some of their leaders, held a tremendous amount of power in the system. Museveni and Kagame effectively organized proxy forces as well as directly supplied troops to fight Kabila and establish their control in eastern and central provinces. John Pierre-Bemba, the leader of MLC, and Ernest Wamba dia Wamba and Emile Ilunga, leaders of RCD and RCD-Goma, had loyal followings of soldiers\textsuperscript{207} mobilized by divisive politics, charisma, and a low-standard of living. These two groups - Rwanda and Uganda and the anti-Kabila armed groups - were tightly interwoven during the war and jointly participated in the mass killing. Their power to organize, ethnicize, and kill cannot be understated.

The pro-Kabila regimes that provided support via their militaries held more power than those that provided primarily political support. The FARDC is notoriously unfit to defend DRC’s territory because of loose troop integration policies and poor training meaning without foreign support, the result of the war might have been different. As mentioned earlier, MONUC largely provided reactive, defensive support, but troops from Namibia, Angola, and Zimbabwe did not have a U.N. mandate providing rules of engagement\textsuperscript{208}. As a result, the geography of power within this group of agents is split between those that provided military support and those that did not.

The power of civilians in any mass killing system is a complicated question as illustrated by Figure 8. More specific agents within the civilian category such as civil society organizations, religious leaders, and elders obviously have varying degrees of power. However, for the purposes of this abbreviated case study, civilians will be viewed as an aggregate, accounting for

\textsuperscript{207} "IRIN Update 675 for 20 May [19990520]." \textit{University of Pennsylvania - African Studies Center.} Office for the Coordination of Humanitarian Affairs, 20 May 1999.

\textsuperscript{208} Cohen, 2000
their various roles and capacities. Due to a lack of localized early warning systems and other community empowerment tools during the war, normal civilians held little power and had few ways to resist the killing other than organizing Mai Mai groups. Civil society groups, even after the formal conclusion of the war created “counter-discourses”\textsuperscript{209} and helped to control and produce a social fabric that combated environments of violence. Alternatively, as outlined above, elders, expecting little help from FARDC, organized community militias to defend themselves, but ended up creating forces that killed many civilians.

These different forms of power were expressed differently throughout the war, sometimes with guns and other times with radios. However, as outlined above there were four primary kinds of power: political, military, social, and coordinating; the last type being the ability to coordinate other agents. The level of each agent’s power can be represented as a level 0, 1, or 2 for the sake of this abbreviated model.\textsuperscript{210}


\textsuperscript{210} The 0, 1, 2 rankings are based on aggregations of power rather than individual circumstances. For instance, the social power of the Kabila regime is the degree to which they can socially influence people throughout the country.
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<td><strong>Political Power</strong></td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Military Power</strong></td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Social Power</strong></td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Coordinating Power</strong></td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

**Figure 11:** Table matching agents with types of power in order to determine their total power in the system.

When this power analysis is applied to the system, the nodes of control and their relationships begin to become apparent.
The last analytical task is to identify the shifts in power across the GCAS that might have contributed to the war’s mass killing. There are five primary power shifts, using the agents identified above, that contributed to the mass killing during the war. First, is a shift that occurred during the First Congo War - the downfall of Mobutu and installation of Kabila. Mobutu dominated the territory then called Zaire for nearly 32 years as the Northwest ignored his kleptocracy and human rights abuses as it battled for control of the region during the Cold War.²¹¹ Mobutu created a strong cult of personality that enabled him to maintain control of DRC and largely remain inward looking when it came to regional politics. However, after the Soviet Union fell in 1990 and Northwestern support declined, he ended the ban on multi-party

politics\textsuperscript{212} which paved the way to his overthrow in 1997 by Kabila. This change from Mobutu to Kabila was a seismic geopolitical shift that broke Mobutu’s grip on DRC domestic power and, to a limited extent, regional power. It did not create a power vacuum necessarily, but rather signaled that DRC was open to exploitation and, ultimately, invasion.

Second, is the power shift in the eastern part of the country caused by insufficient military leadership under Kabila, spillover from the Rwandan genocide, a proliferation of armed groups and aggressive Rwandan and Ugandan policies. This is arguably the most important shift in the geography of power that caused mass killing. While the DRC military, called Forces Armées Zairoises under Mobutu, were stronger prior to Kabila’s takeover, it remained relatively weak. There were only 25,000 ground forces in 1993.\textsuperscript{213} Mobutu’s command over what strength he had, however, was effective in handling the numerous armed challenges that he faced. During the early days after Kabila became head of the military, it was fragmented, leaderless, and could not handle practical challenges such as translation.\textsuperscript{214} Additionally, Rwanda and Uganda saw a moment of opportunity with a weak Congolese executive and fighting force. For economic, political, and social reasons including historical distrust and ethnic incitement, both countries sponsored large armed groups to fight on their behalf.\textsuperscript{215} These armed groups - RCD, MLC, Banyamulenge groups, etc. - were the primary perpetrators of mass killing during the war.\textsuperscript{216} Kabila’s weak territorial and military control combined with increasing power to DRC’s east and genocide spillover played major roles in the ontology of mass killing.

Third, is the international system’s disengagement with DRC after the fall of the Soviet

Union in 1990. The U.S. in particular had a vested interest in supporting Mobutu after the CIA, working with others, installed him in the 1960s as they attempted to ward off Soviet influence in the region.\textsuperscript{217} However, during the years prior to 1997, the Clinton administration allowed a river of guns and military training to flow into region via direct delivery of weapons and commercial sales.\textsuperscript{218} Beyond rhetorical condemnation, humanitarian relief efforts, and a defensive peacekeeping force, there was little significant engagement. This allowed Rwanda, Uganda, armed groups, pro-Kabila regimes and the Kabila regime itself to kill with little oversight or accountability.

Fourth, is the decreased agency and power of civilians throughout the war. Although there were cases where civilians organized militias and willingly joined armed groups, the majority of people were caught in a place with little agency or power. The geopolitics of the war were occurring at a level beyond the reach of most ordinary Congolese and ethnicization was being driven by a deluge of refugees and participants in the genocide spilling over from Rwanda as well as directly from the regimes to the east. Moreover, as mentioned earlier, civilians had almost no way to systematically protect themselves using an early warning system. This is not to say that civilians did not have any agency or power, but it likely decreased as violence intensified and body counts rose.

Fifth, is the transition from Laurent-Désiré Kabila to his son, Joseph Kabila. Joseph assumed the presidency after his father was assassinated in January 2001. Despite his lack of experience, the younger Kabila seemed to be more willing to engage in negotiations while simultaneously managing FARDC.\textsuperscript{219} A significant amount of killing occurred from when he

\textsuperscript{218} Hartung and Moix, 2000
took office until the Global All-Inclusive Agreement was signed in December 2002.\textsuperscript{220} The relationship between Joseph and the formal conclusion of the war might only be a correlation. While both Kabilas came to power in the context of war, Joseph was chief of staff of DRC’s official land forces while his father was accustomed to unofficial guerilla warfare. Moreover, the older Kabila had a more complex relationship with Rwanda and Uganda because of their support of his army in his fight against Mobutu.\textsuperscript{221} Joseph did not have that connection which could have contributed to his tendency toward conciliation in 2002.

These five shifts of power, from one agent or subsystem to another, during the Second Congo War begin to answer ontological questions about why and how the killing came to be. Power shifts away from agents and relationships that promoted a normal state toward those that promoted an at-risk state opened opportunities for mass killing within the context of a regional war. A litany of agents seized those opportunities with the deadliest of consequences. Obviously these only begin to understand the war’s mass killing, but GCAS provide a model worth exploring.

\textit{Conclusion}

This chapter began with a review of Congolese history, including events that led up to the Second Congo War. The abbreviated geographic complex adaptive system illuminates some ways that the Second Congo War operated and also displayed shifts in power that might have contributed to the war’s mass killing. Given that the case study above is merely a schematic, much more research will need to occur to make the model a valuable tool for pragmatic and nuanced prevention efforts.

\textsuperscript{220} McGreal, Chris. "War in Congo kills 45,000 people each month." \textit{The Guardian}, 22 Jan 2008.
Conclusion: Implications, Limitations, and Areas for Further Research

The paper’s use of complexity science, systems thinking, and geography to analyze mass killing allowed for the exploration of three key points. First, mass killing is a complex phenomenon that requires nuanced analysis and policy response. The post-Cold War transition to seeing mass killing as a component of broader political violence calls for narratives that go beyond state-based geopolitics. Crises in DRC, Syria, Nigeria, and elsewhere operate based on numerous meso- and micro-level dynamics and well as national and global ones. Many of the international system’s “tools in the toolbox,” need to accommodate this complexity by going beyond the convention - sanctions, rhetorical condemnation, and military intervention. Long-term development initiatives including state- and civil society-building are crucial prevention enterprises.

Second, geography deserves a greater role in mass killing analysis. The spatialized nature of mass killing lends itself to a discipline that explores how spaces are shaped by the environment and human systems, in this case conflict systems. McDoom, Guhaug, Kirsch, Flint, Tyner and many more explore a variety of geographic concepts from constructed spaces to the loss of strength gradient that can be integrated into existing frameworks.

Third, understanding how power functions in systems is essential to understanding the ontology of mass killing. Solomon argues “a greater role for power relationships...in determining response outcomes” and this paper argues a greater role for them in prevention analysis. Geographies of power aid in specifying how agents gain and maintain different kinds of power. This shifting distribution changes how agents interact with each other, therefore changing the system at-large. Significant long-term power shifts such as a decaying state or militarization have the potential to present opportunities for mass killing.
This paper posits that a way to analyze the ontology of mass killing is a hybrid schematic called geographic complex adaptive systems that combine complex adaptive systems and geographies of power. GCAS are a way to respect the complexity of human systems. Positions that are either paralyzed by complexity or attempt to resolve it through excessive categorization and classification deserve critical attention. Research with the goal of increasing mass killing prevention effectiveness, such as this paper, should consider adopting a compromise position that neither is overwhelmed by or dismissive of complexity. In other words, “empirical observation...requires a measure of categorization,”222 but not categorization that reaches the point of oversimplification.

Adding complexity to conflict analysis is important, but should not be the only goal of research. Complexity for complexity’s sake will do little to improve prevention policy; a degree of simplification is necessary for actionable policy. The schematic described in chapters two and three is admittedly one that simplifies and categorizes, but it has the potential to bring more complexity to current theories. The prevention community could benefit from embracing complexity science as an integral component of analysis.

GCAS involve seeing the system, mapping the system, identifying relationships, and creating a geography of power; it is an explicitly geographic and utilizes the unique ways that geographers see human systems - spatially, integrated, and constructed. The five stages each serve a specific analytical purpose that helps reach the goal of understanding how mass killing comes to be. They can also begin to tackle the vexing questions around why mass killing happens in some conflicts, but not others.

GCAS are not tangible models, but rather a way of understanding conflict and can serve as a schematic for a more robust analytical lens. The figures used throughout this paper are meant to illustrate crucial components of conflict that deserve analysis - agents, relationships, power, and so on. However, complexity science analysis does not have to end with tangible figures. Expanding system boundaries beyond the main actors could be a useful exercise for scholars and policymakers alike. Syria, for instance, involves more than Assad, the opposition, the U.S., U.N., Iran, and Russia. EU trade policy and Saudi Arabian material support, as examples, are often overlooked, and systems thinking might be able to account for a diverse variety of agents. Similarly, analyzing relationships between agents and how power affects their actions is a transferable principle of complexity science; these exercises can exist independent of GCAS.

GCAS departs from some conventional ways of viewing mass killing. Stages of conflict might be ineffective because they do not allow for delays, backsliding, or adequate complexity. Risk factor lists can lack sufficient context-specific information and fail to address the uniqueness of country-specific risk aggregation. While GCAS use categories, such as normal state versus at-risk state, high power versus low power, and subsystems, they categorize aspects of the conflict, not the conflict itself. In other words, categorizing levels of power that agents have, for instance, is different than saying that a conflict at-large moves from one stage to the next all at once. Also, the shifts in power that provide opportunities for mass killing often occur over a long period of time and may not necessarily be discrete.

There are research and policy implications for using GCAS to analyze mass killing. First, they have the potential to contribute to an emerging paradigm within conflict studies that views mass killing as an adaptive system, rather than a teleological end. Instead of seeing mass killing
as the final stage of a linear process, GCAS see it as part of an evolutionary network where killing can come and go as circumstances change. According to Valentino’s thesis, agents will find the logic of mass killing more appealing when they think it can help them accomplish their goals. This does not necessarily have to come after a discrete list of preconditions. All too often policymakers and conflict experts wait as violence escalates, warning about impending mass killing as their voices echo off of empty legislative chambers. Ban Ki-Moon, in February 2014, discussed the plight of Syrians while commemorating the 20th anniversary of the genocide in Rwanda, invoking an implicit comparison between the two knowing that the opportunities for action were few.

Instead of waiting for the next horrifying stage of violence to occur, a robust prevention research canon, involving GCAS, could continue to be developed in order to proactively address mass killing. The key to using GCAS as a prevention aid is creating the models prior to a conflict’s mass killing; they are not merely post facto analytical tools. If they are created for watchlist countries before mass killing, they can lend insight into where and how it might begin. This requires a level of understanding that goes beyond conventional media narratives and delves into the area’s politico-social dynamics.

Tangible policy action, even with better research, will be difficult. Mass killing prevention remains on the margins of U.S. foreign policy, both as a moral and national security priority. Change emanating from the halls of Congress has arguably become less feasible in a post-Iraq, post-Afghanistan, and post-Great Recession political environment. The Obama administration has taken steps to increase its capacity such as creating the Atrocities Prevention

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223 “UN chief cites Syria at Rwanda genocide commemoration.” Capital News. 28 Feb 2014.
Board in 2012\textsuperscript{225} and appointing Samantha Power\textsuperscript{226}, a noted genocide expert,\textsuperscript{227} as Ambassador to the U.N. Despite these positive steps, recent crises in Syria, Burma, Central African Republic, Nigeria and elsewhere prove the need for strategic, determined efforts by the mass killing prevention community.

Despite GCAS’ utility, they have notable limitations. First, the cleanliness of the schematic will rarely translate into analysis. Complicating factors such as rapidly shifting power centers and the evolutionary nature of agents and subsystems will make analyzing GCAS difficult. Second, the inherent complexity of GCAS makes them a time-consuming method. The DRC case study is, again, a highly simplified representation of a GCAS. A GCAS is never complete; there could always be more agents and relationships. Much of the DRC research canon, for example, adequately addresses which agents should be included within the GCAS. There are projects that map rebel groups, make connections to regional actors, and trace the history of intervention. However, the paralysis of complexity still seems to be present. Third, is the paper’s heavy focus on the politico-scientific components of mass killing. A comprehensive understanding will require anthropology, economics, environmental studies, psychology, sociology, and more. The extremely simplified model outlined in chapters two and three is merely a potential starting point.

In order to make GCAS better over time, more research must be conducted regarding localized relationships\textsuperscript{228} between agents as well as a continuous re-evaluation of power centers and leverage points. Another limitation of GCAS is that they are oriented toward a negative


\textsuperscript{227}For Power’s seminal work about genocide prevention and liberal intervention, see Power, Samantha. \textit{A Problem From Hell: America and the Age of Genocide}. New York: Basic Books, 2013.

\textsuperscript{228}For a thorough analysis of local violence in DRC, see Autesserre, Séverine. \textit{The Trouble with the Congo: Local Violence and the Failure of International Peacebuilding}. Cambridge University Press: New York, 2010.}
peace. They merely aim to prevent the slide into mass killing and do not necessarily help with a positive peace agenda involving civil society and judicial sector capacity-building or poverty alleviation, as examples.

The research agenda for the mass killing prevention community is vast and wide-ranging. From building early warning systems to grasping the role of emerging economic powers, the ways to approach a fuller understanding of mass killing are nearly endless.

Regarding GCAS, future research needs to begin to identify which agents and relationships should be prioritized based on themes throughout multiple systems. Particular agents, for example a country’s executive, will appear in most systems, but others are less obvious. The long-term shifts in power also deserve critical attention in order to determine which shifts are most likely to present mass killing opportunities. Lastly, research could explore how GCAS, or components of them, particularly geographic ones, could be incorporated into other conflict frameworks such as risk factor lists and statistical modeling.

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