One if by land, and two if by sea: Identifying the Military Domains of International Crisis Behavior

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Abstract

The emergence of new modes of conflict has prompted inquiry about the relationship between conflict escalation and how states fight. Despite rich theoretical literature contrasting deterrence and spiral models of conflict more generally, empirical work on different domains of military action — land, air, sea, WMD, space, and cyber — has been largely constrained to single-domain studies, limiting our understanding of how these domains interact. This paper contributes to our understanding of cross-domain military interactions by introducing a new dataset of the domains in which states took military action during 412 international crises from 1918 to 2010. In doing so, it tests existing theories about cross-domain deterrence and cross-domain conflict to identify the relationship between conflict escalation and belligerents interacting with unlike means. We demonstrate that cross-domain interactions are not rare – they are instead the modal form of conflict – but despite contemporary concern, this phenomenon is no more common today than aggression with unlike means. Crises with cross-domain military interactions are less violent and no longer than crises in which belligerents engage with similar means

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1 Introduction

Recent international crises have experienced a seeming similarity in adversaries responding to their opponent's military actions with dissimilar means. Hamas' cyber attacks in 2019 were met with Israeli airstrikes (Newman 2019), in 2020 Azerbaijani tanks clashed with Armenian drones in the Nagorno-Karabakh region (Dixon 2020), Chinese malware attacks have recently joined the fray in an ongoing border skirmish with India (Sanger and Schmall 2021), and Russian electoral inference in 2016 was met with no concrete response due to concerns about the appropriateness of various kinetic and non-kinetic military operations (Healey 2018). There is little consensus about whether to sound the alarm about dangerously escalatory cross-domain interactions (Dixon 2020) or cautioning against excess concern (Borghard and Schneider 2019). Furthermore, are these and other recent cases emblematic of the future of warfare (Gatopoulos 2020), or is this nothing more than a familiar story, retreaded (Gannon et al. 2021)?

While recent events have motivated an interested in understanding the domains in which states take military action and the consequences those choices have for international stability, this phenomenon has not been studied systematically. Part of this is due to difficulty identifying military domains — is it simply geographic distinctions between land, air, and sea that match up with different military commands? Where do new tools or technologies like nuclear, space, and cyber fit into this typology? The second difficulty concerns limited empirical data concerning the conduct of conflict. While scholars have developed numerous detailed datasets on conflict's participants, duration, location, and outcome in order to understand war's causes and consequences, empirically-oriented work concerning the conduct of conflict has only more recently received attention (Lindsay and Gartzke 2019a). Evidence is inconsistent since we typically frame it around emerging techs with little empirical evidence (Sechser, Narang, and Talmadge 2019; Horowitz 2020) or individual domains in isolation (Allen and Martinez Machain 2017; Kostyuk and Zhukov 2019; Cunningham 2020).

This paper takes an inductive, data-driven approach to identify spatial and temporal patterns in the military domains in which states operate during conflict as well as the relationship between cross-domain interactions and the intensity and duration of international crises.[1] Rather than come up with a new typology of military domains, we take a commonly agreed upon understanding shared by practitioners and scholars that contains the traditional domains of land, air, and sea as well as the recent domains of space, cyber, and weapons of mass destruction (WMD).[2] Our motivation in gathering data on the conduct of conflict is driven by the recognition that the domains in which states fight are a reflection of actors' goals, priorities, resolve, and capability and subsequently shape important events like the severity and duration of conflict (Lindsay and

[1]On the decision to approaching new social science data inductively, see Grimmer, Roberts, and Stewart (2021).

[2]While WMD is rarely a distinct military branch and has geographic overlap with the other domains, they do represent a distinct domain in how actors think about them in the international context.

Gartzke 2020). In doing so, we produce a novel dataset of the military domains in which 3833 crisis actors operated during 412 international crises from 1918 to 2010 as an expansion to the existing International Crisis Behavior dataset (Brecher and Wilkenfeld 2000).

Our research contains two initial findings that contributing to existing research on the consequences of the domains in which states fight. First, cross-domain conflict is prevalent, but not novel. Some degree of cross-domain military actions occur in 57% of crises over the past century, with 24% of crises involving completely dissimilar military actions by belligerents. Moreover that is not a recent phenomenon, as the rate of "cross-domainness" has remained constant over the past century despite the advent of new military domains during that time period like WMD, space, and cyber. Second, contemporary optimism concerning cross-domain conflict may have historical support. Crises in which belligerents engage in cross-domain military conflict are less violent and no more durable than crises in which states respond with like-means. While data on the more salient new domains like cyber remains limited, there is insight to be gleaned about cross-domain interactions in more traditional military domains that should inform theories of deterrence and spiral models of conflict that are being applied to more recent cases.

This paper will proceed in six parts. Section 2 identifies the existing state of the art concerning the domains in which states fight. Section 3 then identifies the theoretical basis underlying both the cross-domain pessimists (cross-domain conflicts are concerning) and optimists (cross-domain conflicts are not concerning) as applied to the intensity and duration of international crises. Section 4 provides an empirical test of these contrasting theories by introducing a novel dataset of the military domains in which states operated during international crises of the past century. Section 5 discusses the implications of these findings for theories of deterrence and the means of conflict, their application to contemporary foreign policy decisions like A2/AD and AirSea battle in East Asia, Russia's "little green men" in Eastern Europe, and kinetic responses to cyber attacks in the Middle East, and avenues for future research using new data on the military domains of international crises. Section 6 concludes.

2 Existing theories of conflict escalation and how states fight

The vast array of theorized determinants of conflict escalation – defined here in terms of its intensity and scope – primarily concern factors present before war occurs (Morgan 1994; Fearon 1995; Powell 1996). Since most wars end with an agreement rather than a 'fight to the death', the conduct of conflict, whether actual or latent, has much to tell us about when that war will escalate (Gartner 1998; Wagner 2000; Biddle 2005, 2007; Boot 2006).

There is a well developed literature on how different *ways* conflicts are fought might influence conflict escalation.[3] The ways in which militaries fight influences war's participants (Fordham 2004; Beckley 2017), victors (Rosen 1991; Lyall and Wilson 2009; Cappella Zielinski and Grauer 2020), costs (Caverley 2014), severity (Talmadge 2019; Gartzke and Lindsay 2020), location (Schilde 2017; Crisher 2017), and duration (Martinez Machain 2015; Cappella Zielinski 2016; Caverley and Sechser 2017) as well as what states are able to project power (Corbett 1911; Beasley 2015), what issues are resolved with force (Allison and Morris 1975; Becker 2017; Fearon 2018; Sechser, Narang, and Talmadge 2019), what threats are credible (Buzan and Herring 1998; Slantchev 2003; Post 2019; Montgomery 2020), the efficacy of states' reputation (Erickson 2018), and the balance of power (Glaser 1992; Horowitz 2010; Gartzke, Kaplow, and Mehta 2014).

Despite interest in the means by which state engage in conflict, there is little agreement conceptualizing and categorizing those means. One broad way to conceptualize them is in terms of the domains in which they take place. There are many ways of thinking about domains, as they can be distinguished from one another by technology, tactic, geography, or purpose (Lindsay and Gartzke 2019a). Some have questioned the utility of conceptualizing these domains as distinct, especially as new domains like space and cyber increasingly play the role of supplementing rather than supplanting operations in the more traditional domains (Stallone 2009; Caton 2012; Libicki 2012). Rather than engage in ontological debates about the best way to typologize state military behavior, we take domains here as a useful starting point for thinking about differences in the way states fight. We know that practitioners think about these domains as distinct and we have theories about the advantages and disadvantages of taking military action in each of these domains (Lindsay and Gartzke 2019a). I use the term domain here loosely to refer to land, air, sea, WMD, space, and cyber.[4] I choose these domains because they differ from one another in how political actors think about them and because they have different constraints concerning concepts of interest like power project capabilities, movement, coordination, casualty risk, and cost (Lindsay and Gartzke 2020, 9–10).[5]

If the problem of the security dilemma is to decide whether a particular response to an adversaries behavior will deter or escalate, the problem as applied to the conduct of conflict is whether the military means one chooses determine the likelihood of escalation. Snyder (1965, 187) described the importance of new (nuclear) means and escalation long ago. "[N]uclear technology introduced a new form of intent-perception

[3] The conduct and consequences of conflict has also been linked to one another since various states characteristics influence the militaries they choose to develop (Kennedy 1976, 177–204).

[4] Zooming out, international actors, of course, interact in non-military ways. Some research thinks about this more broadly, where military interactions represent a domain among other strategies that are economic and diplomatic. I bracket that discussion here since the goal of this paper is to contribute to research that disaggregates that military domain. For existing work on issue linkages involving military and non-military domain interactions, see Rosenau (1968), Tollison and Willett (1979), Vasquez (1983), Morgan (1990), Morgan and Palmer (2000), Starr (2000), Poast (2012), Greenhill (2019), and Huang and Kang (2019).

[5] Zooming in, there are differences in the strengths and weaknesses of capabilities that produce unique cross-domain dynamics regarding conflict intensity and duration (Lindsay and Gartzke 2020). We bracket that discussion here given limitations in empirical data, but it represents a fruitful avenue for future research.

and a new form of uncertainty — that concerning what types of military capability the opponent was likely to use and what degree of violence he was willing to risk or accept". This view is widely credited with originating discussion of the stability-instability paradox regarding the relationship between capabilities an actor possesses and the capabilities they use. The resulting debate created competing perspectives on escalation, characterized as deterrence and the spiral model. Snyder's deterrence perspective contrasts with the spiral model advocated by Jervis (1984). Powell (2015)'s recent work represents the newest attempt to theorize the relationship between power and risk. He develops a formal model where the challenger decides how much military power to use to achieve its ends. The more power it uses, the higher its chance of winning, but the higher the potential risk of escalation as well. Although an important contribution to understanding conflict escalation and the deterrence and spiral models of conflict, what it means to bring "more power to bear" in a crisis is unspecified (Powell 2015, 598).

Just like the amount of capabilities a state devotes to a conflict influence its outcome, the nature of those capabilities similarly matters (Carcelli and Gartzke 2017). In one sense, it is intuitive to note that military domains have some inherent level of belligerence that can be compared to one another. A nuclear strike is likely to be interpreted as more intense belligerence than a non-nuclear attack at any feasible level of use. Yet this intuition remains coarsely formulated. Foundational conceptions of escalation ladders Kahn (2007) have evolved in a way that more closely parallels existing "domains" like Libicki (2009, 28–29) noting belligerence increases as an actor shifts from diplomatic and economic to cyber, then physical force, then nuclear force. But this is coarse, since not all conventional domains involving physical force are created equal and more importantly it does not account for the strategies in which the other side is operating. Whether the move from one "physical force" domain to another is consistent with the deterrence or spiral model of conflict remains unknown.

With this in mind, evaluations of the importance of actions in domains has recently shifted to theorizing about interactions across domains (Lindsay and Gartzke 2019b). There is suspicion that cross-domain interactions are more prevalent now because there are new domains in which states can operate. While literature on the nuclear domains and conventional-nuclear interactions is no longer in its infancy (Kissinger 1960; Wallace 1979; Weede 1980; Carver 1986), this has recently expanded to cross-domain or multi-domain interactions involving newer domains of space (Early 2014; Lin-Greenberg and Milonopoulos 2021), cyber (Healey 2018; Libicki 2012; Nye 2017; Schneider 2017; Lindsay and Gartzke 2018; Kostyuk and Zhukov 2019), drones (Boyle 2013; Byman 2013; Hazelton 2016; Horowitz, Kreps, and Fuhrmann 2016; Schneider and Macdonald 2017; Zegart 2018), and artificial intelligence (AI) (Jensen, Whyte, and Cuomo 2020; Johnson 2020). Research has expressed concern that these and other new tools of conflict may allow new forms of insidious revisionism

(Brands 2016), although skepticism about the novelty and efficacy of these "new" forms of warfare casts doubt on those concerns (Gannon et al. 2021).

Although these new domains have motivated an increasing interest in the subject, empirical evidence remains limited since many of the domains of interest (e.g. cyber) have less well established evidence of empirical trends (Horowitz 2020). Even among recent attempts to empirically identify the ownership and use of new modes of warfare like satellites (Early 2014 on satellites), cyber attacks (Valeriano and Maness 2014; Kostyuk and Zhukov 2019), drones (Horowitz, Kreps, and Fuhrmann 2016), and smart bombs (Kahn and Horowitz 2021), the efforts are contained to a single capability or domain. As a result, existing research on cross-domain conflict is it tends to think about the "cross" component being across domains within an actor rather than across domains across actors. Nye (2017, 46) recognizes this in noting "it is a mistake to see the cyber realm in isolation. The term "cyber deterrence" can be confusing because theorists tend to focus on in-kind or in-domain deterrence rather than on a broad range of tools that can be used both actively and passively and with graduated effects. A response to a cyberattack need not be by cyber means any more than a response to a land attack need be by the army rather than naval or air forces."

We agree with Powell (2015, 598) when he states "the amount of power the challenger brings to bear affects the stability of the conflict. More specifically, how much power the challenger brings to bear limits how much risk the defender can generate". We expand upon his conceptualization of the military might used by the challenger. Powell varies "military might" as different types or levels of conflict (Powell 2015, 599). But types and levels of conflict are not synonymous, nor should they be grouped together (Kreps and Schneider 2019). We seek to provide insight about how the relationship between the types of conflict by adversaries explains differences in conflict escalation.

3 Is a ship a fool to fight a fort?

Royal Navy Admiral Nelson is (mis)credited with having proclaimed "a ship's a fool to fight a fort" (Ferreiro 2016). Interpreting foolish actions to be those that escalate the conflict in violence and/or duration, we can derive two contrasting expectations about cross-domain interactions and conflict escalation. When the conduct of conflict involves dissimilar military domains — as in the recent cases of Azerbaijan-Armenia, China-India, Israel-Hamas, and US-Russia — will that cross-domain interaction deter escalation, or cause it to spiral? Despite opposing predictions, both theories share the assumption that the manner in which states engage in a crisis influences whether it is resolved peacefully or violently since it influences how states show resolve and/or capability. These theories thus differ in whether demonstrations of resolve and capability succeed or fail when they involve taking actions in a military domain in which your opponent is not operating.

3.1 Cross-domain escalation: the danger of an ear for an eye

Crises in which actors interact in dissimilar military domains may be more violent and longer because cross-domain interactions complicate interpretations of proportionality and stake, thus contributing to misinterpretation of resolve (Morrow 2019). If a belligerent taking action with 100 ground troops is met with the defender deploying 200 ground troops, the belligerent could reasonable interpret the defenders action as a "re-raise" indicating the defender places high stakes on the issue in dispute. But if the defender responds to a deployment of 100 troops with 5 aircraft, it is less clear whether that is a re-raise. In essence, cross-domain conflict presents actors with an apples to oranges comparison concerning the resolve and value for the issue at stake that makes a negotiated settlement more difficult to come by given ambiguity about the extent of the bargaining range.

Uncertainty can cause war by creating incompatible expectations about war's utility and outcome (Fearon 1995; Gartzke 1999). Asymmetry in the military domains in which belligerents are taking actions can be a source that uncertainty. Cross-domain interactions may be perceived by the adversary as shifting to a domain where one has escalation dominance because you highly value the stakes of the conflict. Since each military domains has different strengths and weaknesses concerning outcomes like credibility, warfighting, costs, and signaling, operating in a different domain that your adversary may signal a difference in one's tolerance for cost and risk (Carcelli and Gartzke 2017; Gartzke et al. 2017; Lindsay and Gartzke 2019a). A stylized representation of military domains is as a game of rock, paper, scissors where each domain's characteristics bring advantages against some of your opponent's chosen domains, but disadvantages against others (Lindsay and Gartzke 2019a, 16, 350). In discussing the dangers of Chinese power projection from land, former US National Security Adviser H.R. McMaster (2016) advised practitioners "recognize that synergy, right, between joint force capabilities and how, you know, really joint operations - it's rock, paper, scissors, you know? So if you can - if you have all of those tools available - maritime, aerospace, cyberspace, land capabilities - then you're able to pose that enemy with multiple dilemmas." While responding to your adversaries rock with paper may help you win the conflict, it could also produce an incentive for your opponent to augment their hand with scissors, thus encouraging escalation. Responding in-kind — playing rock against rock — may be de-escalatory because it represents a symbolic gesture to opt against an efficient response (paper) that would require the opposing side to engage in a new, more efficient response (scissors).[6] Responding in-kind thus represents a symbolic gesture to opt against an efficient response that would require the opposing side

[6]A similar argument about the defense-dominant nature of responding in-kind is made by Biddle and Oelrich (2016).

to engage in a new more efficient response. By responding in-kind, states can agree to call it a draw in a way that represents a face saving measure (Carson 2016, 2018; Carnegie and Carson 2018). Conversely, undertaking that engagement in a new military domain may unintentionally create an "escalatory updraft" if the opponent misinterprets what should be a tit-for-tat response that ends aggression with one that instead escalates it (O'Neill 1991, 104). To return to Powell (2015)'s logic about bringing more power to bear, taking action in a new domain may represent a reduction in cost for you, but the very logic of escalation dominance that generates that outcome also means interacting in the new domain represents an increase in cost for your opponent, with adverse consequences for the likelihood of a peaceful settlement.

Scholars have raised this concern in the context of the US and China in arguing "A war at sea could thus quickly become a war on land, potentially even raising risks of nuclear escalation if the US starts to erode potential capabilities relevant to China's nuclear arsenal" (Talmadge 2019, 880–81).[7] States often share an assumption that opponents will "follow precedent by responding in kind with similar weapons against a similar target set", so failing to do so risks un-calibrated escalation (Warden 2018, 24). In the cyber context, scholars have argued retaliating to physical force with a cyber attack may raise issues of proportionality (Libicki 2009). While China thinks that cyber attacks are a proportional response to US trade pressure given the stakes each place on the sectors being harmed by the other actions, the United States disagrees. "The U.S. approach to Chinese gray zone tactics seems to be consistently several steps behind the threat. As in the Russia case, this is likely due in large part to the absence of a coherent strategic approach, leading to ad hoc U.S. responses from one crisis point or domain of interaction to the next." (Hicks and Friend 2019, 8).

3.2 Cross-domain deterrence: the safety of playing chess while your opponent is playing checkers

The opposite logic could also be at play. Crises involving states taking military actions in dissimilar domains could be less likely to escalate by communicating a change in the stakes and a willingness to escalate or by giving one side the upper hand if conflict actually breaks out (Rovner 2020). The apples to oranges analogy may be backwards; rather than creating confusion about resolve and the opponent's evaluation of the stakes, a willingness to play a different game entirely may sharpen that logic in a way that signals it may be better to try to resolve the conflict without fighting.

Rather than simply thinking of military domains as playing rock, paper, or scissors, the virtues of different domains in their ability to signal or fight wars also creates distinctions in what it means to "play" one of them. Threats differ from forward deployments which are further different from seizing territory or discharging

[7] See also Talmadge (2017) and Cunningham (2020) for more on China and the risk of nuclear escalation.

a rocket (Lai 2004; Mackey 2014; Post 2019). In this way, operating in a new domain could deter rather than inflame by providing an avenue to graduated escalation (Cashman and Robinson 2007; Montgomery 2020). Reinforcing an army unit by putting bombers on alert or forward deploying a naval unit could be a graduated way of signaling resolve and a willingness to escalate without necessarily increasing the number of army troops already on the battlefield (Slantchev 2005, 2011; Warden 2020). Using the same assumption of escalation dominance, action in a new domain in which your opponent is not operating because they do not have escalation dominance in that domain can be a costly signal that makes a negotiated settlement more likely (Cimbala 1994; Quek 2013; Handberg 2016). In the same way that children on a playground may yell 'hotter' or 'colder' as their blindfolded classmate tries to find some object, operating in new domains can add credibility to verbal statements about whether an actor perceived an offered negotiation as preferable to continuing to fight. Furthermore, deterrence may work not because of mutual vulnerability, but because of one-sided fear about overwhelming punishment (Green 2020; Lieber and Press 2020). If a state operating in a new domain during a crisis is indicative of willingness to take action in a domain where they have escalation dominance, that may convey to the other side that the state is willing to incur a higher cost.

Historically, Nixon placing bombers on nuclear alert during the 1969 Giant Lance operation demonstrated the introduction of a new domain as a way to signal a willingness to gradually escalate or de-escalate based on their opponent's actions (Sagan and Suri 2003; Burr 2005). This case is consistent with existing theories of signaling in finding that some domains are better suited to turning the dial incrementally rather than all at once (Kroenig 2018; Post 2019; Montgomery 2020). President Kennedy had a similar rationale behind the "flexible response" doctrine in 1961, which aimed to provide more options for controlled escalation. In the event of more limited Soviet aggression like an attempt to hold Berlin hostage, proponents of flexible response hoped the more credible threat of responding with other conventional forces would be sufficient to get the Soviet Union to back down (Duffield 1991).[8] Similarly, a ceasefire was declared between Israel and Hamas the day after Israel responded to Hamas' cyberattacks with an airstrike (Morris, Eglash, and Balousha 2019). One way to interpret this event is the very conditions that make a cross-domain response an immediate escalation make it a medium and long-term de-escalation. By showing that an opponent has gone over the line in the intensity of their aggression, an unexpected cross-domain response could convey that there are significant costs to be had if they do not pull back.

As an aside, cross-domain interactions may not be the direct cause of escalation (or de-escalation), but rather an observable indicator for different motives to escalate in a way that masks the stakes (Slantchev 2011).

[8] There is disagreement concerning whether Kennedy actually believed in — and would have implemented — "flexible response" in the ways espoused at the time or if it merely served political purposes (Gavin 2001). We use this example here to illustrate the strategic logic held by proponents of the policy, rather than if the United States would have actually followed through.

States with more at stake may be more willing to escalate, but cross-domain interactions may communicate that poorly since it relies on your opponent identifying the costs of your action when that same action would generate different costs for them.[9] Rather than try to empirically identify whether the underlying causes of cross-domain interactions are directly or indirectly determinants of conflict intensity, we simply hope to shed light on the association between the use of these domains — whatever their origins — and crisis outcomes.

4 Empirics

4.1 Research Design

This paper's primary empirical contribution is the creation of a new dataset recording the domains in which warfighting and military threats occurred during 412 distinct crises from 1918 to 2010. In sum, the new data contains information on 3833 crisis actors, the majority of which are states.[10] This crisis-domain dataset represents – to the best of our knowledge – the most extensive data collection available on the domains in which militaries operate during conflict.

Doing so involved three distinct steps. First, we event coded the 412 crises in the International Crisis Behavior (ICB) dataset (Brecher and Wilkenfeld 2000; Brecher et al. 2020), identifying the military domains in which crisis actors acted at the sentence level. Second, we re-organized and subset that data to the crisis-dyad level using pre-existing work on ICB crisis dyads. Third, we create a new measure of the dissimilarity of the domains in which each side in the crisis took military actions, which we will refer to as "cross-domainness".

4.1.1 Event coding

We extend the ICB dataset by gathering extensive data on the tools utilized during crises. The ICB data provides a unique opportunity to examine conflict escalation because it is not limited to cases where conventional military conflict occurred. Rather, the data examines crises – some of which escalated to militarized interstate conflict with some degree of violence and others which did not. As a result, this data provides variation in the dependent variable since we can compare cases where a crisis did violently escalate to cases where the crisis did not. Examining patterns in the military domains and units involved in each of these cases can shed light on when a crisis is likely to escalate. The dataset introduced here contains data on the military domains used by each actor during these international crises. As such, the unit of analysis is

[9] For existing research on motives for escalation, see Lebow (2010), Dafoe, Renshon, and Huth (2014), Paul, Larson, and Wohlforth (2014), Fikenscher, Jaschob, and Wolf (2015), Renshon (2016), Lupton (2018), and Shifrinson (2019).

[10] International organizations and non-state actors are often involved in crises and sometimes deploy military or quasi-military capabilities like peacekeepers or foreign aid distributors. We do not consider the military logic of these actors here, but the data is available for future work on the topic.

Domain	Description
Air	Bombers, fighters, and missiles
Cyber	Information operations and cyber disruption
Land	Armored vehicles, artillery, and troops
Sea	Aircraft carriers, submarines, and surface ships
Space	Satellites and surveillance beyond the earth's atmosphere
WMD	Nuclear, chemical, and biological weapons

Table 1: Military domains coded for each crisis actor. Codings are binary with 1 indicating the actor took an action in that domain during the crisis and 0 otherwise.

the crisis-actor and the newly coded variables are binary true/false values representing whether that actor employed that domain during the crisis.

The data source used by the coders was the ICB crisis narratives that provide qualitative descriptions of the crises. This has a few benefits over other events datasets. First, the ICB crisis narratives are written in a systematic fashion. They are all approximately the same length, contain the same level of detail, and were written by the same research team at the University of Maryland. This reduces concerns that variation among crisis variables is due to variation in the data generating process. For example, more recent crises do not have more detailed crisis narratives which is not the case for the reporting of militarized interstate disputes captured by scraping news sources. Second, the ICB narratives are accompanied by the more commonly used ICB dataset that codes important international relations variables in the dataset. This helps verify the coding effort since the information that coders extract from the crisis narratives should be consistent with previous codings that populate the quantitative ICB dataset.

The data created here involves the domains in which states took actions during international crises.[11] We define the domains in which a crisis-actor can take a military action based on the military units that undertook the action, as described in Table 1. The coders distinguished actions, speech acts, and thoughts for consistency with pre-existing event datasets like CAMEO and Phoenix (Schrodt et al. 2005; Schrodt 2012; Althaus et al. 2020). We define actions as a physical act performed by one of more actors. Examples of actions include raises in alert level, mobilizations, fortification, military exercises, weapons tests, deployments, shows of force, blockades, border violations, attacks, invasions, and bombardments. Planning to take an action does not constitute an action unless this action is subsequently carried out. For example, a state making a verbal threat to send tanks into a neighboring country is not is not coded as a ground action unless the state mobilized, deployed, invaded, attacked or otherwise took a subsequent physical action with those tanks.

The first set of codings were done by graduate students at the University of Maryland that were overseen by

[11]This is a subset of a broader project producing event data using the ICB narratives. For the complete event data and more detailed explanation of the underlying ontology, see Carcelli et al. (2021).

the ICB directors who helped construct the original ICB datasets and narratives. For each crisis, two research assistants coded the ICB crisis narratives at the sentence level for a new series of variables. A third coder was used to break ties or when there were discrepancies about how to code the events in a sentence. Coders could not make reference to the existing codings and the raw coding includes a measure of uncertainty for each coder. Coders selected one of the 455 ICB crises and for each individual sentence in the corresponding ICB crisis narrative, they coded the events that occurred as a series of actions undertaken by an actor along with supporting details like when the action took place, where, and to what effect. The final version of the data includes an aggregation of the multiple different codings that exist for each case. This paper only focuses on the military domains used during these crises. This represents an improvement over current efforts to analyze aggregate analysis of crisis behavior by including fine-grained information about how actors behaved. Figure 1 shows the distribution of actions taken in each domain by crisis actor. Consistent with expectations, the past century witnessed crisis-actors most often operating in the land domain, with significantly fewer WMD, cyber, and space actions taking place. Even so, the prevalence of WMD events may appear higher than expected. This is because the domain variables refer to where the action took place. This does not refer to what was used during the action, but where the action happened. As a result actions like raising nuclear alert levels or forward deploying nuclear bombers constitute WMD "actions" even if nuclear bombs were not subsequently dropped against the adversary.

Of course, actors do not always restrain their military activities to a single domain. Conventional wisdom surrounding the efficacy of full-spectrum military forces lead one to rightly believe that actors often engage in multiple military domains simultaneously, especially as the stake of a conflict heighten. Figure 2 describes the combination of military domains that each crisis-actor undertook. While the sole deployment of land forces still remains by far the most common form of military action, combined land- and air operations is the second most common, followed by land, sea, and air being used in unison.

4.1.2 Identifying crisis-dyads

The original ICB data exists at two levels of analysis, the crisis-level and the crisis-actor level. A crisis is defined as an international event that meets 3 conditions. First, an actor must perceive a threat to one or more of its basic values. Second, the actor must have an awareness of a finite timeline for responding to that value threat. And third, there must be a heightened probability of military hostilities. A crisis can escalate to an actual military dispute, but that does not always happen. Many crises are resolved prior to escalation to actual conflict because the existence of the crisis motivates diplomatic solutions to resolve the crisis without resorting to war. While the actor-level data latter contains more granularity, it leaves the role of each actor

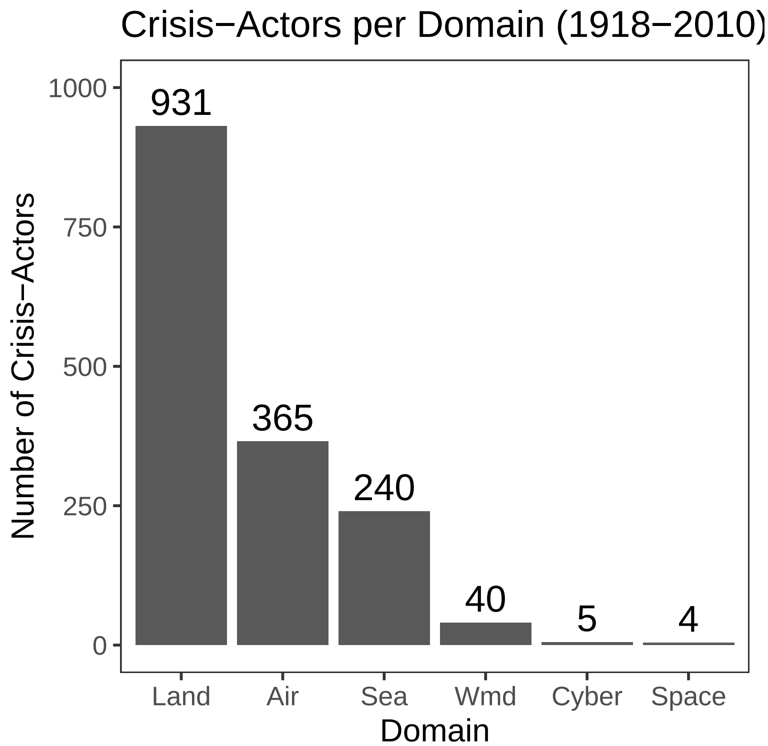

Figure 1: Distribution of domains by crisis-actor

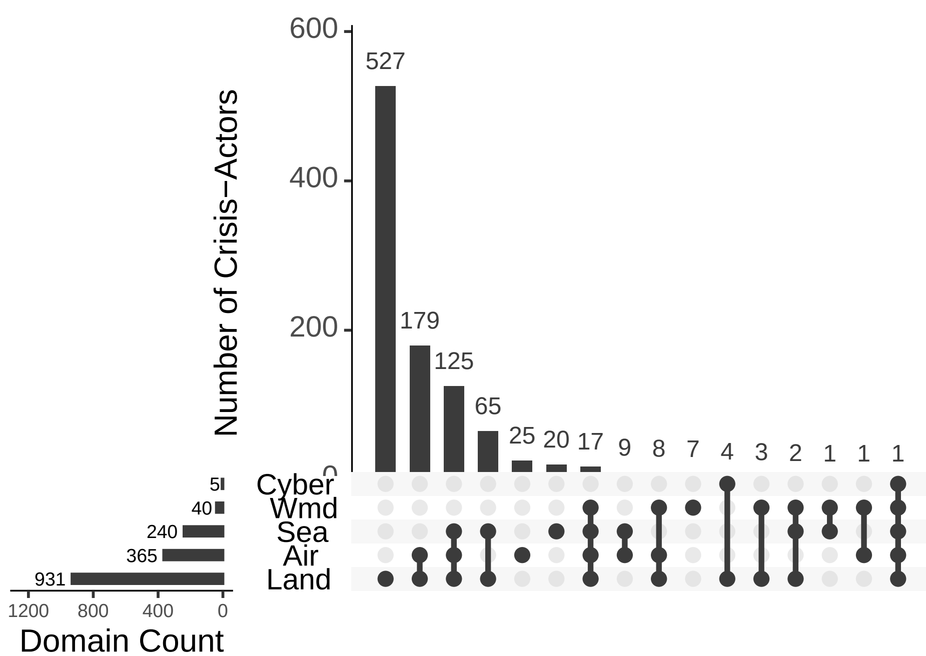

Figure 2: Combination of domains for each crisis actor. Each bar represents the number of crises with that unique intersection of domain values present

unspecified. So after identifying the military domains in which crisis-actors took actions, this new data was merged with existing data on ICB crisis dyads (Hewitt 2003; Beardsley and Asal 2009; Levin-Banchik 2020). Three conditions determine whether an actor is included is the ICB crisis-dyad data. First, both sides of the dyad must be states as defined by the Gleditsch and Ward (1999) state list dataset. Second, at least one state must meet all the crisis conditions specified by the original ICB project. Third, at least one actor must perceive that the other has directed a threat or hostile action against them.

Although the new ICB domains data created for this project contains information on 3833 crisis-actors, not all of them are members of crisis-dyads. After subsetting to the crisis-dyad conditions, we are left with 1238 crisis-dyad actors that were on one of two sides in 412 previously identified crisis-dyads. The loss of 2595 actors is primarily attributed to newly gathered information on non-state actors (including international organizations like the Organization of American States and United Nations) or actors that were mentioned in the crisis narratives as a mediator or neighboring state, but not a crisis participant involved as one of the two sides in the crisis. Numerous crises involve multiple dyads if, for example, military coalitions were involved. To simplify coding, when multiple actors participated on the same side in the conflict, that side was coded as having taken actions in a given military domains if any actor on that side took actions in that domain. For example, if both France and the United States were coded as being on the same side (side A) in a crisis and France deployed naval assets and the United States deployed ground forces, side A is simply coded as having taken action in both the naval and land domain.

4.1.3 Measuring cross-domainness

The third and final step involves identifying the dissimilarity of the domains in which each side of each crisis-dyad took actions. We call this measure cross-domainness which is a variable at the crisis level of analysis. For each crisis, if the two sides took actions in identical domains, cross-domainess is low. If the two sides took actions in entirely distinct domains, cross-domainness is high.

We produce this measuring by creating a Jaccard similarity coefficient comparing the military domains in which each of the two sides took actions during each ICB crisis. This measure identifies the union of domains in which each side took actions as a ratio of those in which only one side took action such that for a crisis-dyad with two sides A and B, $J_{(A,B)} = \frac{A \cap B}{A+B-(A \cap B)}$. Table 2 provides descriptive examples of how domain similarity in each crisis would be measured. This measure is appropriate because we each crisis contains precisely two sides, meaning there are two vectors to compare, the values are binary, and we are concerned with the similarity of measures that were employed as opposed to those that were not. Similar measures like the simple matching coefficient (SMC) are less appropriate because they weigh mutual 0's as

Crisis	Belligerents	Land	Air	Sea	WMD	Space	Cyber	Cross-domainness
Panay Incident (1937)	U.S.	-	-	1	-	-	-	1
	Japan	-	1	-	-	-	-	
Yemen War IV (1966)	Yemen, Egypt	1	1	-	1	-	-	0.67
	Saudi Arabia	1	-	-	-	-	-	
Kashmir I (1947)	India	1	1	-	-	-	-	0.5
	Pakistan	1	-	-	-	-	-	
Gulf of Tonkin (1964)	S. Vietnam, U.S.	1	1	1	-	-	-	0.33
	N. Vietnam	1	-	1	-	-	-	
Kashmir II (1965)	India	1	-	-	-	-	-	0
	Pakistan, China	1	-	-	-	-	-	

Table 2: Example of cross-domainness measure at the crisis-level using the Jaccard similarity coefficient. The measure is bounded between 0 and 1, with 0 indicating the two sides took actions in identical domains and 1 meaning complete dissimilarity.

an increase in similarity.[12] These kinds of measures are less appropriate for measuring similarity in military domains since there is variation across space and time about what 0's mean. In some cases it means omission by choice but in others it means omission by necessity. Although neither the US nor Vietnam used WMDs during the Vietnam war, that doesn't make their military strategy similar because the US could have done so but Vietnam could not have, so those 0's mean different things. We avoid this problem by measuring similarity in terms of what they did use.

Figure 3 shows the distribution of cross-domainness in every ICB crisis. This figures demonstrates that cross-domain military crises is not novel — in fact, it represents the modal form of conflict over the past century. Of the 412 ICB crises, 24% are entirely cross-domain, meaning the two side had zero overlap in what military domains they operated in during the crisis, and 57% had at least some amount of cross-domain interaction. In only 43% did both sides behave in-kind. Figure 4 shows that the temporal distribution of cross-domain interactions runs contrary to conventional wisdom. Despite the common demarcation of the nuclear age and advent of new domains like cyber and space, international crises are not more cross-domain than they used to be. Although new military tools have become available to states, they are either not being utilized in international crises, or they are being utilized only in cases where the opposing side responds in kind.

4.2 Model

The unit of analysis is the international crisis which has been collapsed from the crisis-dyad level using the method described. To test hypotheses about the relationship between cross-domain military interactions and the crisis escalation, we model the relationship using two separate independent variable — intensity of

[12]For an overview comparing different similarity measures and criteria for their appropriate application, see Ahlgren, Jarneving, and Rousseau (2003) and Egghe (2010).

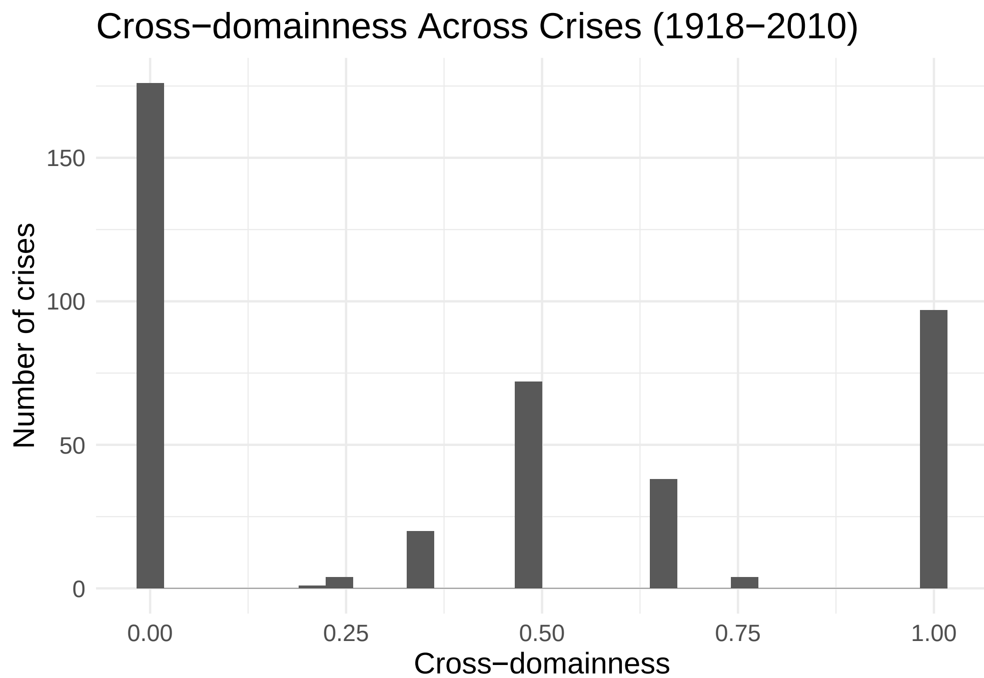

Figure 3: Distribution of cross-domainness in international crises. Higher values represent higher cross-domain interactions between adversaries

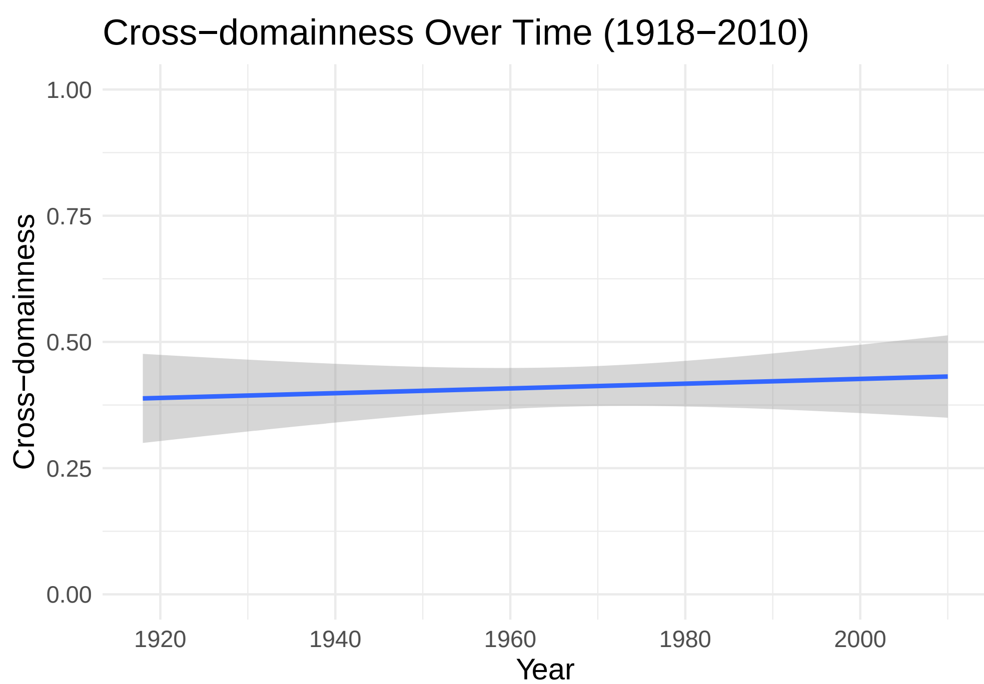

Figure 4: Distribution of Cross-domainness over time. Line represents a bivariate linear model with the shaded area corresponding to the 95% confidence interval

violence and crisis duration. We choose these two dependent variable because they are common observable indicators for conflict escalation (Allen 2007; Asal and Beardsley 2007).

The dependent variable for the first model — intensity of violence — is measured on an ordinal 1-4 scale with 1 describing no violence and 4 describing-full scale war. The dependent variable for the second model is crisis duration measured in days. Figure 5 shows the distribution of the dependent variables, both of which come from the original ICB crisis-level data. Because Model 1 has an ordinal dependent variable, the appropriate model specification is an ordered probit (Johnston, McDonald, and Quist 2020). Because Model 2 is a duration variable operationalized as the months from crisis initiation to crisis termination, we estimate a Cox proportional hazard model (Box-Steffensmeier and Zorn 2001).

One shortfall of using the crisis as the unit of analysis is that many conventional control variables that exist at the actor or sub-state level cannot be appropriately measured given difficulty in theoretically motivating methods of aggregating those measures to the crisis-level (Petersen, Vasquez, and Wang 2004, 91).[13] Nonetheless, both models include a battery of controls that are theoretically motivated giving existing literature concerning factors that influence the intensity and duration of international crises. We include a control for the number of crisis actors, since more participants in an international crisis may make it more difficult to get a mutually acceptable agreement, thus increasing the intensity and duration of a crisis (Petersen, Vasquez, and Wang 2004). We include a control for whether or not a crisis is part of a protracted conflict, which prior research has hypothesized produces more violent crises since they are part of a process that is more difficult to resolve (Azar, Jureidini, and McLaurin 1978; Brecher and Wilkenfeld 2000).[14] We include a control for whether the value that a crisis actor felt was threatened was territorial in nature since territorial conflicts like border wars are more violent and difficult to resolve (Vasquez 1995; Vasquez and Henehan 2001; Owsiak and Rider 2013). Territorial conflicts could also involve more similar capabilities by opposing belligerents since land and air forces may be most relevant in holding or taking territory. We include a control for whether the crisis was motivated by ethnic differences since ethnic conflicts are more violent and difficult to resolve (Ben-Yehuda and Mishali-Ram 2006; Mishali-Ram 2006). We include a control for the the power disparity between both sides of a crisis, which is a composite measure of population, GNP, major power alliances, territorial size, military capability, and alliance capability (Quinn et al. 2006). We include a control for whether one of the two superpowers, the United States or Soviet Union, was involved in the crisis (Colaresi and Thompson 2002). Lastly, we control for contiguity which identifies whether or not the primary crisis actors share a border (Bremer 1992; Vasquez 1996). Figure 4 shows the bivariate correlation

[13] This includes state-level variables like regime type and dyad-level variables like rivalry. There is a vast and well-developed literature on micro-foundations associated with the intensity and duration of conflict like leader traits and psychology. See, among others, McDermott (2004), Saunders (2009), Chiozza and Goemans (2011), Horowitz and Stam (2014), Yarhi-Milo, Lanoszka, and Cooper (2016), Renshon, Lee, and Tingley (2017), Stein (2017), and Yarhi-Milo (2018). We bracket discussion of the relationship between individual attributes and the choice of military domains for future research.

[14] ICB defines a protracted conflict as "an environment of ongoing disputes among adversaries, with fluctuating interaction ranging from violence to near-tranquility, multiple issues and spillover effects on all aspects of their relations, and the absence of mutually-recognized or anticipated termination (the Arab-Israeli conflict, 1947-)" (Brecher et al. 2020).

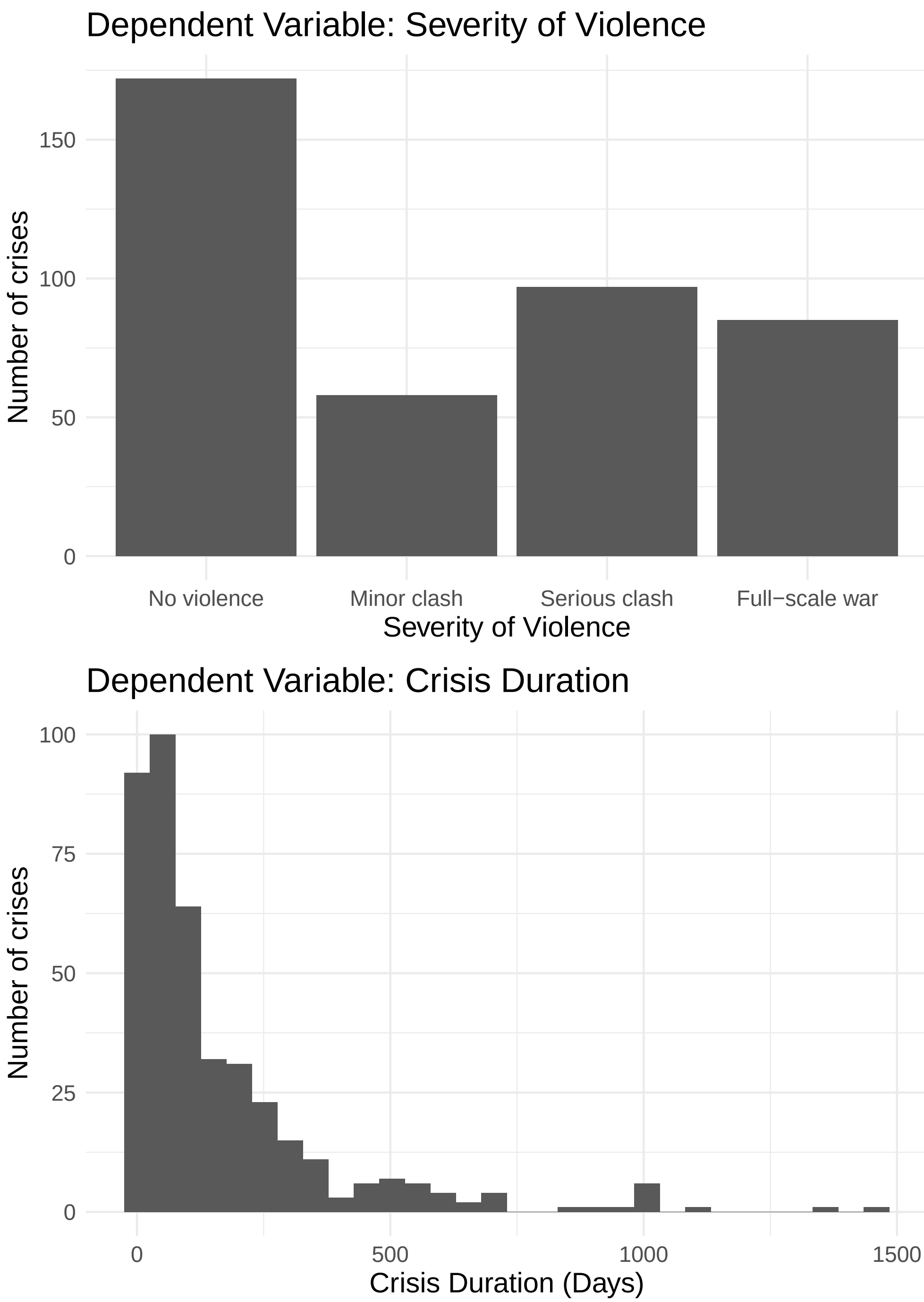

Figure 5: Distribution of dependent variables

between each of the two dependent variables (violence severity and crisis duration) and the independent variable of interest (cross-domainness).

4.3 Results

The full model results are shown in Table 3. For each dependent variable we first estimate a bivariate model containing only crossdomainness as an independent variable. We then conduct full models that include all control variables. For the first two models concerning crisis intensity, the results show that cross-domainness is negatively associated with intensity of violence with statistical significance of at least the 0.05 level. As the coefficients of ordered logistic regression are difficult to interpret, the odds ratio coefficient for the crossdomainness variable (0.65) indicates that the odds of a crisis with a serious clash or full scale war are 45% lower than the odds of experiencing violence with a minor clash or no violence if the actors use completely dissimilar means.[15]. These results provide evidence consistent with theories of cross-domain deterrence rather than cross-domain escalation — crisis in which opponents take military actions in dissimilar domains are less violent than those in which opponents take military actions in the same domains. As models 3 and 4 are Cox hazard models, the coefficients detail the likelihood of a crisis ending in a given time period. Positive coeffients mean higher values of a given variable are associated with longer crises while negative coefficients mean higher values of that variable are associated with shorter crises. The coefficients for cross-domainness are positive, but not statistically significant at the 0.05 level, meaning we cannot reject the null hypothesis that cross-domainness has no discernable effect on the duration of a crisis.

These findings are consistent across a range of alternate modeling decisions detailed in the appendix. We run additional models using a binary dependent variable for violence severity, a modeling decision used in prior work on ICB crisis violence (Hewitt and Wilkenfeld 1996; Chiozza and Goemans 2004). Despite the appropriateness of ordered probit and Cox hazard models, we also find consistent results using ordered logistic and OLS regression. Lastly, given the relative rarity of military action in the domains of WMD, space, and cyber, we re-run the models with a stricter cross-domainness measure computed only based on actions in land, air, and sea domains and find similar support for our argument.

Crises in which belligerents interact in dissimilar military domains are less violent, but neither longer nor shorter, that crises in which belligerents interact with like-means. While contemporary cross-domain conflicts with new modes of conflicts have ignited pessimism about the escalatory potential of new modes of conflict, the empirical evidence should give interested parties some confidence that they can respond to their adversaries' "apples" with their own "oranges" without that being associated with a bloodier and longer contest. As this is a large-n study using observational data, it is difficult to determine the causal direction of the relationship. This paper has proposed one mechanism by which cross-domain interactions could intensity the severity and duration of a crisis. The causal arrow may of course run the other way. It could be that the more a state

[15] A complete table of the odds ratios is provided in the appendix

	DV: Violence Intensity		DV: Crisis Duration	
	Model 1	Model 2	Model 3	Model 4
Cross-domainness	-0.52^{***}	-0.43^{***}	0.17	0.05
	(0.14)	(0.15)	(0.12)	(0.14)
Number of actors		0.08^{***}		-0.05^{***}
		(0.02)		(0.01)
Power discrepancy		-0.00		-0.00
		(0.00)		(0.01)
Protracted conflict		0.29^{**}		0.15
		(0.13)		(0.12)
Territorial conflict		0.09		0.09
		(0.14)		(0.12)
Major power involv		0.42^{***}		0.04
		(0.14)		(0.13)
Ethnic conflict		0.17		-0.55^{***}
		(0.14)		(0.12)
Contiguous		0.25^{*}		0.15
		(0.15)		(0.13)
AIC	1070.39	883.36	4145.26	3481.54
BIC	1086.47	926.04		
Log Likelihood	-531.20	-430.68		
Deviance	1062.39	861.36		
Num. obs.	412	358	412	358
R^2			0.00	0.10
Max. R^2			1.00	1.00
Num. events			412	358
Missings			0	54
PH test			0.10	0.00

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.
Models 1 and 2 are ordered probit models and models 3 and 4 are Cox proportional hazard models.

Table 3: Statistical models

cares about the outcome of the crisis, the more likely they are to bring their best military assets to the fight. But doing so may cause more blood to be spilled since it involving bringing mobility, stealth, and complexity to the battlefield.

5 Implications of bringing a gun to a knife fight

Emerging interest in understanding cross-domain military interactions is well-deserved, given the frequency with which these interactions occur. But this research need not be spurned by, not limited to, the study of new domains made possible because of emerging technologies. Crises have always been cross-domain and theories that concern interactions involving new domains of conflict need not reinvent the wheel since cross-domain interactions have been a consistent regularity for the past century. Different ways of defining and thinking about domains may produce new insights and certainly new domains should be compared to more traditional ones, but the findings here represent an important and thusfar underrepresented contribution to that discussion.

Concerns about the escalation dynamic of cyber-kinetic interactions are loosely based off of theories of deterrence and spiral models of conflict that have rarely accounted for the strategic interaction of the military domains used during conflict. The common assumption held by pessimists—that cross-domain interactions risk a dangerous spiral because of potential miscommunication over proportionality, stake, and resolve. Rather, cross-domain interactions contain elements of the stability-instability paradox, where one side's willingness to operate in a new domain of conflict—a potential indicator of a willingness to escalate—creates conditions that lessen observed crisis escalation. This paper builds on the state of the art by furthering our understanding of conflict escalation. At least one part of the story in explaining why some conflicts spiral while others deter concerns the interaction between the domains in which each side's military is taking action. These insights help us answer the question about whether emerging technologies will make conflicts worse or whether they will be stabilizing (Sechser, Narang, and Talmadge 2019; Talmadge 2019). Attempts to use full-spectrum combined arms forces may make sense for a strategic standpoint if they increase the probability of victory—an outcome not examined here— but those doing so should consider preparing for a bloodier war.

These findings have implications for a number of contemporary policy debates. Recent work has investigated how other states can best combat Chinese naval expansion (Beckley 2017; Talmadge 2019; Cunningham 2020). This example demonstrates that the escalatory effects of the tools used in a crisis are fundamental to understanding the evolution of conflict in the 21st century. As the United States considers anti-access/anti-denial (A2/AD) in East Asia vis-a-vis competition with China, strategies that seek to take advantage of full-spectrum combined-arms forces where China does not, blending multiple military tools together as done with AirSea Battle, may invoke a less bloody contest that matching China's moves. As NATO considers how to respond to Russian gray zone aggression, whether "little green men" in Crimea or cyber attacks against Estonia, responding with other non-cyber or non-special operations capabilities may not be as escalatory as alarmists argued after Israel responded to Hamas cyberattacks with missile strikes.

There is much more to be said about how states fight, both as an independent variable explaining other outcomes of interest and also as a dependent variable of interest itself. As the primary contribution of this paper concerns new data on domain-interactions over the past century, we hope part of its value comes in opening up many other avenues for research concerning questions this paper raises but does not answer. Not all cross-domain interactions are created equal. While the theories tested here concern general cross-domain escalation dynamics, a land vs air conflict may turn out differently than a land vs sea conflict, although both are considered "cross-domain". There are specific contexts where that may be especially true, like the India Pakistan context where Pakistani concerns about Indian mobilization of integrated battle groups may shift the cross-domain dynamic in ways not explained here. Future work should examine the sequence of when actors take actions in different domains, since that matters for theories of first-mover advantage and unintended escalation (Quester 1977; Reiter 2009; Garfinkel and Dafoe 2019). The data as presented here makes simplifying aggregations regarding the domains in which states take actions during international crises. Future work can disaggregate each of those. By looking at military units instead of domains, theories can be further refined since, for example, not all naval capabilities are the same in terms of things like signaling or warfighting. Actions can also be further disaggregated, as further work with the underlying data could parse out and evaluate differences in types of actions like mobilizations, raises in alert level, bombardments, and occupations. The theory and findings here are also limited to military domains, but the interaction between a state's use of military, economic, and diplomatic tools would also contribute to our collective understanding of crisis escalation and duration. Lastly, this paper investigates military domains as an independent variable in the hopes of furthering our understanding of how the choice of military domains is associated with crisis intensity and duration. We have not explained why states choose to operate in some military domains as opposed to others. Future work should think of the military domains or crisis behavior as a dependent variable and use this novel data to explain why states choose the operate in the domains they do.

6 Conclusion

Epidemiologists spend much of their time identifying factors that increase the risk of particular health problems in individuals. An important component of their work relies on the proper identification of events and conditions that serve as an indicator that health problems will soon follow. Similarly, scholars of international relations are interested in identifying factors that indicate that the outbreak of conflict is increasingly likely (Senese and Vasquez 2008). The goal in this case is not only to causally identify factors that make war more likely so that we can better understand events of the past, but also to improve our ability to forecast the likelihood of conflict in the future (Valeriano and Marin 2010). The military domains in which states contest one another and the similarity of those domains constitutes an important pice of that puzzle.

References

Ahlgren, Per, Bo Jarneving, and Ronald Rousseau. 2003. "Requirements for a Cocitation Similarity Measure, with Special Reference to Pearson's Correlation Coefficient." *Journal of the American Society for Information Science and Technology* 54 (6): 550–60. https://doi.org/10.1002/asi.10242.

Allen, Susan Hannah. 2007. "Time Bombs: Estimating the Duration of Coercive Bombing Campaigns."

Journal of Conflict Resolution 51 (1): 112–33. https://doi.org/10.1177/0022002706296153.

Allen, Susan Hannah, and Carla Martinez Machain. 2017. "Understanding the Impact of Air Power." *Conflict Management and Peace Science* 36 (5): 545–58. https://doi.org/10.1177/0738894216682485.

Allison, Graham T., and Frederic A. Morris. 1975. "Armaments and Arms Control: Exploring the Determinants of Military Weapons." *Daedalus* 104 (3): 99–129.

Althaus, Scott, Joseph Bajjalieh, John Carter, Buddy Peyton, and Dan Shalmon. 2020. "Cline Center Historical Phoenix Event Data." University of Illinois at Urbana-Champaign: Cline Center for Advanced Social Research.

Asal, Victor, and Kyle Beardsley. 2007. "Proliferation and International Crisis Behavior." *Journal of Peace Research* 44 (2): 139–55. https://doi.org/10.1177/0022343307075118.

Azar, Edward E., Paul Jureidini, and Ronald McLaurin. 1978. "Protracted Social Conflict; Theory and Practice in the Middle East." *Journal of Palestine Studies* 8 (1): 41–60. https://doi.org/10.2307/2536101.

Beardsley, Kyle, and Victor Asal. 2009. "Winning with the Bomb." *Journal of Conflict Resolution* 53 (2): 278–301. https://doi.org/10.1177/0022002708330386.

Beasley, William M. 2015. "Closing the Presence GAP." *Proceedings* 141 (11): 52–58.

Becker, Jordan. 2017. "Clearing the Air on Transatlantic Burden-Sharing, Part 2: You Gotta Give (Inputs) to Get (Outputs)." *War on the Rocks*. https://warontherocks.com/2017/05/clearing-the-air-on-transatlantic-burden-sharing-part-2-you-gotta-give-inputs-to-get-outputs/.

Beckley, Michael. 2017. "The Emerging Military Balance in East Asia: How China's Neighbors Can Check Chinese Naval Expansion." *International Security* 42 (2): 78–119. https://doi.org/10.1162/ISEC_a_00294.

Ben-Yehuda, Hemda, and Meirav Mishali-Ram. 2006. "Ethnic Actors and International Crises: Theory and Findings, 19182001." *International Interactions* 32 (1): 49–78. https://doi.org/10.1080/03050620600584435.

Biddle, Stephen. 2005. *Military Power: Explaining Victory and Defeat in Modern Battle*. Manas Publications.

———. 2007. "Strategy in War." *PS: Political Science & Politics* 40 (3): 461–66. https://doi.org/10.1017/S1049096507070941.

Biddle, Stephen, and Ivan Oelrich. 2016. "Future Warfare in the Western Pacific: Chinese Antiaccess/Area Denial, U.S. AirSea Battle, and Command of the Commons in East Asia." *International Security* 41 (1): 7–48. https://doi.org/10.1162/ISEC_a_00249.

Boot, Max. 2006. *War Made New: Weapons, Warriors, and the Making of the Modern World*. Penguin.

Borghard, Erica D., and Jacquelyn Schneider. 2019. “Israel Responded to a Hamas Cyberattack with an Airstrike. That’s Not Such a Big Deal.” *Washington Post*, May.

Box-Steffensmeier, Janet M., and Christopher J. W. Zorn. 2001. “Duration Models and Proportional Hazards in Political Science.” *American Journal of Political Science* 45 (4): 972–88. https://doi.org/10.2307/2669335.

Boyle, Michael J. 2013. “The Costs and Consequences of Drone Warfare.” *International Affairs* 89 (1): 1–29. https://doi.org/10.1111/1468-2346.12002.

Brands, Hal. 2016. “Paradoxes of the Gray Zone.” SSRN Scholarly Paper ID 2737593. Rochester, NY: Social Science Research Network.

Brecher, Michael, and Jonathan Wilkenfeld. 2000. *A Study of Crisis*. University of Michigan Press.

Brecher, Michael, Jonathan Wilkenfeld, Kyle C. Beardsley, Patrick James, and David Quinn. 2020. “International Crisis Behavior Data Codebook.” Codebook Version 14.

Bremer, Stuart A. 1992. “Dangerous Dyads: Conditions Affecting the Likelihood of Interstate War, 1816-1965.” *The Journal of Conflict Resolution* 36 (2): 309–41.

Burr, William. 2005. “The Nixon Administration, the "Horror Strategy," and the Search for Limited Nuclear Options, 1969-1972: Prelude to the Schlesinger Doctrine.” *Journal of Cold War Studies* 7 (3): 34–78.

Buzan, Barry, and Eric Herring. 1998. *The Arms Dynamic in World Politics*. Lynne Rienner Publishers.

Byman, Daniel. 2013. “Why Drones Work: The Case for Washington’s Weapon of Choice.” *Foreign Affairs* 92 (4): 32–43.

Cappella Zielinski, Rosella. 2016. “Political Economy of National Security.” Edited by Patrick James. *Oxford Bibliographies in International Relations*. New York, NY: Oxford University Press. https://doi.org/10.1093/obo/9780199743292-0184.

Cappella Zielinski, Rosella, and Ryan Grauer. 2020. “Organizing for Performance: Coalition Effectiveness on the Battlefield.” *European Journal of International Relations* 26 (4): 953–78. https://doi.org/10.1177/1354066120903369.

Carcelli, Shannon, Rex W Douglass, J Andrés Gannon, and Thomas Leo Scherer. 2021. “Introductiong the International Crisis Behavior Event (ICBe) Dataset.” Working Paper.

Carcelli, Shannon, and Erik A. Gartzke. 2017. “The Diversification of Deterrence: New Data and Novel

Realities." In *Oxford Research Encyclopedia of Politics*. Oxford University Press. https://doi.org/10.1093/acrefore/9780190228637.013.745.

Carnegie, Allison, and Austin Carson. 2018. "The Spotlight's Harsh Glare: Rethinking Publicity and International Order." *International Organization* 72 (3): 627–57. https://doi.org/10.1017/S0020818318000176.

Carson, Austin. 2016. "Facing Off and Saving Face: Covert Intervention and Escalation Management in the Korean War." *International Organization* 70 (1): 103–31. https://doi.org/10.1017/S0020818315000284.

———. 2018. *Secret Wars: Covert Conflict in International Politics*. Princeton Studies in International History and Politics. Princeton, NJ: Princeton University Press.

Carver, Michael. 1986. "Conventional Warfare in the Nuclear Age." In *Makers of Modern Strategy from Machiavelli to the Nuclear Age.*, edited by Peter Paret, Gordon Craig, and Felix Gilbert, 779–814. New Jersey: Princeton University Press.

Cashman, Greg, and Leonard C. Robinson. 2007. *An Introduction to the Causes of War: Patterns of Interstate Conflict from World War I to Iraq*. Rowman & Littlefield.

Caton, J. L. 2012. "Beyond Domains, Beyond Commons: Context and Theory of Conflict in Cyberspace." In *2012 4th International Conference on Cyber Conflict (CYCON 2012)*, 1–11.

Caverley, Jonathan D. 2014. *Democratic Militarism: Voting, Wealth, and War*. Cambridge University Press.

Caverley, Jonathan D, and Todd S Sechser. 2017. "Military Technology and the Duration of Civil Conflict." *International Studies Quarterly* 61 (3): 704–20. https://doi.org/10.1093/isq/sqx023.

Chiozza, Giacomo, and H. E. Goemans. 2004. "International Conflict and the Tenure of Leaders: Is War Still Ex Post Inefficient?" *American Journal of Political Science* 48 (3): 604–19. https://doi.org/10.1111/j.0092-5853.2004.00090.x.

———. 2011. *Leaders and International Conflict*. Cambridge University Press.

Cimbala, Stephen J. 1994. *Military Persuasion: Deterrence and Provocation in Crisis and War*. Pennsylvania State University Press.

Colaresi, Michael P., and William Thompson. 2002. "Strategic Rivalries, Protracted Conflict, and Crisis Escalation." *Journal of Peace Research* 39 (3): 263–87. https://doi.org/10.1177/0022343302039003002.

Corbett, Julian. 1911. *Some Principles of Maritime Strategy*. Longmans, Green and Co.

Crisher, Brian. 2017. "Naval Power, Endogeneity, and Long-Distance Disputes." *Research and Politics* 4 (1):

1–6.

Cunningham, Fiona S. 2020. "The Maritime Rung on the Escalation Ladder: Naval Blockades in a US-China Conflict." *Security Studies* 29 (4): 730–68. https://doi.org/10.1080/09636412.2020.1811462.

Dafoe, Allan, Jonathan Renshon, and Paul Huth. 2014. "Reputation and Status as Motives for War." *Annual Review of Political Science* 17 (1): 371–93. https://doi.org/10.1146/annurev-polisci-071112-213421.

Dixon, Robyn. 2020. "Azerbaijan's Drones Owned the Battlefield in Nagorno-Karabakh and Showed Future of Warfare." *Washington Post*, November.

Duffield, John S. 1991. "The Evolution of NATO's Strategy of Flexible Response: A Reinterpretation." *Security Studies* 1 (1): 132–56. https://doi.org/10.1080/09636419109347460.

Early, Bryan R. 2014. "Exploring the Final Frontier: An Empirical Analysis of Global Civil Space Proliferation." *International Studies Quarterly* 58 (1): 55–67. https://doi.org/10.1111/isqu.12102.

Egghe, Leo. 2010. "Good Properties of Similarity Measures and Their Complementarity."

Erickson, Jennifer. 2018. *Dangerous Trade: Arms Exports, Human Rights, and International Reputation.* Columbia University Press.

Fearon, James D. 2018. "Cooperation, Conflict, and the Costs of Anarchy." *International Organization* 72 (3): 523–59. https://doi.org/10.1017/S0020818318000115.

———. 1995. "Rationalist Explanations for War." *International Organization* 49 (3): 379–414. https://doi.org/10.1017/S0020818300033324.

Ferreiro, Larrie D. 2016. "Horatio Nelson Never Wrote 'A Ship's a Fool to Fight a Fort'; It Was Jackie Fisher Who Invented the Attribution." *Journal of Military History* 80 (3): 855–56.

Fikenscher, Sven-Eric, Lena Jaschob, and Reinhard Wolf. 2015. "Seeking Status Recognition Through Military Symbols: German and Indian Armament Policies Between Strategic Rationalizations and Prestige Motives." In *Recognition in International Relations: Rethinking a Political Concept in a Global Context*, edited by Christopher Daase, Caroline Fehl, Anna Geis, and Georgios Kolliarakis, 86–103. Palgrave Studies in International Relations Series. London: Palgrave Macmillan UK. https://doi.org/10.1057/9781137464729_5.

Fordham, Benjamin O. 2004. "A Very Sharp Sword: The Influence of Military Capabilities on American Decisions to Use Force." *Journal of Conflict Resolution* 48 (5): 632–56. https://doi.org/10.1177/0022002704267935.

Gannon, J Andrés, Erik A. Gartzke, Jon R. Lindsay, and Peter Schram. 2021. "The Shadow of Deterrence: Why Capable Actors Engage in Conflict Short of War." Working Paper.

Garfinkel, Ben, and Allan Dafoe. 2019. "How Does the Offense-Defense Balance Scale?" *Journal of Strategic Studies* 42 (6): 736–63. https://doi.org/10.1080/01402390.2019.1631810.

Gartner, Scott Sigmund. 1998. "Opening up the Black Box of War." *Journal of Conflict Resolution* 42 (3): 252–58. https://doi.org/10.1177/0022002798042003002.

Gartzke, Erik. 1999. "War Is in the Error Term." *International Organization* 53 (3): 567–87. https://doi.org/10.1162/002081899550995.

Gartzke, Erik A., Shannon Carcelli, J Andrés Gannon, and Jiakun Jack Zhang. 2017. "Signaling in Foreign Policy." *Oxford Encyclopedia of Foreign Policy Analysis*, August.

Gartzke, Erik, Jeffrey M. Kaplow, and Rupal N. Mehta. 2014. "The Determinants of Nuclear Force Structure." *Journal of Conflict Resolution* 58 (3): 481–508. https://doi.org/10.1177/0022002713509054.

Gartzke, Erik, and Jon R. Lindsay. 2020. "The Influence of Sea Power on Politics: Domain- and Platform-Specific Attributes of Material Capabilities." *Security Studies* 29 (4): 601–36. https://doi.org/10.1080/09636412.2020.1811450.

Gatopoulos, Alex. 2020. "The Nagorno-Karabakh Conflict Is Ushering in a New Age of Warfare." *Al Jazeera*, October.

Gavin, Francis J. 2001. "The Myth of Flexible Response: United States Strategy in Europe During the 1960s." *The International History Review* 23 (4): 847–75.

Glaser, Charles L. 1992. "Political Consequences of Military Strategy: Expanding and Refining the Spiral and Deterrence Models." *World Politics* 44 (4): 497–538. https://doi.org/10.2307/2010486.

Gleditsch, Kristian S., and Michael D. Ward. 1999. "A Revised List of Independent States Since the Congress of Vienna." *International Interactions* 25 (4): 393–413. https://doi.org/10.1080/03050629908434958.

Green, Brendan Rittenhouse. 2020. *The Revolution That Failed: Nuclear Competition, Arms Control, and the Cold War*. Cambridge: Cambridge University Press. https://doi.org/10.1017/9781108779593.

Greenhill, Kelly. 2019. "Asymmetric Advantage: Weaponizing People as Nonmilitary Instruments in Cross-Domain Coercion." In *Cross-Domain Deterrence: Strategy in an Era of Complexity*, edited by Jon R. Lindsay and Erik A. Gartzke, 1st edition, 259–89. New York, NY: Oxford University Press.

Grimmer, Justin, Margaret E. Roberts, and Brandon M. Stewart. 2021. "Machine Learning for Social Science:

An Agnostic Approach." *Annual Review of Political Science* 24 (1). https://doi.org/10.1146/annurev-polisci-053119-015921.

Handberg, Roger. 2016. "Aircraft Carrier or Ballistic Missile Defense: Signaling Commitment in Situations of Uncertainty." *Comparative Strategy* 35 (5): 355–62. https://doi.org/10.1080/01495933.2016.1240975.

Hazelton, Jacqueline. 2016. "Drone Strikes and Grand Strategy: Toward a Political Understanding of the Uses of Unmanned Aerial Vehicle Attacks in US Security Policy." *Journal of Strategic Studies* 40 (1-2): 68–91. https://doi.org/10.1080/01402390.2016.1196589.

Healey, Jason. 2018. "Not the Cyber Deterrence the United States Wants." *Council on Foreign Relations Digital and Cyberspace Policy Program.*

Hewitt, J. Joseph. 2003. "Dyadic Processes and International Crises." *Journal of Conflict Resolution* 47 (5): 669–92. https://doi.org/10.1177/0022002703252973.

Hewitt, J. Joseph, and Jonathan Wilkenfeld. 1996. "Democracies in International Crisis." *International Interactions* 22 (2): 123–42. https://doi.org/10.1080/03050629608434885.

Hicks, Kathleen H., and Alice Hunt Friend. 2019. "By Other Means Part I: Campaigning in the Gray Zone." Lanham: Center for Strategic & International Studies.

Horowitz, Michael C. 2020. "Do Emerging Military Technologies Matter for International Politics?" *Annual Review of Political Science* 23 (1): 385–400. https://doi.org/10.1146/annurev-polisci-050718-032725.

———. 2010. *The Diffusion of Military Power: Causes and Consequences for International Politics.* Princeton University Press.

Horowitz, Michael C., Sarah E. Kreps, and Matthew Fuhrmann. 2016. "The Consequences of Drone Proliferation: Separating Fact from Fiction." *International Security* 41 (2): 7–42.

Horowitz, Michael C., and Allan C. Stam. 2014. "How Prior Military Experience Influences the Future Militarized Behavior of Leaders." *International Organization* 68 (03): 527–59. https://doi.org/10.1017/S0020818314000046.

Huang, Chin-Hao, and David Kang. 2019. "Beyond Military Deterrence: The Multidimensionality of International Relations in East Asia." In *Cross-Domain Deterrence: Strategy in an Era of Complexity*, edited by Jon R. Lindsay and Erik A. Gartzke, 1st edition, 317–34. New York, NY: Oxford University Press.

Jensen, Benjamin M, Christopher Whyte, and Scott Cuomo. 2020. "Algorithms at War: The Promise, Peril, and Limits of Artificial Intelligence." *International Studies Review* 22 (3): 526–50. https://doi.org/10.1093/is r/viz025.

Jervis, Robert. 1984. *The Illogic of American Nuclear Strategy.* Cornell University Press.

Johnson, James. 2020. "Delegating Strategic Decision-Making to Machines: Dr. Strangelove Redux?" *Journal of Strategic Studies* 0 (0): 1–39. https://doi.org/10.1080/01402390.2020.1759038.

Johnston, Carla, James McDonald, and Kramer Quist. 2020. "A Generalized Ordered Probit Model." *Communications in Statistics - Theory and Methods* 49 (7): 1712–29. https://doi.org/10.1080/03610926.2019.1565780.

Kahn, Herman. 2007. *On Thermonuclear War.* New Brunswick [N.J.: Transaction Publishers.

Kahn, Lauren, and Michael C. Horowitz. 2021. "Who Gets Smart: Explaining How Precision Bombs Proliferate." SSRN Scholarly Paper ID 3792071. Rochester, NY: Social Science Research Network. https://doi.org/10.2139/ssrn.3792071.

Kennedy, Paul M. 1976. *The Rise and Fall of British Naval Mastery.* Humanity Books.

Kissinger, Henry. 1960. "Limited War: Conventional or Nuclear? A Reappraisal." *Daedalus* 89 (4): 800–817.

Kostyuk, Nadiya, and Yuri Zhukov. 2019. "Invisible Digital Front: Can Cyber Attacks Shape Battlefield Events?" *Journal of Conflict Resolution* 63 (2): 317–47. https://doi.org/10.1177/0022002717737138.

Kreps, Sarah, and Jacquelyn Schneider. 2019. "Escalation Firebreaks in the Cyber, Conventional, and Nuclear Domains: Moving Beyond Effects-Based Logics." *Journal of Cybersecurity* 5 (1): 1–11. https://doi.org/10.1093/cybsec/tyz007.

Kroenig, Matthew. 2018. *The Logic of American Nuclear Strategy: Why Strategic Superiority Matters.* Oxford University Press.

Lai, Brian. 2004. "The Effects of Different Types of Military Mobilization on the Outcome of International Crises." *The Journal of Conflict Resolution* 48 (2): 211–29.

Lebow, Richard Ned. 2010. *Why Nations Fight: Past and Future Motives for War.* Cambridge University Press.

Levin-Banchik, Luba. 2020. "Precrisis Military Hostility and Escalation in International Crises." *Conflict Management and Peace Science* 38 (1): 63–86. https://doi.org/10.1177/0738894220906376.

Libicki, Martin C. 2009. *Cyberdeterrence and Cyberwar.* Santa Monica, CA: RAND.

———. 2012. "Cyberspace Is Not a Warfighting Domain." *I/S: A Journal of Law and Policy for the Information Society* 8: 321.

Lieber, Keir A., and Daryl G. Press. 2020. *The Myth of the Nuclear Revolution: Power Politics in the Atomic Age*. Ithaca New York: Cornell University Press.

Lindsay, Jon R., and Erik Gartzke. 2018. "Coercion Through Cyberspace: The Stability-Instability Paradox Revisited." In *Coercion: The Power to Hurt in International Politics*, edited by Kelly M. Greenhill and Peter Krause. New York, NY: Oxford University Press.

———, eds. 2019a. *Cross-Domain Deterrence: Strategy in an Era of Complexity*. 1st edition. New York, NY: Oxford University Press.

———. 2020. "Politics by Many Other Means: The Comparative Strategic Advantages of Operational Domains." *Journal of Strategic Studies* 0 (0): 1–34. https://doi.org/10.1080/01402390.2020.1768372.

Lindsay, Jon R., and Erik A. Gartzke. 2019b. "Introduction: Cross-Domain Deterrence, from Practice to Theory." In *Cross-Domain Deterrence: Strategy in an Era of Complexity*, edited by Jon R. Lindsay and Erik Gartzke, 1st edition, 1–26. New York, NY: Oxford University Press.

Lin-Greenberg, Erik, and Theo Milonopoulos. 2021. "Private Eyes in the Sky: Emerging Technology and the Political Consequences of Eroding Government Secrecy." *Journal of Conflict Resolution*, February. https://doi.org/10.1177/0022002720987285.

Lupton, Danielle L. 2018. "Signaling Resolve: Leaders, Reputations, and the Importance of Early Interactions." *International Interactions* 44 (1): 59–87. https://doi.org/10.1080/03050629.2017.1316268.

Lyall, Jason, and Isaiah Wilson. 2009. "Rage Against the Machines: Explaining Outcomes in Counterinsurgency Wars." *International Organization* 63 (1): 67–106. https://doi.org/10.1017/S0020818309090031.

Mackey, Kyle. 2014. "Prewar Mobilization and the Termination of Interstate Wars." SSRN Scholarly Paper ID 2385749. Rochester, NY: Social Science Research Network.

Martinez Machain, Carla. 2015. "Air Campaign Duration and the Interaction of Air and Ground Forces." *International Interactions* 41 (3): 539–64. https://doi.org/10.1080/03050629.2015.1018414.

McDermott, Rose. 2004. "Prospect Theory in Political Science: Gains and Losses from the First Decade." *Political Psychology* 25 (2): 289–312. https://doi.org/10.1111/j.1467-9221.2004.00372.x.

McMaster, H. R. 2016. "Harbingers of Future War: Implications for the Army with Lieutenant General H.R. McMaster." Washington, DC.

Mishali-Ram, Meirav. 2006. “Ethnic Diversity, Issues, and International Crisis Dynamics, 1918-2002.” *Journal of Peace Research* 43 (5): 583–600. https://doi.org/10.1177/0022343306066524.

Montgomery, Evan Braden. 2020. “Signals of Strength: Capability Demonstrations and Perceptions of Military Power.” *Journal of Strategic Studies* 43 (2): 309–30. https://doi.org/10.1080/01402390.2019.1626724.

Morgan, T. Clifton. 1990. “Issue Linkages in International Crisis Bargaining.” *American Journal of Political Science* 34 (2): 311–33. https://doi.org/10.2307/2111449.

———. 1994. *Untying the Knot of War: A Bargaining Theory of International Crises.* Ann Arbor: University of Michigan Press.

Morgan, T. Clifton, and Glenn Palmer. 2000. “A Model of Foreign Policy Substitutability: Selecting the Right Tools for the Job(s).” *Journal of Conflict Resolution* 44 (1): 11–32. https://doi.org/10.1177/0022002700044001002.

Morris, Loveday, Ruth Eglash, and Hazem Balousha. 2019. “Israel and Gaza Militants Agree to Cease-Fire After Weekend of Violence.” *Washington Post*, May.

Morrow, James. 2019. “International Law and the Common Knowledge Requirements of Cross-Domain Deterrence.” In *Cross-Domain Deterrence: Strategy in an Era of Complexity*, edited by Jon R. Lindsay and Erik A. Gartzke, 1st edition, 187–204. New York, NY: Oxford University Press.

Newman, Lily Hay. 2019. “What Israel’s Strike on Hamas Hackers Means for Cyberwar.” *Wired*, May.

Nye, Joseph. 2017. “Deterrence and Dissuasion in Cyberspace.” *International Security* 41 (3): 44–71. https://doi.org/10.1162/ISEC_a_00266.

O’Neill, Barry. 1991. “Conflictual Moves in Bargaining: Warnings, Threats, Escalations, and Ultimatums.” In *Negotiation Analysis*, edited by H. Peyton Young, 87–108. University of Michigan Press.

Owsiak, Andrew P., and Toby J. Rider. 2013. “Clearing the Hurdle: Border Settlement and Rivalry Termination.” *The Journal of Politics* 75 (3): 757–72. https://doi.org/10.1017/S0022381613000595.

Paul, T. V., Deborah Welch Larson, and William C. Wohlforth. 2014. *Status in World Politics.* Cambridge University Press.

Petersen, Karen K., John A. Vasquez, and Yijia Wang. 2004. “Multiparty Disputes and the Probability of War, 18161992.” *Conflict Management and Peace Science* 21 (2): 85–100. https://doi.org/10.1080/07388940490463898.

Poast, Paul. 2012. "Does Issue Linkage Work? Evidence from European Alliance Negotiations, 1860 to 1945." *International Organization* 66 (2): 277–310. https://doi.org/10.1017/S0020818312000069.

Post, Abigail. 2019. "Flying to Fail: Costly Signals and Air Power in Crisis Bargaining." *Journal of Conflict Resolution* 63 (4): 869–95. https://doi.org/10.1177/0022002718777043.

Powell, Robert. 1996. "Stability and the Distribution of Power." *World Politics* 48 (2): 239–67. https://doi.org/10.1353/wp.1996.0006.

———. 2015. "Nuclear Brinkmanship, Limited War, and Military Power." *International Organization* 69 (3): 589–626. https://doi.org/10.1017/S0020818315000028.

Quek, Kai. 2013. "Are Costly Signals More Credible? Evidence from Three Experiments." *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2256528.

Quester, George H. 1977. *Offense and Defense in the International System*. Transaction Books.

Quinn, David, Jonathan Wilkenfeld, Kathleen Smarick, and Victor Asal. 2006. "Power Play: Mediation in Symmetric and Asymmetric International Crises." *International Interactions* 32 (4): 441–70. https://doi.org/10.1080/03050620601011107.

Reiter, Dan. 2009. *How Wars End*. Princeton University Press.

Renshon, Jonathan. 2016. "Status Deficits and War." *International Organization* 70 (03): 513–50. https://doi.org/10.1017/S0020818316000163.

Renshon, Jonathan, Julia J. Lee, and Dustin Tingley. 2017. "Emotions and the Micro-Foundations of Commitment Problems." *International Organization* 71 (S1): S189–S218. https://doi.org/10.1017/S0020818316000473.

Rosen, Stephen Peter. 1991. *Winning the Next War: Innovation and the Modern Military*. Cornell University Press.

Rosenau, James N. 1968. "Comparative Foreign Policy: Fad, Fantasy, or Field?" *International Studies Quarterly* 12 (3): 296–329. https://doi.org/10.2307/3013508.

Rovner, Joshua. 2020. "Give Instability a Chance?" *War on the Rocks*. https://warontherocks.com/2020/07/give-instability-a-chance/.

Sagan, Scott Douglas, and Jeremi Suri. 2003. "The Madman Nuclear Alert: Secrecy, Signaling, and Safety in October 1969." *International Security* 27 (4): 150–83.

Sanger, David E., and Emily Schmall. 2021. "China Appears to Warn India: Push Too Hard and the Lights Could Go Out." *The New York Times*, February.

Saunders, Elizabeth N. 2009. "Transformative Choices: Leaders and the Origins of Intervention Strategy." *International Security* 34 (2): 119–61. https://doi.org/10.1162/isec.2009.34.2.119.

Schilde, Kaija. 2017. "European Military Capabilities: Enablers and Constraints on EU Power?" *JCMS: Journal of Common Market Studies* 55 (1): 37–53. https://doi.org/10.1111/jcms.12444.

Schneider, Jacquelyn. 2017. "The Information Revolution and International Stability: A Multi-Article Exploration of Computing, Cyber, and Incentives for Conflict." Dissertation, Washington, D.C.: George Washington University.

Schneider, Jacquelyn, and Julia M. Macdonald. 2017. "Why Troops Don't Trust Drones." *Foreign Affairs*, December.

Schrodt, Philip A. 2012. "Precedents, Progress, and Prospects in Political Event Data." *International Interactions* 38 (4): 546–69. https://doi.org/10.1080/03050629.2012.697430.

Schrodt, Philip A., Deborah Gerner, Ömur Yilmaz, and Dennis Hermreck. 2005. "The CAMEO (Conflict and Mediation Event Observations) Actor Coding Framework." In *American Political Science Association Annual Meeting*. Washington, DC.

Sechser, Todd S., Neil Narang, and Caitlin Talmadge. 2019. "Emerging Technologies and Strategic Stability in Peacetime, Crisis, and War." *Journal of Strategic Studies* 42 (6): 727–35. https://doi.org/10.1080/01402390.2019.1626725.

Senese, Paul D., and John A. Vasquez. 2008. *The Steps to War: An Empirical Study*. Princeton University Press.

Shifrinson, Joshua R. Itzkowitz. 2019. "Linkage Politics: Managing the End of the Cold War." In *Cross-Domain Deterrence: Strategy in an Era of Complexity*, edited by Jon R. Lindsay and Erik A. Gartzke, 1st edition, 290–316. New York, NY: Oxford University Press.

Slantchev, Branislav L. 2003. "The Power to Hurt: Costly Conflict with Completely Informed States." *The American Political Science Review* 97 (1): 123–33. https://doi.org/10.2307/3118225.

———. 2005. "Military Coercion in Interstate Crises." *American Political Science Review* 99 (4): 533–47. https://doi.org/10.1017/S0003055405051865.

———. 2011. *Military Threats: The Costs of Coercion and the Price of Peace*. Cambridge University Press.

Snyder, Glenn. 1965. "The Balance of Power and the Balance of Terror." In *World in Crisis: Readings in International Relations*, edited by Frederick Hartmann, 180–91. New York: The Macmillan Company.

Stallone, Martin. 2009. "Don't Forget the Cyber! Why the Joint Force Commander Must Integrate Cyber Operations Across Other War Fighting Domains, and How a Joint Forces Cyberspace Component Commander Will Help."

Starr, Harvey. 2000. "Substitutability in Foreign Policy: Theoretically Central, Empirically Elusive." *Journal of Conflict Resolution* 44 (1): 128–38. https://doi.org/10.1177/0022002700044001007.

Stein, Janice Gross. 2017. "The Micro-Foundations of International Relations Theory: Psychology and Behavioral Economics." *International Organization* 71 (S1): S249–S263. https://doi.org/10.1017/S0020818316000436.

Talmadge, Caitlin. 2017. "Would China Go Nuclear? Assessing the Risk of Chinese Nuclear Escalation in a Conventional War with the United States." *International Security* 41 (4): 50–92. https://doi.org/10.1162/ISEC_a_00274.

———. 2019. "Emerging Technology and Intra-War Escalation Risks: Evidence from the Cold War, Implications for Today." *Journal of Strategic Studies* 42 (6): 864–87. https://doi.org/10.1080/01402390.2019.1631811.

Tollison, Robert D., and Thomas D. Willett. 1979. "An Economic Theory of Mutually Advantageous Issue Linkages in International Negotiations." *International Organization* 33 (4): 425–49. https://doi.org/10.1017/S0020818300032252.

Valeriano, Brandon, and Ryan C Maness. 2014. "The Dynamics of Cyber Conflict Between Rival Antagonists, 200111." *Journal of Peace Research* 51 (3): 347–60. https://doi.org/10.1177/0022343313518940.

Valeriano, Brandon, and Victor Marin. 2010. "Pathways to Interstate War: A Qualitative Comparative Analysis of the Steps to War Theory." *Josef Korbel Journal of Advanced International Studies* 2: 1–27.

Vasquez, John A. 1995. "Why Do Neighbors Fight? Proximity, Interaction, or Territoriality." *Journal of Peace Research* 32 (3): 277–93.

———. 1983. "The Tangibility of Issues and Global Conflict: A Test of Rosenau's Issue Area Typology." *Journal of Peace Research* 20 (2): 179–92. https://doi.org/10.1177/002234338302000206.

———. 1996. "Distinguishing Rivals That Go to War from Those That Do Not: A Quantitative Comparative Case Study of the Two Paths to War." *International Studies Quarterly* 40 (4): 531–58. https://doi.org/10.2307/2600890.

Vasquez, John, and Marie T. Henehan. 2001. "Territorial Disputes and the Probability of War, 1816-1992." *Journal of Peace Research* 38 (2): 123–38.

Wagner, R. Harrison. 2000. "Bargaining and War." *American Journal of Political Science* 44 (3): 469–84. https://doi.org/10.2307/2669259.

Wallace, Michael D. 1979. "Arms Races and Escalation: Some New Evidence." *The Journal of Conflict Resolution* 23 (1): 3–16.

Warden, John. 2018. "Limited Nuclear War: The 21st Century Challenge for the United States." 4. Lawrence Livermore National Laboratory: Center for Global Security Research.

Warden, John K. 2020. "Conventional-Nuclear Integration in the Next National Defense Strategy." Center for a New American Security.

Weede, Erich. 1980. "Arms Races and Escalation: Some Persisting Doubts (Response to Wallace's Article, JCR, March 1979)." *The Journal of Conflict Resolution* 24 (2): 285–87.

Yarhi-Milo, Keren. 2018. *Who Fights for Reputation: The Psychology of Leaders in International Conflict*. Princeton University Press.

Yarhi-Milo, Keren, Alexander Lanoszka, and Zack Cooper. 2016. "To Arm or to Ally? The Patron's Dilemma and the Strategic Logic of Arms Transfers and Alliances." *International Security* 41 (2): 90–139. https://doi.org/10.1162/ISEC_a_00250.

Zegart, Amy. 2018. "Cheap Fights, Credible Threats: The Future of Armed Drones and Coercion." *Journal of Strategic Studies* 43 (1): 6–46. https://doi.org/10.1080/01402390.2018.1439747.