CONFLICT DYNAMICS IN MILITARIZED INTERSTATE DISPUTES

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Conflict Dynamics in Militarized Interstate Disputes

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My dissertation examines the determinants of interstate dispute dynamics. When making decisions, do state decision makers have an eye on the future as they perform cost-benefit analyses, or are they "blinded" by history? I refer to these two alternatives as "dynamics." I claim that different disputes exhibit different types of dynamics. I argue that the importance (or salience) of the issue being fought over will influence which dynamic will be present. Decisions regarding disputes over highly salient issues will be most affected by history, while decisions regarding less salient issues will be most affected by considerations about the future. I test my argument using a set of unique methodological techniques that can determine which conception of conflict dynamics is more helpful, and when. In general, I find evidence supportive of my argument: decisions regarding highly important issues are most affected by history, while decisions regarding less-important issues are most affected by considerations about the future. The project provides important insights into how we should think about militarized conflict, both interstate and intrastate, speaking to potential mediation and resolution strategies.

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LIST OF ABBREVIATIONS, SYMBOLS, AND EXPRESSIONS

ξ_{t+k}: the forecast error, measured as the difference between the value of the actual outcome (o_{t+k}) and expected outcome (o^{e}_{t+k}) (fn. 13 [p. 14])

a/A: specific action a available to an actor; the set of all possible actions comprises A (p. 12, 16)

$a_{\sim i,t}$: the actions taken by other relevant actors in t (fn. 13 [p. 14])

BMS: Boehmke, Morey, and Shannon (2006) (p. 212)

c: cost of fighting; c_i = cost of fighting for State i, c_j: cost of fighting for State j (p. 18)

COW: Correlates of War (p. 77)

D: how long a militarization will last (p. 47); *see also* MID DURATION

e: error in a state's estimate of a militarization's length; $e > 0$ represents an overestimation (longer than the militarization will be in truth), while $e < 0$ represents an underestimation (shorter than the militarization will be in truth) (p. 48)

H&K: Hays and Kachi (2009) (p. 212)

ICOW: Issue Correlates of War (p. 77)

k: an abstract number of periods, used to express the expected outcome k periods from the current time (fn. 13 [p. 14])

LR: likelihood ratio (p. 98)

MID: militarized interstate dispute (p. 77)

o/O: an outcome o that can result from a particular process; the set of all possible outcomes comprises O (pp. 13, 16); see also o_{t+k}

o_{t+k}: the actual, realized outcome in $t + k$ (fn. 13 [p. 14])

o^{e}_{t+k}: the expected outcome in period $t + k$ (fn. 13 [p. 14])

O.S.: overall salience (p. 36)

p: the probability of State *i* winning a militarized contest against State *j* (p. 18)

SEM: simultaneous equation model (p. 86)

SMB: Shannon, Morey, and Boehmke (2010) (p. 139)

SP: split population (p. 98)

t: *see* CLAIM DURATION

v: total value of issue, which is directly related to an issue's overall salience level (p. 43)

x: the initial offer made by State *i* to *j* in Fearon's (1995) basic bargaining game (p. 25)

X_t: the set of information available to decision makers at *t* (fn. 13 [p. 14])

y_1: the dependent variable in the first equation of the SEM, CLAIM DURATION (p. 86); *see also* CLAIM SPELL *and* ISSUE DURATION

y_2: the dependent variable in the second of the SEM equation, MID DURATION (p. 86)

PREFACE

A dissertation, I've decided, is a bit like an iceberg. Just like only 10 percent of an iceberg's mass is visible above water, the pages that follow are only a small, visible indicator of this dissertation project's true size. I would be remiss if I did not acknowledge the mass below the waterline, as it were.

First, my colleagues in the Department of Political Science at the University of Pittsburgh have been wonderful. It has been an excellent environment to learn what it means to be a political scientist and develop the requisite skills. My dissertation committee epitomizes this. Chuck Gochman, Jude Hays, Burcu Savun, and John Vasquez each brought a unique, yet complementary, perspective to the table. It only bettered the final dissertation as a whole. They also acted as excellent counterbalances, being enthusiastic about the project when I was less-than-thrilled, and were challenging when I was overly sanguine. Suffice it to say, this project would not have come to fruition without their guidance. For that, and their support during my entire tenure at Pitt, they have my sincerest thanks and gratitude.

Others at Pitt have also played a part in helping me to understand what comprises "good" social science research. I've been fortunate enough to work with Daniela Donno (and Bruce Russett) on an "enduring" joint project; our collaboration has been a delight. Daniela also read several parts of this dissertation at various stages, and always had clear, thoughtful feedback to offer. Her willingness to do so, while juggling our project and her other professional obligations,

has taught me much about doing research and being an academic. All of the department's faculty were extremely supportive throughout my graduate career, be it through their candid advice or sharp insight regarding this project: among others, I thank David Bearce, Stephen Chaudoin, Steve Finkel, Kristin Kanthak, George Krause, and Nita Rudra. Last, but certainly not least, I owe a substantial debt to my fellow graduate students. They were superb sounding boards (and sanity checkers!), particularly my cohortmates, fellow IR students, and officemates: Kristen Coopie Allen, Ian Cook, Scott Cook, Will Daniel, Jen Laks Hutnick, Hirokazu Kikuchi, Brandon Myers, Sarah Cormack Patton, and Lauren Perez, plus many, many others.

Parts of this dissertation were presented at Peace Science, in 2011 and 2012, and the University of Pittsburgh's Symposium on Political Violence. I benefited greatly from the discussions that occurred at all these fora. Gary Goertz, Ashley Leeds, and Shawn Ling Ramirez all offered helpful, detailed feedback about the project at pivotal stages. Also, Bill Thompson was kind enough to share his private data on strategic rivalries.

Finally, my friends and family deserve a badge of honor. They have dealt with truncated holidays, intermittent communication, and infrequent visits for the better part of half a decade. Some of them probably found out more than they ever wanted to know about political science in the process. Their support never wavered, though. Mom, Dad, and Katie deserve particular credit. None of them batted an eye during any part of my collegiate career, when they had sufficient cause to run for cover on more than one occasion. That takes a certain type of long-suffering, good-humored patience and faith. I'll always be amazed by and thankful for it.

As for a dedication, this dissertation has one, but I've often been warned of the power of words, once written. Instead, I will say only this: to wherever the adventure leads next.

1.0 INTRODUCTION

How does an international dispute evolve? History is rife with examples of these disagreements, ranging from small, isolated diplomatic spats to more serious confrontations involving issues such as the location of a country's borders or its right to exist as a sovereign entity. Such disputes feature prominently in the news. Argentina and Britain's dispute over the Falkland Islands experienced heightened diplomatic tensions and renewed calls for resolution in April 2012, around the 30th anniversary of the 1982 Falkland War.[1] The competing ownership claims over various South China Sea island archipelagos have become increasingly vociferous, such as the Chinese-Filipino dispute over the Scarborough Shoal.[2] Regional organizations, like ASEAN, have been paralyzed by member-state discord over these multilateral disputes.[3]

[1] For example: (1) Charbonneau, Louis, 2012, "Argentina's Fernandez Takes Falklands Claim to U.N." Reuters, http://www.reuters.com/article/2012/06/14/us-britain-argentina-falklands-un-idUSBRE85D1P220120614 (accessed June 20, 2012); (2) "Falklands to Hold Referendum on Status Next Year," 2012, Reuters, http://www.reuters.com/article/2012/06/12/us-britain-falklands-referendum-idUSBRE85B0T920120612 (accessed June 20, 2012); (3) "Falklands Vote to Stay UK Territory," 2013, *BBC*, http://www.bbc.co.uk/news/uk-21750909 (accessed March 14, 2013); (4) Holden, Michael, 2012, "Britain Warns Argentina over Falklands Aggression," Reuters, http://www.reuters.com/article/2012/06/14/us-britain-argentina-falklands-idUSBRE85D1NA20120614 (accessed June 20, 2012).

[2] E.g.: (1) "China Summons Manila Envoy over South China Sea Standoff," 2012, Reuters, http://www.reuters.com/article/2012/04/18/us-china-philippines-idUSBRE83H0DJ20120418 (accessed June 21, 2012); (2) Spegele, Brian, 2012, "Beijing to Withdraw Fishing Boats From Disputed Shoal," *Wall Street Journal*, http://online.wsj.com/article/SB10001424052702303379204577474162595763298.html (accessed June 21, 2012).

[3] (1) "All Change at ASEAN," 2013, *The Economist*, http://www.economist.com/news/asia/21571461-hopes-calmer-times-under-years-new-management-all-change-asean (accessed February 18, 2013); (2) "ASEAN in Crisis: Divided We Stagger," 2012, *The Economist*, http://www.economist.com/node/21560585 (accessed August 24, 2012).

Some disagreements remain entirely peaceful. Others involve the use of military force. If we think about the absence or presence of militarized conflict as characterizing different phases of interstate disagreements, how might the attributes of one phase affect the attributes of the other? This broad question about dispute dynamics and militarized conflict serves as the focus of my dissertation.

To date, scholars have conceptualized conflict dynamics in one of two ways. The first consists of work rooted in a game-theoretic, rationalist tradition. It starts from the premise that war, and fighting in general, is *ex post* inefficient. If decision makers know this, why do states fail to reach peaceful agreements over disputed issues? James Fearon's answer to the question is that states fight because of incentives to misrepresent private information about their capabilities or resolve, an inability to credibly commit to peace, and/or disagreement over what are perceived to be indivisible issues (Fearon 1995).

Many studies have found supportive empirical evidence for the broad rationalist argument (e.g., Fearon 1994; Reed 2000; Shannon, Morey, and Boehmke 2010; Slantchev 2003, 2004). Game-theoretic research rooted in this rationalist tradition has been especially valuable for its insights regarding the connections between how militarized conflicts begin, progress, and end. Most of this work, however, suffers from a dearth of substantive theorizing about the nature of, and connections between, these various aspects of war.

Such explanations can be found in the second approach to conflict dynamics: conflict-as-process explanations. Conflict-as-process stories depict war as the outcome of a sequence of interactions among disputing parties. John Vasquez's "steps to war" is perhaps the most well-known conflict-as-process story (1987, 2009).[4] The sequence begins with disagreement over an issue (or issues) that can be potentially addressed through the use of military force. Under certain circumstances, political leaders may opt to employ threats of force, which in turn may escalate to ever higher levels of hostility, eventuating in war.

Despite the prominence and oft-invoked nature of such arguments within the interstate conflict literature, there exist no explicit quantitative studies of the step-by-step element of a general conflict-as-process story, though numerous qualitative analyses exist (e.g., Valeriano and Marin 2010).[5] Research from the broader foreign policy behavior literature, however, has produced supportive evidence of the general behavioral pattern suggested by conflict-as-process arguments (e.g., Crescenzi and Enterline 2001; Crescenzi, Enterline, and Long 2008; Goldstein 1992; Goldstein and Pevehouse 1997; Lebo and Moore 2003; Vasquez and Mansbach 1984; Ward 1982).

In thinking about Fearon's rationalist explanation and Vasquez's steps to war, an intriguing contrast emerges with respect to the underlying causal logic. The rationalist logic is forward looking, i.e., anticipatory. It asserts that the decision to employ (or not employ) military force is based on beliefs regarding how target states will respond. Will the adversary capitulate? Will it respond with a similar level of force? Will it escalate hostilities? The conflict-as-process logic (what I will call "non-anticipatory") is more backward looking, i.e., reliant on forms of history dependence, such as path dependence. Particular characteristics of adversaries, context, environment, and history have unexpected effects on the probability of escalation, which affects

[4] Wright (1965), Bloomfield and Leiss (1969), Rummel (1976), Maoz (1982), Huth and Allee (2002), and Senese (2005), among others have also depicted war in this manner and this is implicitly the logic underlying the construction of the Correlates of War project's militarized interstate dispute (MID) dataset (Ghosn, Palmer, and Bremer 2004; Gochman and Maoz 1984; Jones, Bremer, and Singer 1996).
[5] Or at least no quantitative articles that I have come across, to date.

the ability to anticipate an adversary's response accurately. Looking at the respective literatures, there is evidence to support each view.

1.1 OVERVIEW OF ARGUMENT

So, which story is correct—or which story is more correct? Do militarized conflicts exhibit dynamics consistent with the anticipatory logic propounded by rationalists, or do we see dynamics more in keeping with the non-anticipatory logic found in conflict-as-process arguments?[6] While it is quite possible, and even likely, that conflict escalation is a mixture of both dynamics in reality, the question I raise is which dynamic is predominant?

I propose that there is no single answer to this question. Some conflicts are more likely to exhibit a predominantly anticipatory dynamic, while others are likely to be more non-anticipatory. I use the anticipatory and conflict-as-process logics to construct a typology of dynamic ideal-types to establish the necessary conditions for each story. I suggest that an anticipatory logic—what I call an "anticipatory dynamic"—has two necessary conditions. First, decision makers must use all information at their disposal when choosing a course of action. Second, this information must be interpreted 'correctly,' in an objective sense. I define a "non-anticipatory dynamic" as the absence of either condition.

I focus on the context surrounding the decision to employ military force to explain when each dynamic will be predominant. I conceptualize "context" as the primary issue over which states are in disagreement (hereafter called the "disputed issue"). My key claim is that the

[6] I wish to make clear that the scholarship associated with both logics is more extensive and far richer in detail and nuance than presented here. I have simplified the arguments and accentuated differences to facilitate construction of ideal types.

overall importance, or salience (Hensel et al. 2008), of the dispute will affect which dynamic is predominant. I contend that decisions to militarize disputes over highly salient issues will be likely to follow a non-anticipatory dynamic. Highly salient issues generally create decision-making environments in which information will be interpreted subjectively. Subjective interpretations are problematic, for they often lead to information being interpreted incorrectly. For instance, states may selectively ignore pieces of information relevant to the decision at hand, simply because the information does not comport with a state's perception of its adversary. This violates one of the two necessary conditions for an anticipatory dynamic, which suggests that the predominant dynamic for decisions over highly salient issues will be non-anticipatory. For issues of lesser importance, the stakes are more concrete and less abstract in nature, which is conducive to objective reasoning and accurate cost-benefit analyses. Both are in line with the necessary conditions for an anticipatory dynamic. Thus, the predominant dynamic for decisions over issues of lesser salience will be anticipatory.

I offer two general mechanisms through which issue salience can induce subjective interpretations of information: (1) through its impact on the divisibility of issues, and (2) on decision-making time pressures. The mechanisms are best thought of as competing explanations, not complements. First, indivisible issues are phrased in stark all-or-nothing terms, making it hard, if not impossible, to find middle ground. Highly salient issues are more likely to be construed as indivisible from the beginning. Indivisibility is a subjective construct, which engenders the subjective interpretation of information about the issue (Allison 1969; Jervis 1968; Lebow 1981). Second, highly salient issues are also often associated with decisional "time pressures," where decision makers have a limited amount of time to debate possible alternatives before choosing one of them (e.g., Lebow 1981). Time pressures create stressful decision-making environments, and decision makers' aversion to this stress can lead to a multitude of information processing problems (Janis and Mann 1977). I delineate between the mechanisms by exploiting how "quickly" the effects will appear. I claim that the effects of an issue indivisibility mechanism take some time to manifest, while the effects of a time pressure mechanism manifest much more quickly, in relative terms.

1.2 OVERVIEW OF EMPIRICAL TESTING

To test my claims, I employ a set of methodological techniques to determine which conception of conflict dynamics is more helpful, and when. I test whether states form accurate beliefs about the length of a militarization over a disputed issue. Examining states' beliefs about militarization length is appealing, because my argument implies that belief accuracy will vary based on the dispute's importance. States' beliefs about how long a militarization will last will influence whether a militarization is initiated at all. In general, I find evidence supportive of my argument. Disputes over highly salient issues have a stronger non-anticipatory than anticipatory dynamic in the form of an issue indivisibility mechanism. The opposite is true for less salient issues: anticipatory dynamics are stronger than non-anticipatory ones.

More specifically, my empirical analysis is comprised of two major components. First, I investigate beliefs about militarization length using a simultaneous estimation model (SEM). The SEM specifies one equation per dynamic, allowing me to check for both dynamics within a unified framework. Existing research usually focuses on one dynamic at the expense of the other. I utilize a simultaneous equation setup that can accommodate both dynamics in a unified framework (Hays and Kachi 2009). The setup allows for interdependence among dispute phases, which is also more consistent with my theoretical argument. Traditional estimation strategies are ill-suited for situations involving interdependence because interdependence violates the models' underlying exogeneity assumption. I posit that states form accurate beliefs about militarization length in disputes over less important issues, but that they form *in*accurate beliefs when disputes are over highly important issues. I find support for my argument: highly important issues are prone to inaccurate beliefs about militarization length, implying a predominantly non-anticipatory dynamic. Less important issues tend to involve accurate beliefs about militarization length, implying a predominately anticipatory dynamic.

In the second portion of my analysis, I examine disputes that never militarize. I posit that peaceful disputes may contain evidence supportive of an anticipatory dynamic. Peaceful disputes can arise for two different reasons. In the first, the dispute had effectively no chance of militarizing. In the second, the dispute *could* have militarized, but states formed accurate beliefs about militarization length and choose not to do so—i.e., anticipation. I use split population models for testing, as they are well-suited for investigating outcomes that arise for more than one reason. My supposition is supported: peaceful disputes show evidence of an anticipatory dynamic. The evidence is more robust for less salient issues than it is for high salient issues, which comports with my general claim that anticipatory dynamics are strongest in disputes over less salient issues.

1.2.1 Contributions

My argument provides some important insights into how we should think about militarized conflict, both interstate and intrastate. To date, no work has extensively examined the possibility that escalatory dynamics may differ across military conflicts. The insights provided by rationalist models have been valuable in furthering our understanding of conflict processes. My argument suggests that certain conflicts may not ‘follow’ a rationalist-anticipatory dynamic, implying that we need to specify where rationalist arguments are valid and appropriate and where they are not.

Additionally, there is little research into or systematic theorizing about the dynamics that underlie disputes and little explicit theorizing about how the dynamics of militarized conflict might be connected to the broader dynamics of the dispute. Increasing our understanding about dynamics places us in a better position to develop strategies for reducing the occurrence of militarized conflict (including war) even in non-anticipatory situations—the aim of Vasquez’ (2009) and predecessors’ work (e.g., Richardson 1960).

1.3 ORGANIZATION

The rest of the dissertation is structured as follows. Chapter 2 presents the conceptual basis for my two ideal-types of conflict dynamics. Chapter 3 provides an explanation as to why different conflicts exhibit different types of dynamics. The core of the explanation relates to the salience of issues underlying conflicts. Having laid out the argument, I discuss its applicability to claim and conflict duration. Chapter 4 addresses questions of research design and methodology. Chapter 5 empirically assesses the claims I have made about dynamics using militarized conflict duration. Chapter 6 does the same by looking at militarized *and* peaceful disputed issues. Chapter 7 contains concluding remarks, along with an enumeration of avenues for future research.

2.0 DYNAMICS 101

How can we understand dispute dynamics? In this chapter, I create a typology of dynamic ideal-types by building from existing work on the topic. A dynamic ideal-type represents the causal process yielding some outcome of interest. Here, I am interested in understanding the causal process that leads to dispute militarization. The typology helps us to think about whether the outcomes we observe are consistent with rationalist-anticipatory stories for militarization or conflict-as-process stories.

My dynamic ideal-type typology is comprised of two conceptual dimensions: (1) the availability of sufficient amounts of relevant information and (2) states' information processing capabilities. I obtain two dynamic types by forming groups from the combination of these two dimensions. I discuss the two types in terms of mutually exclusive ideal-types, but disputes may be a mixture of both dynamics. One dynamic type may simply dominate the other.

The different dynamic ideal-types produce divergent implications about the fundamental processes behind militarized conflict. The first dynamic ideal-type suggests that expectations regarding <u>future</u> outcomes have an appreciable causal impact on the decision to militarize (e.g., Fearon 1995). The second suggests that <u>past</u> outcomes, rather than future expectations, will better explain the decision to initiate (e.g., Vasquez 2009).

The chapter is organized into four parts. I begin by establishing the foundations of my typology by using rational expectation theory from economics. Next, I lay out the two conceptual dimensions of my typology. The third section discusses the two ideal-types that result from the combination of the typology's dimensions. I conclude with a brief recapitulation of this chapter's main points and hypotheses.

2.1 THE TYPOLOGY'S FOUNDATIONS: RATIONAL EXPECTATIONS

2.1.1 Preliminaries

A typology of dynamic ideal-types describes the pattern of observed outcomes during a process of interest. Formally, it describes the relationship between the behavior of self-interested actors (i.e., actions, *a*) and how actions combine to yield an observed outcome (*o*).[7] The typology does *not* describe specific decision-making rules or logics that are adopted by decision makers, nor do decision makers make a conscious choice to follow one dynamic ideal-type over another. The typology describes *general* patterns of behavior.

The general principles motivating my notion of dynamic ideal-types are easiest to see with a simple example. Consider three individuals, each of whom is packing to leave for work in the morning. All live in the same city. Today, the weather forecast calls for clear skies in the morning, but a quick-moving storm system will arrive in the afternoon, bringing heavy rain that will last into the night. The first individual checks the weather forecast, sees that there is a high chance of rain later that day, and packs an umbrella. The second individual, a long-time resident of the city, also checks the forecast, but doubts its authenticity. Weather systems have never

[7] I refer to any decision made by a *single* actor as an "action." The word "outcome" refers to the result of the actions taken by *all* actors.

moved quickly through the area before—clear skies in the morning always mean clear skies the rest of the day. Armed with this knowledge, the second individual leaves for work without an umbrella. The third individual has just moved to the city within the last week, and is still without a TV and an internet connection. The individual looks out the window to check the weather, and sees clear skies. Concluding that there is no chance of rain, the third individual eschews an umbrella. Subsequently, when it pours during the evening commute, as predicted, only one of the three individuals is properly equipped.

Dynamic ideal-types characterize how an individual's beliefs about rain in the evening, indicated by packing an umbrella (a), compare with what actually transpires—rain (o).[8] I refer to these beliefs as an individual's "expectation" regarding some outcome. One of the dynamic ideal-types represents the case where an individual's expectation and the actual outcome are identical—e.g., we brought an umbrella because we believed it would rain, and it did rain. Individual 1 represents this case, in this example. The other ideal type obtains from the cases in which an expectation and the actual outcome are mismatched, like Individuals 2 and 3. This is the primary purpose of the typology I develop: an explicit framework with which we can compare the accuracy of an actor's expectations regarding an outcome with the actual outcome that occurs.

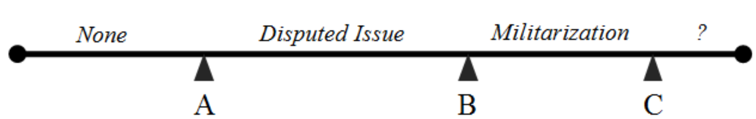

FIGURE 2.1. Stylized Event Timeline

[8] This example is vastly oversimplified. For instance, there is no strategic element between actors' actions (a) and the outcomes that transpire (o). Nonetheless, I think its simplicity provides a helpful heuristic for understanding the subsequent argument, which is more complex.

My process of interest is the militarization of interstate disputes. To understand why states militarize such disputes, I begin by describing the "world" in which states operate. I assume that the world is a "rationalist" one, characterized by the same set of assumptions commonly made in formal bargaining models of militarized conflict. These models—and their underlying assumptions—represent the dominant viewpoint among recent academic work on militarized behavior.

Figure 2.1 provides a stylized depiction of events as they unfold between two states, *i* and *j*. States *i* and *j* have divergent preferences regarding an issue, e.g., control over a piece of territory. I treat states as unitary actors, though I will mention domestic actors and decision makers at various points in the discussion. The best outcome (*o*) for *i* is generally the worst outcome for *j*, and vice versa.

At Point A, the dispute between State *i* and *j* begins. Official representatives of *i* or *j*'s government make explicit statements challenging the issue's current status quo policy.[9] Both states are treated as purposeful utility maximizers, meaning they both wish to obtain the best possible deal at the lowest cost.

The states' central decision makers are tasked with resolving the dispute.[10] Military force is one of several actions (*a*) available to decision makers force to resolve the disagreement. The cost associated with different types of actions varies, but employing military force of *any* sort (e.g., verbal threats, mobilization of forces, engaging in active combat) has costs (Fearon 1997; Slantchev 2011). When military force is threatened or employed by at least one state (Figure 2.1, Point B), the dispute has become militarized. Presumably, reciprocated fighting at high

[9] I recognize that disagreements may exist between *subnational* actors within one state and the government of another state. However, I focus only on "official" disagreements among states because decisions regarding military force are ultimately made by governments.
[10] I use "states" and "decision makers" interchangeably in some parts of the discussion.

intensity—what we call "war"—generates the greatest costs.[11] States could resolve the dispute through peaceful means as well, and obtain comparable agreements to those they would obtain from militarizing. This is the basis of the puzzle articulated most notably by Fearon (1995): why does militarized conflict occur, when similar settlements could be reached without incurring the cost of militarization?

For my application to interstate disputes, I define the set of available actions and outcomes as follows. States can take two possible actions at time *t*: they can take military action to resolve the dispute, or they can refrain from militarizing. The set of available actions, *A*, can be written {Militarize; ~Militarize}. Two outcomes (*o*) can result from the actions in *A*. First, if neither state chooses to militarize, then the outcome is peace. Second, if at least one state chooses to militarize the dispute, then the outcome is military conflict. The set of outcomes, *O*, can be written {Peace; Militarized Conflict}. This depiction oversimplifies the reality that state decision makers face. For example, initiating a peaceful settlement attempt (bilateral or multilateral) could be a third available action. My argument about dynamics in interstate disputes can accommodate this and other actions and outcomes. I begin with a simpler scenario to facilitate clearly laying out my argument about dynamic ideal-types. My argument can also be generalized to any scenario where we are interested in understanding the processes that generate outcomes.

[11] The distinction between militarized conflict and war is relevant for empirical work. Wars are militarized conflicts that reach at least 1000 total battle deaths (Jones, Bremer, and Singer 1996; Singer and Small 1972; Small and Singer 1982). By contrast, "war" is used in the formal modeling literature to ensure that fighting has a non-zero cost. Otherwise, "militarized conflict" and "war" are often treated as implicit synonyms in game-theoretic models. When comparing the findings and insights within and across the bodies of empirical and formal work, it helps to be aware of these semantic differences.

2.1.2 Rational Expectation Theory

The conceptual underpinnings of the typology are easiest to grasp when defined in terms of "rational expectations." An oft-used concept in economics (Muth 1961), the concept (or theory) of rational expectations describes the causal process yielding some outcome of interest. Efficiency in economic markets is probably the best-known application. Formally, actors exhibiting behavior consistent with rational expectations will make efficient use of all available information in the present to form unbiased expectations about an outcome in the future (Sheffrin 1996; Williams and McGinnis 1988, 971).[12] They will then choose the action that best maximizes their interests. We can also refer to these future expectations about outcomes as "forecasts" or "predictions."

Rational expectation theory does not require that actors have perfect foresight. It recognizes that the world is filled with uncertainty, impacting actors' ability to produce accurate predictions. Rational expectations allow actors to make "mistakes" when forming their expectations. The theory only requires that mistakes are not systematic (i.e., errors must be idiosyncratic; on the whole, forecasts must be unbiased).[13] Actors have reason to avoid making

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[12] Some work makes the distinction between a *strong* and *weak* form of rational expectations (Brown and Maital 1981, 493–494; Krause 2000, 289–290; Sheffrin 1996, 14–15). Strong or fully rational expectations require that all available and relevant information be used to form unbiased expectations. By contrast, weak or partially rational expectations require that the expectations only be unbiased (i.e., not all information may be used efficiently). My substantive discussion generally refers to weak rational expectations, as it is the less stringent of the two definitions. The distinction matters most for empirical testing, so I revisit this issue during my empirical discussion in Ch. 4.

[13] Formally, rational expectations require that, on average, aggregate forecasts are unbiased. This can be mathematically expressed as follows (Brown and Maital 1981, 493–494; Mishkin 1986, 47–50). An actor i uses some set of information at time t (which I denote as X_t) to form an expectation about o's value k periods from now (which I denote as o^e_{t+k}). X_t can—and is likely to—include information regarding the probable decisions/actions of other relevant actors (i.e., $a_{\sim i,t}$). Let o_{t+k} be the actual value of o at time $t + k$. o_{t+k} is the product of (1) the decisions made by all actors at t and (2) any exogenous shocks to the system. If aggregate behavior is consistent with rational expectations, then the difference between o_{t+k} (actual value) and o^e_{t+k} (expected value), given X_t (the information we had at t), should be zero on average: i.e., $E(o_{t+k} - o^e_{t+k}|X_t) = 0$. The difference between actual and expected values is known as the forecast error: $\xi_{t+k} = (o_{t+k} - o^e_{t+k})$.

the same mistake persistently because they are self-interested (i.e., utility maximizers). In order to obtain outcomes that are most congruent with their preferences, actors have an incentive to continually (1) assess the accuracy of their previous expectations, (2) gather new information and/or update their previous information based on what they observe, and (3) use all this information to form new expectations. Given new expectations about outcomes, actors can subsequently adjust their behavior so as to best maximize their respective utilities. The sequence of objective assessment, updating, and expectation formation is better known as Bayesian updating or Bayesian learning. I use the term "learning" to refer to this specific process from this point onwards.

All behavior that is consistent with rational expectations relies on an inherently forward-looking logic. However, the converse is not true: all inherently forward-looking logics do *not* produce behavior consistent with the concept of rational expectations. The key feature that distinguishes rational expectation logic from other forward-looking logics is its <u>unbiased-forecast property</u>, induced by the self-interested nature of actors. Krause and Granato allude to the importance of self-interestedness by noting that rational expectations yield behavior that "reflect not only a prospective or forward-looking orientation, but also *goal direction and optimizing*" (emphasis added, 1998, 136).

Other forward-looking logics can yield systematically biased expectations, even those involving expectations. Adaptive expectations, for instance, are formed by using past values of a variable to predict its future values (Sheffrin 1996, 80–81). Actors have no opportunity to discover if past values are inaccurate, as they incorporate no additional information when forming their expectations. Adaptive expectations therefore need not be unbiased (see, e.g., Williams and McGinnis 1988, 970–971). On the other hand, rational expectations are formed using past values of *multiple* variables to predict the future value of one variable in particular. By using multiple variables, actors have several sources of information, making it possible to identify and correct any past inaccuracies.[14] The result is unbiased expectations.

In economics, market efficiency is one of the best-known applications of rational expectation theory (Mishkin 1986, 10–12). Economists also use rational expectation theory to explain inflation patterns and business cycles (see Sargent 2008 for an overview). In many economic applications, precedence is usually given to relevant *economic* information, revealed by the market, when actors are forming expectations about future economic outcomes. Scholars of political economy have investigated similar economic outcomes, but they place more emphasis on the impact and interpretation of relevant *political* information, such as electoral outcomes and the chance of government dissolution (e.g., for currency markets, Bernhard and Leblang 2006; Freeman, Hays, and Stix 2000).

The concept of rational expectations has also been employed in other areas within political science. For instance, Krause has extensively examined the formation of aggregate expectations of economic performance by the American public (Granato and Krause 2000; Krause 1997, 2000; Krause and Granato 1998). McGinnis and Williams have found evidence consistent with a rational expectation story for US-Soviet military expenditures during the Cold War (McGinnis and Williams 1989; Williams and McGinnis 1988).

Most importantly, rational expectations underlie classic game-theoretic models of militarized conflict. The parallels can be seen in the four basic components of a rational choice model.[15] First, A is the set of actions available to a state. Second, O is the set of possible outcomes, given the actions in A. Third, some function f connects every action in A with a

[14] Hereafter, I use the term “expectation” to refer to a rational expectation unless I explicitly state otherwise.
[15] Slantchev (2011, 5–9) provides an excellent, accessible discussion of these various assumptions.

consequence in O (f: $A \rightarrow O$).[16] Finally, states can rank the outcomes in O from most to least preferred (Osborne and Rubinstein 1994, 4–5). They then evaluate the entire set of actions available to them and select the action that maximizes the chance of obtaining their best outcome, taking into account the probable actions of others. In the parlance of rational expectation theory: states form expectations about future outcomes, and then adjust their behavior accordingly so as to maximize their utility. Strategically incorporating beliefs about others' actions when choosing one's own—backward induction—generates the anticipatory behavior synonymous with rationalist assumptions and with rational expectation theory.

2.2 TYPOLOGY DIMENSIONS

The unbiased forecasting property of rational expectation theory will hold only if two conditions are met. Specifying both conditions is necessary if we want to use rational expectation theory to gain substantive insight into dispute dynamics. The conditions are the basis for the two dimensions of my dynamic ideal-type typology.

2.2.1 Information Availability: "All Relevant Information"

The first is the assumption that sufficient information is available to form rational expectations. This dimension is best thought of in terms of objective quantity: do states have access to enough

[16] Uncertainty can be incorporated through the introduction of a stochastic element into f, akin to exogenous shocks/idiosyncratic errors in the rational expectation story. See, e.g., Signorino (2002, 2003) for an illustration in the context of econometric tests of game-theoretic models.

information to learn from? Formally stated, rational expectation theory requires that states use all relevant information.

"All relevant information" appears to be a demanding stipulation at first glance, but the term is actually a misnomer. We cannot really know what comprises the set of *all* relevant information with certainty. We also do not know what information is actually used by states to form expectations about military conflict (Brown and Maital 1981, 493). Instead, we usually have a subset of relevant information whose contents are informed by substantive theory. All relevant information simply means that there is enough information to form unbiased expectations.[17]

The above suggests that we must be able to answer two questions when applying rational expectation theory to a specific outcome of interest. First, what constitutes the subset of relevant information for the outcome of interest? Second, how readily available is this information? As the outcome of interest here is militarized conflict, I turn to the substantive work on the subject.

Regarding the first question, classic game-theoretic work on militarization has traditionally focused on two types of information. The first is the probability of State *i* winning a militarized contest against State *j*. It is represented by the parameter "*p*" in most formal models, and is also referred to as a state's military capabilities. The second type of information is *i*'s own cost of fighting, as well as the perceived cost of fighting for *j*. A state's cost of fighting is typically represented by "*c*" in formal models. By some, it is also referred to as a state's

[17] For *strong* rational expectations, actors are required to make efficient use of all relevant information—they use all information in X_t to form their expectations. If this is so, then it implies that X_t will be completely unrelated to the forecast error (ξ_{t+k}): i.e., $\mathrm{Corr}(X_t, \xi_{t+k}) = 0 \equiv \mathrm{Corr}\big(X_t, (o_{t+k} - o^e_{t+k} | X_t)\big) = 0$. This is referred to as the *orthogonality* property (Sheffrin 1996, 6).

“resolve” (Maoz 1983, 199; Powell 1987, 720).[18] The parameter captures the opportunity costs associated with militarizing.

Regarding the second question, information regarding militarized conflict is not as readily available as one would expect. There are two reasons why this is so. First, most outcomes examined using rational expectation theory are relatively common occurrences. For instance, the buying and selling of stock shares happens daily, which influences the stock’s listed price. By contrast, militarized conflict is a rare occurrence. States lack regular opportunities to learn and update information about p and/or c, making it more difficult to evaluate the accuracy of their expectations and adjust their behavior as needed (Smith 1991; Soros 1994). History is replete with examples. During the July Crisis of 1914, Imperial Germany realized the perils of its unequivocal support to allied Austria-Hungary too late to avoid the imminent war (Lebow 1981, 143–147).

Second, majority of the economic outcomes analyzed with rational expectations are continuous in nature. Stock prices are listed as monetary values, which are updated continuously as traders buy and sell shares of the stock. However, militarization is a discrete event. We can only directly observe its presence or absence. The underlying causal process yielding militarization, while continuous, is unobservable. An equivalent situation would be listing only whether a stock’s price was above or below a certain value. Discrete events are thus less informative than continuous ones because the former exhibits less variation, by definition.

States can—and do—overcome the informational disadvantages associated with militarization. The disadvantages are not insurmountable. I contrasted militarized conflict with one of the classic economic applications of rational expectation theory to make one simple point:

[18] I demonstrate the basis for this label in Ch. 3.

such informational disadvantages *exist* for militarization, compared to other types of outcomes. As a result, there is a higher potential for states to form inaccurate expectations about military conflict, even when states are pure utility maximizers.

2.2.2 Information Processing Capabilities

The second condition required for unbiased forecasting to hold is that actors are able to efficiently *process* all relevant information. The objective component of rational expectations suggests that actors will usually ascribe the correct meaning to the information they possess. If they did not, forecasts would be systematically biased and, thus, inconsistent with rational expectations. I refer to this as the "information processing" capability of an actor. Put differently, do actors learn (in the Bayesian sense) what they are supposed to learn, given the information available to them?

Objective actors always learn perfectly; we say that they have perfect or near-perfect information processing capabilities. Actors with near-perfect processing capabilities will actively seek out information about the positive and negative effects of all actions in A, and then form their expectations using the relevant information they discovered. Non-objective actors, on the other hand, do not have near-perfect information processing capabilities (Rathbun 2007). A greater degree of probabilism is involved in the learning process (Jervis 1976, 222). Non-objective actors do not consider all $a \in A$, do not actively search for relevant information, and/or selectively ignore available information that is relevant.

What factors raise the likelihood of imperfect information processing capabilities? Answering the question requires knowing about the potential sources of information processing problems, of which there are several. Tetlock and McGuire (1986) divide the body of existent work on the subject into two categories, which are not meant to be exhaustive or mutually exclusive. I find their categories to be a helpful expositional device and employ them here.

First, information processing problems can arise due to the set of preexisting beliefs and assumptions held by decision makers. These beliefs and assumptions form the cognitive structures of decision-making environments. Operational codes describe decision makers' worldview, and are comprised of a set of *philosophical* beliefs about the "nature of the political universe" and a set of *instrumental* beliefs about the means employed to obtain one's preferred ends (George 1969, 201–216; Walker 1983, 2011). The procedures, norms, and guidelines that arise out of operational codes influence how (and if) information is interpreted and assimilated into the decision-making process. Bureaucracies can institutionalize these procedures, norms, and guidelines (Allison 1969), perpetuating their effect over time. Work on cognitive maps, stereotypes, schemas, scripts, and framing are other examples of research falling under this heading.

Second, information processing problems can stem from the specific rules and procedures used by decision makers. Whereas the first category was primarily concerned with *what* decision makers think about the world at large, the concern here is *how* decision makers think about alternative courses of action. How sophisticated are decision makers' reasoning and judgment skills?

There are two general models of individual decision making. First, *cognitive models* argue that decision makers interpret information so that it is consistent with prior beliefs, decisions, and feelings (Jervis 1976). The drive for cognitive consistency can lead to processing problems because information that challenges preexisting beliefs may be heavily discounted or ignored. Further, the complexity and uncertainty surrounding many political decisions lead decision makers to rely on heuristic devices. Heuristics are processing shortcuts that allow a course of action to be chosen quickly and with little analytic effort (Stein 2002; Yudkowsky 2008). Many heuristics consistently and deliberately oversimplify how decision makers interpret relevant information, producing processing errors that negatively affect decision making (Tversky and Kahneman 1974). Prospect theory specifically suggests that *how* information is presented (i.e., framing) will affect how decision makers interpret it (Kahneman and Tversky 1979; Levy 1997; Mercer 2005). Additional examples of research rooted in cognitive models include fundamental attribution error, noncompensatory choice heuristics, and cognitive dissidence theory.

Motivational models, on the other hand, suggest that decision makers are driven by a desire to avoid fear, guilt, shame, and other forms of psychological stress (Janis and Mann 1977, 205–206). They pertain to situations in which decision makers are "motivated" to minimize stress, whereas cognitive models' drive for cognitive consistency requires no such impetus (Kaufmann 1994). A number of factors are associated with psychologically stressful situations. Chief among them is the importance of the issue being decided upon; highly stressful situations are associated decisions over highly salient, non-trivial issues.

Aversion to psychological stress can lead to several well-documented forms of processing problems. There is an inverse-"U" relationship between psychological stress and information processing. At one end of the spectrum, too little stress, and decision makers will gather too little information. They will selectively gather information, particularly when they believe there is little chance of finding a better alternative to the current policy. This selectivity ranges from passively avoiding negative information to actively seeking supportive information while openly ignoring negative information. At the other extreme, too much stress can lead decision makers to gather too much information. An example of a highly stressful situation is one in which insufficient time for deliberation. In such situations, decision makers may adopt a behavior of "hypervigilance." They indiscriminately incorporate all available information, without rigorously assessing the information's reliability and without critically thinking about the information's relevance or implications (Lebow 1981, 110). Janis and Mann emphasize that good decision making can still occur in stressful situations—the peak of the inverse "U"—but only under extremely specific and rare circumstances.

Many of the hallmarks of individual-level models of decision making also apply to groups of individuals. Group decision-making has some additional characteristics that can engender information processing problems, one of which is groupthink. Groupthink "refers to a deterioration of mental efficiency, reality testing, and moral judgment that results from in-group pressures" in small groups (Janis 1982, 9). Small, cohesive groups are at the highest risk for groupthink behavior, for several reasons. Smaller groups place a premium on consensus-seeking and conformity, at the cost of "realistically appras[ing] alternative courses of action" (Janis 1982, 9). Individual members do not critically evaluate or analyze relevant information because they self-censor their opinions to conform to the group's values and norms. Additionally, smaller groups are more prone to developing an atmosphere of invulnerability and self-confidence. As a result, group members discount or disregard relevant information, akin to cognitive consistency at the individual level. The overall result is a "defective" group decision-making process, yielding a decision and outcome that are inconsistent with rational expectation theory.

We can now return to our initial question: what factors raise the likelihood of imperfect information processing capabilities? My interest is not in identifying the specific type of processing problem, but to identify the *general conditions that make any processing problem* *more likely to occur*. The preceding discussion suggests three possibilities. First, situations associated with strong cognitive structures make it more likely that decision makers will ignore or discount relevant information. Second, situations that induce psychological stress will be more prone to processing problems. In general, psychological stress increases when stakes increase—that is, the potential outcomes are associated with significant gains *or* significant losses (Janis and Mann 1977, 50). Choosing an appropriate course of action becomes imperative in order to sidestep potential loss. Finally, situations that involve deliberation among a small, cohesive, insulated group of decision makers are more prone to processing problems arising from groupthink.

2.3 CONFLICT DYNAMIC IDEAL-TYPES

By combining the dimensions from the previous section, I obtain my two dynamic ideal-types—anticipatory and non-anticipatory. The overall typology of conflict dynamics is displayed in Table 2.1. I treat the dimensions as dichotomous for the purposes of constructing Table 2.1, but they need not be in practice.

TABLE 2.1. Dynamic Ideal-Type Matrix

		Availability of Relevant Information?		Non-Anticipatory Subcategories
		Yes	*No*	
Perfect/Near-Perfect Processing Capabilities?	*Yes*	Anticipatory	Non-Anticipatory$_{IA}$	*NA due to information availability (IA)*
	No	Non-Anticipatory$_{IP}$	Non-Anticipatory$_{IP}$	*NA due to information processing (IP)*

2.3.1 Anticipatory Dynamic

An anticipatory dynamic is characterized by the availability of relevant information and the ability to correctly process it. The observed outcomes will be consistent with rational expectations. All existing research that explicitly makes use of classic game-theoretic modeling to explain the causal process leading to militarized conflict falls under this heading. I recognize that this is a diverse body of work, encompassing a wide range of formal models and specific modeling assumptions. That said, what this work has in common is the broad set of rationalist assumptions I have been discussing. The general relationship suggested by an anticipatory dynamic, in proposition form, is:

> *Proposition 2.1 (Anticipatory Dynamic): Expectations about future outcomes influence the actions taken by a state and the outcomes that result.*

Understanding the basic intuition behind anticipation is important for parts of my argument in the next chapter. I use Fearon's (1995) basic take-it-or-leave-it bargaining game to illustrate, in which States *i* and *j* dispute the allocation of some issue. The total value of the disputed issue is normalized to 1. In line with rationalist assumptions, both states are absolute utility maximizers and both have perfect or near-perfect information processing capabilities.

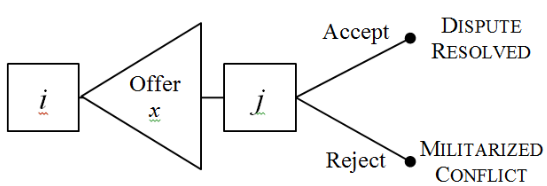

FIGURE 2.2. Basic Crisis Bargaining Game

Fearon's bargaining game is comprised of two moves, depicted in Figure 2.2. First, State *i* makes an offer, suggesting that it receives *x* amount of the good and *j* receives the remainder, (1

– x). Second, State j decides whether to accept or reject the offer, evaluating the expected utilities associated with each action. If j accepts i's offer, then the dispute is 'RESOLVED' and the game ends. j's expected utility from accepting is equal to the offer itself, $(1 - x)$. If j rejects the offer, then MILITARIZED CONFLICT is the result. Militarization is a costly endeavor (c),[19] but the winner receives all of the disputed good and leaves the loser with nothing. The probability of victory for i is equal to p and the probability of victory for j is $(1 - p)$. State j's expected utility for fighting amounts to a lottery over the two war outcomes (victory and defeat), less the cost of fighting: $(1 - p - c_j)$.

Fearon's discussion of rationalist explanations for war is perhaps the most well-known. Based on the model above, it notes how other explanations "fail either to address or to explain adequately what prevents leaders from reaching *ex ante* (prewar) bargains that would avoid the costs and risks of fighting," going on to note that "[a] coherent rationalist explanation for war must…show why states are unable to locate an alternative outcome that both would prefer to a fight" (1995, 380). Fearon demonstrates the existence of deals that both states prefer to war (see fn. 24), yet the latter can still occur for three reasons: incentives to misrepresent p and c, commitment problems,[20] and issue indivisibility.[21] In general, a state will resort to militarized conflict when, given available information, it believes that the expected utility associated with fighting is greater than the expected utility associated with any other possible outcome.

Of equal interest is an explanation for why we observe *peaceful* disputes. One reason we observe peaceful disputes could be because disputants simply cannot militarize them. I refer to these disputes as being "Truly Peaceful" in Ch. 4. States may lack the ability to project their

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[19] Note that I have assumed $c_i \neq 0$ and $c_j \neq 0$.
[20] Also referred to as an enforcement problem (see Fearon 1998).
[21] Powell (2006) demonstrates that issue indivisibility reduces to a commitment problem.

military power far enough to come into contact with one another. States' military forces may also be committed elsewhere, precluding their use in the dispute. For example, it is unsurprising that the Clipperton Island dispute between France and Mexico (1897-1934) experienced no militarization. Clipperton Island is located 800 miles southwest of Mexico in the Pacific. There was no French presence, military or civilian, on the island when Mexico first initiated the claim over Clipperton in 1897. Throughout the entirety of the dispute, the countries' military forces were not in close proximity, with France being involved with various conflicts on the European Continent ("Arbitral Award on the Subject of the Difference Relative to the Sovereignty over Clipperton Island" 1932).[22] In short, peaceful disputes could remain peaceful because states lack the military capability to militarize them; the disputes' chance of being militarized is near zero.

Fearon's model illustrates a second reason why disputes may never militarize: they have a chance of militarizing, but are instead peacefully resolved. Thus, peaceful disputes are a consequence of anticipatory behavior. To see this, begin at State j's decision node in Figure 2.2. State j's expected utility from rejecting i's offer is equal to $(1 - p - c_j)$. State j will therefore accept any offer $(1 - x)$ whose expected utility is at least as good as the expected utility from rejecting it. This comes out to be $(1 - x) \geq (1 - p - c_j)$.[23] Knowing this, State i will offer j exactly $(1 - p - c_j)$ in order to maximize its own share of the good, x, maximizing its own utility in doing so.[24]

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[22] In the 19th century, France invaded Mexico on two occasions due, in part, to Mexican default on foreign loans. After the victorious second invasion, France began to respond to the growing Prussian threat in Europe withdrawing from Mexico in 1866, 31 years before the Clipperton Island dispute began (US State Department n.d.).

[23] The lowest offer that an actor will accept is known as its *reservation value*. State j's reservation value is normally written in terms of x, not $(1 - x)$: $x \leq p + c_j$. I also assume that states are risk averse and will resolve indifference in favor of peace, hence "at least equal to" instead of "greater than."

[24] State i's expected utility for peace and war can be computed in a similar manner, yielding $x \geq p - c_i$. We can write i and j's reservation values as a single inequality, $p - c_i \leq x \leq p + c_j$. The inequality demonstrates the existence of potential offers that *both* sides prefer to fighting—one of Fearon's key insights (Fearon 1995, 388).

A testable implication flows from the above discussion. Peaceful disputes may result from anticipatory behavior; they are not wholly the result of states' being militarily incapable of engaging one another. One place to look for signs of an anticipatory dynamic, then, is among the disputes that never militarize. In hypothesis form:

Hypothesis 2.1 (A, Peaceful): Peaceful disputes will show evidence of an anticipatory dynamic.

2.3.2 Non-Anticipatory Dynamic

My second conflict dynamic ideal-type is a non-anticipatory dynamic. A non-anticipatory dynamic is characterized by outcomes that are *in*consistent with rational expectations.[25] Inconsistencies with rational expectation theory will occur if one or both of its necessary conditions are not met. States have a dearth of relevant information with which to form their expectations and/or they do not have near-perfect information processing capabilities. The result is biased expectations. Arguments involving adaptive expectations or other forward-looking, non-rational expectation logics fall under this heading, as do conflict-as-process arguments (which I will discuss more in a moment).

A secondary concern of my dynamic ideal-type typology is broadly describing the reasons behind expected outcome and actual outcome mismatches, complementing its primary task of describing whether actors' expectations about an outcome comport with the actual outcome that occurs. Returning back to the simple weather example that opened this chapter, the reasons for Individual 2 and 3's actions correspond to one of the typology's two dimensions.

[25] That is, I define a non-anticipatory dynamic via negation: it is the opposite of an anticipatory dynamic, hence its name—*non*-anticipatory.

Individual 2's situation represents an insufficient amount of relevant information. Individual 2 would have grabbed an umbrella, had information been available about the weather later that day. By contrast, Individual 3 represents information processing problems. Individual 3 had enough information regarding the weather, but chose to disregard it.

My dynamic ideal-types are not concerned with the *specific* way in which individuals arrive at their beliefs—e.g., that Individual 2 lacked information about the weather because of his/her recent move to the city, while Individual 3 ignored the forecast because of his/her own experiences. In every case, the individuals operate with an identical set of preferences—that is, it is better to remain dry and protected from the elements than to be drenched.

Like the individuals, states at the outset of the dispute have identical preferences: utility maximization. In what I call a "non-anticipatory dynamic ideal-type," states are trying to anticipate future outcomes, but their ability to do so is limited, depending on which necessary condition is violated. Table 2.1 makes evident how a non-anticipatory dynamic can result from one of three scenarios. I group the three scenarios into two broad subcategories.[26]

Scenario 1 belongs to the subcategory of non-anticipatory dynamics resulting from *unavailable information*. States have perfect or near-perfect information processing capabilities, but they lack sufficient amounts of relevant information necessary to form accurate expectations. Classic game-theoretic work discusses the first scenario at length. At first, this may seem counterintuitive—rationalist arguments explain non-anticipation?—but it is entirely consistent with what I have argued. To see how, one needs only reword the motivating puzzle of Fearon (1995): fighting is an outcome that is inconsistent with rational expectations, yet it still occurs—

[26] I cannot distinguish between the three scenarios, empirically. I can only detect non-anticipation, not whether non-anticipation is the result of Scenario 1, Scenario 2, or Scenario 3. Nonetheless, I discuss each scenario here.

why? One of Fearon's proffered explanations details why systematic 'deviations' from rational expectation theory could occur—incomplete information.

At the start of this chapter, I assumed that states operate in a rationalist world. The hypothetical scenario I laid out was predicated on this assumption. The discussion in preceding sections has highlighted some of the additional implications of a rationalist world. Since game-theoretic, rationalist models assume that states possess perfect or near-perfect processing capabilities, all disputes begin devoid of processing problems. We know, though, that some disputes *do* eventually experience processing problems, which begs the question: how do these processing problems arise? The question is even more intriguing in light of the other rationalist assumptions—mainly, that states are pure-utility maximizers. That is, they are ***always*** trying to anticipate future outcomes. States thus have an incentive to correct any processing problems that arise, so that they can form accurate expectations and obtain the best deal possible. Why, then, do we observe processing problems at all, when states have an interest in ensuring that none exist?

The second and third scenarios comprise the subcategory of non-anticipatory dynamics resulting from such *processing problems*, at least in part. I group the two scenarios along this dimension because they radically depart from the starting "rationalist world" assumption of perfect/near-perfect information processing. In the second scenario, states possess sufficient amounts of information, but processing problems prevent accurate expectation formation. Interstate rivalries are a good example of the second scenario, particularly major power rivals. Definitions of interstate rivalry differ, but all share some common elements.[27] Interstate rivals are states whose interactions are frequent, competitive, and "psychologically hostile" in nature.

[27] See, e.g., Bennett (1996), Goertz and Diehl (2001), Thompson (2001), Mitchell and Thies (2011), and Vasquez (2009). For an overview, see Vasquez and Leskiw (2001).

Frequent interactions provide rival states with more opportunities to gather and update information about their disputes. Competitiveness creates additional incentives for rivals to gather and update information indirectly, through other channels (Moore 1995; Williams and McGinnis 1988). Major powers have the resources to extensively develop these channels. They are also highly active on the international stage, giving major-power rivals additional opportunities to glean very basic information. Most importantly, definitions of rivalry all involve some element of psychological hostility, which refers to how rivals place more emphasis "on hurting or denying something to the other side than on gaining something positive for oneself" (Vasquez 2009, 79, 83–87). Decision makers view information about disputes with rivals through hostile lenses of dislike and mistrust, coloring the information's interpretation and affecting the course of action chosen.

In the third and final scenario, a non-anticipatory dynamic arises due to information processing problems *and* a lack of information. Disputes between minor power rivals (Thompson 2001) could conceivably fall under this scenario, instead of the second scenario. Minor power rivalries are still characterized by the same frequent, competitive, and psychologically hostile interactions as major power rivalries. Yet, minor powers are less involved, internationally, and have fewer resources to deploy for information gathering. Basic information may be less readily available than it is in major power rivalries. Disputes between major power rivals that, for whatever reason, suffered from a dearth of available information would also be included in this category.

The presence of information processing problems in the last two scenarios is an important commonality. Both scenarios are consistent with conflict-as-process stories, of which interstate rivalry research is a part. Conflict-as-process arguments describe escalation as a *causal*, *self-*

perpetuating process that ‘ratchets’ up in hostility, resulting in a “conflict spiral.” Threats are exchanged, the hostility of the interactions escalates, and eventually leads to war (Vasquez 2009, 169).[28] As the dispute escalates, the potential for “stress-induced cognitive impairment, misperceived intentions, and emotionally driven behavior” increases (Leng 2004, 52); states’ ability to form unbiased expectations is impaired (Moore 1995). The key intuition behind conflict-as-process stories is succinctly stated by Vasquez: “The *history* of prior interactions…establishes a set of expectations and a reservoir of psychological hostility or friendship that act as a set of constraints on existing interactions” (emphasis added, 2009, 171; see also Mansbach and Vasquez 1981, 203–207).

The self-perpetuating nature of some conflict-as-process arguments is consistent with path dependency. Path dependence is a history-dependent process in which both the occurrence and the order (or sequencing) of past events matter (Page 2006; Pierson 2004). Events “occurring at particular times essentially remove certain options from the menu of political possibilities. By doing so, they can greatly alter the consequences of events or processes occurring at a later stage” (Pierson 2004, 12). In addition to *closing* off certain alternative actions, past events also *constrain* actors to the current course of action by making it difficult and costly to select alternatives (Bennett and Elman 2006).

To explain *why* history has a constraining effect, scholars have offered several potential mechanisms.[29] Positive feedback is one such mechanism. It operates through self-reinforcement: engaging in a behavior at time t increases the benefits of engaging in the same behavior at $t + 1$ (Pierson 2000, 2004). Positive feedback is consistent with the self-perpetuating

[28] For a criticism of Vasquez’s broader steps-to-war argument, see Levy and Thompson (2010).
[29] See Bennett and Elman (2006, 256–259) for a discussion of other constraint mechanisms.

escalatory spiral described in conflict-as-process arguments.[30] The decision to militarize a dispute becomes not only costly to make, but also costly to *reverse* (Carpenter and Lewis 2004, 202).

In proposition form, the non-anticipatory logic can be stated:

> *Proposition 2.2 (Non-Anticipatory Dynamic): The actions taken by a state and the outcomes that result are influenced by past outcomes.*

The long arm of history in path-dependent processes is indicative of a general relationship between dynamics and "time." This is the subject of Section 3.2.2 in the next chapter. Before moving on, I briefly summarize the major points from this chapter.

2.4 CONCLUSION

In this chapter, I developed a typology of dynamic ideal-types to describe the causal processes generating events during an interstate dispute. I motivated the typology using rational expectation theory, from which I distilled the key conditions required for rational expectations to hold. The key conditions formed the basis for the typology's two conceptual dimensions. The combination of these dimensions yielded my two dynamic ideal-types. Anticipatory dynamics are consistent with rational expectation theory, and require that states have sufficient information available to them and that the information is processed correctly. Non-anticipatory dynamics will result when states have insufficient information to form accurate expectations and/or they do not correctly process all available information.

[30] Path dependence also implies that the sets of outcomes and actions available to actors are endogenous. Anticipatory dynamics, by contrast, require that both be exogenous.

Which disputes exhibit which dynamic type? How can we refine the logics associated with the above propositions? Having established the conditions required for each dynamic ideal-type, I can now offer an explanation in the next chapter. Table 2.2 summarizes this chapter's propositions and hypothesis.

TABLE 2.2. Summary of Chapter 2 Propositions and Hypothesis

Proposition 2.1 (Anticipatory Dynamic): Expectations about future outcomes influence the actions taken by a state and the outcomes that result. *Proposition 2.2 (Non-Anticipatory Dynamic): The actions taken by a state and the outcomes that result are influenced by past outcomes.* *Hypothesis 2.1 (A, Peaceful): Peaceful disputes will show evidence of an anticipatory dynamic.*

3.0 THE ROLE OF ISSUE SALIENCE

How can we understand interstate dispute dynamics? What determines the predominant dynamic ideal-type in a dispute? This chapter makes two principal claims. First, I claim that different types of disputes will exhibit different types of dynamics. Second, I argue that the importance, or salience, of a dispute will affect its predominant dynamic.

Issue salience is a recurrent theme in conflict research. Both anticipatory and non-anticipatory explanations of conflict escalation begin with a disputed issue, and we know that states rely on military force only in certain situations. The disputed issue's characteristics are some of the first factors that can affect the dispute's bargaining environment, influencing all events that subsequently unfold. Additionally, these factors can condition the effect of other variables that potentially influence dynamic type. It is therefore imperative that we develop a clear understanding of how disputed issues affect dynamics.[31]

Diehl (1992) makes the general case for the impact of issue area on the decision to employ military force (see also Vasquez and Mansbach 1984). Vasquez refers to the nature of the contested issue as one of the "fundamental causes that set[s] off a train of events…that end[s] in war" (2009, 7). He also notes that "the thrust of the evidence shows that only certain kinds of issues are commonly associated with war, despite the fact that war is an act of force that,

[31] For example, I believe that domestic politics will also affect the dynamic we observe, but that issue salience will condition the way in which domestic politics matters. This is one of the reasons why I have assumed unitary state actors.

logically, could be used to resolve any issue" (Vasquez 2009, 137). Research on interstate rivalries also has found that different issue areas affect whether states become rivals in the first place (Huth 1996a; Rasler and Thompson 2006), as well as how long rivalries last (Bennett 1998; Dreyer 2012).

I argue that a dispute's level of overall salience (which I abbreviate "OS") will affect the availability of information and/or states' ability to process it. An anticipatory dynamic requires that states have (a) sufficient amounts of information to (b) process with perfect or near-perfect ability. The absence of either condition will impair states' ability to form accurate expectations, increasing the chance of a non-anticipatory dynamic. I contend that high OS issues will be the most prone to violating one or both of these conditions, for one of two reasons. First, issue OS affects the amount of time that states believe they have to gather and process relevant information (i.e., "time pressures"). Or, alternatively, issue OS affects the issue's perceived or actual indivisibility. Therefore, I hypothesize that the predominant dynamic in high OS issues will be non-anticipatory.

I suggest that a dispute's overall issue salience has one of these two effects through its impact on the effect of "time." I leverage the relationship between time, conceptualized as the length of the disputed issue (Figure 2.1, Segment AB), and states' expectations about how long a militarized conflict will last (Segment BC) to obtain predictions regarding conflict dynamics. Segment AB represents "claim duration." Segment BC represents "conflict duration." I focus on states' ability to form accurate expectations about Segment BC—that is, the duration of militarized conflict. If my argument is correct, one of its implications is that the accuracy of states' expectations regarding conflict duration will vary as Segment AB becomes longer.

The chapter is organized into three major sections. I first discuss the disputed issue and define overall salience. Second, I show how conflict duration and time provide a way to generate specific, testable predictions regarding dynamic types. Finally, I explain how overall salience will affect dynamic type to generate testable hypotheses. The chapter concludes with a brief summary of its major points and a table containing the hypotheses from this chapter.

3.1 THE DISPUTED ISSUE

3.1.1 Dispute Initiation

I begin with the emergence of an interstate dispute (Figure 2.1, Point A). A dispute exists between two states when official representatives of one state's government make explicit statements or claims that either (1) challenge the status quo regarding the issue or (2) are counter to the explicit statements or claims made by the official representatives of another state's government.

Little quantitative work has investigated the factors associated with dispute initiation. Huth (1996b) has investigated the initiation of territorial disputes, finding that initiation is more likely when the territory is strategically positioned; has economic value; or when *i* and *j*'s populations have enough ethnic/linguistic similarities to create a potential basis for irredentist claims. Similarly, Frederick (2012) assesses over a dozen potential explanations for territorial dispute initiation. He finds that initiation patterns are different across geographic regions, with some explanations finding support in some regions, but not others.. Some work has also been done on the initiation of cross-border river disputes. River disputes are more likely to occur over longer rivers, river basins with little water runoff, or river basins with a high population density (Brochmann and Hensel 2009; Hensel and Brochmann 2008). More recently, Lee and Mitchell (2012) find that higher levels of foreign direct investment reduce the chances of territorial, maritime, and river dispute initiation. This is the extent of empirical research on this topic, to the best of my knowledge.

For the purposes of the subsequent discussion, I assume that the onset of a disputed issue is exogenous to its militarization and to the initiation of other disputes. More plainly, disputes arise in a more-or-less random fashion, making them unrelated to the process behind militarized conflict. This is a strong assumption to make, I admit. I think it necessary for theoretical preciseness to start.[32] Others have made the same assumption for similar reasons (e.g., Huth and Allee 2002; Huth, Croco, and Appel 2011; Slantchev 2011). On substantive grounds, research into the behavior of interstate rivals calls the assumption into question almost immediately (e.g., Colaresi, Rasler, and Thompson 2007; Dreyer 2010; Rasler and Thompson 2006; Vasquez and Leskiw 2001), as do broader arguments about 'perverse' issue linkage (Krebs 1999; Vasquez 1983, 2009; Vasquez and Mansbach 1984).[33] It is hard to assess whether my assumption is valid because there have been no empirical tests of these arguments to date.

3.1.2 Overall Salience

I employ Hensel, Mitchell, Sowers, and Thyne's (2008) concept of overall issue salience to represent a disputed issue's importance. I find the concept useful because of its clear distinction

[32] The assumption also simplifies portions of the empirical analysis. I discuss this more in Ch. 4.
[33] 'Perverse' issue linkage arguments suggest that issue linkage has a *negative* effect on successful bargaining or successful cooperation, instead of the *positive* effect suggested by most issue linkage arguments (e.g., Keohane 1984).

between tangible and intangible salience. To understand the manner in which this concept is formulated, though, some additional foundational definitions are required.

In general, an issues-based approach portrays the political process as "a quest for values satisfaction" by states (Mansbach and Vasquez 1981, 58). Values can be thought of as ends or goals that a state may desire (Hensel 2001, 82). Some values have ends which can be directly seen—referred to as "tangible" values—while the ends associated with other values cannot be observed directly (s"intangible" values).[34] I will refer to values as "goals" from this point onward, so as not to be confused with "value," which I have been using to broadly describe an issue's overall worth.

Scholars have created several lists of basic goals and the tangibility associated with each goal (e.g., Hermann and Coate 1982; Mansbach and Vasquez 1981); I employ the list used by Hensel et al. (2008), reproduced below in Table 3.1. The list is not exhaustive. Because goals cannot be pursued directly, states pursue "stakes" instead. Stakes are the "more concrete…objects that are seen as possessing or representing the desired" goals. Linking together one or more stakes and goals produces an issue (Hensel 2001, 82).

[34] Rosenau (1968, 146) describes a tangible value as one whose means must be purchased before it can be used and whose end can be seen directly ("photographable," in his informal parlance). An intangible value is characterized by unpurchasable means or by an end that can be observed only indirectly.

TABLE 3.1. Examples of Basic Goals and Their Tangibility

Tangible Goals	*Intangible Goals*
• Security: Safety from external danger (absence of threats or protection from threats) • Survival: Provision of basic human needs (food/water/shelter) • Wealth: Accumulation of resources, goods, or money (beyond basic human needs)	• Culture/Identity: Related to one's cultural, religious, or ideological beliefs or identity • Equality/Justice: "Fairness" or impartiality in the distribution of other values • Independence/Autonomy: Ability to formulate and implement one's own policies • Status/Prestige/Influence: The degree of respect one is accorded by others

Source: Hensel et al. (2008, 120). Lists are in alphabetical order.

Salience refers to the importance of an issue. It is "the extent to which (but, principally, the intensity with which) peoples and their leaders value an issue and its subject matter" (Randle 1987, 27). Assuming unitary states, as I have, implies that state decision makers and the population assign the same level of importance to an issue. Hensel et al. define an issue's *overall* salience as a product of the tangible and intangible salience ascribed to the issue's stakes and/or goals. Formally, overall issue salience is the general importance of an issue "to the state's leadership or…[to] a substantial portion of its population," based on whether the issue has a relatively high or low amount of both tangible and intangible salience (Hensel et al. 2008, 121).

In the article, Hensel et al. suggest a hierarchy of issue salience. They argue that issues "that take on relatively high values of both tangible and intangible salience" will generally be the most salient, followed by issues with high salience on at least one dimension ("moderate overall salience"), followed by issues with low salience on both dimensions ("low overall salience") (2008, 121–122). The relative values taken on each dimension are primarily determined by counting the number of goals associated with the issue, though this is not stated explicitly. Table 3.2 reproduces a two-by-two matrix from Hensel et al. depicting the combination of these tangible and intangible dimensions. I have added the overall salience category labels to the table. Hensel et al. stress that their categorization relies on *relative* comparisons along their two salience dimensions (2008, 121).

TABLE 3.2. Variations in Disputed Issue Types Based on Tangibility and Salience

	Relatively Low Intangible Salience	Relatively High Intangible Salience
Relatively High Tangible Salience	MODERATE O.S. River (*Turkish dam projects on Euphrates River*) Maritime (*Cod Wars*)	HIGH O.S. Territory (*Golan Heights*, *Alsace-Lorraine*) Regime survival (*Castro*)
Relatively Low Tangible Salience	LOW O.S. Firms or industries (*Airbus subsidies, shrimp imports*) Treatment of individuals (*caning of [US citizen] Michael Fay [for vandalism in Singapore]*)	MODERATE O.S. Identity (*treatment of Germans in South Tyrol*) Influence (*Russia and elections in former Soviet republics*)

Source: Table 1, Hensel et al. (2008, 121). O.S. = overall salience.

High salience is the implicit reference point along each dimension. Territorial disputes are an example of a high overall salience issue. Territory often has several tangible and intangible goals associated with it, such as economic and/or strategic value (tangible) and national prestige or identity (intangible). Achieving these goals often brings benefits to many within a state, making them highly coveted by states.[35] By contrast, an issue area has a relatively low amount of salience if it has significantly fewer tangible and intangible goals associated with it, relative to the appropriate high salience category. The benefits associated with the issue's stakes and/or goals are either negligible or only a small portion of a state's total population receives them (Hensel et al. 2008, 121). For example, trade disputes involve allegations of one country employing discriminatory trade practices (e.g., tariffs, anti-dumping) against another country's

[35] I refer here to the potential first-order (or direct) effect of any goals and benefits associated with a disputed issue. I recognize that there may be second-, third-, ..., n^{th}-order (or indirect) effects as well, but these become increasingly difficult to parse out in a substantively rigorous way. I therefore follow Hensel et al. (2008), who also (implicitly) focus only on direct effects.

goods or services. Trade disputes are typically associated with one goal, economic wealth, and no others (though exceptions, of course, exist). The potential benefits from a trade dispute affect only a small proportion of a state's overall population, typically—the producers of the goods or services being allegedly discriminated against.

One possible criticism of the overall issue salience categorization scheme pertains to the moderately salient category. Disputes with high tangible salience and low intangible salience (H,L) are categorized the same as those with low tangible salience and high intangible salience (L,H). Disputes with high intangible salience are likely more important than disputes with lower intangibility, irrespective of tangible salience. States will expend resources to connect an issue with an intangible goal only if the goal is perceived as important enough to justify the expenditure. Intangibility is associated with indirectly observable ends, making it easier for states to create a connection between a stake and an intangible goal.[36] States will expend the effort to explicate the connection between stakes and intangible goals only when they believe the issue to be important enough to justify the expenditure. In short, a *de facto* selection effect exists for issues with high intangible salience: we observe issues with high levels of intangible salience precisely because states believe the issue to be highly important. A refined hierarchy of overall salience might read, from most to least salient: high; moderate-high (high intangible, low tangible); moderate-low (low intangible, high tangible); low.

Another potential criticism is that States *i* and *j* may not assign the same amount of tangible and intangible salience to an issue. For example, State *i* may believe a territorial issue has high levels of tangible and intangible salience, but State *j* believes that the same issue has only a high level of tangible salience. In response, Hensel et al. argue that <u>general</u> issue areas

[36] By contrast, the ends associated with tangible salience are directly observable; the situation is clearer cut and less subject to interpretation.

can be broadly "classified as being relatively high or low along each dimension," even though specific, "individual examples of each issue type may vary in both tangible and intangible salience" (emphasis added, 2008, 121). I agree with the intuition behind their rebuttal. Further, I believe the categorization is still valid for my purposes—to create groups with broadly similar characteristics. To show how, I use Hensel et al.'s existing framework to strengthen the connection between their rebuttal and their substantive theory.

An issues-based approach suggests two explanations for different issue salience valuations. First, states may associate the same goals with an issue, but they assign *different levels of salience* to the issue's goals. For example, States i and j both believe that some issue is associated with security, but pursuing security is more important to i than j. To accommodate the possibility, we need only add a parameter to the basic bargaining model from Ch. 2 that captures different valuations. Let v_i and v_j represent the issue's total value to States i and j, respectively, where total value is directly related to the issue's overall salience. Also relax the previous implicit assumption from Ch. 2 that $v_i = v_j = 1$, such that $v_i > 0$ and $v_j > 0$.[37] Allowing v to vary by state simply adds another piece of relevant information that is required for accurate expectation formation. It is also another piece of privately held information that states have an incentive to misrepresent.

The expected utilities can be recomputed to include v. Since $v_i \neq v_j$, I normalize the size of the good so that the reservation values are on comparable metrics, for discussion purposes.[38] In Ch. 2, State j accepted any offer $(1 - x)$ from i whose value was at least $(1 - p - c_j)$; written in

[37] Some formal work does explicitly include the issue's total value, v, as a model parameter (e.g., Carter 2010; Slantchev 2011). In models where v is not explicitly included, it is considered to be a component of c, the overall cost of fighting. This is one of the reasons why some refer to c as "resolve" instead of "opportunity costs."
[38] I normalize by dividing each state's expected utility by the corresponding v, which amounts to a min-max normalization.

terms of x, j's reservation value is $p + c_j$. The value 1 appears in the expressions because we assumed that $v_j = 1$. If we relax this assumption, State j will now accept any offer x from i whose expected utility (for j) is at least equal to $(v_j p + c_j) \equiv (p + c_j/v_j)$. Making a similar substitution to find State i's reservation value, i will make no offer x less than $p - c_i/v_i$. Notice how costs are discounted at a greater rate when v is larger, as it would be when the issue is more salient. As v increases, the size of c/v goes toward zero, shrinking the range of offers that both states find preferable to militarization. All else equal, more salient issues are more prone to military conflict.

A second explanation for different issue salience valuations is a more severe version of the first. States may associate *different goals* with the same issue. For instance, State i may associate an issue with prestige and ideology, but State j associates the same issue with independence and autonomy. The US and North Vietnam during the Vietnam War is one such example. The previous insight about v will still hold if, on the whole, there is a degree of regularity as to which goals are associated with which issues (vs. random assignment of goals to issues). Descriptive work on disputed issues lends some support to the notion. For example, studies repeatedly mention security, survival, wealth, and identity as goals associated with territorial issues (Carter 2010; Dzurek 2005; Goertz and Diehl 1992; Holsti 1991; O'Lear et al. 2005; Vasquez 2009). Some territorial issues may lack some of these goals, and others may have additional goals, but the variations can be treated as idiosyncratic. States can exploit knowledge about the "usual suspects" to derive more accurate beliefs about their opponent's value of v.

Much of the existing work on issues and militarized conflict falls into the upper-right cell of Table 3.2. Scholars have long focused on the effect of territorial disputes on the outbreak of militarized conflict or war (e.g., Carter 2010; Diehl and Goertz 1991; Goertz and Diehl 1992;

Lektzian, Prins, and Souva 2010; Senese 2005; Vasquez 2009). Senese and Vasquez (2008) notably examine how territorial disputes affect a range of militarized conflict, including the chances of conflict initiation and territory's effect on the likelihood of escalation to war.[39] Related research provides evidence regarding the difficulty associated with resolving territorial disputes. Hensel and Mitchell (2005) find that territorial disputes with higher levels of salience are (1) less likely to be settled peacefully, and (2) more likely to lead to militarized conflict. Territorial disputes are also more likely to experience militarization than river or maritime issues (Hensel et al. 2008). Examinations of regime disputes and militarization are far rarer (Tures 2000).

Research has also begun into the issue areas from the upper-left cell. River disputes involve disagreements over river navigation rights, water consumption and quantity, or pollution (e.g., Brochmann and Hensel 2009; Furlong, Gleditsch, and Hegre 2006; Hensel, Mitchell, and Sowers 2006; Kalbhenn 2011; Tir and Stinnett 2012). Maritime disputes generally involve disagreements about oil exploration rights, fishing rights, right of navigation, or maritime boundaries (e.g., Nemeth et al. 2006). Both river and maritime disputes are examples of moderately salient issues. For example, maritime disputes can impact the economies of coastal countries that depend heavily on maritime-based industry (e.g., fishing). This gives them a high level of tangible salience. However, compared to the issues comprising the high overall salience category, maritime disputes usually do not have a significant amount of intangible salience (Hensel et al. 2008, 122).[40] Both bottom cells of Table 3.2 remain largely uninvestigated in the quantitative literature on militarized conflict.[41]

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[39] Others examine similar connections (e.g., Chi and Flint 2012; Huth and Allee 2002).

[40] Some maritime disputes have higher levels of intangible salience than this statement would initially suggest. These disputes are normally linked to a territorial dispute. A disagreement over the ownership of some set of islands

3.2 DISTINGUISHING AMONG DYNAMICS: CONFLICT DURATION

To parse out the effects of overall salience on dynamic type, we need a way to refine last chapter's predictions, such that we can distinguish among dynamic types. I claim this can be done using the *duration* of a militarized conflict. Specifically, I evaluate states' ability to form accurate expectations about the length of a potential militarization. I refer to this as "conflict duration," equivalent to Segment BC in Figure 2.1.

3.2.1 Why Conflict Duration?

We have a real interest in understanding the duration of militarized conflicts because of their economic, human, and reputational costs. Even spats arising from non-militarized conflict can have deleterious effects. As an example, take recent events in China and Japan's dispute over the Senkaku/Diaoyu Islands in the East China Sea.[42] Up to late 2012, three of the five islands were nominally owned by a private Japanese landlord. When the Japanese government bought the three islands, China was outraged. Japanese exports to China decreased sharply, so much so that JPMorgan Chase estimates "the sale may have cut Japan's growth in the latest quarter [4Q 2012] by about one percentage point."[43] The costs stemming from *militarized* conflict, even those lasting a few days, are just as steep, if not more so. As militarized conflicts last longer, these costs only mount further.

(territory) has implications for countries' recognized maritime boundaries and exclusive economic zones (both are types of maritime disputes). The intangible salience of these "linked" maritime disputes comes from the related territorial dispute, not something intrinsic to the maritime dispute itself.

[41] IPE scholars have examined various aspects of international trade disputes, which fall into the lower-left cell of Table 3.2 (e.g., Busch and Reinhardt 2002; Davis and Bermeo 2009; Guzman and Simmons 2002).

[42] E.g., "The Senkaku or Diaoyu Islands: Narrative of an Empty Space," *The Economist*, December 22, 2012.

[43] "China-Japan Dispute Takes Rising Toll on Top Asian Economies," 2013, *Bloomberg News*, http://bloom.bg/UHEigY (accessed January 14, 2013).

Expectations about conflict duration are relevant because they influence the initial decision to militarize a dispute. Returning to the basic bargaining model from State *j*'s perspective (a similar logic applies to *i*), recall that *j* will militarize if its expected utility from fighting, $p + c_j/v_j$, is believed to be greater than its expected utility from peace, x. As fighting is costly, any militarized action consumes a portion of *j*'s finite pool of resources. All else equal, the longer any militarization lasts, the more resources it will consume, and therefore the more costly it will be.[44] In this light, c_j represents *j*'s expectation about its *total* costs for the entire conflict. If *j* added together its expected cost of fighting on day 1, its expected cost of fighting on day 2, all the way through day *D*—the day that *j* believes the fighting will end—the result would be c_j.[45]

State *j*'s belief about how long the conflict will last (*D*) is therefore a vital piece of information for computing its total expected utility for fighting.[46] Equally important to the expected-utility calculation is *j*'s expected cost of fighting each day, which I refer to as either "per-day" or "per-period" costs. Do per-day costs increase, decrease, or stay the same across the course of the militarized conflict? These are questions related to conflict escalation, which I leave for future work. I treat per-period costs as constant in the subsequent discussion, for simplification purposes.[47] In sum, forming accurate expectations about militarized conflict requires accurate beliefs about *D* and per-period costs.

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[44] Leventoğlu and Slantchev's (2007) punctuated equilibrium model of war illustrates this intuition well.
[45] I arbitrarily chose days as my unit of time; any unit would have worked to illustrate my point. Additionally, depicting per-day (i.e., per-period) costs in this way is incredibly simplistic. I think it is fine for the illustrative purposes of my discussion, but I acknowledge that my treatment would need to be more rigorous if I were formally specifying a game-theoretic model to solve. For a more nuanced treatment, see Powell (2004, 352), whose war-as-inside-option model divides the per-period cost of fighting into preparation costs (e.g., mobilization) and battle costs (the casualties and destruction from actual fighting).
[46] State *i*'s belief about *D* is no less important, as it will affect *i*'s initial offer to *j*.
[47] In reality, this assumption is doubtful. Longer conflicts have a greater chance of escalating to the 1000-deaths threshold for "war," suggesting an increase in per-period costs for lengthier conflicts. The relationship between

An inaccurate estimation about D affects j's expected utility calculation in one of two ways. Overestimation would cause j to behave more peacefully. If the conflict would last D days ("truth," for expositional purposes), but j believes it would last $D + e$ days (with $e > 0$), then j's estimate of c_j would be too high compared to its true costs (all else equal). This yields a lower expected utility of fighting for j, increasing the range of potential offers that j finds preferable to war.[48] Peace would be more prevalent.

By contrast, underestimating D is more troublesome: j will militarize more often. State j's belief that the fight will last $D – e$ days leads to an underestimate of c_j. This increases j's expected utility from fighting and decreases the range of potential offers j finds preferable to conflict. Historical accounts hint that states tend to underestimate D more than they overestimate it. Before certain conflicts begin, state leaders are "optimistic" about their prospects and often predict quick fights resulting in victory, not protracted fights ending in victory (or defeat). On the eve of World War I, for example, the common belief among most of Europe's leaders was that "the coming war…would be short. The fighting might last three months or perhaps six months" (Blainey 1988, 35).[49] Instead, the fighting lasted almost 52 months.

All else equal, I expect states will only militarize a dispute when they expect the fights to be short. Militarization of any sort has economic, reputational, and human costs which accrue as a militarization becomes lengthier. A utility-maximizing state wants to minimize costs, all else equal: hence, shorter militarizations.

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conflict intensity and duration is likely endogenous. Conflicts that last longer have a greater chance of reaching the threshold for war, but it may also be true that more intense conflicts are likely to last longer. I take no stance on which causal direction is "correct," only that the general relationship exists. Evidence of a connection between a conflict's duration and its escalatory pattern is therefore unsurprising (e.g., Cederman 2003).

[48] Specifically, the range will increase by: e*(j's per-day cost of conflict).

[49] I use the phrase "optimism" differently than it is used in the crisis-bargaining/formal modeling literature. The latter discusses optimism only in terms of both sides' common belief in victory (p) (Fey and Ramsay 2007; Slantchev and Tarar 2011). Instead, I suggest that optimism involves belief in victory *and* a short conflict.

3.2.2 The Effect of Time on Expectation Accuracy

How accurate are states' expectations regarding conflict duration? My ideal-types suggest that the accuracy of states' expectations will vary over time within the dispute. In general, time can be understood as the number of periods since the start of a process. Here, I conceive of it as time elapsed since the initiation of an interstate dispute (Figure 2.1, Point A—CLAIM DURATION). Crucially, my ideal-types imply that time can have one of two effects on expectation accuracy. The key difference is whether or not states will possess perfect or near-perfect information processing capabilities over the course of an entire dispute. This equates to the top row versus the bottom row of Table 2.1.

3.2.2.1 Time as Beneficial

First, the passage of time can have a beneficial effect because it is potentially *informative*. This will be the case when information processing capabilities are perfect or near-perfect and will remain that way throughout the dispute (Table 2.1, top row). Fearon's (1995) seminal work tells us that incomplete information is one of the causes of militarized conflict. Any factor that helps remedy informational asymmetries is thus beneficial.

Each additional time period gives states an opportunity to gather additional information, helping them to overcome any informational shortcomings. For instance, states may develop new channels for information gathering (Moore 1995). More fundamentally, actors can assess the accuracy of past expectations and make adjustments when forming new expectations. Game theoretically, Leventoğlu and Tarar (2008) demonstrate a similar result. They show that insufficient information yields non-anticipatory dynamics *only* when an actor is unwilling or unable to wait before making a decision. That is, time limitations can lead to insufficient information.

What this suggests is that expectations about conflict duration potentially become more accurate as time goes on. States gain opportunities to update and gather information, allowing them to refine their expectations. In the presence of near-perfect processing capabilities, increasingly accurate expectations translate to a lesser chance of a non-anticipatory dynamic and a greater chance of an anticipatory dynamic. To summarize the broader rationale as a proposition:

> *Proposition 3.1 (Time and Information Availability): As more time passes, expectation accuracy will improve.*

Notice how this viewpoint relies on an objective world: states interpret information correctly, but they may simply lack information to interpret. Extant work on interstate conflict relies predominantly on this view, as it is congruent with game-theoretic work on the subject.

3.2.2.2 Time as Pernicious

The effect of time changes if we consider a subjective world in which correct interpretation is not a given. When processing problems can arise, the passage of time may have a *pernicious* effect because of its causal nature. Exemplified by the discussion of path dependency in Section 2.3.2, key attributes of the broader process are altered as time goes on. The set of *A* and/or *O* change as various actions *a* or outcomes *o* are added to or removed from the respective sets. There may be few indications of the additions or subtractions in the short run, which makes it harder for actors to know "which policies produce which outcomes" (Callander 2011, 643). The alterations are also hard to identify because they are often the unexpected consequence of some action. The alterations are therefore not only hard to identify, but difficult to anticipate, *ex ante* (Greif and Laitin 2004, 639).

The passage of time also creates more opportunities for information processing problems to arise. As more time passes, collective subjective emotions can accumulate within a state. States may define an issue as part of an "ideological struggle," using language "that take[s] on highly moralistic overtones" with "a sense that this may be the final battle between good and evil" or a sense that one's own survival or way of life is at risk (Vasquez and Mansbach 1984, 425). While rhetoric of this sort may be employed for strategic reasons (Krebs and Jackson 2007), its subjective nature causes emotions to build over time.[50] Importantly, the buildup has a constitutive effect, affecting the dispute's bargaining environment and actors' identities (Goddard 2006, 2009). Disputes become more difficult to resolve, as both sides adopt increasingly irreconcilable bargaining positions. I expand on these points below in Section 3.3.1.2.

The emotional buildup colors the way in which states process information regarding their adversaries (Jervis 1968; see also Janis 1982; Janis and Mann 1977). For instance, states may selectively ignore pieces of information relevant to the decision at hand, simply because the information does not comport with a state's perception of its adversary. States may also rely too heavily on select pieces of information, chosen because the information *does* comport with its perceptions. As a result, states' expectations regarding conflict duration may be inaccurate in the presence of processing problems. Such processing problems become more likely as more time

[50] The emotional buildup can be an intentional or unintentional byproduct of symbolic rhetoric. Some also argue that symbolic rhetoric has an increased chance of being *used* as time goes on (Vasquez 1983, 2009). Because the buildup is gradual, it is difficult to observe and anticipate, *ex ante* (Greif and Laitin 2004, 639).

passes in a pernicious-effect story, even if states are *trying* to form accurate expectations in an effort to evaluate their available courses of action.

The broader implication is that expectations will not become more accurate as time passes. In fact, expectations may become less accurate. As a summarizing proposition:

> *Proposition 3.2 (Time and Information Processing): As more time passes, expectation accuracy will not improve or will get worse.*

The pernicious effect of time is evident in Argentina and Britain's ongoing dispute over the Malvinas/Falkland Islands. The Falkland Islands have been under British control since 1833, but Argentina also claims ownership. Argentina views the sovereignty of the islands as paramount to national identity, alleging that the islands were "taken in an act of imperialist high-handedness" that left Argentina "territorially incomplete" (Freedman 2005, 17). These claims are enshrined in the Argentine Constitution:

> The Argentine Nation ratifies its legitimate and non-prescribing sovereignty over the Malvinas, Georgias del Sur and Sandwich del Sur Islands and over the corresponding maritime and insular zones, as they are an integral part of the National territory.
>
> The recovery of said territories and the full exercise of sovereignty, respectful of the way of life of their inhabitants and according to the principles of international law, are a permanent and unrelinquished goal of the Argentine people.[51]

While the Malvinas "mattered a great deal to all Argentines" (Freedman 2005, 18), only a small—albeit well-organized—minority in Britain had an interest in maintaining ownership of the Islands. Negotiations over the Islands' sovereignty had been ongoing since the mid-1960s, but a resolution remained elusive (Freedman and Gamba-Stonehouse 1991, 7–9).

[51] http://www.senado.gov.ar/web/interes/constitucion/english.php

At the start of 1982, the governing Argentinian junta decided to pursue a "double policy," in which it would push hard for a negotiated settlement to the dispute while also preparing for "the employment of military power should the first alternative fail" (Freedman and Gamba-Stonehouse 1991, 12). Secrecy was imperative to the military portion of the plan, lest Britain have a chance to send a defensive force to the Falklands. As a result, Argentina was hyperattentive to any hint of an increased British military presence in the region.

This attentiveness had severe consequences. In March 1982, a small diplomatic crisis erupted over unauthorized Argentinian scrap-metal merchants on the nearby South Georgia Islands, also under (disputed) British control as a dependency of the Falkland Islands. Top British officials viewed the South Georgia crisis as unrelated to the Falklands. However, Argentina believed that Britain viewed the two as intertwined (Freedman and Gamba-Stonehouse 1991, 71). More importantly, the junta believed that Britain was amassing a substantial military force to expel the merchants from South Georgia. The force would ostensibly serve as a stepping stone for a permanent garrison on the nearby Falklands. With Falklands negotiations stalled, losing the military option to resolve the dispute was unacceptable to the junta. Consequently, Argentina decided to invade the Falklands sooner than it had planned, resulting in the 1982 Falklands War.

In truth, the British were not amassing a military force, nor did they intend to garrison more forces in the Falklands.[52] Notably, Argentinian officials made the decision to invade based on several unverified pieces of information. British parliamentarians' statements during the House of Commons debate on the crisis were erroneously equated with the stances of top British

[52] In fact, Britain was planning to reduce their forces in the Falklands. As part of their annual defense review, the British had decided in June 1981 to withdraw the HMS *Endurance*, Britain's only semi-regular naval presence in the region (Freedman and Gamba-Stonehouse 1991, 19–20).

officials. The junta also relied on unofficial reports from Argentina's London embassy; the reports were based on British media speculation, not official statements from the British government (Freedman and Gamba-Stonehouse 1991, 73–77). In short, Argentinian officials placed too much credence in certain information without verifying its veracity or credibility, as a consequence of the emotional, symbolic nature of the Falklands.

3.2.3 Connecting Time and Conflict Duration

We can map the discussion in Sections 3.2.1 and 3.2.2 on to Proposition 2.1 and Proposition 2.2. Proposition 2.1 states: (Anticipatory Dynamic): Expectations about future outcomes influence the actions taken by a state and the outcomes that result. In Section 3.2.1, I introduced and justified the use of conflict duration as a "future outcome" in my setting. I also discussed how the decision to militarize constitutes an "action" taken by states that is related to conflict duration (cf. Ch. 2). Rewording the proposition, we obtain: Expectations about conflict duration influence states' decision to militarize a dispute and the observed conflict duration that results. This echoes the logic behind Hypothesis 2.1. Section 3.2.2 explicated how *when* this action is taken may have bearing on conflict duration. We can also reword the proposition using this idea of when: Expectations about conflict duration influence when states decide to militarize a dispute and the observed conflict duration that results. When we discuss "when" in the context of militarization, it amounts to CLAIM DURATION.

We can also conceive of "when" as a past outcome. It represents a prior sequence of peaceful or non-peaceful time periods, none of which have resolved the dispute. With this in mind, we can reword Proposition 2.2. The proposition states: (Non-Anticipatory Dynamic): The actions taken by a state and the outcomes that result are influenced by past outcomes.

Rewording the proposition yields: The decision to militarize a dispute and the observed conflict duration that results is influenced by when states decide to militarize a dispute.

Table 3.3 summarizes the set of reworded propositions by standardizing their sentence syntax using a "_________ influence(s) _________" form. By doing so, it becomes evident that the two dynamic types suggest different relationships between CLAIM DURATION and CONFLICT DURATION. An anticipatory dynamic implies that *expectations about conflict duration will influence claim duration.* This is very different from the relationship suggested by a non-anticipatory dynamic, which is that *claim duration influences conflict duration*—the converse of what an anticipatory dynamic suggests.

The reworded propositions also map nicely on to the propositions from this chapter. Proposition 3.1 concerns the beneficial effect of time. Time acts as a permissive factor, giving actors the opportunity to gather more information about a given dispute. The primacy of information quantity is implicit in Proposition 3.1, while near-perfect processing capacity is treated as immutable and a given. Expectations about conflict duration will therefore become accurate as more information accrues, suggesting that outcomes can be perfectly explained by expectations. The reworded Proposition 2.1 reflects this logic.

Proposition 3.2 concerns the pernicious effect of time. Time was pernicious because it affected the dispute environment in a causal, constitutive way. States' ability to form accurate expectations about conflict duration potentially diminishes as more time passes. The reworded version of Proposition 2.2 highlights this causal effect of time, as time *influences* outcomes.

TABLE 3.3. Chapter 2 Propositions, Reworded

Proposition 2.1	Anticipatory Dynamic	Expectations about conflict duration	*influence*	states' decision to militarize a dispute and the observed conflict duration that results.
		Expectations about conflict duration		when states decide to militarize a dispute and the observed conflict duration that results.
Proposition 2.2	Non-Anticipatory Dynamic	When states decide to militarize a dispute	*influences*	the decision to militarize a dispute and the observed conflict duration that results.
NOTE: "when" is equivalent to CLAIM DURATION.				

Importantly, time only has a pernicious effect for non-anticipatory dynamics, specifically, those arising from information processing problems. We can use this fact to help distinguish between anticipation and non-anticipation by asking: what factors influence whether time has a pernicious effect? Extant work broadly conceives of time as beneficial, so little has been done in this regard. I argue that the nature of the issue being fought over plays a major role, which is the subject I turn to next.

3.3 EFFECT OF OVERALL ISSUE SALIENCE

Having established the conceptual definition of "overall salience" and the preliminary basis for distinguishing among dynamics, we can now address the key questions motivating this chapter.

Why is overall issue salience important for understanding dynamics? What is the relationship between overall issue salience and dynamic ideal-types? How does overall salience have this effect? I argue that disputes with higher levels of overall salience will be most affected by non-anticipatory dynamics. Disputes with lower overall salience, on the other hand, will be most affected by anticipatory dynamics.

I contend that overall issue salience will influence the effect of "time" within a dispute. I argue that the passage of time will be pernicious in disputes over highly salient issues. The end result is that high overall salience has *adverse* effect, at minimum, on information processing capabilities. In certain situations, overall salience may also adversely affect information availability, as decision makers feel they must act decisively and are thus unable to wait for more details to filter in before deciding upon course of action. Either possibility suggests states will have difficulty forming accurate rational expectations for decisions pertaining to highly salient issues. A non-anticipatory dynamic will therefore be strongest in these situations. This general claim can be stated in hypothesis form:

> *Hypothesis 3.0 (Overall Salience): When an issue has high levels of overall salience, a non-anticipatory dynamic will be strongest. When an issue has moderate or low levels of overall salience, an anticipatory dynamic will be strongest.*

A few general characteristics of overall salience set up the basis for this claim. First, more salient issues have higher stakes than other types of issues. Each state associates the disputed issue with sizable benefits: potential gains are large, but so are the losses. One state will realize these gains at the other's expense, because State *i* and *j*'s preferences are divergent, resulting in a zero-sum situation. The possibility of sizable losses increases the psychological stress associated with the dispute. A dispute's starting stress level "is a direct function of the goal[s]…that the decision maker expects to remain unsatisfied: the more goals expected to be unfulfilled and the more important…those goals," the greater the psychological stress (Janis and Mann 1977, 50).

In addition, more salient issues are associated with a greater number of stakes and goals. Fulfilling all of these stakes and goals simultaneously becomes more difficult. Experimental research has shown that decision makers avoid making trade-offs among various goals (Einhorn and Hogarth 1981; George 1980; Steinbruner 2002). Instead of making thoughtful trade-offs between different goals, decision makers focus on obtaining one or two goals, unwittingly at the expense of the others. They then engage in post hoc rationalization to justify their choice with as many independent reasons as possible (Jervis 1976, 129–137). Jervis terms this process "belief-system overkill." The ensuing decisions rely on inaccurate expectations, resulting in suboptimal outcomes.

3.3.1 Non-Anticipatory Dynamics

The basic characteristics of highly salient issues suggest that these issues have a higher risk of information processing problems from the start. This is not to say that processing problems will always affect more salient issues, or that decision makers cannot take corrective steps. The baseline likelihood for processing problems is simply higher when decisions pertain to issues with high levels of overall salience.

These characteristics, along with the propositions made thus far, suggest two mechanisms through which issue salience could affect information availability or processing. We can also use these mechanisms to derive testable hypotheses regarding the relationship between claim duration and conflict duration.

3.3.1.1 Mechanism 1: Time Pressure

The first mechanism pertains to decisions made near the <u>beginning</u> of a dispute's lifetime, in its earlier stages. A "time pressure" mechanism broadly suggests that issues are prone to non-anticipatory dynamics when CLAIM DURATION is small due to insufficient information. States simply have not had enough time to gather relevant information about the dispute. Insufficient amounts of relevant information will lead to an increased chance of a non-anticipatory dynamic, even if states possess perfect or near-perfect information processing abilities.

There are multiple ways in which states can gather information. Listing them all is too extensive of a task, but one is diplomatic communication. Formal models in which militarization does not automatically end the dispute—conflict-as-inside-option models—have focused on the importance of such communication. States can learn additional information based on which offers/counteroffers are accepted or rejected, which allows them to refine their expectations about militarization (Leventoğlu and Tarar 2008; Powell 2004). In the models, the revealed information is credible because of the possibility that a rejected offer may lead to militarization. There have been few chances to exchange offers in the early stages of any dispute.

If states are aware that there is insufficient information available in the early stages of a dispute, why not postpone making any major decisions until later? States may have a limited amount of time to act if they wish to avoid an undesirable (i.e., costly) outcome. More simply put: decision makers are on the clock because time is of the essence (Leventoğlu and Tarar 2008). When states face time limitations, they are said to be "impatient" because they cannot wait before choosing a course of action.

Sources of state impatience can vary. *External actors* precipitate impatience in international crises. Crises are situations in which states must act quickly to avert a highly undesirable outcome that has a high risk of occurring (Hermann 1969; Lebow 1981). A defining element of crisis is that the issue at stake is highly important, involving "a threat to one or more basic goals" of the state (Brecher and Wilkenfeld 1997, 3). The high stakes create the highly stressful decision-making environment associated with crisis situations. High levels of stress makes decision makers less deliberative as they feel "rushed" into choosing a course of action. They suffer from reduced attention span, rely more on existing cognitive structures to filter information, and become more myopic (Tetlock and McGuire 1986, 168).[53] The result is an increased likelihood of information processing problems, which only compound the existing information availability problem.

There are several potential criticisms of a crisis-based time pressure mechanism. The biggest is that decision makers may become *more* deliberative in crisis situations instead of less (e.g., Oneal 1988). The Cuban Missile Crisis is often mentioned as an example (Allison 1969; Janis 1982, 132, 148). Despite the high stakes and perceived time limitations, the Kennedy administration carefully deliberated about the most appropriate response to Soviet missiles in Cuba.

I acknowledge that increased deliberation is a possibility. However, the case studies also suggest that Kennedy administration officials made a conscious effort to ensure a high-quality decision-making process. Such quality, in the absence of conscious effort, is not the norm—processing problems are likely when the issue is highly salient. Offsetting processing problems through active, "vigilant" decision-making behavior seems to be the exception more than the rule (Janis and Mann 1977, chap. 3–4). A pivotal element of this criticism is the idea that information processing capabilities are affected by crisis. However, a dearth of information (in

[53] For a recent overview of experimental research on myopicness and time horizons, see Krebs and Rapport (2012).

an objective, quantifiable sense) is at the heart of my time pressure mechanism, not processing problems.

A more compelling criticism would thus focus on whether or not crisis situations suffer from insufficient information. The evidence seems more mixed in this regard. Crises do not appear to be regularly associated with information shortages. Looking at descriptive statistics on international crises, crises rarely emerge out of the blue with proverbial "strangers." They tend to involve states that regularly interact with one another. Of the 1228 dyadic crises recorded in the International Crisis Behavior dataset (Hewitt 2003), 54.0 percent of them involve interstate rivals or neighboring countries.[54] Add crisis dyads involving at least one major power, and the percentage jumps to 83.6. In general, crisis participants are arguably 'familiar' with one another. However, it is still unclear whether participants would possess relevant information *about the specific dispute in question*. In other words: states might know a lot about one another, but they may not know as much about the particulars relevant to the current dispute.

Other countries are not the only potential source of state impatience. States may also be impatient for *internal, domestic reasons*.[55] A time pressure mechanism focusing on domestic sources of impatience can sidestep the criticisms associated with a crisis-based mechanism altogether. This alternative logic is laid out in the steps-to-war argument advanced by Vasquez (2009; Senese and Vasquez 2008). In the presence of a perceived external security threat, a state tries to increase its security by building up its military, entering alliances, and taking other actions consistent with a security-focused mindset. Doing so makes other states feel less secure, inducing similar behavior. The security dilemma among states affects behavior *within* states by

[54] Rivalry is defined in terms of strategic rivals, which are states that mutually perceive one another to be "sufficiently threatening competit[ors] to qualify as enemies" (Thompson 2001, 557).
[55] I walkthrough this reasoning, even though I have assumed unitary states, for the sake of completeness.

influencing the formation of domestic constituencies that favor a “firm and often escalatory” response to hostile actions or behavior taken by other states (Senese and Vasquez 2008, 15). Hard-liners are also characterized as being unwilling to compromise when it comes to foreign policy goals (Vasquez 2009, 220). As the number of hard-liners increase, it becomes easier to mobilize public support for more coercive responses. Berinsky (2007) has found empirical evidence consistent with this assertion. Leaders are pressured (and perhaps encouraged) to take a harder tack with their state’s adversary due to the combination of public pressure and hard-liners’ unwillingness to compromise (Vasquez 2009, 217–218). Domestic hard-liner pressure, in a sense, “rushes” the leadership into making decisions. The rush prevents leaders from collecting additional information that could help inform the deliberations.

A more general counterargument to a time-pressure story is that more information is typically available about higher salience issues than lower salience issues. The information revealed by exchange offers and counteroffers would be less crucial, compared to a more information-poor dispute. Ergo, states would have sufficient information to form accurate expectations, even early in the dispute’s lifetime, for high overall salience issues. I think the initial premise is reasonable, but I disagree with the conclusion. It will only hold if information processing capabilities are near-perfect. Even though a time pressure mechanism is primarily concerned with information availability, I have also suggested that more salient issues have a higher risk of processing problems.

When states suffer from information availability problems, they have a decreased ability to form accurate expectations about conflict duration. Lengthier conflicts are associated with inaccurate expectations. In hypothesis form, a time pressure mechanism can be stated as:

Hypothesis 3.1 (Non-Anticipation, Time Pressure): When states militarize disputes quickly, they end up in protracted militarized conflicts.

3.3.1.2 Mechanism 2: Issue Indivisibility

The second mechanism is an "issue indivisibility" mechanism. It pertains to decisions made later in a disputed issue's lifetime. The mechanism works through salience's effect on the actual or perceived indivisibility of the issue. An indivisible issue has few, if any, compromises that are acceptable to both disputants (Powell 2006, 170; Toft 2006), making it difficult to resolve the disagreement peacefully. Any division of the good is perceived as destroying some of its perceived value v. Informally, v can be thought of as incredibly large for indivisible issues ($v >> c$).[56]

Indivisibility is problematic because it is an inherently subjective construct.[57] States ascribe greater value to an issue than what its tangible, objective value would suggest (i.e., tangible salience). Whereas the goals and stakes associated with tangible salience generally have a shared, identifiable metric to facilitate quantification and comparison, those associated with intangible salience do not. In the extreme, a state may define an issue as part of an "ideological struggle," using language "that take[s] on highly moralistic overtones" with "a sense that this may be the final battle between good and evil" or a sense that one's own survival or way of life is at risk (Vasquez and Mansbach 1984, 425).

More salient disputes have a higher baseline susceptibility to the use of symbolic language and rhetoric from the start. Indivisibility describes the most extreme form of

[56] An extremely large v has other implications. It forces the c/v term in states' expected utility functions toward zero. States thus have little incentive to refine the accuracy of their beliefs about D, all else equal, when v is large. No matter how long or short states believe the militarization will be, the c/v term will still be infinitesimal.
[57] Powell (2006) makes a similar argument, contending that issue indivisibility is inherently subjective, which disqualifies it from being one of the "rationalist" explanations for war (cf. Fearon 1995).

intangibility, where a good's value is defined in an *entirely* symbolic way. It is easier to use symbolic rhetoric when an issue possesses any amount of intangible salience than when it does not, for the reasons I laid out in Section 3.1.2 earlier (e.g., fn. 36). Increasingly symbolic rhetoric may be employed for strategic framing purposes so as to strengthen states' bargaining positions (Krebs and Jackson 2007).

Over time, though, rhetoric can have a persuasive, constitutive effect, either intentionally or unintentionally (Goddard 2009).[58] Actors' identities are transformed through such social interaction and discourse (Wendt 1999), where identity refers to the "relatively stable, role-specific understandings and expectations about self" (Wendt 1992, 397). At the state level, transformed identities influence, among other things, whether other states are viewed as foes (on this point, see also Vasquez and Mansbach 1984; Vasquez 2009, 79–87). The cognitive structures used by decision makers to process information will reflect the state's new beliefs about the hostile, threatening nature of others. As a result, an adversary's behavior may be interpreted as being more hostile in its intent than it is, in an objective sense, which may result in a response that is more hostile than necessary (again, in an objective sense) (Jervis 1968).

Changes in states' identity can alter states' preferences over outcomes.[59] State preferences may be altered due to changes in the intrinsic utilities associated with each outcome, creating a new rank-ordering of preferred outcomes that may differ from previous orderings. Alteration of state preferences may also be due to states' use of a different calculus to rank outcomes. Anticipation relies on states employing a pure utility-maximization calculus, where outcomes are ranked from most-preferred to least-preferred on the basis of one's own utilities.

[58] Some also argue that symbolic rhetoric has an increased chance of being *used* as time goes on (Vasquez 1983, 2009).
[59] Game-theoretic models assume that preferences over *outcomes* are fixed and exogenous. By contrast, preferences over *actions* are allowed to change.

Instead, states may become interested in utility maximization *relative to* the other disputant (i.e., relative gains/losses) (Dreyer 2010; Powell 1991, 1999, 54–58; Vasquez 2009, 79; Waltz 1979). Neorealists hint at this worldview, maintaining that "states are *positional*, not atomistic, in character...focus[ing] both on …absolute and relative gains" (emphasis in original, Grieco 1988, 474).

At the extreme, states may employ a utility-minimization rule, focusing on minimizing the other state's utility without regard to one's own (Vasquez 2009, 80). The unbiased-forecast property of rational expectations is predicated on utility-maximizing states, in an absolutist sense (i.e., egoistic, concerned only with absolute gains), which produces goal-oriented, optimizing behavior. It is unclear whether unbiased forecasting is still guaranteed when preferences are altered regarding utility maximization. At the least, the probability that states would behave in a goal-oriented, optimizing way would seem to be diminished if they do not employ a utility-maximization calculus.

Symbolic rhetoric plays a large role in explaining the emergence of rivalry between Argentina and Chile in the nineteenth century. The states were involved in three territorial disputes: the ownership of Patagonia; border demarcation in the Andes Mountains; and, later, three islands in the Beagle Channel. All three disputes experienced multiple militarizations. Both countries used "juridical and moral justifications" as the basis for their territorial claims (Escudé 1988, 145; Thies 2001, 413). Thies notes that "it is unlikely that Argentine or Chilean leaders realized that they were laying the foundations of an institutionalized rivalry at this point. It is even more unlikely that they were able to anticipate the consequences of their territorial ambition for the next century of relations between their two states" (2001, 413).[60] Extensive

[60] For a similar point about rivalries in general, see Goertz, Jones, and Diehl (2005).

press coverage in both countries disseminated the rhetoric, engendering a strong sense of nationalism among the publics. The nationalistic fervor became institutionalized in the educational curricula, perpetuating the effect of the rhetoric across time. Even decades later, popular backlash scuppered multiple peaceful settlement attempts.

Another more prominent example is Jerusalem and its symbolic importance to Israelis and Arabs alike. Jerusalem's symbolic importance also has roots in symbolic rhetoric. At the time of Israel's independence in 1948, both sides considered the city to be divisible, and both preferred an Israeli-Jordanian division to a UN "internationalization" of the city (Goddard 2009, 122–123). Israel and Jordan's 1949 armistice to the Arab-Israeli War accepted the de facto division of the city that had developed during the war. Israel occupied West Jerusalem, and Jordan occupied East Jerusalem (Goddard 2009, 136–138).

However, Israel began using symbolic rhetoric rooted in religion during the late 1960s and the 1980s. Israel retook East Jerusalem and the West Bank during the Six Day War in 1967; in the aftermath, the sitting Israeli government invoked religious rhetoric to justify Israel's claims to the recaptured territory (Goddard 2009, 162–167). As another consequence of the war, Palestinians emerged as a distinct identity, separate from Jordanians, for the first time. The Palestinian Liberation Organization (PLO), dominated by Fatah, relied on secular nationalist rhetoric to justify their claims to a Palestinian state in its early years (Goddard 2009, 178–183). Other groups in the Palestinian territories, such as the Muslim Brotherhood, began to challenge the PLO's legitimacy as the dominant force in Palestinian politics in the 1980s. The PLO added religious symbolism to its existing nationalist rhetoric to reinforce its position (Goddard 2009, 183–187). In the end, the use of religious, symbolic rhetoric by both Israeli and Palestinian decision makers rendered Jerusalem an indivisible issue, as the sides could no longer reconcile their bargaining positions (Goddard 2009, 195–207; Hassner 2003).

Transforming state identities through social interaction is typically a slow process that takes time (Johnston 2001, 499). It has an increased chance of occurring as more time passes since the start of the dispute. The slow process of identity transformation is exemplified by the Anglo-Irish debate over Irish Home Rule, which began in earnest in the late 1800s. Under "Home Rule," Ireland would be self-governed with its own parliament, but would remain part of the British Empire (Goddard 2009, 47). The Home Rule debate, and the actions taken during it, gave way to one of the 20th century's more intractable disputes: Northern Ireland, also referred to as Ulster in the discussions of that era. Stacie Goddard's careful case study reveals that the construction of "Northern Ireland/Ulster" as an autonomous actor with a distinct identity was the unexpected product of political rhetoric surrounding the Irish Home Rule debate once it reached the British Parliament (Goddard 2009, 56–57).

The emergence of an Ulster identity did not occur suddenly. Unlike the other 23 counties on the island of Ireland, which were overwhelmingly Catholic, the nine counties comprising Ulster had sizable Protestant minorities. Yet, the religious commonality was mostly irrelevant for most of the Home Rule debate; Ulster was a non-issue (Goddard 2009, 53). Up until the mid-1880s, the residents of Ulster were fragmented along class, intra-Protestant, and English-Scottish lines, precluding the formation of a collective "Ulster" identity (Goddard 2009, 89–90).

Things changed in 1886, when the first Home Rule Bill came before the British Parliament. At the time, returning some political power to Ireland—be it Home Rule or other major legal reforms—was thought to be "unavoidable" (Goddard 2009, 79). With this sense of inevitability in mind, the British opposition party offered a variety of new counterarguments against the bill. The rhetoric was employed solely for strategic ends, with the purpose of forcing a settlement more in line with the opposition's anti-Home Rule preferences (Goddard 2009, 83–86).[61] The counterargument that finally gained traction was the "Orange Card": Irish Home Rule would threaten the rights of the Protestants living in Ulster. Even though the "Ulster problem" had never come up before, the opposition "believed that Ulster could be useful in the short term as a bluff designed to force [the major Home Rule supporters] to compromise. After 1886, [the opposition] fully intended to 'tell Ulster to go to the devil'" (2009, 88, 94).

The rhetorical shift had little short-term impact.[62] However, the longer-term impact of playing the Orange Card was fatal, in every sense of the word. By framing Home Rule as a "fight against Catholic tyranny," the opposition's rhetoric had the unintentional effect of unifying the fragmented groups residing in Ulster, creating a new actor with a collective identity—a Protestant, anti-Home Rule Ulster (Goddard 2009, 90–92). Britain's opposition began reluctantly working with the fledgling Ulsterites, so as not to repudiate their own counterargument, which reinforced Ulster's new identity with startling speed. The reluctant cooperation became more pronounced in the 1900s, with Ulsterites taking up key positions in the opposition party leadership (Goddard 2009, 93–95).

By the time that the third Home Rule Bill was proposed in 1912, the debate was no longer just about Irish Home Rule, but whether Ulster should be partitioned from the rest of Ireland. Ulsterites were vehemently opposed to being placed under Catholic-Irish rule, as being Protestant formed the basis for their identity as a group. As the bill was being debated, militias

[61] Goddard suggests that "despite fierce language, [the opposition] sought negotiation, not deadlock, and had no intention of abandoning a negotiated settlement to the Irish question" (2009, 88).
[62] The first Home Rule Bill failed to pass in 1886, but only due to a revolt within the ruling party, which deprived the bill of a majority in the House of Commons (Goddard 2009, 48, 60). The second Home Rule Bill in 1893 passed the House of Commons, but was vetoed by the opposition-controlled House of Lords (Goddard 2009, 88).

organized to "fight" against Home Rule, in case the bill were to pass and be implemented (Goddard 2009, 49–50, 102–103). The British opposition felt obliged to support the partition because of how wedded they had become to Ulster, even though the opposition fundamentally hated the idea of partition, as it implicitly agreed to Home Rule—the very outcome the opposition was trying to avoid all along (Goddard 2009, 104–105). Goddard goes on to argue that these transformations, in conjunction with other changes in the Anglo-Irish political landscape, played a key role in casting Ulster as an indivisible issue among the key actors.[63]

In short, none of the above identity transformations happened as soon as the Orange Card was played in 1886. Instead, it took around a quarter of a century for the Ulster collective identity to truly coalesce and transform itself into a potent political force. The effects stemming from these transformations would not be evident if we had looked only at 1886, or 1886 and the five years prior. They took a longer time to manifest, which suggests more broadly that indivisibility will not immediately have an effect on forming (accurate) expectations. Time must pass before the effects will become observable. I have referred to this period of time as t, CLAIM DURATION. Elsewhere, it is referred to as the "time horizon."[64]

The necessity of long time horizons has serious implications for testing an issue indivisibility mechanism. Most empirical tests of rational expectation theory and other rational choice-based work employ a short time horizon. This includes most work on militarized conflict.[65] The implicit assumption is that any effect of interest will manifest quickly. Existing research has therefore neglected the potential implications and effect of *time* on militarized conflict over a dispute.

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[63] For an abbreviated version of her case study of Northern Ireland, see Goddard (2006).
[64] This phrase is borrowed from Pierson (2004). I formally define time horizon as the "period of time over which meaningful change occurs" (Pierson 2004, 80; see also Abbott 1988).
[65] A notable exception is empirical work on interstate rivalries.

In sum, the major implication of the indivisibility mechanism is that information processing problems may get *worse* over time for highly salient issues. It is easier to define highly salient issues with symbolic rhetoric than issues of lesser importance. As a result, the ability to accurately form expectations about conflict duration will decrease as the dispute goes on and t increases. A non-anticipatory dynamic will be more likely. In hypothesis form:

> *Hypothesis 3.2 (Non-Anticipation, Indivisibility): When an issue is contested for a long period of time, it becomes defined in indivisible terms, giving rise to lengthy militarized disputes.*

3.3.2 Anticipatory Dynamics

If states have (1) sufficient amounts of information and (2) can process the information correctly (in an objective sense), then an anticipatory dynamic will result. Anticipation suggests that *expectations* about conflict duration will affect CLAIM DURATION. Therefore, the outcome of interest is no longer conflict duration, as it was in the non-anticipatory hypotheses. Instead, CLAIM DURATION is the main outcome for the anticipatory hypotheses. Issue salience is treated as fixed and exogenous in anticipatory stories, sharply contrasting with the non-anticipatory scenarios in which issue salience could change over the course of the dispute.[66] Anticipatory stories consider issue salience to be directly related to the total value of the issue (v), which is considered to be an additional component of the costs of fighting.[67]

[66] For non-anticipation, the implicit assumption is that changes in salience are differences in degree, not kind. Put differently, while salience can increase or decrease over the course of a dispute, the *overall salience category* to which the dispute belongs will remain constant.

[67] Some formal work does disaggregate the issue's total value from c by including it as a model parameter (e.g., Carter 2010; Slantchev 2011).

3.3.2.1 Strategic Delay

When states expect lengthy (and hence costly) militarized conflicts, they can react in one of two ways. First, they may elect not to militarize the dispute in t, if the expected benefits from fighting are outweighed by the costs of doing so. Instead, states deliberately take no action or pursue other, less-costly resolution strategies. The decision to forgo militarization is reevaluated at $t + 1$, $t + 2$, and so on. If expected conflict duration remains long, and expectations are fairly accurate, the implication is that lengthy expected conflicts should lead to longer t's. States will strategically delay militarizing the dispute, potentially to the point of observing no militarization at all. Hypothesis 2.1 covers part of this idea. The hypothesis that follows from the rest is:

> *Hypothesis 3.3 (Anticipatory: Strategic Delay): When states expect lengthy MIDs, there is an incentive to delay militarization as long as possible in order to maximize the likelihood of resolution by other means.*

3.3.2.2 Strategic Prevention

The previous hypothesis rests on the assumption that the passage of time is costless or otherwise negligible. Relaxing the assumption makes *peace* costly when a dispute exists, suggesting a second anticipatory mechanism. States have an incentive to attack as quickly as possible, in line with a general commitment problem logic. When delays are costly, states are penalized for each period in which the dispute goes unresolved. The source of the delay costs can vary—e.g., forgone economic gains, political blowback, international opprobrium—but states are aware of the costs with near certainty. States thus have an incentive to resolve the dispute as fast as possible, as neither can credibly commit to leaving the dispute unresolved in the face of a costly peace. Militarization will result, even when conflicts are expected to be long, when the costs of *not* militarizing are even higher.

This proffered mechanism is a specific form of the standard "prevention" logic for commitment problems, in which states resort to military force in t to prevent the realization of a worse outcome (i.e., because acting in later periods will yield outcomes with smaller utilities). The other two commonly offered commitment-problem logics—preemption and bargaining over an issue that itself is a source of bargaining power (Fearon 1995, 401–409)—also are viable explanations for lengthy conflict potentially leading to quicker dispute militarizations.

The prevention logic differs from the non-anticipatory mechanisms in two key ways. First, the standard prevention story assumes that information processing is perfect or near-perfect, which distinguishes prevention from non-anticipation arising from processing problems (the bottom row of Table 2.1, e.g., issue indivisibility/Hypothesis 3.2). Second, and perhaps more crucially, states do not suffer from a dearth of relevant information in a prevention story, unlike non-anticipation resulting from objective information shortages (the top-right cell of Table 2.1, e.g., time pressure/Hypothesis 3.1). Commitment problems, in general, are unique in that all relevant information *is* available—i.e., there is "perfect" information (Powell 2002, 23–27)—and yet, *militarized conflict still occurs*. In the logic I offered here, states look forward into the future, form accurate expectations, and conclude that militarizing *now* affords the best opportunity for them to obtain an outcome associated with the highest utility possible. Waiting any longer will yield outcomes with lower utilities, hence the need to act now, to prevent these less-desirable outcomes (from a pure utility point of view) from occurring. In short, a strategic prevention logic is characterized by near-perfect processing and sufficient amounts of relevant information. It is thus distinct from the two proffered non-anticipatory mechanisms because non-anticipation lacks one of these characteristics, by definition.

The testable general hypothesis that follows from a strategic prevention logic is:

Hypothesis 3.4 (Anticipatory: Strategic Prevention): When states expect lengthy MIDs, there is an incentive to militarize preventatively to gain a strategic advantage.

3.4 CONCLUSION

What is the connection between overall issue salience and militarized conflict? Why *is* overall issue salience an important factor in a story about conflict dynamics? When will one conflict dynamic type be predominant over the other? How can these dynamic ideal-types be applied to specific questions about militarized interstate conflict—what leverage do they give us? These are some of the questions motivating this chapter.

I have argued that militarized conflicts over issues with high levels of overall salience will be affected most by non-anticipatory dynamics. In general, overall salience negatively affects the ability to process information accurately. Additional pernicious effects can manifest through one of two possible mechanisms: time constraints or issue indivisibility. Both can hamper states' ability to form accurate expectations. It is important to note that my argument is not deterministic, but probabilistic. It utilizes the logic of the major works associated with the anticipatory and non-anticipatory literatures and expands on them by incorporating additional insights from other disciplines.

To further distinguish between dynamics, I applied my ideal-type framework to expectations about conflict duration. My justification relied on the relationship between claim duration and conflict duration. The relationship takes the following form when stated in informal, intuitive terms: When states decide to militarize a dispute, they *think* the militarization will unfold in a particular way. How do these thoughts compare with what *actually* transpires? This chapter's hypotheses, which help to answer this basic question, are summarized in Table 3.4.

How can we empirically assess the validity of these hypotheses? Doing so is not as straightforward as it would first appear. This, and other topics, are the subject of the next chapter.

TABLE 3.4. Summary of Chapter 3 Propositions and Hypotheses

Proposition 3.1 (Time and Information Availability): As more time passes, expectation accuracy will improve. *Proposition 3.2 (Time and Information Processing): As more time passes, expectation accuracy will not improve or will get worse.* *Hypothesis 3.0 (Overall Salience): When an issue has high levels of overall salience, a non-anticipatory dynamic will be strongest. When an issue has moderate or low levels of overall salience, an anticipatory dynamic will be strongest.* *Hypothesis 3.1 (Non-Anticipation, Time Pressure)*: *When states militarize disputes quickly, they end up in protracted militarized conflicts.* *Hypothesis 3.2 (Non-Anticipation, Indivisibility)*: *When an issue is contested for a long period of time, it becomes defined in indivisible terms, giving rise to lengthy militarized disputes.* *Hypothesis 3.3 (Anticipatory: Strategic Delay)*: *When states expect lengthy MIDs, there is an incentive to delay militarization as long as possible in order to maximize the likelihood of resolution by other means.* *Hypothesis 3.4 (Anticipatory: Strategic Prevention)*: *When states expect lengthy MIDs, there is an incentive to militarize preventatively to gain a strategic advantage.*

4.0 RESEARCH DESIGN

What are the determinants of interstate dispute dynamics? I have argued that the disputed issue's salience plays a major role. How can we evaluate dispute dynamics? I have claimed that the relationship between CLAIM DURATION and conflict duration can give us analytical purchase. More specifically, I have argued that overall issue salience will be a major determinant of dispute dynamics. The intangibility of highly salient issues impairs states' ability to form accurate rational expectations about conflict duration. The major implication is that disputes over highly salient issues will be strongly affected by past experiences, more so than expectations about the future. In this chapter, I lay out the research design and modeling techniques that allow me to evaluate this assertion.

This chapter has three major sections. First, I provide my basic operational definitions. I also describe the basic structure of my dataset. Second, I discuss the models that allow me to test my questions about dispute dynamics. The chapter ends with a brief conclusion in the form of a large table that summarizes the major elements of each modeling strategy.

4.1 DATA

4.1.1 Operational Definitions

I begin by defining my two core concepts: conflict/militarization and disputed issues. I define militarized conflict as the existence of a militarized interstate dispute (MID) between States *i* and *j*. A MID, as defined by the Correlates of War (COW) project, is a threat, display, or use of military force by one state against another state (Ghosn, Palmer, and Bremer 2004).

A disputed issue exists when official representatives of *i* or *j*'s government make explicit statements challenging the issue's status quo policy. I use the Issue Correlates of War (ICOW) data on disputes over territorial, maritime, and river issues.[68] Importantly, the ICOW data include disputes that experience a MID *and* disputes that do not; both categories will be pivotal for testing purposes. I categorize the ICOW dispute types into categories based on Hensel et al.'s (2008) overall salience categorization from Table 3.2, as I have argued that different types of issues exhibit different dynamics. This implies that we should see different patterns (or, for empirical testing, different coefficients) across overall issue salience categories.

ICOW's territorial disputes are high overall salience issues. They are disputes in which one state "claim[s] sovereignty over a piece of territory that is claimed or administered by another state" (Hensel 2001, 90). An example is Argentina and Great Britain's dispute over the ownership of the Falkland Islands. ICOW's maritime and river disputes are categorized as moderately salient issues. Maritime issues are disputes "over the access to or usage of a maritime area," such as disagreements about fishing or navigation rights (Mitchell 2002, 1). The

[68] The ICOW data do not cover every potential type of interstate dispute in Table 3.2. Nonetheless, I think they are a good starting point because they contain the major categories that commonly appear in historical narratives.

series of "Cod Wars" between Britain and Iceland in the 1950s and 1970s are perhaps the best-known set of maritime disputes (e.g., Kurlansky 1997). Finally, river disputes are those "over the usage (or misuse/abuse) of a specific river," with examples including navigation rights, water consumption and quantity, or pollution (Hensel 2005, 2). An example is Iraq and Iran's dispute over navigation rights on the Shatt al-Arab, the river forming part of the countries' southern boundary.

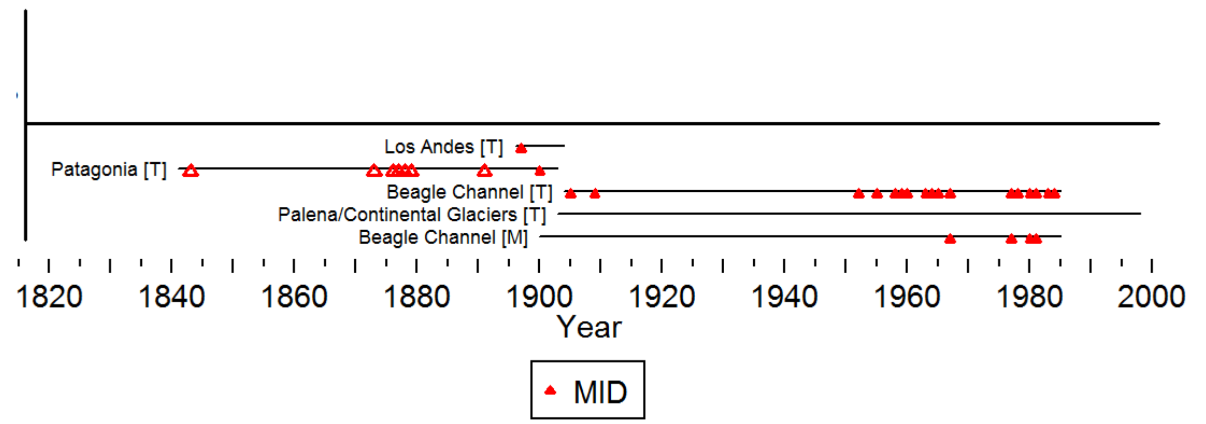
4.1.2 General Data Structure

Testing an argument about dispute dynamics places the disputed issue at the heart of the analysis. The data are therefore structured by competing claims over a given issue, broken down into directed state pairs. The states are ordered according to their relation to the status quo. States making explicit statements that challenge an issue's status quo (or statements challenging those made by another state) are listed first, followed by the state targeted by the challenger's statement. I refer to these as "claim-dyads." They are my main unit of analysis.

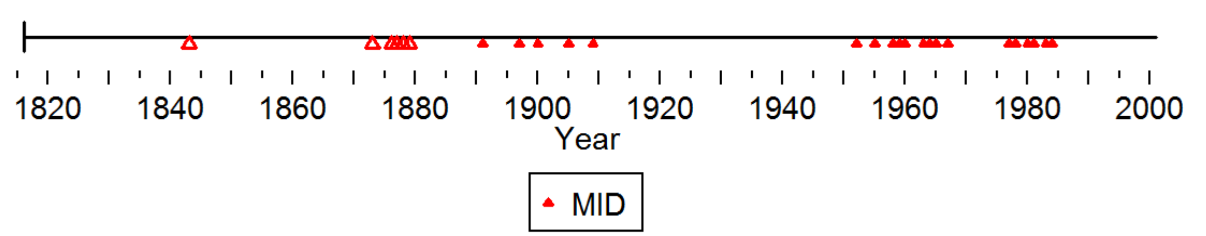
I group the MIDs with the disputed issue-claims they aim to resolve.[69] The top panel of Figure 4.1 shows an example coding for Argentina and Chile, in which all dyadic MIDs can be assigned to ICOW disputes. Each line below the figure's horizontal-"T" axis represents one claim-dyad. The lines are labeled with the name of the claim and whether the claim is over a

[69] It is possible for a MID to be associated with more than one claim-dyad, meaning that the MID appears more than once in the data. This can occur for two reasons. First, the disputed issue *and* the MID are both multilateral. The MID associated with the Berlin Crisis of 1961, for instance, appears twice in the dataset. The disputed issue—control of West Berlin—involves two dyads: US-Russia, and West-Germany-East Germany. The 1961 MID, related to the erection of the Berlin Wall, was also multilateral, and involved the same two dyads (among others). Second, the MID is related to a linked territorial/maritime dispute. Argentina and Chile's disagreement over the ownership of three islands in the Beagle Channel (territory) also affected the maritime boundary claimed by both countries. The five MIDs occurring over the maritime portion of the Beagle dispute also appear for the related territorial dispute. (Figure 4.1 shows only four MIDs for the Beagle/maritime dispute because two of the MIDs occur in the same year.) In total, 14 MIDs appear twice in the dataset.

territorial (T), maritime (M), or river (R) issue. The *x*-axis denotes calendar years; the *y*-axis is unitless. Each line's endpoints are located at the first and last year that the claim-dyad was active. MIDs occurring over a claim-dyad appear as triangles on that claim-dyad's line for the year in which the MID began.[70] For instance, Argentina and Chile's dispute over Patagonia began in 1841, ended in 1903, and experienced 8 MIDs.[71] Accordingly, the line representing Patagonia stretches from 1841 to 1903 and has 8 triangles plotted along it.



Panel A. Claim-dyad specific: Timelines broken down by disputed issues



Panel B. Dyad-specific: One unified historical timeline

FIGURE 4.1. Chile-Argentina Issue-Dyads

A claim-dyad strategy has a few advantages over the design strategies employed most frequently in interstate conflict research. Most studies take a "dyad-specific approach": they consider all MIDs that occur between two states, without considering how the dyad's MIDs map to different disputed issues. Dyads are the key conceptual unit instead of *claim*-dyads. This effectively

[70] Hollow triangles indicate MIDs that are ineligible to enter some of my estimation samples, for reasons I discuss in Section 4.2.1.2.
[71] The eight MIDs began in 1843, 1873, 1876, 1877, 1878, 1879, 1891, and 1900, respectively.

amounts to "collapsing" the five claim-dyad lines from the top panel of Figure 4.1 into a single line. I do this in the bottom panel of Figure 4.1. All of Chile and Argentina's MIDs are plotted along a single axis. As the bottom panel makes evident, we lose important nuance regarding the underlying issue in a dyad-specific approach.

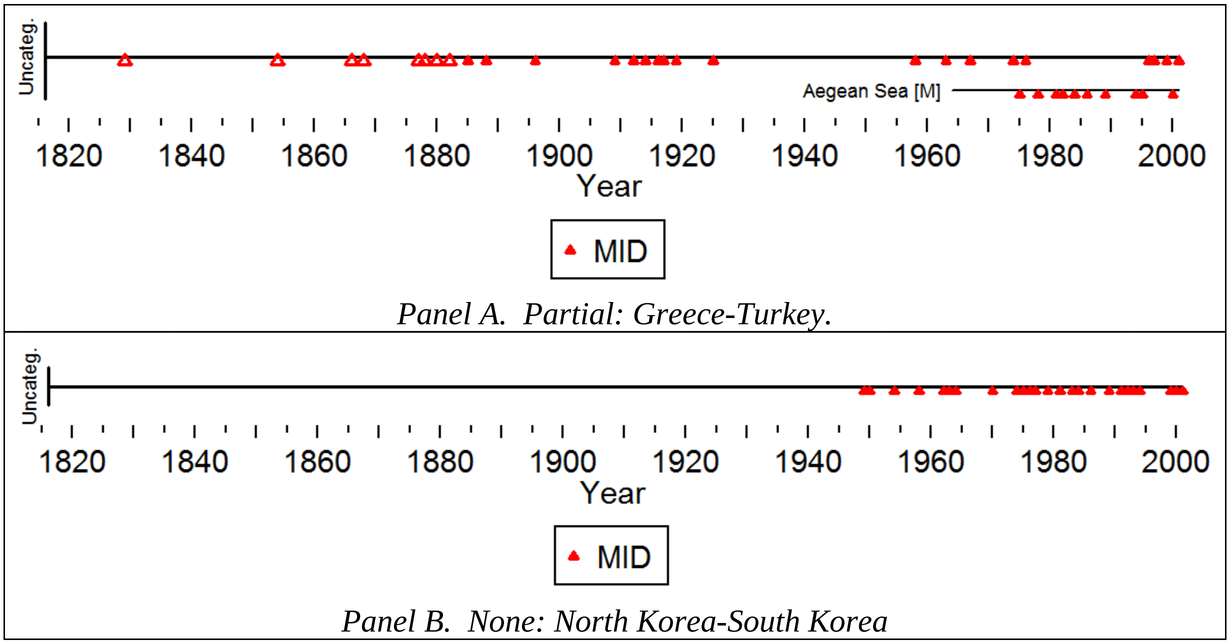


FIGURE 4.2. Historical MID Patterns: Examples of MID-ICOW Match Rates

A claim-dyad approach is not without its drawbacks. The biggest problem is that the underlying claims associated with some MIDs do not appear in ICOW. The ICOW data do not cover all possible types of disputed issues between states, nor is ICOW's coverage of territorial, maritime, and river disputes worldwide. In some cases, every dyadic MID can be matched with underlying dispute, as ICOW has data on all the disputed issues in question (e.g., Chile and Argentina, Figure 4.1). In other cases, only some of the MIDs can be matched (e.g., Figure 4.2, Panel A). At worst, none can be matched (e.g., Figure 4.2, Panel B). Unmatched MIDs (labeled as "uncateg(orized)" in the figures) do not enter any of my estimation samples at all.[72] I believe that my smaller sample of MIDs biases me against finding supportive results, as I have fewer cases to substantiate my hypotheses.

A new claim-dyad is recorded during disputes over the same issue when part of the original claim is resolved, or if there is a change in the identity of the challenger or target[73] (Hensel and Mitchell 2007, 5; Hensel 2001, 91–94, 2008, 5–6).[74] As an example, Table 4.1 shows how the Finnish-Russian dispute over Karelia and Petsamo appears in my dataset.

TABLE 4.1. Karelia and Petsamo Claim-Dyads

	Dyad Name (Non-Directed)	Dispute Name	Challenger	Target	Start	End	MID?
1	RUS-FIN	Karelia and Petsamo	FIN	RUS	1918	1920	Yes
2	RUS-FIN	Karelia and Petsamo	RUS	FIN	1938	1940	Yes
3	RUS-FIN	Karelia and Petsamo	FIN	RUS	1941	1944	Yes
4	RUS-FIN	Karelia and Petsamo	RUS	FIN	1941	1944	Yes
5	RUS-FIN	Karelia and Petsamo	FIN	RUS	1945	1947	No

[72] A claim-dyad focus also sidesteps some of the problems associated with a dyad-centric focus. The MID data contain a "revisionist type" variable containing information about the "principal object that the state sought to change" (Jones, Bremer, and Singer 1996, 178). There are four possible revision types: territory, policy, regime, or other; maritime and river issues are some of the issues classified as "Policy." Usually, researchers loosely interpret revision type as denoting the primary issue under contention in the MID. Cases with "other" revisionist types are usually dropped from the analysis. However, Henehan and Vasquez (2001, 129) note that four wars—the most serious and severe type of MID—have causes so complex that they are categorized as "other." The authors also note that all four wars involve territory in some way, raising questions about the validity of analyses that drop MIDs coded as "other". By contrast, all four wars appear without a problem in my claim-dyad dataset. Each is unambiguously associated with the appropriate territorial dispute.

[73] This could also happen, for instance, in the case of military conquest (Hensel 2008, 6).

[74] In this way, the coding rules for new claim-dyads are similar to the rules for grouping militarized incidents into new MIDs (see Jones, Bremer, and Singer 1996, 174–177).

The dispute is comprised of five claim-dyads:

1. The first claim-dyad begins soon after Finland gains its full independence from Russia in 1917. Finland challenges Soviet rule in East Karelia in 1918 by launching several expeditions to free the population from socialist rule (Solsten and Meditz 1988). The claim is resolved in 1920 with the Treaty of Dorpat, in which Finland renounces its claims to East Karelia in exchange for sovereignty over Petsamo (Huth and Allee 2002, 317).
2. A new claim-dyad begins in 1938 when Russia challenges Finnish territorial holdings. The Russians demand that Finland cede or lease some of its islands in the Gulf of Finland, located in a strategic position off the coast of Karelia, as part of a mutual assistance pact ("No. 74 Finland-USSR Boundary" 1967, 5). Finland's refusal to sign the pact eventually leads to the Winter War (1939-1940) and a Soviet victory. The war's peace treaty forces Finland to cede almost all of Finnish Karelia to the Soviets (among other territorial concessions) (Solsten and Meditz 1988).
3. The third claim-dyad begins in 1941 when Finland attempts to reclaim the territory lost during the Winter War, beginning another war in the process (Continuation War, 1941-1944). The claim ends with the Moscow Armistice in 1944. The armistice reestablishes the borders set by the 1940 peace treaty and requires Finland to cede Petsamo back to the Soviets, the victors of the conflict.
4. The fourth claim-dyad is a counterclaim by the Soviets to Finland's claim in (3). It also ends with the Moscow Armistice.[75]

[75] This is one of the dataset's two "simultaneous counterclaims"—instances in which (1) the challenger-target ordering in one claim-dyad is reversed in another and (2) the two claim-dyads occur at the same time. The other occurs between Iran and Iraq over the Shatt al-Arab.

5. The last Karelia and Petsamo claim-dyad begins with Finland making a claim in September 1945. It ends with the Paris Peace Treaties of 1947, the peace treaty that formally concludes the Continuation War. It stipulates that Finland concede another small piece of territory near Petsamo to Russia ("No. 74 Finland-USSR Boundary" 1967). The Finnish-Russian border established by the Paris Peace Treaties is still in place today.

Disputed issues involving multiple state pairs are coded in a similar way. For example, Wrangel Island has two claim-dyads in the dataset: one between the US and Canada, and another between Russia and Canada. Appendix A contains the full list of disputes entering the dataset, after excluding those with missing control variable data.

4.1.3 Main Dependent Variables

I use three different dependent variables to test my story about dispute dynamics: CLAIM DURATION, MID?, and MID DURATION. CLAIM DURATION captures *when* a claim-dyad is militarized. It records the number of months elapsed between the start of a claim-dyad and a MID. I take these data from the ICOW's dataset on disputed issue settlement attempts. CLAIM DURATION is a "total time" variable, as it continuously counts the number of months that have passed within a claim-dyad, never resetting to zero. Total time is appropriate because one of my non-anticipatory mechanisms does not have an immediate effect. The effects from an issue indivisibility mechanism must accumulate, and will therefore take some time to appear once the claim-dyad has begun.[76]

The last two dependent variables are related. MID? is a dummy variable that indicates whether a claim-dyad militarized. The specifics vary, depending on the model. I discuss the particulars as I lay out each model's specification. The other dependent variable is MID DURATION. It records the number of months that MID lasts based on the MID's recorded start and end dates. I use the COW MID data and Maoz's dyadic MID data (2005) to code this variable.[77] A MID starts on the day in which State *i* takes an overt, "explicit, non-routine, and governmentally authorized action" against State *j* (Jones, Bremer, and Singer 1996, 169). MIDs end when disputants agree to stop fighting[78] or neither side takes military action for six months (Jones, Bremer, and Singer 1996, 175–176). Using the Karelia and Petsamo example, Table 4.2 illustrates how CLAIM DURATION and MID DURATION are coded.

TABLE 4.2. Karelia and Petsamo: Duration Dependent Variable Codings

	Dyad Name (Non-Dir.)	Chal.	Target	Claim Start	# of MIDs?	y_1: CLAIM DURATION	y_2: MID DURATION
1	RUS-FIN	FIN	RUS	4/1918	1	13	16.900
2	RUS-FIN	RUS	FIN	8/1938	1	14	5.200
3	RUS-FIN	FIN	RUS	5/1941	1	1	38.367
4	RUS-FIN	RUS	FIN	12/1941	1	0.0083	38.367
5	RUS-FIN	FIN	RUS	9/1945	0	17	.

NOTE: y_1 and y_2 are both recorded in months.

[76] Alternatively, the variable could be measured using a "gap time" formulation. A gap-time coding would record the number of months since the claim-dyad's start date and reset to zero after every MID. Measuring time using a "gap time" formulation is prevalent conflict research; peace spell counters for cubic spline construction are the best example. The inappropriateness of a CLAIM SPELL measure for my theoretical argument provides us with an avenue for robustness checks, which I discuss in the chapters to come (e.g., Figure 5.3).
[77] Before the release of the third version of the MID data, there were no official dyadic MID data from COW. Creating a dyadic dataset from the MID-participant data often resulted in inaccuracies for multilateral MIDs. Zeev Maoz created a dyadic MID dataset that corrected for any inaccuracies. He also added more detailed information about each dispute-dyad, such as dyadic-level start and end dates, which, in the case of multilateral MIDs, could differ from the MID's overall start and end dates.
[78] Specifically, the disputants reach a formal resolution, sign a cease-fire, or agree to a mutual troop withdrawal.

4.2 ESTIMATION STRATEGY

I examine my question about dynamics using two categories of estimation techniques. Each is aimed at the hypotheses arising from one theoretical chapter a particular concern raised by my substantive argument. I begin by focusing on the connectivity between CLAIM DURATION and MID DURATION. To examine this relationship, I employ a simultaneous equation model (SEM) (Hays and Kachi 2009). The second technique addresses my concern about claim duration and sample selection through the use of a split-population framework (Svolik 2008; Xiang 2010).

4.2.1 Duration SEM

4.2.1.1 Model Rationale

To test Chapter 3's hypotheses, we need an estimation strategy that satisfies three criteria. First, it must account for the factors influencing CLAIM DURATION. Second, it must account for the factors influencing MID DURATION. Third, it must accommodate the connection between CLAIM DURATION and MID DURATION. The nature of the connection is different across dynamic types. On the one hand, anticipation suggests: (expectations about) MID DURATION $\Rightarrow$ CLAIM DURATION. On the other hand, non-anticipation suggests: CLAIM DURATION $\Rightarrow$ MID DURATION.

The third criterion is problematic from an econometric standpoint, because the two dynamic types suggest that claim duration and MID duration could simultaneously affect one another. The problem, then, is one of simultaneity bias: CLAIM DURATION and MID DURATION are both endogenous. Traditional estimation strategies require one of the two to be exogenous, or else estimates will be systematically biased and inaccurate.

A simultaneous equation model (SEM) setup meets all three criteria. We can specify one equation per dynamic type to capture the relationship suggested by each, taking care of (a) and (b). Criterion (c) can be addressed by including the dependent variable of one equation as an independent variable in the other. I then jointly estimate the equations using maximum likelihood. The general form of the SEM becomes:[79]

$$\text{CLAIM DURATION} = \alpha_{\text{ANT}}(\text{MID DURATION}) + X\beta_1 + Z_1\gamma_1 + \varepsilon_1$$ <ANTICIPATORY DYNAMIC>

$$\text{MID DURATION} = \alpha_{\sim\text{ANT}}(\text{CLAIM DURATION}) + X\beta_2 + Z_2\gamma_2 + \varepsilon_2$$ <NON-ANTICIPATORY DYN.>

I use Hays and Kachi (2009)'s SEM estimator for continuous-time durations.[80] The SEM has a few nice properties that make it well-suited to the question under investigation. First, the connection between CLAIM DURATION (y_1) and MID DURATION (y_2) is explicitly modeled by including y_1 as a regressor in y_2's equation and vice versa. This makes the α's, which represent the degree of direct dependency among the outcomes (i.e., y_2's effect on y_1 for $\alpha_{1,}$ α_{ANT}), the main parameters of interest for my hypotheses.

Second, since both dependent variables appear as regressors in the SEM, the estimator thus places <u>expected</u> values of y (vs. actual) on the right-hand side of the equations. I can explicitly test whether *expectations* about future outcomes influence the past (an anticipatory dynamic) or whether the past affects future outcomes (a non-anticipatory dynamic).[81] Finally, specifying two equations and jointly estimating them allows for the possibility that both dynamics may be present, but that one dynamic may have a 'stronger' effect than the other. This is in line with what I argue regarding predominant dynamic types. If both α's are statistically

[79] Technical details of the estimator can be found in Appendix C.3.

[80] Hays and Kachi's model is log-linear, with the idiosyncratic error (ϵ) distributed as Type I Extreme Value (minimum). The dependent variables are assumed to have Weibull distributions (Hays and Kachi 2009, 6). Hays and Kachi investigate the general properties of this estimator via simulation.

[81] It is worth noting that, even though the *realized* values of CLAIM DURATION and MID DURATION are observed sequentially, *expectations* about each are formed simultaneously.

significant, a Wald test can show us whether one of the coefficients is significantly larger in magnitude than the other.

In general, the statistical significance of the α's indicates the causal directionality of the relationship between CLAIM DURATION and MID DURATION. A significant α_{ANT} implies that MID DURATION has a direct effect on CLAIM DURATION—an anticipatory dynamic (Proposition 2.1). A positively signed α_{ANT} corresponds with a strategic delay story (Hypothesis 3.3); lengthier MIDs give rise to longer CLAIM DURATIONs. A negatively signed α_{ANT} is consistent with a strategic prevention logic, in which shorter MIDs are associated with longer CLAIM DURATIONs (Hypothesis 3.4). Based on my argument, I expect α_{ANT} to be significant in the sample of moderately salient issues.

Moving to non-anticipation, a positively signed $\alpha_{\sim ANT}$ is consistent with an issue indivisibility story, where longer disputes produce longer militarized conflicts (Hypothesis 3.2). A negatively signed $\alpha_{\sim ANT}$ is consistent with a time pressure story, where shorter CLAIM DURATIONs lead to longer MIDs (Hypothesis 3.1). I have argued that highly salient issues are most prone to non-anticipatory dynamics, so I expect $\alpha_{\sim ANT}$ to be significant in the sample of highly salient issues.

4.2.1.2 Specification

Each row in the SEM dataset represents one militarization occurring between two states over a given disputed issue. The claim-dyad-MID is the specific unit of analysis. I disaggregate to this level so that I can match data on the length of individual militarizations with data on *when* each militarization begins during the claim-dyad. Returning to the Karelia-Petsamo example, four of the five claim-dyads each experience one militarization. The result is four observations in the SEM dataset. As another example, Argentina and Chile's territorial dispute over the Beagle

Channel islands contains one claim-dyad that experiences 19 MIDs. There are therefore 19 claim-dyad-MID observations in the sample.

TABLE 4.3. Spatial Domains of ICOW Disputed Issue Data

Salience	High	Moderate	
Issue Area	Territory	Maritime	River
Spatial	W. Hemisphere, N./W. Europe	W. Hemisphere, all of Europe	W. Hemisphere, N./W. Europe, Middle East

NOTE: Data on river and maritime disputes do not begin until 1900. Only territorial disputes are in the sample for 1885-1899.

I examine all claim-dyads that experience at least one militarization between 1885 and 2000.[82] The spatial domain varies depending on issue type due to the coverage of the ICOW data (see Table 4.3). Because I have assumed that claim onsets are exogenous to one another and to militarization, the different spatial domains are not problematic for the questions I examine here.

A more pressing concern is the generalizability of these results to other regions. There is no strong ex ante reason to suspect differences across regions, in terms of militarization patterns over each type of disputed issue. For instance, in the case of territorial disputes, Frederick (2012) has found different territorial dispute *initiation* (i.e., claim onset) patterns across regions. However, he does not investigate whether these regional differences translate into different territorial dispute *militarization* patterns as well. Thus, it remains unclear whether we should expect different dispute militarization patterns across regions.[83]

[82] This temporal domain is a function of data availability for one of the control variables (trade flows).
[83] An alternative to ICOW's data on territorial disputes is Huth and Allee's (2002) territorial dispute data. Huth and Allee's data covers a larger spatial domain than ICOW, examining all territorial disputes regardless of region, but for a narrower time frame (1919-1995 only). I elect not to use Huth and Allee's data because of the difficulty in adding detailed information on MIDs—which I require to identify the SEM—to their dataset efficiently. I leave this task as an avenue worth exploring in the future. Notably, Huth and Allee's data *do* provide a way to investigate militarization patterns across regions. A preliminary analysis reveals that, between 1919 and 1995, territorial

I run the model on two separate samples of disputed issues because I argue that different types of issues exhibit different dynamics, implying different α's (in terms of their significance and signage) across groups. One sample contains dyadic claims over issues with high levels of overall salience. The other contains dyadic claims over issues with moderate levels of overall salience. The different ICOW issue types are placed in overall salience categories based on Hensel et al.'s (2008) categorization from Table 3.2. There are 175 claim-dyad-MIDs in the SEM estimation sample. The crosstab is displayed in Table 4.4.

TABLE 4.4. SEM Sample: Claim-Dyads and MIDs

	HIGH O.S. *Territory*	MODERATE O.S. *Maritime/River*	*Total*
Claim-Dyads	22	43	65
Claim-Dyad-MIDs	81	94	175

The SEM makes use of two dependent variables: CLAIM DURATION and MID DURATION, both of which were described in Section 4.1.1. Seven variables are included as controls in both equations (the X's). The variables are motivated by previous research on militarized conflict.[84] All values are recorded for the year in which the relevant duration begins.[85] For disputes that experience multiple MIDs, I "update" the CLAIM DURATION control variables by taking their values at the end of the last MID (e.g., Figure 2.1, Point C). DEMOCRACY records the average Polity2 score for the dyad; the data come from the Polity IV dataset (Marshall and Jaggers 2005). INTERDEP controls for the dyad's level of economic interdependence using the average of each state's total trade flows in a given year divided by the state's GDP (Barbieri, Keshk, and Pollins

disputes in the Americas and Europe (ICOW's spatial domain) are no more likely to militarize than territorial disputes in the rest of the world.

[84] Some, but not all, of the variables were aggregated into the same dataset using EUGene (Bennett and Stam 2000).

[85] This amounts to Figure 2.1, Point A for CLAIM DURATION and Figure 2.1, Point B for MID DURATION.

2008; Oneal and Russett 2005). IGO is a count of the number of *i* and *j*'s shared IGO memberships, generated using COW's IGO membership data (Pevehouse, Nordstrom, and Warnke 2004). CONTIGUITY is a dichotomous variable, coded 1 if the two states share a land border or are separated by less than 150 miles of water (Small and Singer 1982). MPDYAD is coded 1 if *i* or *j* is a major power in *t*, as defined by COW. SETTMIL keeps a running count of MIDs over the claim-dyad, added to provide a rudimentary correction for multiple MIDs over a claim (Box-Steffensmeier and Jones 2004, 160). Finally, LINKED is a dichotomous variable that is coded 1 if a maritime or river dispute is related to a territorial dispute (or vice versa) and 0 otherwise. I control for LINKED because moderately salient issues that are related to highly salient issues might behave more like the latter (see fn. 40).[86]

Instrumental variables are required to identify the SEM because it is nonrecursive. CLAIM DURATION appears as a regressor in MID DURATION's equation, and MID DURATION appears as a regressor in CLAIM DURATION's equation. If z is being used as an instrument for y_1, it must satisfy the exclusion assumption: z must affect the other dependent variable (y_2) only through its effect on y_1. That is, z only has an indirect effect on y_2. Unsurprisingly, z must also be a strong predictor of y_1 (i.e., a strong instrument). Finding strong instruments that meet the excludability assumption is notoriously difficult (Goenner 2011; Sovey and Green 2011). I believe the effort worth undertaking because of my interest in the connection between CLAIM DURATION and MID DURATION. To be consistent with my theoretical story, any instrument must represent information available to States *i* and *j* when they were forming their expectations. That is, no instruments can be used whose values are only observable *ex post*.

[86] I also detail the reasoning behind LINKED in Ch. 5, when I discuss the scatterplot of MID DURATION vs. CLAIM DURATION (Figure 5.1).

Four instruments meet these criteria (the *Z*'s).[87] One instrument appears in the CLAIM DURATION equation, and the other three appear in the MID DURATION equation. The sole instrument in the CLAIM DURATION equation, Z_1, is multilateral claim (MLATCLAIM), which I code using the ICOW data. MLATCLAIM is coded 1 if other disputes have occurred between any two states over the same issue in the past (e.g., the same tract of land) and 0 otherwise. For example, various parts of Alaska were disputed by the US, Britain, and Russia. The very first dispute over Alaska, between Britain and Russia, is coded as 0 for MLATCLAIM, since there were no prior disputes over Alaska at that time. All subsequent disputes over Alaska—involving the US and Russia in one case, and the US and Britain in the other—are coded as 1. States may proceed more cautiously when resolving disputes over issues with a prior history of disputes, so as not to re-involve any additional states. Longer dispute times may result, suggesting a relationship between MLATCLAIM and CLAIM DURATION. Alternatively, such disputes may take less time to resolve, as earlier disputes may have established a common framework for addressing key elements of the dispute.

The MID DURATION equation contains three instruments (Z_2). The first instrument is MLATMID, which is coded 1 if the dyad in question is joining an ongoing MID. For instance, say that States *i* and *j* initiate a MID, and that State *k* joins the MID later by attacking *i*. MLATMID would be coded 1 for *i* and *k*'s observation, but 0 for State *i* and *j*, since *i* and *j* could not have known of *k*'*s* eventual involvement when the MID began. We only know *ex post* that *i* and *j*'s MID will become multilateral. Some argue that militarizations involving more belligerents will be longer (e.g., Blainey 1988, 197), while others argue that such militarizations will be shorter because of the collective action problems that plague larger coalitions (e.g.,

[87] Rudimentary tests show that the set of instruments usually satisfy the exclusion restriction. However, they are weak instruments, which can sometimes cause complications for obtaining accurate estimates.

Bennett and Stam 1996, 243–244). In both cases, though, a significant relationship exists between MID DURATION and the number of belligerents.[88]

Second, POWERRATIO is the ratio of the dyad's highest to lowest CINC scores (Singer, Bremer, and Stuckey 1972). I take the natural log of the ratio to help compensate for the variable's skewness. The ratio of CINC scores captures the balance of military power between the two states. I expect balance of military power will affect CLAIM DURATION only through its impact on expected MID DURATION, as military power is only relevant if it can potentially be brought to bear by militarizing the dispute. Militarizations in which the balance of power favors one side tend to be shorter than militarizations in which the sides are equally matched, as the stronger side can quickly defeat its weaker opponent (Bennett and Stam 1996).

Third, I believe that presence of a third-party ally is good third instrument for similar reasons as POWERRATIO. It represents potential interveners in the event of militarization, in turn affecting the balance of power, which affects militarization length for the reasons I have discussed above. ALLY3P is a dummy variable coded 1 if either state in the dyad has an offensive or defensive alliance with another state. It is coded using the Alliance Treaty Obligations and Provisions data (Leeds et al. 2002).

In certain respects, the SEM estimator is similar to extant tests of rational expectation theory. These tests take one of two forms. In the first, researchers have some measure of actors' expectations. Survey questions can ask actors about the expected value of an outcome k periods in the future (o^e_{t+k}) (Mishkin 1986, 44–47; Sheffrin 1996, 14–21). Scholars can then evaluate the accuracy of o^e_{t+k} by comparing it with o's actual value in $t + k$ (o_{t+k}). An example is

[88] MLATCLAIM need not be, and often is not, a determinant of MLATMID. The two variables are barely correlated (Corr = -0.024), because claims can be multilateral without a MID being multilateral. For example, Paraguay and Argentina's disagreement over the central Chaco region is not a multilateral claim. Yet, the MID that ensues over the claim *is* multilateral (the War of the Triple Alliance)—Brazil joins in, taking Argentina's side against Paraguay.

Krause's (2000, 292–293) research on inflation expectations among the American public, where he uses a survey question about price movements as his measure of inflation expectations (o_{t+k}^{e}) and compares respondents' answers to the actual inflation numbers (o_{t+k}). In the second form of rational expectation testing, researchers have no observed data on actors' expectations. Practitioners must specify a system of equations to test their hypotheses (Mishkin 1986, 21–22, 47–51; Sheffrin 1996, 140–144). One equation generates a 'predicted' expectation, and in the other, the prediction becomes a regressor. The SEM framework is most similar to the second approach. The estimator relies on multiple equations to generate predicted expectations, which serve as regressors.

Table 4.5 displays summary statistics for the variables in the SEM sample.

TABLE 4.5. Descriptive Statistics – SEM Sample

	Mean	*St. Dev.*	*Min*	*Max*
Dependent Variables				
CLAIM DURATION (mths.)	409.046	405.616	0.008	2042
MID DURATION (mths.)	3.760	8.794	0.033	97.133
Instruments				
Multilateral claim	0.429	0.496	0	1
Multilateral MID	0.046	0.209	0	1
Third party alliance	0.669	0.472	0	1
Power ratio	0.743	0.222	0.159	0.999
Controls				
Democracy (mean)				
@ CLAIM DURATION	2.346	5.258	-9	10
@ MID DURATION	2.763	5.568	-9	10
Interdependence (mean)				
@ CLAIM DURATION	0.215	0.135	0.039	0.855
@ MID DURATION	0.223	0.134	0.037	0.684
Shared IGO mshps.				
@ CLAIM DURATION	32.314	17.725	0	68
@ MID DURATION	36.623	18.524	0	75
Contiguity				
@ CLAIM DURATION	0.760	0.428	0	1
@ MID DURATION	0.766	0.425	0	1
Major power dyad?				
@ CLAIM DURATION	0.280	0.450	0	1
@ MID DURATION	0.280	0.450	0	1
Militarization count	4.629	4.572	1	19
Linked issue	0.503	0.501	0	1
Territorial issue?*	0.463	0.500	0	1

* Included as control in pooled sample only

N = 175 for all variables (aggregate estimation sample)

4.2.2 Split Population

4.2.2.1 Model Rationale

One troublesome aspect of the SEM analysis is its exclusion of claim-dyads that never experience militarization, as the estimator cannot accommodate such cases. If we pretend that no such restriction exists, Table 4.6 shows the cross-tab of peaceful and militarized claim-dyads that could, hypothetically, enter the SEM sample. Hypothesis 2.1 suggests that peaceful claim-dyads may also show signs of an anticipatory dynamic. The population of peaceful claim-dyads may be comprised of two groups: (1) those claim-dyads that could have militarized, but did not, and (2) those that could not have militarized (what I refer to as "Truly Peaceful" disputes; the capitalization is intentional). In the extreme, not accounting for unobserved heterogeneity of this sort could induce sample selection bias. Coefficient estimates would be biased, affecting hypothesis testing. My concern is that the 148 peaceful claim-dyads (shaded row) contain meaningful information in the form of unobservable heterogeneity.

TABLE 4.6. Crosstab of Militarization and Overall Salience
SEM SAMPLE

	HIGH O.S. *Territory*	MODERATE O.S. *Maritime/River*	*Total*
MID	22	43	65
Peaceful	27	121	148
Total	49	164	213

NOTE: Unit of analysis = claim-dyad.

I investigate this possibility by using a series of split population models, using a different dataset structure from the SEM dataset.[89] Split population models recognize the unobserved heterogeneity within a group, and account for it during the estimation process. Formally, split population models are employed when multiple data generating processes are associated with a single observed outcome. In my application, the single observed outcome with multiple data generating processes is MID? = 0—the peaceful claim-dyads. Peaceful disputes could occur for the two reasons I laid out in the previous paragraph. Examples of split population models include bivariate probit models with partial observability (e.g., Meng and Schmidt 1985; Poirier 1980; Xiang 2010) and zero-inflated count models (e.g., Hall 2000; Lambert 1992).

Split population models are designed to test the assertion that not all peaceful claim-dyads are Truly Peaceful. This is important, since anticipation suggests that some claim-dyads will never militarize—states form accurate rational expectations and conclude that militarizing the dispute would be counter to their interests. Both dynamic types suggest that time has an effect on the accuracy of expectations. Further, when and whether a dispute militarizes are questions that go hand in hand. A reasonable place to check for a split population, then, would be the time at which a dispute militarizes (CLAIM DURATION from the SEM), if it militarizes at all.

I use two different estimators to check for a split population. I describe the estimators in simple terms here; the technical details are in the first two sections of Appendix C. The first is a Weibull split population model, developed by Milan Svolik (Svolik 2008). In the simplest terms, the estimator combines a Weibull model and a logit model together. Svolik's estimator contains two equations, which correspond with the Weibull and logit components. The dependent

[89] I describe the split population dataset structure in the next section.

variable for the Weibull equation is the y_1 dependent variable from the SEM. It is sufficient to conceive of this as CLAIM DURATION, for now.[90] For peaceful disputes, CLAIM DURATION counts the number of months between the start and end of the dispute. It is easiest to think of the Weibull as the "main" equation.

If we are to obtain accurate estimates for the Weibull equation, we must include information from all the disputes that could militarize (non-Truly Peaceful). This amounts to all the disputes in the "MID" row of Table 4.6 and some of the disputes from the "peaceful" row. Information from any dispute that cannot militarize should be excluded from the Weibull.[91] The problem is, we are unsure which peaceful claim-dyads should be included or excluded. This is the purpose of the logit equation.[92] The dependent variable for the logit equation is a dummy variable that records whether a dispute stays peaceful (i.e., it is coded 1 when MID = 0); let π represent this probability.

Teasing out the heterogeneity in the population of peaceful disputes is now straightforward. Truly Peaceful disputes have little or no risk of militarizing; the logit will reflect this by returning a large value for π. For non-Truly Peaceful disputes, the logit will return a larger value for $(1 - \pi)$. We must also incorporate the information from these disputes into the Weibull equation so that our coefficient estimates are as accurate as possible, as they could have militarized, but did not. The key is to recognize that CLAIM DURATION is right-censored for non-Truly Peaceful disputes. We have not observed the dispute long enough for militarization to occur. We can employ the well-established, routine procedures for accommodating right-

[90] The dependent variable will technically be CLAIM SPELL, for reasons that I discuss over the course of the next two chapters.
[91] Excluding "irrelevant" observations is the same reason why, in classic studies of dyadic MID onset, we want to include only those dyads capable of militarizing.
[92] For this very reason, the logit equation is sometimes referred to as the "splitting" equation. Its role is to generate estimates that help "split" the population of peaceful disputes in the likelihood function.

censored durations in survival models (Box-Steffensmeier and Jones 2004, 16–19). The end result is an estimator that takes the form of Table 4.7, row 1.[93] The table also lists the comparable forms for standard Weibull models.

TABLE 4.7. Word Depiction of Various Duration Log-Likelihoods

	Model Description	*Militarizes (MID)*		*Peaceful (no MID)*
(1)	Svolik's SP Weibull = *Sample: all disputes*	$(1-\pi)$*(regular Weibull)	+	(π + [$(1-\pi)$*(right-censored Weib.)])
(2)	Standard Weibull = *Sample: all disputes*	(regular Weibull)	+	(right-censored Weibull)
(3)	Standard Weibull = *Sample: excludes peaceful*	(regular Weibull)	+	0

NOTE: π = probability that a dispute is Truly Peaceful. (2) and (3) assume that $\pi = 0$.

The presence of different groups among peaceful disputes is a testable proposition with a split population model. The logic of the test follows from the informal discussion in the previous paragraphs. First, I estimate two models: a Weibull model with the split-population element (Table 4.7, row 1) and a Weibull model without the split population element (Table 4.7, row 2). Then, I compare the log-likelihoods of the two models with a likelihood-ratio (LR) test (Maller and Zhou 1995).[94] If the data contained no split population, adding a split population component would give us no additional analytic purchase over when disputes militarize. The difference between the log-likelihoods would be statistically insignificant. A statistically significant LR test suggests that a split population *does* exist among peaceful disputes. Some peaceful claim-dyads are Truly Peaceful, but importantly, some are not. If an anticipatory dynamic is in effect,

[93] The actual log-likelihood for Svolik's estimator is in Appendix C, Equation [1].

[94] The likelihood-ratio test statistic is equal to -2([log-likelihood$_{\text{Reg. Weibull}}$] – [log-likelihood$_{\text{SP Weibull}}$]). The test statistic is distributed χ^2, with ([degrees of freedom$_{\text{Reg. Weibull}}$] – [degrees of freedom$_{\text{SP Weibull}}$]) degrees of freedom (Greene 2012, 526–527).

and it causes some at-risk disputes not to militarize, the test statistic should be statistically significant.

As a robustness check, I also estimate the models using a bivariate probit (biprobit) with partial observability (Meng and Schmidt 1985; Poirier 1980), which also accommodates split populations.[95] Political scientists have used biprobit models with partial observability to analyze a variety of phenomena. Vreeland (2003) analyzes the determinants of IMF loan programs, noting that we will only observe an IMF program when a government requests an IMF loan *and* the IMF agrees to lend. Absence of either condition results in an observationally equivalent outcome—no loan is made—even though there are two possible reasons why no loan is made. For a more topical example, Xiang (2010) investigates MID onset using a partial observability model. He notes that MID onset is observed only when the state pairs have the opportunity *and* the willingness to fight. Both are necessary, but not sufficient, conditions for a MID to occur. If two states do not experience a MID, it could be due to lack of opportunity or lack of willingness (or both). We cannot tell which reason is responsible for the outcome we observe.

Biprobit models with partial observability have two equations. The dependent variables are identical dichotomous variables, coded 1 if a MID occurs in a claim-dyad-year and 0 otherwise (MIDYR). Different covariates are included in each equation to capture the different underlying concepts: IMF decision vs. government decision for Vreeland, opportunity vs. willingness for Xiang, and for me, CLAIM DURATION vs. TRULY PEACEFUL. To obtain the first in a discrete-time setup, I add a logged version of CLAIM DURATION to the right-hand side. This produces a survival model with a log-normal hazard. Instruments further distinguish between the

[95] Appendix C contains the empirical proof of this assertion. This approach is still lacking in some respects, which I also discuss in Appendix C. Nonetheless, biprobit with partial observability still is an improvement over certain elements of Svolik's estimator.

explanations for whether and when a dispute militarizes. I discuss these more in the next subsection.

In biprobits, a LR test also reveals whether a split population is present. ρ is the parameter of interest. If ρ is equal to zero, then there is no correlation between the error terms for the equations. A split population does not exist, and the LR test will be insignificant. If the unobservables of each equation are correlated, then ρ will not be equal to zero, and the LR test will come back statistically significant. This would be consistent with an anticipatory dynamic.

4.2.2.2 Specification

I shift to a discrete-time setup for the split-population analyses. The unit of analysis is the claim-dyad-year; each row represents a year in which a claim is ongoing between two states. Covariate values are recorded for that year. I estimate the proposed models on separate samples of highly salient and moderately salient disputes. I expect that the split-population test statistic will be significant in the moderately salient sample, indicating the presence of an anticipatory dynamic. I am agnostic as to the test statistic's significance in the highly salient sample, which I discuss further in Ch. 6.

Table 4.8 shows the cross-section of claim-dyads that could enter the split-population sample, broken down by issue salience and the occurrence of militarization. There are 99 claim-dyads in the highly salient sample, which yields 2228 claim-dyad-years. There are 214 claim-dyads in the moderately salient sample, which yields 3455 claim-dyad-years. The different dataset structure increases the number of claim-dyads that enter the split-population sample, relative to the SEM sample. This is because the SEM's continuous-time setup required that there were no missing data for the year in which (a) CLAIM DURATION began and (b) MID DURATION began. The discrete-time analysis does not have this limitation because it contains data for each year of a dispute, not just the years in which CLAIM DURATION and MID duration began.

TABLE 4.8. Crosstab of Militarization and Overall Salience

SPLIT POPULATION SAMPLE

	HIGH O.S. *Territory*	MODERATE O.S. *Maritime/River*	*Total*
MID	42	50	92
Peaceful	57	164	221
Total	99	214	313

NOTE: Unit of analysis = claim-dyad.

For the Svolik estimator, the first dependent variable will be CLAIM SPELL. The reason for this will become clear over the next two chapters. Throughout this chapter, I have mostly referred to the first Svolik dependent variable as "CLAIM DURATION" to simplify matters. The second dependent variable is a dummy variable coded 1 if a dispute never militarizes and 0 otherwise. For the biprobit, the dependent variable in both equations is the same: a dummy coded 1 if the claim-dyad militarizes in year *t* and 0 otherwise. The dependent variables will nonetheless have different substantive interpretations based on the covariates that are included on the right-hand side. The first equation will be equivalent to CLAIM SPELL and the second equation will be equivalent to TRULY PEACEFUL, as I will now explain further.

Instruments are still important for my split population models. Svolik's model can be estimated off functional form, but good instruments make identification easier.[96] The biprobit requires instruments to be identified. Two of the four SEM instruments appear without

[96] I reestimate all of the main Svolik models without instruments (i.e., I include the same covariates in both equations and identify off functional form). I report these models as robustness checks in Ch. 6. The functional-form Svolik models are plagued by the same convergence problem when SETTMIL, the count of militarizations over the claim, is included as a control as biprobit. As a result, they are estimated without SETTMIL.

modification; ALLY3P and POWERRATIO are included as instruments in the CLAIM DURATION equation. A third SEM instrument, MLATCLAIM can be recoded to take advantage of the claim-dyad-year data structure. The new variable, MLATCLAIMYR, is coded 1 if multiple claims are ongoing over the issue in year *t* and 0 otherwise. The last SEM instrument, MLATMID, is unusable in the split-population analysis. Its coding is predicated on the observation being a claim-dyad-MID (or claim-dyad-MID-year, in this case). It has no equivalent for claim-dyad-years in which no MID occurs.

The split population control variables are essentially the same as the SEM control variables. Six of the seven SEM variables reappear: DEMOCRACY, INTERDEP, IGO, CONTIGUITY, MPDYAD, and LINKED. The seventh control, SETTMIL, is included in the main models with Svolik's estimator, but not in the biprobit models. Including SETTMIL causes convergence problems in biprobit's estimation procedure.

Table 4.9 displays summary statistics for the variables in the split population sample.

TABLE 4.9. Descriptive Statistics – Split Population Sample

	N	*Mean*	*St. Dev.*	*Min*	*Max*
Instruments					
Multilateral claim in *t*					
High	2228	0.129	0.336	0	1
Moderate	3455	0.370	0.483	0	1
Third party alliance					
High	2228	0.428	0.495	0	1
Moderate	3455	0.616	0.486	0	1
Power ratio					
High	2228	0.627	0.248	0.129	1
Moderate	3455	0.616	0.237	0.140	1
Controls					
Democracy (mean)					
High	2228	3.380	4.594	-9	10
Moderate	3455	4.400	5.389	-9	10
Interdependence (mean)					
High	2228	0.251	0.173	0.044	1.117
Moderate	3455	0.260	0.257	0.027	3.964
Shared IGO mshps.					
High	2228	26.092	17.874	0	93
Moderate	3455	35.762	17.820	0	101
Contiguity					
High	2228	0.648	0.478	0	1
Moderate	3455	0.645	0.479	0	1
Major power dyad?					
High	2228	0.500	0.500	0	1
Moderate	3455	0.551	0.497	0	1
Militarization count					
High	2228	0.859	2.089	0	17
Moderate	3455	0.459	1.200	0	11
Linked issue					
High	2228	0.411	0.492	0	1
Moderate	3455	0.272	0.445	0	1

4.3 CONCLUSION

Table 4.10 provides a succinct summary of the material discussed in this chapter by comparing it along several key dimensions. It also indicates the chapters to which each analysis corresponds. I now turn to estimating these models and reporting my findings.

TABLE 4.10. Overview of Empirical Models for Testing

	Ch. 5	*Ch. 6*	
Purpose	Investigate interplay between when a claim-dyad militarizes and militarization length	Investigate whether peaceful claim-dyads contain additional evidence of an anticipatory dynamic.	
Simple Research Question	Does CLAIM DURATION have an effect on MID DURATION?	Are all peaceful claim-dyads Truly Peaceful?	
Relevant Hypotheses	H3.0, H3.1, H3.2, H3.3, H3.4	H2.1	
Method	SEM	Svolik split pop.	biprobit, partial
Parameter(s) of interest	α_{ANT}, $\alpha_{\sim ANT}$	LR test statistic (χ^2)	ρ, LR test statistic (χ^2)
Hypo(s) supported if…	1. $\lvert\alpha_{\sim ANT}\rvert > \lvert\alpha_{ANT}\rvert$: H3.1, H3.2 • $\alpha_{\sim ANT} < 0$: H3.1 • $\alpha_{\sim ANT} > 0$: H3.2 2. $\lvert\alpha_{\sim ANT}\rvert < \lvert\alpha_{ANT}\rvert$: H3.3, H3.4 • $\alpha_{ANT} < 0$: H3.4 • $\alpha_{ANT} > 0$: H3.3 3. Item 1 holds for highly salient issues; Item 2, moderately salient: H3.0	Significant LR test ($\pi \neq 0$)	Significant LR test ($\rho \neq 0$)
		• Statistically significant LR test: indicative of anticip. dynamic • Key: statistical significance in moderately salient sample • Agnostic about significance in highly salient sample	
y_1	CLAIM DURATION	CLAIM SPELL	MIDYR (*CLAIM SPELL*)
y_2	MID DURATION	ENDMID	MIDYR (*TRULY PEACEFUL?*)
Instruments: y_1 equation	MLATCLAIM	MLATCLAIMYR	MLATCLAIMYR
Instruments: y_2 equation	MLATMID, ALLY3P, POWERRATIO	ALLY3P, POWERRATIO	ALLY3P, POWERRATIO
Common controls	DEMOCRACY, INTERDEP, IGO, CONTIGUITY, MPDYAD, SETTMIL, LINKED	DEMOCRACY, INTERDEP, IGO, CONTIGUITY, MPDYAD, SETTMIL, LINKED	DEMOCRACY, INTERDEP, IGO, CONTIGUITY, MPDYAD, LINKED
Unit of analysis (UoA)	claim-dyad-MID	claim-dyad-year	
N: High, Moderate Samples	81, 94	2228, 3455	
Cross-Tabs	Table 4.4, Table 4.6	Table 4.8	
Summary Statistics	Table 4.5	Table 4.9	
Log-Likelihood (Appendix C, Eq. #)	[12]	[1]	[2]

* The spatial domain is the same across all three columns (see Table 4.3). The basic temporal range is also the same: claim-dyad-years occurring between 1885 and 2000. The range has different implications depending on the unit of analysis.

5.0 EVALUATING DYNAMICS: MID DURATION

In this chapter, I investigate the relationship between issue salience and conflict dynamics using a simultaneous estimation model (SEM). The SEM specifies one equation per dynamic, which allows me to test for both dynamics in a unified framework. Specifically, I evaluate the relationship between the time elapsed from the start of a disputed issue-claim—"claim duration"—and conflict (MID) duration.

I find robust support for my argument. Disputes over highly salient issues have non-anticipatory dynamics. They are more prone to inaccurate beliefs about MID duration as more time passes during the claim-dyad. Moderately salient issues, on the other hand, are more prone to anticipatory dynamics. States tend to form accurate expectations about MID duration, which affects when a claim-dyad experiences militarization.

My findings have several implications. First, deviations from "rational expectations" are not idiosyncratic, as many current game-theoretic works argue. Empirical evidence that disputes over highly salient issues are most affected by a non-anticipatory dynamic suggests a systematic pattern, not idiosyncrasy. I also use the SEM to replicate the analysis of two recent articles examining MID duration. I show that failing to account for "claim duration" (broadly understood) produces biased and inaccurate estimates. Additionally, by drawing attention to the importance of claim duration, my argument speaks to scholars' current conceptualization of "time" (Beck, Katz, and Tucker 1998; Beck 2010; Carter and Signorino 2010a, 2010b; Licht

2011). This is potentially relevant to not only academic researchers, but policy makers seeking to mediate disagreements among or within states. The potential importance of "when" an event occurs is not discussed often in interstate conflict research, but it is frequently discussed in the literatures on historical institutionalism and path dependence. My empirical findings suggest that the non-anticipatory dynamic in play is also a path-dependent one. Not only do past occurrences matter for conflict duration, but the *order* of the occurrences matters.

Chapter 5 has four sections. I first provide descriptive statistics about CLAIM DURATION and MID DURATION. Next, I report and discuss the results of my main analysis. Third, I show the ramifications of my argument and estimation procedure by replicating the results from two previously published articles on MID DURATION. A brief summary of the chapter's findings and concluding remarks end the chapter.

5.1 DESCRIPTIVE STATISTICS

Before beginning the analysis, it is helpful to see the distribution of the data. Figure 5.1 shows the relationship between the two dependent variables, plotting CLAIM DURATION against MID DURATION. Each point represents a MID over a claim-dyad. The scatterplot provides some initial descriptive evidence broadly in line with my argument. First, MIDs over highly salient issues (shaded circles) appear to exhibit a distinct pattern from MIDs associated with moderately salient issues (all squares). The squares tend to cluster near the axes, whereas the circles have a bit more spacing from the *x*-axis. The cluster of moderately salient points in the upper-right quadrant is intriguing because the points seem to follow the pattern for highly salient issues. These dyadic MIDs are over river and maritime claims related to ongoing territorial claim-dyads.

Another interesting observation arises once we distinguish between moderately salient issues with a link to ongoing territorial disputes (shaded squares) and those with no link (hollow squares): the pattern of shaded squares is more similar to the pattern of shaded circles than the pattern of hollow squares. If, as I have argued, highly salient issues are prone to being defined in intangible ways, then moderately salient issues with "links" to highly salient issues may behave more like the latter. This is precisely what we see.

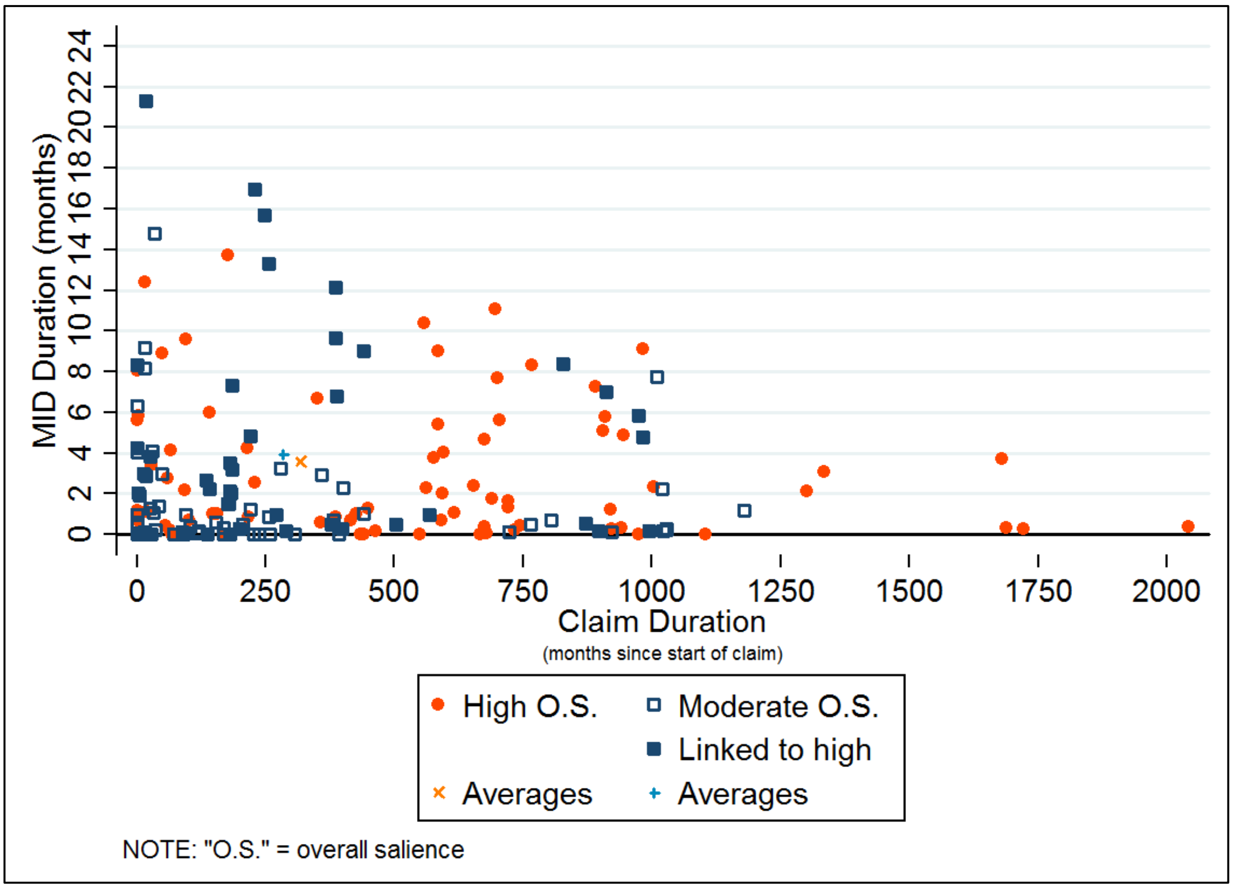


FIGURE 5.1. Scatterplot of CLAIM DURATION vs. MID DURATION

5.2 MAIN EMPIRICAL ANALYSIS

5.2.1 Principal Results

Table 5.1 contains the main results for the baseline specifications noted in Ch. 4. The shaded rows denote the parameters of interest for my hypotheses. The reported coefficients represent the *direct* effect of the covariates on each dependent variable (Paxton, Hipp, and Marquart-Pyatt 2011). The coefficients are expressed in log-duration times, as the SEM is a Weibull accelerated failure time model. Coefficients cannot be interpreted as substantive effects on *y*,[97] but signage and significance have the same meaning as usual. Variables that increase duration times will have positively signed coefficients, while variables that decrease duration times will have negatively signed coefficients. The α's are unique in that we can interpret them as elasticties (Gujarati 2002, 175–177). A 1 percent increase in MID DURATION will produce a α_{ANT} percent change in CLAIM DURATION; a 1 percent increase in CLAIM DURATION will produce a $\alpha_{\sim ANT}$ percent change in MID DURATION.

I begin by analyzing the sample of issues with high overall salience. I argued that conflicts over such issues should have a predominantly non-anticipatory dynamic, which will be indicated by a statistically significant $\alpha_{\sim ANT}$ parameter. Claim duration should directly affect MID duration ($\alpha_{\sim ANT}$), even after controlling for the potential effect of expectations about MID duration on claim duration (represented by α_{ANT}). Should α_{ANT} also be statistically significant, then predominance suggests that $\alpha_{\sim ANT}$'s magnitude should be larger and statistically different from that of α_{ANT} (i.e.: $|\alpha_{\sim ANT}| > |\alpha_{ANT}|$). We can compare the magnitudes in this way because

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[97] The coefficients represent the substantive effect of *x* on ln(*y*). See Appendix C.3.

CLAIM DURATION and MID DURATION are measured using the same metric (time, in months). An issue indivisibility mechanism corresponds with a positively signed $\alpha_{\sim\text{ANT}}$, while a time pressure mechanism corresponds with a negatively signed $\alpha_{\sim\text{ANT}}$.

Model 1 contains the main estimates for the highly salient sample. The results are consistent with my argument. $\alpha_{\sim\text{ANT}}$ is highly significant and positive, suggesting that CLAIM DURATION affects MID DURATION. The positive sign is consistent with an issue indivisibility mechanism (Hypothesis 3.2). Militarized conflicts occurring later in a disputed issue (relative to the claim-dyad's start) will last longer than earlier-occurring conflicts. Specifically, a 1 percent increase in CLAIM DURATION produces a 0.29 percent increase in MID DURATION. However, α_{ANT} is also weakly significant. This suggests that, in addition to *affecting* MID DURATION, CLAIM DURATION is *affected by* MID DURATION. A negative α_{ANT} suggests a strategic prevention mechanism (Hypothesis 3.4). As the expected duration of a military conflict increases, the militarization will occur earlier in a claim-dyad. A 1 percent increase in MID DURATION produces a 0.077 percent decrease in CLAIM DURATION.

Since both α's are significant, I check for predominance by comparing the magnitude of the two parameters using a Wald test. The *p*-values from this Wald test are reported in Table 5.1, above the *N*. In line with my argument, I find that a non-anticipatory dynamic is predominant for militarizations over highly salient issues: $|\alpha_{\sim\text{ANT}}|$ is significantly larger than $|\alpha_{\text{ANT}}|$ (p = 0.047, one-tailed). As a robustness check, I remove the insignificant variables and reestimate the model (reported as Model 2).[98] These results should be interpreted with some caution, as they treat some variables as unofficial instruments by excluding them from one equation. Nonetheless, the main results from Model 1 continue to hold. My broad supposition

[98] I use a weak definition of insignificance: the variable fails to obtain one-tailed significance at the 0.10 level.

that highly salient issues will exhibit predominantly non-anticipatory dynamics is supported (Hypothesis 3.0).

Next, I analyze the sample of issues with moderate overall salience. I expect that an anticipatory dynamic will be predominant, indicated by the statistical significance of α_{ANT}. Model 3 contains the main results for this sample. The results again are in line with my expectations, though the evidence is weaker. α_{ANT} is weakly significant and negative, supportive of Hypothesis 3.4 (strategic prevention). A 1 percent increase in MID DURATION produces a 0.13 percent decrease in CLAIM DURATION. I find no empirical support for Hypothesis 3.3 (strategic delay).[99] $\alpha_{\sim\mathrm{ANT}}$ is statistically insignificant, which suggests that, after controlling for the effects of expectations, CLAIM DURATION has no influence on the length of MIDs over maritime or river issues. Model 4 shows that the results hold when the insignificant variables are removed from Model 3. I conclude that my main hypothesis regarding overall salience (Hypothesis 3.0) is supported. As the overall salience moves from moderate to high, dynamic-type predominance switches from an anticipatory dynamic to a non-anticipatory dynamic.

[99] This is likely the product of excluding peaceful disputes from the analysis, as the SEM cannot accommodate these disputes. I explore the possibility in the next chapter.

TABLE 5.1. Main Results: Simultaneous Effect of Claim Duration and MID Duration

	Model 1 *High*	Model 2 *High*	Model 3 *Moderate*	Model 4 *Moderate*	Model 5 *Pooled*
<u>Claim Duration</u>					
Multilateral claim†	-0.753***	-0.753***	-0.705**	-0.671**	-0.596***
MLATCLAIM	(0.206)	(0.193)	(0.347)	(0.328)	(0.203)
Democracy (mean)	0.007		-0.049	-0.055*	-0.018
DEMOCRACY	(0.025)		(0.034)	(0.031)	(0.024)
Interdependence (mean)	-1.244	-1.142	-0.217		-0.285
INTERDEP	(0.950)	(0.917)	(1.301)		(0.901)
Shared IGO mshps.	0.009	0.009	-0.005		0.016**
IGO	(0.006)	(0.006)	(0.012)		(0.006)
Contiguity	-2.046***	-2.125***	1.816***	1.822***	0.827*
CONTIGUITY	(0.621)	(0.610)	(0.531)	(0.532)	(0.424)
Major power dyad?	-0.865	-0.929	0.731	0.815	0.995**
MPDYAD	(0.581)	(0.569)	(0.562)	(0.512)	(0.431)
Militarization count	0.073***	0.067***	0.301***	0.287***	0.090***
SETTMIL	(0.023)	(0.022)	(0.096)	(0.080)	(0.031)
Linked issue	0.095		-0.542	-0.506	0.202
LINKED	(0.199)		(0.391)	(0.383)	(0.217)
Constant	7.781***	7.925***	3.833***	3.611***	3.945***
	(0.828)	(0.798)	(0.824)	(0.585)	(0.610)
α_{ANT} (MID Duration)	-0.077*	-0.067*	-0.130*	-0.130*	-0.057
	(0.056)	(0.049)	(0.093)	(0.089)	(0.059)
λ_1^{-1}	1.397***	1.405***	0.714***	0.712***	0.801***
	(0.135)	(0.134)	(0.062)	(0.061)	(0.050)

(continued on next page)

	Model 1 *High*	Model 2 *High*	Model 3 *Moderate*	Model 4 *Moderate*	Model 5 *Pooled*
(continued from previous page)					
MID Duration					
Multilateral MID†	-1.220	-0.352	-1.414	-1.255	-0.549
MLATMID	(0.880)	(0.703)	(0.979)	(0.951)	(0.658)
Third party alliance†	0.276		0.119		0.136
3PALLY	(0.650)		(0.651)		(0.414)
Power ratio†	-2.272	-2.264*	-1.112		0.137
POWERRATIO	(1.401)	(1.372)	(1.369)		(0.946)
Democracy (mean)	-0.141***	-0.117***	-0.023		-0.041
DEMOCRACY	(0.047)	(0.035)	(0.047)		(0.031)
Interdependence (mean)	4.564***	4.028***	4.129**	3.926**	2.500**
INTERDEP	(1.493)	(1.309)	(1.724)	(1.650)	(1.201)
Shared IGO mshps.	-0.006		-0.036*	-0.045***	-0.019
IGO	(0.015)		(0.021)	(0.015)	(0.013)
Contiguity	1.943	0.662	0.066		0.298
CONTIGUITY	(1.534)	(0.591)	(0.600)		(0.592)
Major power dyad?	1.221		-1.359*	-1.127**	-0.482
MPDYAD	(1.179)		(0.788)	(0.508)	(0.566)
Militarization count	-0.038		0.217**	0.245***	0.112***
SETTMIL	(0.061)		(0.103)	(0.087)	(0.040)
Linked issue	-1.712***	-1.594***	0.824	0.779	0.065
LINKED	(0.425)	(0.361)	(0.518)	(0.493)	(0.293)
Constant	-0.296	1.114	1.854	1.337	0.827
	(1.987)	(1.416)	(1.427)	(0.853)	(0.970)
$\alpha_{\sim ANT}$ (Claim Duration)	0.291**	0.214**	-0.101	-0.092	-0.096
	(0.143)	(0.097)	(0.095)	(0.084)	(0.081)
λ_2^{-1}	0.757***	0.752***	0.639***	0.631***	0.618***
	(0.069)	(0.068)	(0.053)	(0.052)	(0.037)
$\lvert\alpha_{ANT}\rvert = \lvert\alpha_{\sim ANT}\rvert$ (p, $Wald_{1T}$)	0.046**	0.058*	0.432	0.401	0.378
N	81	81	94	94	175
Log-Likelihood	-258.112	-259.543	-379.228	-380.020	-687.822

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables except α's (one-tailed); † = instruments.
λ^{-1}: inverse of Weibull shape parameter. Unclustered standard errors reported in parentheses.
Model 5 also includes a control for territorial issues in both equations (statistically insignificant; not reported)

To get a better sense of the substantive effects, I compute the expected value for each dependent variable via simulation, akin to the popular Clarify package in Stata (King, Tomz, and Wittenberg 2000; Tomz, Wittenberg, and King 2001). Ideally, we would choose different values of CLAIM DURATION to compute its effect on MID DURATION (or vice versa). However, I cannot directly manipulate the value of CLAIM DURATION (or MID DURATION). Both variables are endogenous variables in the SEM.

Instead, I apply a shock to the idiosyncratic error term of CLAIM DURATION's equation (or MID DURATION's equation). The idiosyncratic errors (ϵ) represent the exogenous, random factors that influence the y's. Manipulating the value of ϵ_1, the idiosyncratic error for the first equation, will affect the value of y_1, CLAIM DURATION. However, manipulating the value of ϵ_1 will also influence the value of y_2, MID DURATION, because of the SEM's nonrecursiveness. I set SETTMIL and the binary control variables to their median values and all other control variables to their means for all the calculations. I use the reduced-form of the SEM to compute the effect of introducing a one-unit shock to an equation's idiosyncratic error on the expected value of CLAIM DURATION (y_1) and MID DURATION (y_2).[100]

TABLE 5.2. Exogenous Error Shock: Highly Salient Sample

	(1) *No shocks*	(2) ϵ_1 *shocked*
CLAIM DURATION (y_1)	552.123	2221.224
MID DURATION (y_2)	1.483	2.277

Durations measured in months. Simulations based on Model 1 (1000 replications), N = 81. Control variables: SETTMIL, all binary variables = sample median, all others = sample mean

[100] The reduced-form equations are displayed in Appendix C.3. The appendix also contains additional details about the way these calculations are made.

Table 5.2 displays the expected durations for the highly salient sample, based on Model 1, under two scenarios. In disputes over highly salient issues, non-anticipation is the predominant dynamic, indicated by the statistical significance of $\alpha_{\sim\text{ANT}}$ in Model 1 and the Wald test for predominance. The results specifically suggest that an exogenous shock to ϵ_1 should lengthen CLAIM DURATION, and thus yield lengthier MIDs. An issue indivisibility mechanism would be consistent with this signage. The expected value of MID DURATION is therefore the value of interest for highly salient issues (shaded row).

In the first scenario, neither error term is shocked. With the control variables at the previously mentioned values, disputes over territorial issues last 552.1 months before militarizing and the subsequent MIDs last 1.5 months when no shocks are introduced. The second scenario introduces a one-unit shock to ϵ_1, the error term of CLAIM DURATION's equation. If time has a pernicious effect, the expected value of MID DURATION should appreciably increase if we shock ϵ_1. The shock lengthens the value of CLAIM DURATION, CLAIM DURATION is a regressor in MID DURATION's equation, and lengthier CLAIM DURATIONS lead to longer militarization lengths (indicated by a positively signed $\alpha_{\sim\text{ANT}}$). This is precisely what happens in the second scenario. MIDs last over 50 percent longer than they did in Scenario 1, with an expected value of 2.2 months in Scenario 2. The increase in value nicely showcases the positive sign on $\alpha_{\sim\text{ANT}}$ in Model 1.

TABLE 5.3. Exogenous Error Shock: Moderately Salient Sample

	(1) *No shocks*	(2) *ϵ_2 shocked*
CLAIM DURATION (y_1)	343.259	317.299
MID DURATION (y_2)	1.751	3.346

Durations measured in months. Simulations based on Model 3 (1000 replications), N = 94. Control variables: SETTMIL, all binary variables = sample median, all others = sample mean

Table 5.3 displays two different scenarios for the moderately salient sample. The calculations are based on Model 3. In disputes over moderately salient issues, anticipation is the predominant dynamic, indicated by the statistical significance of α_{ANT}. Anticipation suggests that expectations about MID DURATION should affect CLAIM DURATION. Specifically, the negative sign on α_{ANT} suggests that an exogenous shock to ϵ_2 (which lengthens MID DURATION) will yield shorter CLAIM DURATIONS. A strategic prevention story is consistent with this signage. The expected value of CLAIM DURATION is therefore the value of interest for moderately salient issues (shaded row).

Scenario 1 computes the expected durations for each dependent variable in the absence of shocks. Like the highly salient simulations, the simulations for the moderately salient sample set the control variables equal to either their median values (SETTMIL and all binary variables) or their mean values (all other controls). In Scenario 1, moderately salient claims last about 354.6 months. The subsequent MIDs are 1.9 months in length. Scenario 2 introduces a shock to ϵ_2. The shock will increase the value of MID DURATION, which in turn should decrease the value of CLAIM DURATION. The simulation results bear this out. The expected value of CLAIM DURATION decreases in value to 320.2 months, down from 354.6 months in Scenario 1 (9.7 percent reduction). The reduction in value showcases the negative sign on α_{ANT} in Model 3.

5.2.2 Robustness Checks

Table 5.4 contains selected additional robustness checks for the main results.[101] Model 6 and Model 7 check the strength of the instrument set. For the most part, the instruments are good predictors of the dependent variables. However, Model 6 and Model 7 show that the three instruments for MID DURATION vary in statistical significance. Only ALLY3P is significant in the highly salient sample, while MLATMID and POWERRATIO are only significant in the moderately salient sample. Rerunning the models with only the significant instruments does not affect the results, shown by Models 8 and 9. The different levels of significance is unsurprising, given that some of the instrument diagnostics performed in Chapter 4 indicated the weakness of the instrument sets (see fn. 87). More positively, the same diagnostics also indicated that the instruments generally met the exogeneity assumption.

In a way, the current coding of CLAIM DURATION is a conservative test for an issue indivisibility mechanism. CLAIM DURATION records the amount of time between the start of a claim-dyad over an issue and the onset of a dyadic MID over the claim. However, some issues experience multiple claims *between the same two states*. In Chapter 4, we saw that the Karelia/Petsamo dispute contained five claim-dyads, but all five claim-dyads involved the same two states, Finland and Russia. I have argued that, over time, a disputed *issue* (not a *claim*, necessarily) between states may develop an intangible element. This suggests an alternative coding that uses the start date from the *first* dyadic claim among all the dyad's claims (e.g., 1918 for all five Karelia/Petsamo claims between RUS-FIN, vs. 1918, 1938, 1941, 1941, and 1945).

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[101] Many other checks are reported and discussed in Appendix D. Details about each model's specification are provided in the interpretation key underneath Table D.1.

TABLE 5.4. Basic Robustness Checks for Table 5.1

	Model 6 *High* SEM	Model 7 *Moderate* SEM	Model 8 *High* SEM	Model 9 *Moderate* SEM	Model 10 *High* DV_1 = dyad start
Claim Duration					
Multilateral claim[†] MLATCLAIM	-1.163*** (0.203)	-0.543 (0.340)	-0.751*** (0.205)	-0.603* (0.324)	-0.677*** (0.226)
Democracy (mean) DEMOCRACY			0.007 (0.025)	0.008 (0.034)	0.008 (0.021)
Interdependence (mean) INTERDEP			-1.268 (0.950)	-0.776 (1.196)	-2.660*** (0.807)
Shared IGO mshps. IGO			0.009 (0.006)	-0.045*** (0.011)	0.000 (0.007)
Contiguity CONTIGUITY			-2.057*** (0.620)	1.075** (0.443)	-1.976*** (0.567)
Major power dyad? MPDYAD			-0.875 (0.580)	0.296 (0.462)	-0.714 (0.562)
Militarization count SETTMIL			0.072*** (0.023)	-0.015 (0.069)	0.048*** (0.015)
Linked issue LINKED			0.101 (0.199)	-0.460 (0.356)	0.160 (0.221)
Constant	6.648*** (0.133)	5.638*** (0.227)	7.797*** (0.827)	5.438*** (0.731)	8.479*** (0.725)
α_{ANT} (MID Duration)	-0.059 (0.055)	-0.017 (0.097)	-0.071 (0.056)	-0.104* (0.081)	-0.034 (0.045)
λ_1^{-1}	1.120*** (0.107)	0.618*** (0.054)	1.400*** (0.134)	0.789*** (0.067)	1.643*** (0.156)

(continued on next page)

	Model 6 *High* SEM	Model 7 *Moderate* SEM	Model 8 *High* SEM	Model 9 *Moderate* SEM	Model 10 *High* DV_1 = dyad start
(continued from previous page)					
<u>MID Duration</u>					
Multilateral MID†	-0.236	-1.918**		-1.195	-1.044
MLATMID	(0.792)	(0.942)		(0.983)	(0.821)
Third party alliance†	-0.723**	-0.162	0.217		0.326
3PALLY	(0.363)	(0.532)	(0.663)		(0.632)
Power ratio†	1.717	1.483*		-1.224	-2.276
POWERRATIO	(1.357)	(0.819)		(1.124)	(1.443)
Democracy (mean)			-0.120**	-0.011	-0.137***
DEMOCRACY			(0.047)	(0.044)	(0.042)
Interdependence (mean)			4.862***	4.305**	4.628***
INTERDEP			(1.613)	(1.676)	(1.606)
Shared IGO mshps.			-0.008	-0.041**	-0.005
IGO			(0.016)	(0.017)	(0.016)
Contiguity			0.936	0.018	1.732
CONTIGUITY			(1.309)	(0.600)	(1.460)
Major power dyad?			0.500	-1.475**	1.284
MPDYAD			(1.048)	(0.710)	(1.174)
Militarization count			-0.024	0.180*	-0.015
SETTMIL			(0.061)	(0.095)	(0.039)
Linked issue			-1.385***	0.885*	-1.598***
LINKED			(0.395)	(0.528)	(0.537)
Constant	-0.435	0.395	-1.292	2.065*	0.023
	(1.211)	(0.751)	(1.598)	(1.146)	(2.056)
$\alpha_{\sim ANT}$ (Claim Duration)	0.067	-0.139*	0.257**	-0.071	0.202*
	(0.114)	(0.101)	(0.148)	(0.091)	(0.134)
λ_2^{-1}	0.651***	0.547***	0.740***	0.632***	0.753***
	(0.059)	(0.044)	(0.068)	(0.052)	(0.068)
$\|\alpha_{ANT}\| = \|\alpha_{\sim ANT}\|$ (p, $Wald_{1T}$)	0.470	0.246	0.076*	0.412	0.087*
N	81	94	81	94	81
Log-Likelihood	-290.906	-405.972	-260.151	-367.843	-247.613

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables except α's (one-tailed); † = instruments
λ^{-1}: inverse of Weibull shape parameter. Unclustered standard errors reported in parentheses.

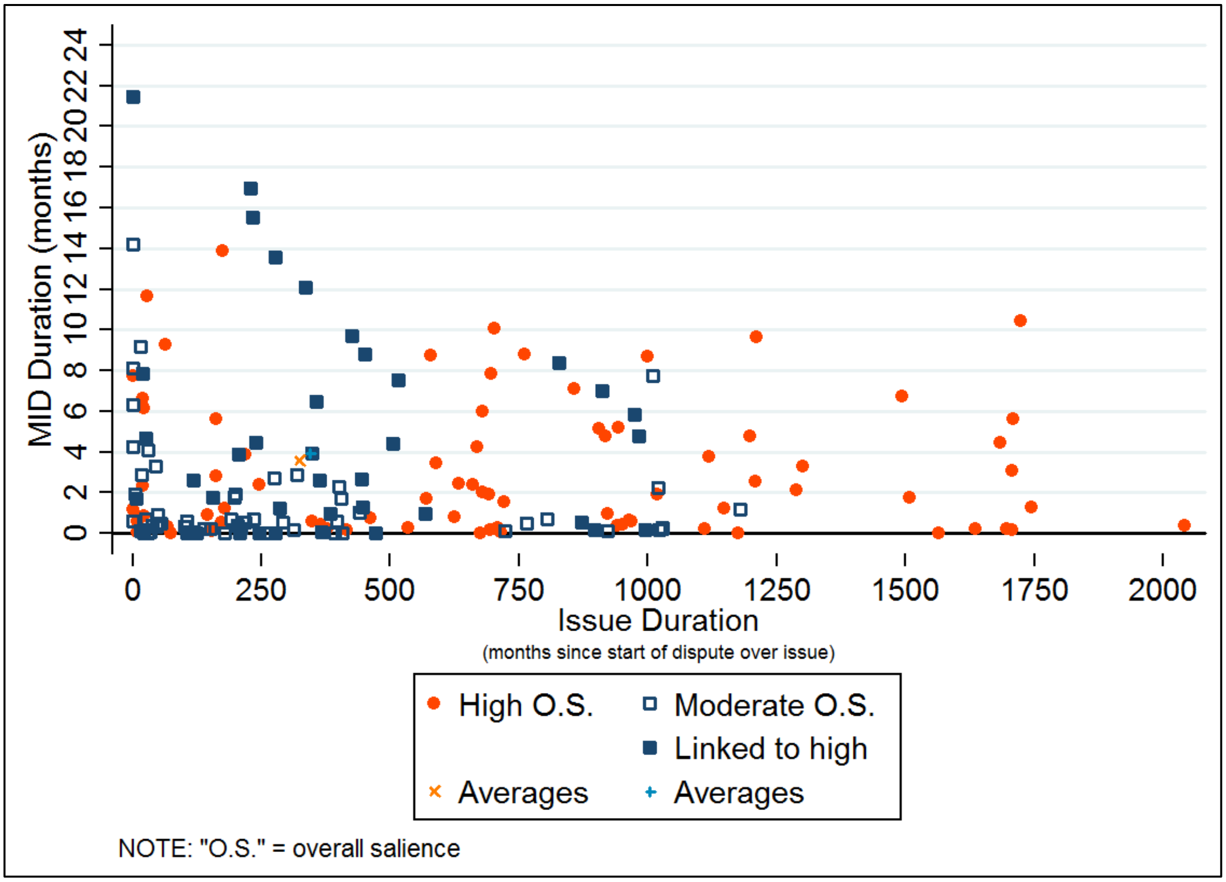

FIGURE 5.2. Scatterplot of ISSUE DURATION vs. MID DURATION

The difference between the dyad-based coding of ISSUE DURATION and the current claim-based of CLAIM DURATION is evident by comparing Figure 5.2 (dyad) and Figure 5.1 (claim). In Figure 5.2, the mean length of ISSUE DURATION is (unsurprisingly) higher. We are effectively checking larger blocks of time for potential non-anticipatory effects. To be consistent with issue indivisibility, the alternative coding should return results closer to dynamic ideal-types in the highly salient sample. $\alpha_{\sim ANT}$ should be positively signed and significant, and α_{ANT} should be insignificant.

The last model in Table 5.4 (Model 10) uses ISSUE DURATION as the first dependent variable for the sample of highly salient issues. As suspected, evidence of non-anticipation becomes much stronger. The evidence of a significant non-anticipatory effect remains intact, but there is no longer any evidence of a significant anticipatory effect. The model reflects the ideal-type predictions; no tests for dynamic predominance are needed.

Moving to other validity concerns, the reported results could also be an artifact of the overall salience categorization scheme. One criticism of the categorization relates to the possibility of variation *within* the overall salience categories. The supportive evidence of my argument could be the product of this within-category heterogeneity.

Fortunately, we can investigate this possibility. The ICOW data contain issue-specific salience variables, which are coded as an index ranging from 0-12. The components of the index vary by issue type (displayed in Table 5.5). If we add the index variable as a control for within-category salience, the main results should be unaffected.

Table 5.6 reports the models that have within-category salience as a control variable.[102] The two reported models use CLAIM DURATION as the first dependent variable, as they are based on the main specification from Table 5.1 (also reproduced for reference as shaded columns in Table 5.6). The main results do not change with the addition of within-category salience in the highly salient sample (Model 11). $\alpha_{\sim ANT}$ remains positive and significant, while α_{ANT} is insignificant. The main results also stay the same in the moderately salient sample (Model 12), with one caveat. As expected, α_{ANT} stays negative and weakly significant. However, counter to expectations, $\alpha_{\sim ANT}$ is *also* negative and weakly significant. As CLAIM DURATION increases in length, shorter MIDs result. The evidence is consistent with a time pressure mechanism (Hypothesis 3.1). The Wald test also shows that α_{ANT} and $\alpha_{\sim ANT}$ are not statistically distinguishable from one another. I discuss the curious nature of these results in a moment.

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[102] Since the index's composition differs by issue, it would be best to also run the analysis on separate samples of river and maritime issues. However, there are not enough river observations to run the maximum likelihood-based SEM (river $N = 16$).

TABLE 5.5. Within-Category Salience Indices

	Territory		*Maritime*
+2	Natural Resources?	+2	HOMELAND TERRITORY
		1	Per state: associated with homeland territory?
+2	Strategic Location?	+2	Strategic Location?
+2	Any large cities? (population > 100k)	+2	Fish stock?
+2	HOMELAND	+2	Migratory fish stock?
1	Per state: Claimed as homeland territory (vs. dependent)		
+2	IDENTITY	+2	Oil?
1	Per state: Identity basis for claim (e.g., ethnic, religious)		
+2	SOVEREIGNTY	+2	Other resources? (i.e., not fish, oil)
1	Per state: Exercised sovereignty over claim in past 200 years?		

	River
+2	HOMELAND TERRITORY
1	Per state: Runs through homeland territory?
+2	NAVIGATION
0.5	Per state: Local transport only
1	Per state: Nat’l, int’l transport
+2	POPULATED AREAS
0.5	Per state: Only towns/villages
1	Per state: Major cities
+2	RESOURCE EXTRACTION
0.5	Per state: For local goods only
1	Per state: For nat’l, int’l goods
+2	HYDROELECTRIC POWER
0.5	Per state: Local power only
1	Per state: Nat’l/int’l power
+2	IRRIGATION USE
0.5	Per state: Local use only
1	Per state: Nat’l/int’l use

Source: ICOW v.1.1 documentation (in particular, Hensel and Mitchell 2007, 16–22).

TABLE 5.6. Robustness: Within-Category Salience

	Model 11 *High*	*Table 5.1, Model 1*	Model 12 *Moderate*	*Table 5.1, Model 3*
Claim Duration				
Multilateral claim†	-1.138***	-0.753***	-0.099	-0.705**
MLATCLAIM	(0.211)	(0.206)	(0.364)	(0.347)
Democracy (mean)	0.003	0.007	-0.068**	-0.049
DEMOCRACY	(0.023)	(0.025)	(0.034)	(0.034)
Interdependence (mean)	-0.280	-1.244	-0.556	-0.217
INTERDEP	(0.800)	(0.950)	(1.165)	(1.301)
Shared IGO mshps.	0.024***	0.009	-0.003	-0.005
IGO	(0.007)	(0.006)	(0.011)	(0.012)
Contiguity	-0.853	-2.046***	1.615***	1.816***
CONTIGUITY	(0.638)	(0.621)	(0.462)	(0.531)
Major power dyad?	0.083	-0.865	0.885*	0.731
MPDYAD	(0.587)	(0.581)	(0.506)	(0.562)
Militarization count	0.039*	0.073***	0.240***	0.301***
SETTMIL	(0.022)	(0.023)	(0.091)	(0.096)
Linked issue	0.249	0.095	-1.035***	-0.542
LINKED	(0.171)	(0.199)	(0.368)	(0.391)
Within-cat. salience index	0.234***		0.338***	
	(0.061)		(0.084)	
Constant	4.487***	7.781***	1.395	3.833***
	(1.135)	(0.828)	(0.957)	(0.824)
α_{ANT} (MID Duration)	-0.052	-0.077*	-0.129*	-0.130*
	(0.053)	(0.056)	(0.089)	(0.093)
λ_1^{-1}	1.524***	1.397***	0.771***	0.714***
	(0.146)	(0.135)	(0.067)	(0.062)

(continued on next page)

	Model 11 *High*	*Table 5.1*, *Model 1*	Model 12 *Moderate*	*Table 5.1*, *Model 3*
		(continued from previous page)		
MID Duration				
Multilateral MID†	-1.053	-1.220	-1.471	-1.414
MLATMID	(0.893)	(0.880)	(0.950)	(0.979)
Third party alliance†	0.235	0.276	0.023	0.119
3PALLY	(0.664)	(0.650)	(0.641)	(0.651)
Power ratio†	-2.521*	-2.272	-0.486	-1.112
POWERRATIO	(1.513)	(1.401)	(1.378)	(1.369)
Democracy (mean)	-0.128***	-0.141***	-0.024	-0.023
DEMOCRACY	(0.049)	(0.047)	(0.046)	(0.047)
Interdependence (mean)	4.504***	4.564***	4.632***	4.129**
INTERDEP	(1.514)	(1.493)	(1.664)	(1.724)
Shared IGO mshps.	-0.007	-0.006	-0.051***	-0.036*
IGO	(0.015)	(0.015)	(0.020)	(0.021)
Contiguity	1.567	1.943	0.071	0.066
CONTIGUITY	(1.613)	(1.534)	(0.584)	(0.600)
Major power dyad?	0.850	1.221	-1.143	-1.359*
MPDYAD	(1.419)	(1.179)	(0.749)	(0.788)
Militarization count	-0.025	-0.038	0.234**	0.217**
SETTMIL	(0.060)	(0.061)	(0.099)	(0.103)
Linked issue	-1.785***	-1.712***	0.349	0.824
LINKED	(0.503)	(0.425)	(0.555)	(0.518)
Within-cat. salience index	-0.072		0.203**	
	(0.163)		(0.094)	
Constant	0.779	-0.259	0.694	1.753
	(2.751)	(1.831)	(1.474)	(1.304)
$\alpha_{\sim ANT}$ (Claim Duration)	0.300*	0.287**	-0.152*	-0.095
	(0.184)	(0.131)	(0.099)	(0.089)
λ_2^{-1}	0.759***	0.827***	0.663***	0.705***
	(0.069)	(0.074)	(0.055)	(0.057)
$\lvert\alpha_{ANT}\rvert = \lvert\alpha_{\sim ANT}\rvert$ (p, Wald$_{1T}$)	0.063	0.047***	0.446	0.378
N	81	81	94	94
Log-Likelihood	-251.353	-249.780	-369.575	-368.769

$*$ = $p \leq 0.10$, $**$ = $p \leq 0.05$, $***$ = $p \leq 0.01$, two-tailed for all variables except α's (one-tailed)
† = instruments; λ^{-1}: inverse of Weibull shape parameter. Unclustered SEs reported in parentheses.

Looking at the coefficients for within-category salience in Table 5.6, we first see that higher within-category salience produces lengthier CLAIM DURATIONS in both overall salience categories. This is indicated by the positive and significant coefficient in the CLAIM DURATION equation. Generalizing the result, it is in line with the current prevailing wisdom: the more important the issue, the longer it will last. In the MID DURATION equation, within-category salience interestingly has a different effect in each sample. For issues with high overall salience, higher levels of within-category salience have no effect on MID DURATION (Model 11). Contrast this with the coefficient in the moderately salient sample. Within-category salience is significant and positively signed, indicating that MIDs last longer when the issue has higher levels of within-category salience.

On the whole, Models 11 and 12 show that the main results are robust to controlling for within-category salience. The evidence also suggests that the overall salience categories are broadly homogenous, providing support for the continued use of the categorization scheme. Controlling for within-category variation does, however, provide us with additional insight into the factors that affect CLAIM DURATION and MID DURATION.

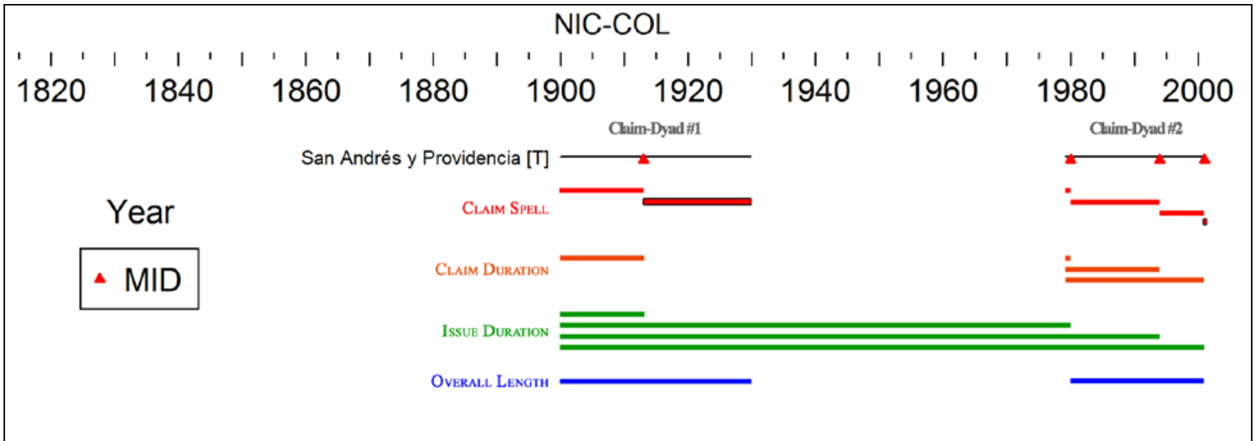
5.2.3 Reflecting upon the Curious Moderately Salient Results

I now return to the curious results from the moderately salient sample. For the within-category salience specification, α_{ANT} was weakly significant, providing some support for my hypotheses. However, counter to my hypotheses, $\alpha_{\sim ANT}$ also became weakly significant, and its magnitude was not significantly smaller than α_{ANT}. Contrast the weak support for my hypotheses regarding moderately salient issues with the strong and robust support I find for my hypotheses regarding highly salient issues. It gives rise to a larger question: why is there only weak evidence of an anticipatory dynamic in moderately salient issues, while there is strong evidence of non-anticipation in highly salient issues? Is this reflective of the true relationship between dynamic types and issue salience, or is something else at work?

There are a few reasons why these differences might be the product of statistical artifact, not substantive truth. One possibility involves censored observations. Claim-dyads that never militarize may be consistent with an anticipatory dynamic, but these observations never enter the SEM sample. The SEM analysis may be suffering from a sample selection problem. This is the main concern of the next chapter.

However, another possible reason relates to the dependent variable coding. I have already discussed how the effects stemming from non-anticipation, particularly an issue indivisibility mechanism, take a long time to visibly manifest. That is, the time horizon is long. This rationale formed the basis for an earlier robustness check involving ISSUE DURATION. In my discussion so far, though, I have implicitly treated the time horizon for anticipation mechanisms as equivalent to the non-anticipation mechanisms. There is reason to believe that this may not be the case. In extant work on anticipation, the effects of such behavior appear fairly quickly. These short time horizons for anticipatory mechanisms, in fact, give rise to one of the major criticisms of game-theoretic work: it tends to be too myopic (e.g., Pierson 2004, 60–62, 99–100). My anticipatory mechanisms are representative of extant work, implying that the effects of an anticipatory dynamic may also manifest more quickly. We may see weak evidence of an anticipatory dynamic simply because the time horizon implied by the CLAIM DURATION variable is too long. The shorter-term effects from anticipation are undetectable.

An easy way to check is to use a CLAIM SPELL coding for the first dependent variable.[103] Whereas CLAIM DURATION relies on a total-time coding formulation, CLAIM SPELL relies on a gap-time formulation. CLAIM SPELL records the number of months that pass between the initiation of a claim-dyad and the start of a first MID over that claim. Importantly, the variable resets to zero and begins counting again for subsequent MIDs if the dispute is not resolved by the first MID.



Observations containing the CLAIM SPELLS outlined in black enter the split population sample only (Ch. 6).

FIGURE 5.3. Illustration of Coding for Various y_1s
(Time Elapsed Variables Related to the Disputed Issue)

Figure 5.3 uses Nicaragua and Colombia's territorial dispute over San Andrés and Providencia to visually depict the differences between a CLAIM SPELL and CLAIM DURATION coding, as well as the difference between other codings that I have employed for y_1. Nicaragua and Colombia's dispute contains two claim-dyads over San Andrés and Providencia. The horizontal lines immediately underneath the calendar year timeline represent the years in which each claim-dyad was active (e.g., 1900-1930 for the first claim-dyad). These lines correspond to a variable that counted the "overall length" of a claim-dyad, which I display at the bottom of the figure for reference. Triangles are plotted along the uppermost horizontal lines for the years in which a MID began (e.g., for the first claim-dyad, a MID began in 1913; it experienced no other MIDs).

[103] See fn. 76.

The figure's construction is based on the SEM dataset's claim-dyad-MID unit of analysis. The first claim-dyad would have one observation in the SEM dataset, as it experienced one MID. The second-claim dyad would have three observations, corresponding with the claim-dyad's three MIDs.

A CLAIM SPELL coding begins counting time periods at the start of each claim-dyad over a given issue. It resets to zero and begins counting anew at the end of every militarization. For an example, take the second claim-dyad in the figure. Each claim-spell line corresponds with an observation in the dataset. The first claim-spell line corresponds with the first observation, in which CLAIM SPELL counts the amount of time between the claim-dyad's initiation (December 1979) and the start of the first MID (February 1980). After the MID concludes, CLAIM SPELL resets for the second observation, represented by the second line. CLAIM SPELL begins counting again from zero from the end of the first MID (February 1980)[104] to the start of the second MID (April 1994). CLAIM SPELL again resets to zero for the third observation, counting the time from the end of the second MID to the start of the third MID, in a similar manner as before.[105]

By contrast, a CLAIM DURATION coding never resets to zero within a claim-dyad. It always counts from the beginning of a claim-dyad to the start of a MID. Using the second claim-dyad again to illustrate, CLAIM DURATION counts the time elapsed between the claim-dyad's initiation and the first MID for the first observation.[106] For the second observation, however, CLAIM DURATION *resumes counting* from the start of the claim-dyad (December 1979) to the start of the second MID (April 1994). For the third observation, CLAIM DURATION again resumes

[104] The MID in question ended in the same month that it began.
[105] The fourth line in the claim-dyad represents the amount of time between the end of the last MID and the last time point in which the dispute is ongoing. This "end" observation enters the split population sample only, since the split population can accommodate claim-dyads (or, in this case, claim-dyad-spells) that never militarize.
[106] For the first observation for all claim-dyads, the coding for CLAIM SPELL and CLAIM DURATION is identical, evidenced by the first line segments in each claim-dyad being of equal length across the two codings.

counting from the start of the claim-dyad to the start of the third MID (November 2001). Notice, though, that CLAIM DURATION does reset to zero across claim-dyads. Figure 5.3 shows this nicely, with the CLAIM DURATION lines beginning at the same left endpoint *within* claim-dyads, but not *across* claim-dyads.[107]

Figure 5.4 provides a scatterplot of CLAIM SPELL vs. MID DURATION, simply for comparison to the previous two scatterplots in Figure 5.1 (CLAIM DURATION) and Figure 5.2 (ISSUE DURATION). The way in which CLAIM SPELL's coding creates a variable with a shorter time horizon is clear, as it "resets" to zero more frequently. If CLAIM SPELL has a shorter time horizon than CLAIM DURATION, and the effects of anticipation have a short time horizon, then we should find evidence of an anticipatory dynamic in the sample of moderately salient issues when CLAIM SPELL is the first dependent variable, y_1. We should also find *no* evidence of non-anticipation in the highly salient sample. All the models so far suggest an issue indivisibility mechanism is at work for highly salient issues. However, the effects of indivisibility have a long time horizon. They should not be evident when we employ a dependent variable with a shorter time horizon.

Table 5.7 displays the results when CLAIM SPELL is used as y_1, the dependent variable in the first equation. I run two sets of models: one uses the main specification from Table 5.1, while the other adds within-category salience as a control (comparable to Table 5.6). The results in Table 5.7 comport with my predictions. There is no evidence of a non-anticipatory effect in

[107] An ISSUE DURATION coding *never* resets to zero, within or across claim-dyads. It counts the time between the start of the *first* claim-dyad over the disputed issue and the start of the MID in question. ISSUE DURATION acts as a perpetual counter, of sorts, by always counting from the same starting point for a dispute between a given pair of states, regardless of how many claims comprise the dispute. In the figure, *all* the ISSUE DURATION lines begin from the same endpoint, within and across claim-dyads. Returning again to the second claim-dyad, the first observation, ISSUE DURATION records the time elapsed between the start of the first claim-dyad over the issue (January 1900) to the start of the first MID of *this* claim-dyad (February 1980). For the second observation, ISSUE DURATION resumes counting from the start of the first claim-dyad to the start of the second MID of this claim dyad, and so on.

the high salience samples (Models 13 and 15), indicated by the statistical insignificance of $\alpha_{\sim ANT}$. In both moderately salient models (Models 14 and 16), α_{ANT} is significant at the 0.05 level and negative. The signage is consistent with a strategic prevention mechanism (Hypothesis 3.4). As states expect lengthier MIDs, they are quicker to militarize the dispute; claim-dyad peace spells become shorter. Additionally, there is no longer any evidence of a non-anticipatory effect in the moderately salient sample. $\alpha_{\sim ANT}$ fails to attain statistical significance at conventional levels.

There are also interesting differences in the estimates for within-category salience. Across the samples, the coefficient for within-category salience in the MID DURATION equation behaves the same as before. It is insignificant in the highly salient sample (Model 15), and positively signed and significant in the moderately salient sample (Model 16). Unlike before, however, within-category salience is *never* significant in the CLAIM SPELL equation, whereas it was strongly significant and positive in Models 11 and 12. What this suggests is that within-category salience has an effect on the broader length of a disputed issue (CLAIM DURATION), but it has little effect on how long the dispute will stay peaceful (CLAIM SPELL). Put differently: within-category salience has an effect on the longer-term trajectory of a dispute, but less so on the short-term prospects for peace.

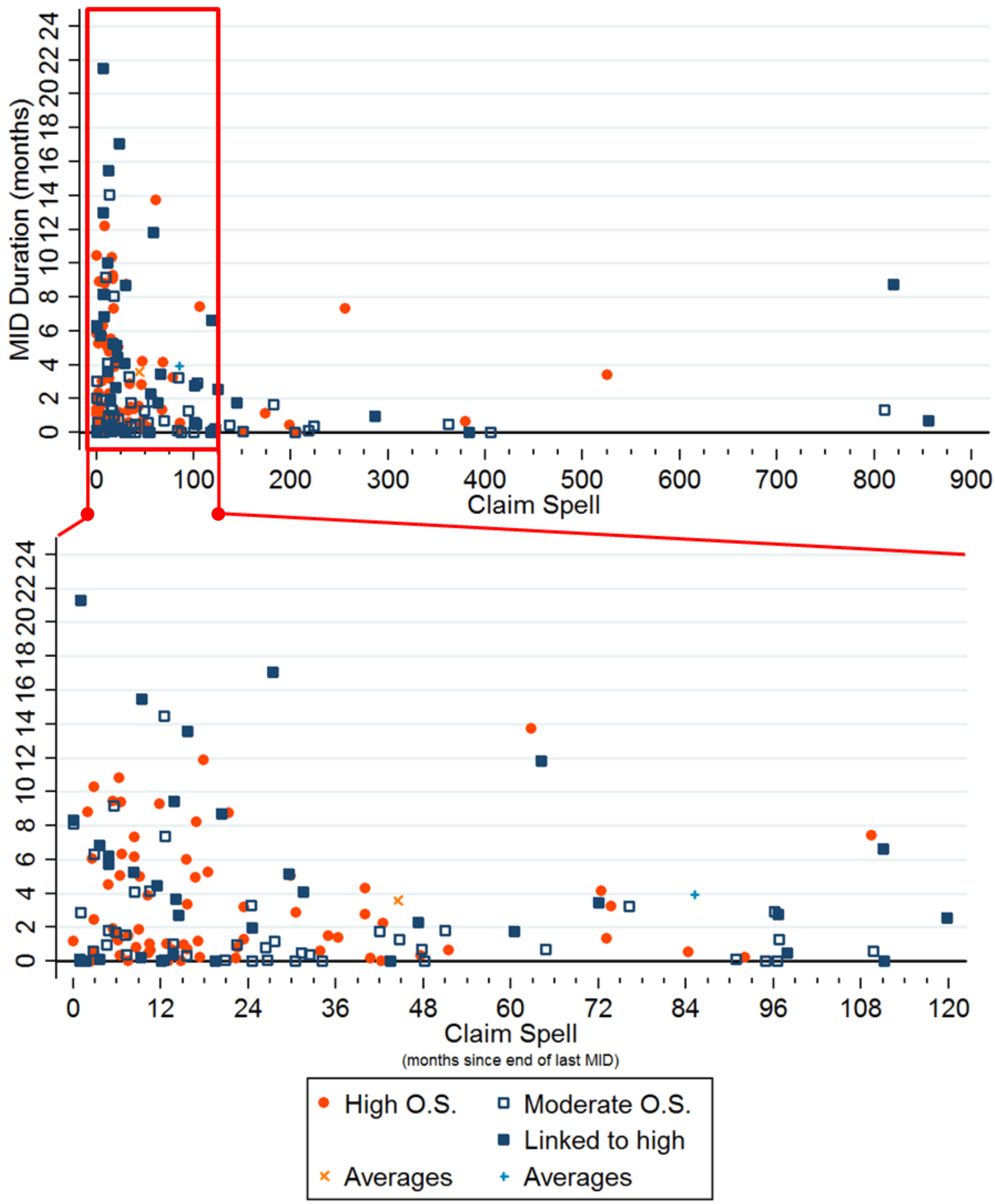


FIGURE 5.4. Scatterplot of CLAIM SPELL vs. MID DURATION

TABLE 5.7. Simultaneous Effect of Claim Spell and MID Duration

	Model 13 *High*	Model 14 *Moderate*	Model 15 *High*	Model 16 *Moderate*
Claim Spell				
Multilateral claim†	0.015	-0.911***	0.079	-0.725*
MLATCLAIM	(0.362)	(0.347)	(0.389)	(0.380)
Democracy (mean)	-0.029	0.011	-0.028	-0.009
DEMOCRACY	(0.045)	(0.035)	(0.045)	(0.039)
Interdependence (mean)	0.933	-0.493	0.718	-0.420
INTERDEP	(1.587)	(1.268)	(1.682)	(1.271)
Shared IGO mshps.	0.011	-0.048***	0.008	-0.045***
IGO	(0.013)	(0.012)	(0.015)	(0.012)
Contiguity	-0.521	0.849*	-0.820	0.872*
CONTIGUITY	(1.082)	(0.467)	(1.267)	(0.462)
Major power dyad?	-0.771	0.343	-1.031	0.465
MPDYAD	(1.031)	(0.492)	(1.184)	(0.494)
Militarization count	-0.108***	0.053	-0.103**	0.032
SETTMIL	(0.038)	(0.078)	(0.040)	(0.080)
Linked issue	0.232	-0.325	0.188	-0.608
LINKED	(0.347)	(0.390)	(0.367)	(0.433)
Within-cat. salience index			-0.060	0.125
			(0.140)	(0.094)
Constant	4.138***	5.330***	4.987**	4.320***
	(1.431)	(0.784)	(2.432)	(1.091)
α_{ANT} (MID Duration)	-0.078	-0.166**	-0.074	-0.154*
	(0.131)	(0.094)	(0.134)	(0.095)
λ_1^{-1}	0.793***	0.735***	0.799***	0.733***
	(0.069)	(0.064)	(0.071)	(0.064)

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	Model 13 *High*	Model 14 *Moderate*	Model 15 *High*	Model 16 *Moderate*
(continued from previous page)				
MID Duration				
Multilateral MID†	-1.046	-1.358	-1.092	-1.353
MLATMID	(0.887)	(0.996)	(0.918)	(0.971)
Third party alliance†	0.488	-0.041	0.507	-0.167
3PALLY	(0.635)	(0.637)	(0.645)	(0.631)
Power ratio†	-2.181	-1.309	-2.103	-0.870
POWERRATIO	(1.411)	(1.369)	(1.484)	(1.368)
Democracy (mean)	-0.108**	-0.006	-0.112**	-0.002
DEMOCRACY	(0.044)	(0.045)	(0.050)	(0.045)
Interdependence (mean)	3.815**	4.256**	3.867**	4.688***
INTERDEP	(1.505)	(1.754)	(1.536)	(1.708)
Shared IGO mshps.	-0.011	-0.041**	-0.011	-0.055***
IGO	(0.015)	(0.021)	(0.016)	(0.021)
Contiguity	1.252	-0.029	1.369	-0.021
CONTIGUITY	(1.499)	(0.602)	(1.634)	(0.590)
Major power dyad?	1.302	-1.587**	1.417	-1.414*
MPDYAD	(1.197)	(0.789)	(1.361)	(0.754)
Militarization count	0.047	0.178*	0.043	0.177*
SETTMIL	(0.041)	(0.098)	(0.049)	(0.093)
Linked issue	-1.614***	0.845	-1.584***	0.485
LINKED	(0.438)	(0.533)	(0.477)	(0.560)
Within-cat. salience index			0.023	0.169*
			(0.137)	(0.093)
Constant	0.809	2.145	0.466	1.261
	(1.892)	(1.414)	(2.724)	(1.447)
$\alpha_{\sim ANT}$ (Claim Spell)	0.201	-0.038	0.191	-0.074
	(0.190)	(0.090)	(0.202)	(0.090)
λ_2^{-1}	0.752***	0.630***	0.752***	0.649***
	(0.069)	(0.053)	(0.069)	(0.054)
$\|\alpha_{ANT}\| = \|\alpha_{\sim ANT}\|$ (p, Wald_{1T})	0.155	0.215	0.1765	0.312
N	81	94	81	94
Log-Likelihood	-293.999	-377.160	-293.892	-374.695

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables except α's (one-tailed)
† = instruments; λ^{-1}: inverse of Weibull shape parameter. Unclustered SEs reported in parentheses.

5.3 THE IMPORTANCE OF ESTIMATION STRATEGY: WHY SEM?

By using a SEM setup, I am able to better test the substantive specifics of my argument. The uniqueness of the estimator, however, begs an important question. What would my results look like if I used standard Weibull survival models to estimate each equation separately, instead of jointly estimating both equations with the SEM? Would the estimates of α_{ANT} and $\alpha_{\sim ANT}$ be nearly identical? In short: is the SEM necessary?

5.3.1 Reason #1: Attenuated α Estimates

Econometrically, the answer is yes, for two main reasons. First, our estimates of α will be biased, either due to attenuation or inflation, if we use standard survival models. Examples of these models include the exponential, Weibull, and Cox models. Standard survival models presuppose that all the independent variables being regressed on y_1 (CLAIM DURATION) are exogenous to the process generating y_1. The same assumption applies to y_2 (MID DURATION). A reciprocal relationship between y_1 and y_2 violates the exogeneity assumption. The violation is indicated in the SEM when both α's are statistically significant. To illustrate this point, Table 5.8 shows the main model results when they are estimated using a standard Weibull. Each Weibull column contains the results of two separate Weibull models (labeled "A" and "B").

The nature of the bias is dependent upon the signage of the α's in the SEM. When the α's are oppositely signed, like they are in the highly salient sample (Model 1), the Weibull estimate of α will be <u>attenuated</u> toward zero (Hays and Kachi 2009, 10). The Weibull estimates will understate the effect of y_1 on y_2 (or vice versa). Model 17 contains the standard Weibull results for the sample of disputes over territorial issues, which are comparable to Model 1. The attenuation bias is clearly evident, as the Weibull estimates of α are closer to zero than the SEM estimates. The Weibull estimate of α_{ANT} is equal to -0.024 in Model 17A, which is less negative than the SEM estimate of -0.077 in Model 1. Additionally, the Weibull estimate of $\alpha_{\sim ANT}$ is less positive than the SEM estimate (0.186 vs. 0.291 [Models 17B, 1]).

When the α's from the SEM are signed identically, as they are in the moderately salient sample (Model 3), the Weibull estimate of α will be <u>inflated</u> (Hays and Kachi 2009, 10). The Weibull estimate of α will be larger in magnitude compared to the SEM's estimate of α. Model 18 contains the Weibull estimates for the moderately salient sample, which are comparable to Model 3. The inflationary bias in both α's is clear in Model 18. The Weibull estimate of α_{ANT} is equal to -0.187 (Model 18A), which is larger than the SEM estimate of -0.130 (Model 3). Further, Model 18B's coefficient for $\alpha_{\sim ANT}$, -0.186, is larger in magnitude than the coefficient in Model 3, where $\alpha_{\sim ANT}$ = -0.101.

TABLE 5.8. Estimation with SEM vs. Estimation with Standard Weibulls

	Model 17 *High* Two Weibulls	*Table 5.1, Model 1*	Model 18 *Moderate* Two Weibulls	*Table 5.1, Model 3*
Claim Duration	(A)		(A)	
Multilateral claim†	-0.738***	-0.753***	-0.733**	-0.705**
MLATCLAIM	(0.202)	(0.206)	(0.347)	(0.347)
Democracy (mean)	0.003	0.007	-0.049	-0.049
DEMOCRACY	(0.025)	(0.025)	(0.035)	(0.034)
Interdependence (mean)	-1.459	-1.244	-0.223	-0.217
INTERDEP	(0.946)	(0.950)	(1.300)	(1.301)
Shared IGO mshps.	0.009	0.009	-0.006	-0.005
IGO	(0.006)	(0.006)	(0.012)	(0.012)
Contiguity	-2.143***	-2.046***	1.773***	1.816***
CONTIGUITY	(0.617)	(0.621)	(0.535)	(0.531)
Major power dyad?	-0.954*	-0.865	0.634	0.731
MPDYAD	(0.575)	(0.581)	(0.564)	(0.562)
Militarization count	0.067***	0.073***	0.319***	0.301***
SETTMIL	(0.023)	(0.023)	(0.095)	(0.096)
Linked issue	0.146	0.095	-0.509	-0.542
LINKED	(0.197)	(0.199)	(0.394)	(0.391)
Constant	7.921***	7.781***	3.870***	3.833***
	(0.826)	(0.828)	(0.832)	(0.824)
α_{ANT} (MID Duration)	-0.024	-0.077*	-0.187***	-0.130*
	(0.047)	(0.056)	(0.078)	(0.093)
λ_1^{-1}	1.409***	1.397***	0.712***	0.714***
	(0.133)	(0.135)	(0.062)	(0.062)

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	Model 17 *High* Two Weibulls	*Table 5.1, Model 1*	Model 18 *Moderate* Two Weibulls	*Table 5.1, Model 3*

(continued from previous page)

MID Duration	(B)		(B)	
Multilateral MID†	-1.049	-1.220	-1.494	-1.414
MLATMID	(0.847)	(0.880)	(0.974)	(0.979)
Third party alliance†	0.365	0.276	0.277	0.119
3PALLY	(0.633)	(0.650)	(0.647)	(0.651)
Power ratio†	-2.250	-2.272	-0.924	-1.112
POWERRATIO	(1.399)	(1.401)	(1.371)	(1.369)
Democracy (mean)	-0.126***	-0.141***	-0.040	-0.023
DEMOCRACY	(0.046)	(0.047)	(0.046)	(0.047)
Interdependence (mean)	4.389***	4.564***	3.892**	4.129**
INTERDEP	(1.507)	(1.493)	(1.714)	(1.724)
Shared IGO mshps.	-0.007	-0.006	-0.031	-0.036*
IGO	(0.015)	(0.015)	(0.021)	(0.021)
Contiguity	1.607	1.943	0.194	0.066
CONTIGUITY	(1.481)	(1.534)	(0.597)	(0.600)
Major power dyad?	1.187	1.221	-1.108	-1.359*
MPDYAD	(1.146)	(1.179)	(0.765)	(0.788)
Militarization count	-0.006	-0.038	0.247**	0.217**
SETTMIL	(0.056)	(0.061)	(0.101)	(0.103)
Linked issue	-1.605***	-1.712***	0.791	0.824
LINKED	(0.414)	(0.425)	(0.510)	(0.518)
Constant	0.278	-0.296	1.623	1.854
	(1.962)	(1.987)	(1.414)	(1.427)
$\alpha_{\sim ANT}$ (Claim Duration)	0.186*	0.291**	-0.186**	-0.101
	(0.137)	(0.143)	(0.088)	(0.095)
λ_2^{-1}	0.761***	0.757***	0.641***	0.639***
	(0.069)	(0.069)	(0.052)	(0.053)
$\|\alpha_{ANT}\| = \|\alpha_{\sim ANT}\|$ (p, Wald$_{1T}$)	--	0.046**	--	0.432
N	81	81	94	94
Log-Likelihood	-107.3/-144.5	-258.112	-187.6/-178.9	-379.228

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables except α's (one-tailed)
† = instruments; λ^{-1}: inverse of Weibull shape parameter. Unclustered standard errors reported in parentheses.

When our main hypotheses pertain to α, each bias has its own dangers. Inflated estimates can induce Type I errors—we may reject the null hypothesis when we should not. The dangers of attenuated estimates are less egregious. Attenuation can induce Type II errors—we do not reject the null when we should—which is still incorrect, but the lesser of the two evils. *Ex ante*, we cannot know whether the bias in the α's will be attenuating or inflationary. It is evident only when we examine the results from the SEM. This highlights the importance of the estimation strategy, and how pivotal it is for obtaining accurate estimates of α.

The bias of the standard Weibull estimates also has implications for existing research on conflict/MID duration (i.e., y_2). My argument and analysis suggests that work to date has omitted a relevant variable: CLAIM DURATION. Ergo, CLAIM DURATION should be included in models predicting MID DURATION. What Models 17 and 18 show, though, is that we cannot obtain accurate estimates of CLAIM DURATION's effect using standard survival models. This will be true for any time counter, like CLAIM DURATION, that represents the effect of time on y_2. Without an estimation strategy that treats elapsed time (call this y_1) as endogenous to y_2, the estimated coefficient for y_1 will be biased.

5.3.2 Reason #2: Biased β's

The bias in α is problematic for an additional reason: it can affect the coefficient estimates for the other independent variables, such as DEMOCRACY and INTERDEPENDENCE. That is, if we use standard survival models, the biased estimates of α can induce bias among the β's, affecting the validity of any hypotheses involving β's. To eliminate the possibility of biased β's, one potential response is to exclude y_1 as a control variable—if y_1 is not included in the regression, the β's cannot be affected by bias in α, since no α is estimated. However, this response is also potentially problematic. If time elapsed is correlated with any of the x's, then we have omitted a relevant variable. Instead of bias among the β's due to attenuation or inflation bias in α, there will be bias among the β's due to omitted variable bias.[108]

Whether biased α's produce biased β's will depend on a variety of factors, such the estimation strategy and the relationship between y_1 and the x's. In this subsection, I demonstrate the importance of proper estimation strategies. I replicate studies by Krustev (2006) and Shannon, Morey, and Boehmke (2010, hereafter "SMB") to show how their main results are affected when estimated using the SEM.

I have selected these two pieces because they are recent examinations of MID duration. In the first article, Valentin Krustev (2006) is interested in the impact of economic interdependence on MID duration. He argues that economic interdependence and MID duration should be inversely related. The opportunity costs associated with fighting are higher when levels of interdependence are high, leading to shorter MIDs. Megan Shannon, Daniel Morey, and Frederick Boehmke (2010) are interested in the effect of international organizations on MID duration. They argue that international organizations can mitigate commitment problems between disputants by increasing the opportunity costs of fighting and by acting as a credible enforcer for agreements. Both reasons should encourage states to end their conflicts more quickly, leading to shorter MID durations. In both articles, the authors find support for their arguments. By adding a time elapsed variable as a control and estimating each article's model with the SEM, I show that Krustev's results disappear entirely, while SMB's are significantly weaker in magnitude and significance.

[108] See Franzese and Hays (2007, 145–147) for a discussion of the potential tradeoffs between simultaneity bias and omitted variable bias in a spatial econometric setting.

As a prefacing note, both sets of authors take a dyad-specific approach to their analyses of MID duration, as depicted in Figure 4.1, Panel B. This means that the y_1 variable in the replications cannot be coded as CLAIM DURATION, because the coding requires a claim-dyad approach. Instead, the replication y_1 is a peace month counter that records the number of months since the last MID onset. The operationalization comports with the way in which conflict researchers currently view "time." Peace months are used to generate "cubic splines," the prevalent modeling approach for handling time dependence (Beck, Katz, and Tucker 1998; Beck 2010; Carter and Signorino 2010a). Splines treat time as a nuisance to estimation instead of a quantity of substantive interest, as I have argued here.

5.3.2.1 Krustev (2006): Economic Interdependence

Table 5.9 displays my replications of Krustev's empirical results. All results are reported in Weibull accelerated failure times. The lightly shaded row is Krustev's variable of interest, interdependence. INTERDEP is operationalized as the lowest dyadic trade-to-GDP ratio in the dyad in a given year (2006, 250–251).

TABLE 5.9. Replication of Krustev (2006): All MIDs, 1950-1992

	Model 19 *All MIDs* Replic., Weibull	Model 20 *All MIDs* Reduced *N*	Model 21 *All MIDs* Exogenous y_1	Model 22 *All MIDs* Exog. y_1, Instr.	Model 23 *All MIDs* SEM
Peace Months					
Distance					-0.143***
					(0.044)
Contiguity					-1.038***
					(0.103)
Power ratio					0.109***
					(0.027)
Allies					0.531***
					(0.101)
Joint democracy					0.612***
					(0.232)
Trade/GDP (low)					12.677*
INTERDEP					(7.370)
Constant					6.237***
					(0.347)
α_{ANT} (MID Dur.)					0.166***
					(0.043)
λ_1^{-1}					0.689***
					(0.020)
MID Duration					
Distance	-0.130**	-0.114**	-0.114**	-0.133**	-0.133**
	(0.056)	(0.056)	(0.056)	(0.055)	(0.058)
Contiguity	-0.395***	-0.355**	-0.440***	-0.091	-0.370**
	(0.152)	(0.153)	(0.156)	(0.163)	(0.183)
Power ratio	-0.095**	-0.097**	-0.100**	-0.069*	-0.047
	(0.040)	(0.040)	(0.040)	(0.039)	(0.041)
Allies	-0.487***	-0.471***	-0.415***	-0.321**	-0.015
	(0.141)	(0.141)	(0.143)	(0.142)	(0.167)
Joint democracy	-1.358***	-1.339***	-1.314***	-1.128***	-1.098***
	(0.269)	(0.268)	(0.267)	(0.263)	(0.272)
Trade/GDP (low)	-22.110***	-21.902***	-19.393***	-14.050*	-4.707
INTERDEP	(7.273)	(7.255)	(7.372)	(7.635)	(8.870)
Multilateral MID†				1.040***	1.164***
				(0.134)	(0.144)
Constant	2.359***	2.205***	2.332***	2.393***	3.575***
	(0.451)	(0.457)	(0.459)	(0.473)	(0.578)
$\alpha_{\sim ANT}$ (Peace Mos.)			-0.001**	-0.212***	-0.571***
			(0.001)	(0.040)	(0.098)
λ_2^{-1}	0.479***	0.479***	0.481***	0.491***	0.473***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.013)
$\lvert\alpha_{ANT}\rvert = \lvert\alpha_{\sim ANT}\rvert$ (p)	--	--	--	--	0.000***
N	1450	1430	1430	1430	1430
Log-Likelihood	-3306.499	-3268.291	-3266.238	-3227.225	-5828.849

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables except α's (one-tailed); † = instruments; λ^{-1}: inverse of Weibull shape parameter. Unclustered standard errors reported in parentheses. Wald test used to test magnitude of α's.

I start by replicating Krustev's main model (his Table 1, Model 1 (2006, 254)), reported here as Model 19.[109] Krustev argues that high levels of economic interdependence should decrease MID DURATION. Therefore, the reported coefficient for INTERDEP should be negatively signed and statistically significant, which it is. Model 20 is identical to Model 19 except that it only uses the MIDs that enter the replication SEM sample. There is a 20-observation difference between Krustev's N (=1450) and the SEM's N (=1430). Most of the observations are lost because of corrections to the MID data after the article was published. Model 20's reduced N does not affect any of the estimates. INTERDEP remains negative and highly significant.

The next three models in Table 5.9 demonstrate the implications of my argument and estimation strategy. Model 21 adds "time elapsed" as a control variable and treats it as exogenous. PEACE MONTHS counts the number of months since the last MID onset. $\alpha_{\sim ANT}$ is negative and statistically significant. Substantively, longer peace spells are associated with shorter MIDs. Controlling for PEACE MONTHS reduces the size of INTERDEP's coefficient, but only slightly (-19.393 in Model 21 vs. -21.902 in Model 20). INTERDEP remains highly significant at the 0.001 level (two-tailed).

To estimate the SEM, we will eventually need instruments. I add MLATMID (*ex ante*) to the specification and run the Weibull analysis again (reported as Model 22).[110] Model 22's

[109] Krustev conducts his major analyses using a Cox model. Since the SEM is based on the Weibull model, we need to shift parametric distributions. I converted the Weibull accelerated failure time (AFT) coefficients to the same interpretation metric as Krustev's Cox results and compared the estimates. They are practically identical; the results are unaffected by changing parametrizations.

[110] The coefficient for INTERDEP is essentially the same if POWERRATIO is also treated as an instrument for MID DURATION and the other instrument, ALLY3P, is included. I report the results with only MLATMID as an instrument so as to maximize comparability with Krustev's original specification. I cannot include my y_1 instrument (MLATCLAIM) because Krustev's data do not distinguish by claim-dyads, and MLATCLAIM is coded based on claim-dyads. The SEM is identified based on the other control variables in the PEACE MONTHS equation. Their values are recorded at Point A in Figure 2.1, whereas the value of the MID duration control variables are recorded at Point B, Figure 2.1. This makes the PEACE MONTHS controls predetermined with respect to MID DURATION, and also makes them different in value from the MID DURATION controls.

estimates show some appreciable differences from the preceding models. First, $\alpha_{\sim ANT}$ is still negative, but the parameter is now highly significant and is *substantially* larger in magnitude than before (-0.212 in Model 22 vs. -0.001 in Model 21). Second, INTERDEP is smaller in magnitude (-14.050) and is no longer highly significant according to two-tailed tests (p = 0.066).[111] Nonetheless, one may still interpret the results as supportive with Krustev's argument, though the substantive effect of INTERDEP is weaker than what his results would suggest.

Such an interpretation becomes untenable once we properly treat PEACE MONTHS as endogenous and run the analysis using the SEM (Model 23). From earlier, we know that standard Weibull estimates of $\alpha_{\sim ANT}$ will be biased, either due to attenuation or inflation. This is borne out in Model 23, where we see that the previous estimates were tainted by attenuation bias (the α's are oppositely signed). $\alpha_{\sim ANT}$ is now equal to -0.571 and highly significant (compared to -0.212 and -0.001 in Models 22 and 21, respectively).

Importantly, Model 23 also shows how attenuation in α can drastically affect the estimate for INTERDEP in the MID DURATION equation. INTERDEP's coefficient drops in value to -4.707 and is no longer statistically significant (p = 0.596, two-tailed). Counter to Krustev's argument and results, economic interdependence does not appear to significantly shorten militarized conflict. By controlling for time elapsed (here, PEACE MONTHS) and recognizing it as endogenous, INTERDEP's coefficient is not only smaller than previously reported, but it is statistically indistinguishable from zero.

[111] Krustev's argument about interdependence yields a directional hypothesis. One can reasonably argue that INTERDEP's p-value should be halved (0.066/2 = 0.033), returning the coefficient to significance at the 0.05 level.

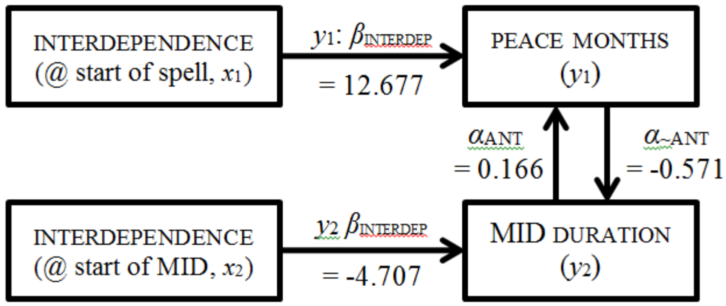


FIGURE 5.5. Path Diagram, INTERDEP Only (Table 5.9, Model 23)

However, the *overall* effect of INTERDEP may still reduce MID DURATION. Up to this point, we have only considered *direct* effects of regressors on dependent variables.[112] INTERDEP affects MID DURATION in two ways, because of the nonrecursive nature of the SEM (depicted in Figure 5.5). First, INTERDEP has a direct effect on MID DURATION (y_2: β_{INTERDEP}), which is the quantity we have been examining so far. The reciprocal relationship between y_1 and y_2—i.e., the α's—produces a feedback effect, further affecting y_2's value. Incorporating the feedback effects yields the total effect of INTERDEP (x_2) on y_2: $\frac{(y_2:\beta_{\text{INTERDEP}})}{(1-\alpha_{\text{ANT}}*\alpha_{\sim\text{ANT}})}$.[113] Second, INTERDEP also affects MID DURATION indirectly through PEACE MONTHS: x_1 affects y_1, and y_1 affects y_2. The indirect effect is represented by $(y_1: \beta_{\text{INTERDEP}}) * (\alpha_{\sim\text{ANT}})$. In the PEACE MONTHS equation, $y_1: \beta_{\text{INTERDEP}}$ is positive and $\alpha_{\sim\text{ANT}}$ is negative, suggesting that the indirect effect should be negatively signed. The total effect of x_1 on y_2, once we account for the feedback, will be equal to $\frac{(y_1:\beta_{\text{INTERDEP}})*(\alpha_{\sim\text{ANT}})}{(1-\alpha_{\text{ANT}}*\alpha_{\sim\text{ANT}})}$. Adding together the total effects for x_1 and x_2 yields the overall effect of INTERDEP on y_2: $\frac{(y_1:\beta_{\text{INTERDEP}})*(\alpha_{\sim\text{ANT}})}{(1-\alpha_{\text{ANT}}*\alpha_{\sim\text{ANT}})} + \frac{(y_2:\beta_{\text{INTERDEP}})}{(1-\alpha_{\text{ANT}}*\alpha_{\sim\text{ANT}})}$.

[112] See Appendix C.3 for more discussion.
[113] So long as $|\alpha_{\text{ANT}} * \alpha_{\sim\text{ANT}}| < 1$ (Paxton, Hipp, and Marquart-Pyatt 2011, 92).

TABLE 5.10. EFFECT OF INTERDEP ON MID DURATION

	x_1: TOTAL EFFECT	x_2: TOTAL EFFECT	OVERALL EFFECT
Effect	-6.615	-4.298	-10.913
Standard Error	(6.978)	(14.273)	(13.157)
p (two-tailed)	0.269	0.763	0.407
BC 95% CIs	[-24.076, 1.272]	[-33.880, 17.877]	[-39.319, 8.497]
N	1430	1430	1430
Bootstrap Reps†	2277	2277	2277

†: number determined using bssize (see Poi 2004). Bootstrapped standard error reported in parentheses. Based on Table 5.9, Model 23. "BC 95% CIs" = bias-corrected 95% confidence intervals.

Table 5.10 displays the three effects with bootstrapped standard errors. The shaded column denotes the main parameter of interest, the overall effect of INTERDEP on MID DURATION. The first two columns of the table display the total direct and total indirect effect of INTERDEP. Both are statistically insignificant. The effects' *p*-values are not significant at conventional levels, and the more reliable bootstrapped confidence intervals encompass zero.[114] It is interesting that the total effect of x_1 is larger than the total effect of x_2. x_1 only affects y_2 indirectly, through its effect on y_1, while x_2 has a direct effect on y_2. One possible interpretation of this result is that the long-term effects of economic interdependence are stronger than the short-term effects.

Moving to shaded column, the overall effect of INTERDEP is closer in magnitude to the coefficient from Model 22, but like INTERDEP in the MID DURATION equation of Model 23, it is still statistically insignificant. On the whole, then, Krustev's original results disappear when replicated with the SEM. There is no evidence that higher levels of economic interdependence

[114] Traditional coefficient tests involving *p*-values assume that the underlying distribution of the data is symmetric—e.g., a Normal distribution. Bootstrapping relaxes this assumption by treating the distribution as unknown. The procedure pulls repeated samples from the data to obtain an approximation of the unknown distribution. Importantly, the approximation need not be symmetric about the distribution's mean. For this reason, the reported confidence intervals from the bootstrap procedure are better indicators of a bootstrapped parameter's statistical significance than its *p*-values. I include the *p*-values in all the tables containing bootstrapped results for reference only.

reduce the length of militarized conflict. By controlling for time elapsed (here, PEACE MONTHS) and recognizing it as endogenous, INTERDEP's coefficient is not only smaller than previously reported, but it is statistically indistinguishable from zero.

5.3.2.2 SMB (2010): Shared IGO Memberships

A similar bias in β becomes evident when replicating the results from Shannon, Morey, and Boehmke (2010). Their empirical analysis is more sophisticated than Krustev's. SMB use a Weibull model with a correction for selection effects. The details of SMB's selection-based Weibull estimator, along with its relationship to the SEM, were discussed in Appendix C.4.

Table 5.11 reports my replications of SMB's analysis. Their sample is comprised of politically relevant MIDs beginning between 1950 and 2000. The lightly shaded row contains SMB's variable of interest, IGO. IGO is a count of international organizations in which both *i* and *j* are members, measured in tens (Shannon, Morey, and Boehmke 2010, 1129, 1132). I begin by estimating two basic Weibull models, as points of reference. The first Weibull, reported as Model 24, uses the specification from SMB's Table 1, Model 2 (2010, 1132).[115] Consistent with SMB's argument, the IGO coefficient is negatively signed and statistically significant. More shared IGO memberships reduce MID DURATION. The second Weibull adds PEACE MONTHS as an exogenous regressor (Model 25). The IGO coefficient becomes only marginally smaller (-0.164 to -0.143) and remains highly significant.

[115] SMB also include the MID's highest hostility level as one of their control variables. I exclude HOSTILITY in most of the Table 5.11 models. The rational expectation logic associated with the SEM requires that all variable values are observable at the time of MID onset (i.e., *ex ante*). This is clearly not the case for HOSTILITY. It is only observable after a MID has concluded.

TABLE 5.11. Replication of Shannon, Morey, and Boehmke (2010)

	Model 24 *PolRel MIDs* Standard Weibull	Model 25 *PolRel MIDs* Exog. y_1	Model 26 *Replication* Weibull w/Select.	Model 27 *PolRel MIDs* Unclustered SEs	Model 28 *PolRel MIDs* SEM
Peace Months‡			‡	‡	
Shared IGO mshps. IGO			0.018	0.018**	-0.132***
			(0.014)	(0.008)	(0.032)
Joint democracy			-0.254***	-0.254***	0.412**
			(0.048)	(0.037)	(0.197)
Major power dyad			0.637***	0.637***	-1.067***
			(0.158)	(0.051)	(0.141)
Power ratio			0.247***	0.247***	-0.396***
			(0.078)	(0.038)	(0.147)
Distance			-0.779***	-0.779***	0.477**
			(0.084)	(0.055)	(0.229)
Peace years *(Models 26 and 27 only)*			-0.153***	-0.153***	
			(0.012)	(0.007)	
Constant			-0.577***	-0.577***	4.422***
			(0.053)	(0.028)	(0.108)
α_{ANT} (MID Duration)					0.156**
					(0.093)
λ_1^{-1}					0.697***
					(0.036)
MID Duration					
Shared IGO mshps. IGO	-0.164***	-0.143***	-0.150**	-0.150***	-0.097*
	(0.046)	(0.046)	(0.073)	(0.045)	(0.056)
Joint democracy	-0.152	-0.287	-0.141	-0.141	-0.578**
	(0.214)	(0.214)	(0.354)	(0.257)	(0.278)
Major power dyad	-0.675***	-0.809***	-0.667**	-0.667***	-1.115***
	(0.210)	(0.210)	(0.269)	(0.202)	(0.289)
Power ratio	0.504**	0.415*	0.342	0.342	0.257
	(0.218)	(0.216)	(0.307)	(0.217)	(0.237)
Distance	-0.036	0.146	0.116	0.116	0.554
	(0.329)	(0.328)	(0.463)	(0.354)	(0.421)
Total actors†	0.109***	0.116***	0.122***	0.122***	0.131***
	(0.015)	(0.015)	(0.017)	(0.017)	(0.018)
Start year†	-0.004	-0.001	-0.002	-0.002	0.007
	(0.005)	(0.005)	(0.006)	(0.004)	(0.007)
Highest hostility lv.			0.720***	0.720***	
			(0.091)	(0.092)	
Constant	8.397	2.386	6.776	6.776	-10.906
	(8.852)	(8.951)	(11.267)	(8.263)	(12.451)
$\alpha_{\sim ANT}$ (Peace Mos.)		-0.197***			-0.578***
		(0.042)			(0.223)
λ_2^{-1}	0.486***	0.486***	0.528***	0.528***	0.474***
	(0.010)	(0.010)	(0.009)	(0.008)	(0.020)
ρ (Error Correlation)	--	--	-0.125***	-0.125***	--
			(0.018)	(0.019)	
$\lvert\alpha_{ANT}\rvert = \lvert\alpha_{\sim ANT}\rvert$ (p, Wald$_{1T}$)	--	--	--	--	0.001***
N (Uncensored)	1482	1482	1482 (48221)	1482 (48221)	1482
Log-Likelihood	-3367.755	-3356.820	-12974.429	-12974.429	-6041.919

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables except α's (one-tailed). Splines included, for first stage of Model 26/Model 27, but not reported. Unclustered standard errors reported in parentheses for all models except Model 26, which has standard errors clustered by dyad. λ^{-1}: inverse of Weibull shape parameter. † = instruments ; ‡ = except for Model 26 and Model 27, which have a first stage DV = MID onset with a discrete-time setup.

Next, I replicate SMB's main results using their Weibull-with-selection estimator, same as the authors' Table 1, Model 2.[116] The exact replication, with standard errors clustered on dyad, is reported as Model 26. I also estimate the same model with unclustered standard errors (Model 27) to make these estimates comparable with the SEM's estimates.[117] IGO's signage remains the same in both Model 26 and Model 27, and is still statistically significant at the 0.05 level in both models. SMB also find evidence of a selection effect, indicated by the statistically significant ρ. The same unobservables that increase the likelihood of MID initiation also make MIDs shorter.

Finally, I estimate the model using the SEM (Model 28). $\alpha_{\sim\text{ANT}}$ is highly significant and negative, which is mathematically consistent with SMB's evidence of a selection effect.[118] The coefficient on IGO is more important. It is equal to -0.097, the smallest of all the models in Table 5.11. The estimate is no longer significant at the 0.05 level for a two-tailed test, but it is for a one-tailed test (p = 0.041), which is in line with SMB's directional hypothesis for IGO. I conclude that SMB's argument still finds empirical support, but the effect of IGO is marginally smaller in magnitude and less statistically significant than they report.

For the sake of completeness, I also calculate the overall effect for IGO using the same procedure outlined during my replication of Krustev's results. The results are reported in Table 5.12 and are surprising. The overall effect of IGO on MID DURATION *is indistinguishable from zero*, not negative, as SMB's argument would imply. Even more surprising is the total effect of IGO on MID DURATION via peace months (x_1). The effect is *positive* (0.070) and statistically

[116] The results in their paper are reported in terms of hazards, not accelerated failure times. My replication results in Model 26 are identical to theirs if my coefficients are reported as hazards.
[117] The SEM cannot currently accommodate clustered standard errors. Clustering affects hypothesis testing because it affects standard error values (but not β's).
[118] With SMB's selection estimator, ρ is equivalent to $\alpha/4$. Model 27's ρ is equal to -0.125, which makes the equivalent α equal to -0.501. One of the advantages of the SEM is that it estimates two α's, allowing for asymmetric relationships between the two equations to be modeled. Notice how SMB's α is similar in value to $\alpha_{\sim\text{ANT}}$, its closest analog in the SEM. In Model 28, $\alpha_{\sim\text{ANT}}$ is equal to -0.578. Also notice, though, that the two values are not identical, hinting at the import of estimating two α's (SEM) instead of just one (SMB).

significant, indicated by the exclusion of zero from the bootstrapped confidence interval. A greater number of shared IGO memberships indirectly increases MID duration: the opposite of what SMB argue.[119]

TABLE 5.12. EFFECT OF IGO ON MID DURATION

	x_1: TOTAL EFFECT	x_2: TOTAL EFFECT	OVERALL EFFECT
Effect	0.070	-0.088	-0.019
Standard Error	(0.087)	(0.080)	(0.101)
p (two-tailed)	0.423	0.855	0.266
BC 95% CIs	[0.044, 0.148]	[-0.290, 0.039]	[-0.221, 0.133]
N	1482	1482	1482
Bootstrap Reps†	994	994	994

†: number determined using bssize (see Poi 2004). Bootstrapped standard error reported in parentheses. Based on Table 5.11, Model 28. "BC 95% CIs" = bias-corrected 95% confidence intervals.

The implications for work on conflict/MID duration are twofold. First, existing work has omitted an important explanatory variable: time elapsed. I conceptualize time elapsed as the amount of time since the start of a disputed issue (CLAIM DURATION), but alternative definitions exist. Thinking more carefully about "time elapsed" may yield additional insights regarding militarized conflict useful to both academics and policy practitioners. Second, I show that choosing the proper econometric model is important for obtaining not only accurate estimates of time elapsed, but accurate estimates of other covariates. The conservative take-away point is that scholars interested in conflict duration (and durations more generally) should carefully think about (a) whether there is a potential 'time elapsed' associated with their process of interest, (b) whether time elapsed has an effect on duration, and (c) the relationship between their *x*'s of

[119] SMB's results also hint at this curiosity. Refer to Model 26, which is the exact replication of their analysis. It shows a positive coefficient for IGO in the PEACE MONTHS equation. However, the positive effect is statistically insignificant in Model 26.

interest and time elapsed. Researchers can then take the appropriate methodological steps to ensure that their analyses are valid.

5.4 CONCLUSION

In this chapter, I tested the portion of my argument concerning the relationship between CLAIM DURATION and MID DURATION. I found evidence that non-anticipatory dynamics are present in the sample of highly salient issues, with non-anticipatory effects being stronger than anticipatory effects. The effects are consistent with an issue indivisibility mechanism: MIDs last longer when they occur later in a highly salient issue. For MIDs over moderately salient issues, I find that anticipatory dynamics are predominant, suggesting that expectations about MID duration play a bigger role than past factors. The anticipatory effects are consistent with a strategic delay mechanism: the longer that MIDs are expected to last, the earlier they occur in a claim-dyad.

The results are fairly robust to a variety of specifications. The findings contribute to our understanding of interstate conflict dynamics, issue dynamics, and the connection between the two. In showing that CLAIM DURATION influenced MID DURATION, I then demonstrated the implications for research on MID duration. Biased results will occur when the effect of CLAIM DURATION is ignored and the improper estimation technique is employed. Ultimately, the biased estimates impair our ability to draw sound substantive conclusions from our empirical models.

Table 5.13 summarizes the hypotheses tested in this chapter and whether they found empirical support. The untested hypothesis about peaceful claim-dyads and anticipation (Hypothesis 2.1) is the subject of the next chapter.

TABLE 5.13. Summary of Chapter 5 Findings

Hypothesis 3.0 (Overall Salience): When an issue has high levels of overall salience, a non-anticipatory dynamic will be strongest. When an issue has moderate or low levels of overall salience, an anticipatory dynamic will be strongest.	SUPPORTED Ch. 5, Model 1 and Model 3
Hypothesis 3.1 (Non-Anticipation, Time Pressure): When states militarize disputes quickly, they end up in protracted militarized conflicts.	NOT SUPPORTED Ch. 5, Model 1
Hypothesis 3.2 (Non-Anticipation, Indivisibility): When an issue is contested for a long period of time, it becomes defined in indivisible terms, giving rise to lengthy militarized disputes.	SUPPORTED Ch. 5, Model 1
Hypothesis 3.3 (Anticipatory: Strategic Delay): When states expect lengthy MIDs, there is an incentive to delay militarization as long as possible in order to maximize the likelihood of resolution by other means.	NOT SUPPORTED Ch. 5, Model 3
Hypothesis 3.4 (Anticipatory: Strategic Prevention): When states expect lengthy MIDs, there is an incentive to militarize preventatively to gain a strategic advantage.	SUPPORTED Ch. 5, Model 3 (Ch. 5, Model 1)

6.0 EVALUATING DYNAMICS: CLAIM DURATION

This chapter adds peaceful claim-dyads to the sample of militarized claim-dyads. Its purpose is to assess whether peaceful claim-dyads contain evidence of an anticipatory dynamic. If disputants form accurate rational expectations successfully, they may realize that militarization is a costly resolution strategy, and states may try to resolve the dispute through other, less costly means. If these alternative strategies succeed, then the claim-dyad will have been resolved without ever experiencing a militarization. The implication is that states may elect not to militarize a dispute *because* of an anticipatory dynamic. Yet, the previous chapter focused only on militarized claim-dyads.

I use split population models to test for the presence of an anticipatory dynamic. I use two different estimation strategies: a split-population survival model (Svolik 2008) and a bivariate probit with partial observability. I estimate the models using different strategies as a way to check the results' robustness. At minimum, I expect to find strong support for the sample of moderately salient issues. The empirical results comport with this expectation. Moderately salient issues show signs of an anticipatory dynamic with both estimating strategies.

Chapter 6 has three major sections. I begin with a simple analysis of the overall length of a disputed issue-claim. Next, I analyze the sample of peaceful and militarized claim-dyads for the presence of a split population. I conclude by summarizing the results of the two chapters

6.1 PRELIMINARIES: OVERALL LENGTH

My main concern in this chapter is when a claim-dyad militarizes. But, this gives rise to a more basic question: how long do claim-dyads last, on the whole? Little work examines the overall length of a claim-dyad, which I refer to as OVERALLLENGTH. Despite the lack of empirical evidence, numerous assertions are treated as informal, verified truths. For example, the informal wisdom is that territorial claim-dyads last longer than other claim-dyads because of their high stakes. Longer-lasting claim-dyads might also have more opportunities to militarize, which makes checking some of these "truths" a worthwhile endeavor.

I perform a descriptive analysis of the factors associated with OVERALLLENGTH. Formally, OVERALLLENGTH measures the number of months between a claim-dyad's initiation and resolution;[120] I perform a basic Weibull analysis on the cross-section of claim-dyads in my sample. I use various attributes of the claim-dyad as regressors, including issue type, number of lifetime MIDs, and number of lifetime peaceful settlement attempts.

[120] Ongoing claim-dyads are coded as being resolved on 12/2001, the last observation point in the ICOW data. They are treated as ongoing in the analysis.

TABLE 6.1. Correlates of Overall Claim-Dyad Length

	Model 29 *Pooled*	Model 30 *Pooled*	Model 31 *Pooled*	Model 32 *Pooled*	Model 33 *Pooled*
Overall Claim Length					
Number of MIDs	0.103	0.159	0.128*	0.199**	0.191**
NUMMIDS	(0.068)	(0.100)	(0.068)	(0.092)	(0.093)
# of fatal MIDs		-0.407*		-0.406*	-0.405*
NUMFATAL		(0.227)		(0.226)	(0.226)
Highest MID host. lv.		0.199*		0.196*	0.193*
HIHOST		(0.103)		(0.101)	(0.101)
Ends in org. violence		-1.178**		-1.193**	-1.159**
ENDVIOL		(0.549)		(0.534)	(0.536)
# of peaceful attempts	0.141***	0.116***			
NUMPEACE	(0.030)	(0.030)			
# of bilateral atts.			0.176***	0.150***	0.148***
BILAT			(0.039)	(0.038)	(0.038)
# of binding 3P atts.			0.136		
3PBIND			(0.210)		
# of non-binding 3P atts.			0.048		
3PNONBIND			(0.060)		
Territorial issue?	-0.025	0.113	-0.046	0.147	0.177
TERRITORY	(0.268)	(0.268)	(0.278)	(0.263)	(0.267)
Linked issue	0.272	0.298	0.273	0.296	0.319
LINKED	(0.240)	(0.238)	(0.240)	(0.237)	(0.240)
Normalized sal. index					0.076
					(0.112)
Constant	4.588***	4.520***	4.579***	4.547***	4.549***
	(0.158)	(0.161)	(0.158)	(0.157)	(0.158)
λ^{-1}	1.400***	1.359***	1.385***	1.351***	1.352***
	(0.084)	(0.082)	(0.084)	(0.081)	(0.081)
N (Uncensored)	226 (175)	226 (175)	226 (175)	226 (175)	226 (175)
Log-Likelihood	-386.004	-378.530	-384.581	-377.964	-377.736

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed. Uncensored *N* reports the number of resolved claim-dyads. λ^{-1}: inverse of Weibull shape parameter. Unclustered standard errors reported in parentheses.

Table 6.1 displays the results of the analysis. It focuses on various specifications in the pooled sample of issues. Model 29 is a basic model containing four variables: (1) the *total* number of MIDs occurring over the claim-dyad (NUMMIDS), (2) the *total* number of peaceful settlement attempts occurring over the claim-dyad (NUMPEACE), (3) the territorial issue dummy (TERRITORY), and (4) LINKED. Only NUMPEACE is significantly associated with OVERALLLENGTH. Dyadic claims tend to last longer when there are a greater number of peaceful settlement attempts over the issue. The non-results of this simple analysis are perhaps the most surprising. Territorial claim-dyads are no more lengthy than maritime or river claim-dyads, nor are claim-dyads that are "linked" to claim-dyads with a different salience category. Additionally, the number of MIDs is unrelated to OVERALLLENGTH.

Of these, the MID (non-)result is particularly shocking. It is hard to believe that the number of MIDs has no impact on a claim-dyad's overall length. Ex ante, we would expect more MIDs to be related to lengthier claim-dyads. Probing further, I add three MID-related variables to the specification. Perhaps the number of MIDs does not matter, but the number of *serious* MIDs does. I capture this possibility in two ways. NUMFATAL counts the number of MIDs in which at least one casualty occurred (i.e., fatal MIDs). HIHOST is equal to highest hostility level reached by any MID over the claim-dyad.[121] Finally, perhaps whether a MID precipitates the end of the claim-dyad influences OVERALLLENGTH. ENDVIOL is a dummy coded 1 if the claim-dyad ends with organized violence and 0 if it does not.

Model 30 adds the three MID variables as controls. The results are more in line with what we would expect, with all three MID variables achieving at least weak significance. HIHOST is positively signed, suggesting that claim-dyads last longer when they experience MIDs

[121] The variable is a scale that I have coded to range from 0-4: 0 = no MID, 1 = threat of military force, 2 = display of military force, 3 = use of force, 4 = interstate war.

with higher hostility levels. NUMFATAL and ENDVIOL are both negatively signed. Claim-dyads tend to be shorter when they end through violent means and when they experience a greater number of MIDs with casualties.

Model 31 performs a similar "unpacking" on NUMPEACE by disaggregating by the *type* of peaceful settlement attempt. Variables that count the number of bilateral attempts (BILAT), as well as the number of multilateral attempts that are binding (3PBIND) and non-binding (3PNONBIND), are added to the specification. I find that the significance of NUMPEACE in Model 29 is entirely due to BILAT; 3PBIND and 3PNONBIND are insignificant. More bilateral settlement attempts are associated with lengthier overall claim-dyads. Interestingly, NUMMIDS also becomes weakly significant in this model. The coefficient's positive sign suggests that more MID-prone claim-dyads last longer.

Model 32 contains the five significant variables from Models 30 and 31—NUMMIDS, NUMFATAL, HIHOST, ENDVIOL, and BILAT—plus TERRITORY and LINKED. As Model 32 shows, the five variables remain significant, and the other two remain insignificant. Model 33 demonstrates that this continues to be the case when controlling for within-issue salience. I use a normalized measure of the within-salience index; the latter was discussed in the previous chapter.[122] I normalize the index because its composition varies by dispute type (see Table 5.5). This variation makes it problematic to include the index as a regressor in a pooled model, because doing so assumes that the index values are comparable across issue types. Normalizing resolves the comparability problem. I calculate issue-specific *z*-scores by computing the index's mean and standard deviation *for each issue type*. An issue with a normalized score equal to 0 represents the "average" issue within each group. Positive values of the normalized index

[122] As discussed Ch. 5, the within-category measure is an index ranging from 0-12 whose individual indicators vary by issue type. Higher values indicate more salient issues of that type.

represent disputes of greater importance, relative to the average issue of that type. Negative values represent disputes of lesser importance, relative to the average issue of that type. The normalized measure is based on a "relative" metric of comparison, contrasting nicely with the raw index's absolute metric. In the pooled sample, normalized salience has no effect on the overall length of a claim-dyad (Model 33).

The results of these basic models speak to the piece of my argument pertaining to issue indivisibility. The commonly used examples of disputes over indivisible issues are territorial in nature (e.g., Jerusalem). Often, the disputes also tend to endure across time, partially because they are difficult to resolve. Based on the common examples alone, a positive relationship appears to exist between the overall length of a dispute and whether an issue is defined in indivisible terms. Most examples of long-lasting, enduring disputes that readily come to mind are also territorial: e.g., Alsace-Lorraine, Gibraltar, and Kashmir. It is difficult to think of a lengthy non-territorial dispute offhand. Informally, it would stand to reason that only disputes over territorial issues can become indivisible, because they seem to be the only disputes that endure across time.

The empirical evidence challenges this informal reasoning. The models show that territorial issues do *not* last significantly longer than maritime or river issues. [123] In a way, Figure 5.1 foreshadows this finding. For territorial and maritime/river claim-dyads that militarize, the CLAIM DURATION averages are fairly close together, as indicated by the points' proximity along the x dimension. The result is important because it suggests that an issue indivisibility mechanism could appear in disputes over *any* type of issue. Put differently, the

[123] This general relationship is not an artifact of my estimation sample. It also holds for the full sample of ICOW claim-dyads (see Table 4.3 for spatial dimensions; the full territory data go back to 1816).

implication is: if territorial disputes last long enough for issue indivisibility to work, *then maritime/river disputes last long enough for issue indivisibility to work, too*.

While there is no difference in the OVERALLLENGTH of the two salience groupings, the other coefficients may still be different. I rerun the final two models from Table 6.1 on each salience grouping to investigate this possibility. Table 6.2 contains the model results. When the coefficients are significant, they behave the same as they did in the pooled samples. However, many of the coefficients become insignificant. Further, there are a number of differences across the two samples. The only variable that is significant across all four Table 6.2 models is BILAT, which has the same positive sign as before. ENDVIOL attains significance in the highly salient sample, where it is negatively signed (Models 34 and 35). It is similarly signed in the moderately salient sample, but it is statistically insignificant (Models 36 and 37). Conversely, NUMMID is insignificant in the highly salient sample, but positively signed and significant in the moderately salient sample. NUMFATAL and HIHOST are never significant.

Models 35 and 37 also control for within-issue salience. I operationalize within-category salience using the raw index, as the sample is no longer pooled. Interestingly, the raw index is insignificant in the highly salient sample (Model 35). Within-category salience is not associated with the length of territorial claim-dyads. However, the index is positive and statistically significant in the moderately salient sample (Model 37). Maritime and river claim-dyads with higher index values are lengthier. The highly salient result is the most surprising, as common wisdom would hold that the intractable nature of territorial disputes makes them last longer. The basic analysis here finds no support for this supposition.

TABLE 6.2. Correlates of Overall Claim-Dyad Length, by Overall Salience

	Model 34 *Territory*	Model 35 *Territory*	Model 36 *Mar/River*	Model 37 *Mar/River*
Overall Claim Length				
Number of MIDs	0.065	0.060	0.516**	0.473**
NUMMIDS	(0.092)	(0.088)	(0.241)	(0.233)
# of fatal MIDs	0.087	0.067	-0.549	-0.497
NUMFATAL	(0.280)	(0.273)	(0.346)	(0.349)
Highest MID hostility lvl.	0.110	0.097	0.064	0.047
HIHOST	(0.136)	(0.135)	(0.159)	(0.156)
Ends in org. violence	-1.943**	-2.077**	-0.694	-0.422
ENDVIOL	(0.853)	(0.868)	(0.766)	(0.768)
Number of bilateral atmpts.	0.114***	0.104***	0.238***	0.245***
BILAT	(0.037)	(0.038)	(0.066)	(0.066)
Linked issue	-0.084	-0.158	0.430	0.568*
LINKED	(0.396)	(0.398)	(0.297)	(0.305)
Within-category salience index		0.092		0.111**
		(0.109)		(0.053)
Constant	5.162***	4.724***	4.297***	3.581***
	(0.254)	(0.566)	(0.190)	(0.390)
λ^{-1}	0.964	0.954	1.424***	1.424***
	(0.124)	(0.123)	(0.097)	(0.096)
N (Uncensored)	52 (39)	52 (39)	174 (136)	174 (136)
Log-Likelihood	-71.275	-70.904	-297.655	-295.518

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed. Uncensored *N* reports the number of resolved claim-dyads. λ^{-1}: inverse of Weibull shape parameter Unclustered standard errors reported in parentheses.

To conclude this subsection, I emphasize its purpose once again. The analyses are exploratory and descriptive in nature, aimed at uncovering basic associations between claim-dyads' overall length and their descriptive attributes. A number of interesting patterns emerge that are contrary to popular wisdom. Territorial claim-dyads do not last significantly longer than maritime or river claim-dyads, after we control for how many MIDs, fatal MIDs, and bilateral settlement attempts the claim-dyad experiences; the hostility level of the most hostile MID; and whether the claim-dyad ends through organized violence. Additionally, territorial claim-dyads with high levels of within-category salience do not last significantly longer or shorter than other territorial claim-dyads. None of these findings constitute causal explanations, but they are nonetheless helpful.

6.2 SPLIT POPULATION: EMPIRICAL TESTING

6.2.1 Svolik's Split-Population Survival Model

Moving to the main analyses of this chapter, I am interested in the presence of an anticipatory dynamic among peaceful claim-dyads. I examine the full sample of peaceful *and* militarized claims for testing. Figure 6.1 is identical to Figure 5.1, only it adds peaceful claims to the scatterplot. Because I am interested in anticipatory dynamics, I use CLAIM SPELL as my duration dependent variable in the rest of this chapter.

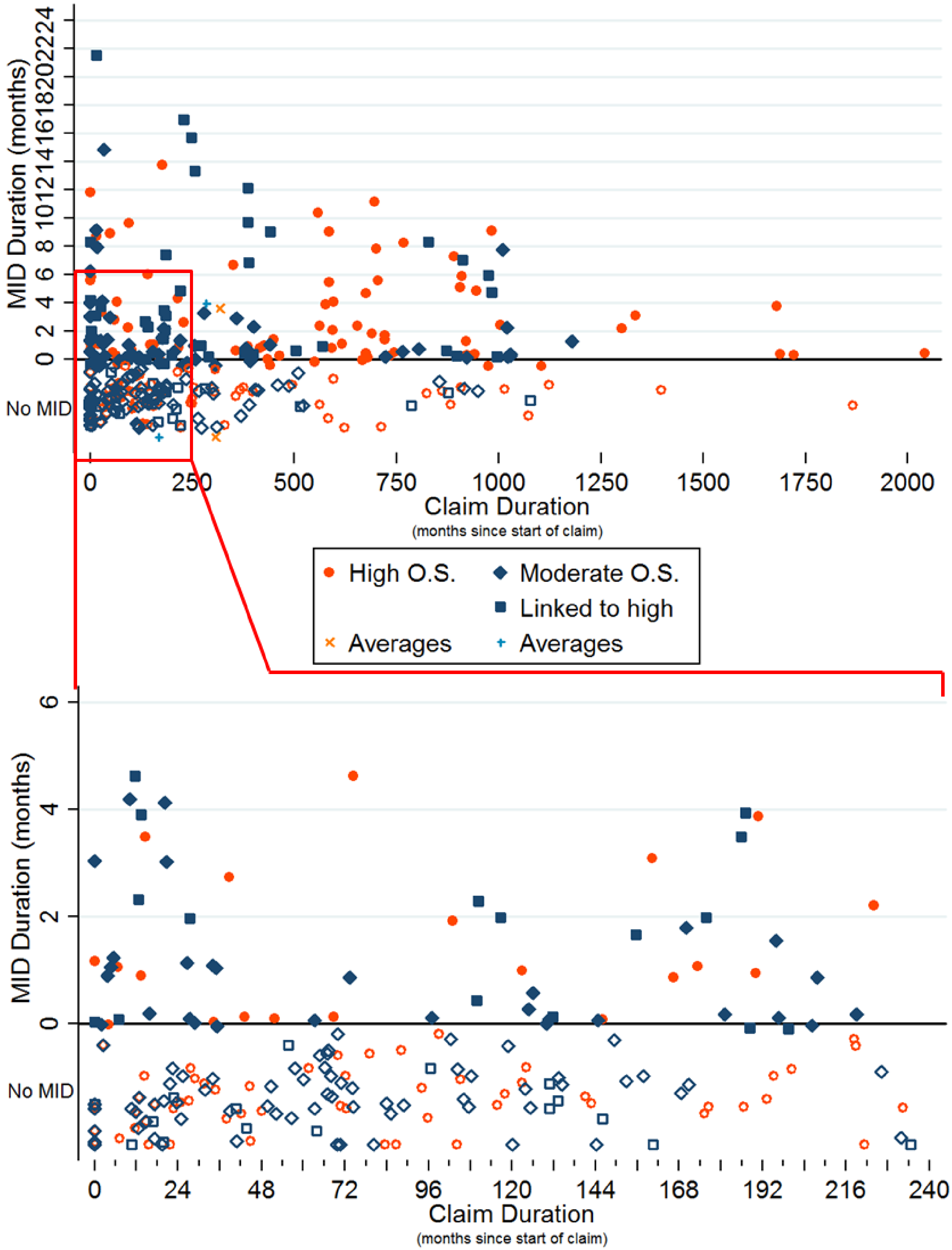


FIGURE 6.1. Scatterplot of CLAIM DURATION vs. MID DURATION, with Peaceful Disputes

I use a discrete-time data structure in this section of the analysis. Each row represents a claim-dyad-year. Svolik's split-population estimator has two dependent variables: (1) CLAIM SPELL, measured in years, and (2) ENDMID, measuring whether the claim spell is terminated by a MID (which, in turn, allows us to estimate TRULY PEACEFUL?). For instance, Table 6.3 shows how Colombia and Nicaragua's first claim over the San Andrés and Providencia Islands would appear in the split population dataset. Figure 5.3 used this dispute to illustrate the various dependent variable codings for y_1. From the CLAIM SPELL section of the figure, we see two line segments for the first claim-dyad, meaning that the SPELL counter begins counting anew, twice. The spell counter begins counting at the start of claim in 1900, and continues to count until 1913, when the claim experiences a MID. Because the first spell ends with a MID, the ENDMID variable is coded as 1 for all observations in the first spell. CLAIM SPELL resets and begins counting again in 1914, the first year after the MID begins. It continues to count until 1930, when the claim is resolved bilaterally, through peaceful means. The spell does not end with a MID, resulting in an ENDMID coding of 0 for all observations in the second spell.

TABLE 6.3. Split Population Data Structure: San Andrés and Providencia

Claim #	Dyad	Year	Spell #	CLAIM SPELL	ENDMID
1	NIC-COL	1900	1	0	1
1	NIC-COL	1901	1	1	1
1	NIC-COL	1902	1	2	1
1	NIC-COL	⋮	⋮	⋮	⋮
1	NIC-COL	1913	1	13	1
1	NIC-COL	1914	2	0	0
1	NIC-COL	1915	2	1	0
1	NIC-COL	⋮	⋮	⋮	⋮
1	NIC-COL	1930	2	16	0

In total, there are 31 observations in the dataset for this claim-dyad. The table omits the observations falling in the middle of a spell; their coding follows from the observations preceding them.

The parameter of interest in the Svolik models is the likelihood-ratio (LR) test for a split population. A statistically significant LR statistic indicates that a split population is present, $\pi \neq$

0. I have suggested that the existence of a split population might be another observable implication of an anticipatory dynamic. Disputes may never militarize because states have no opportunity to militarize the dispute, or states choose not to militarize the dispute, although they could have. The latter would be consistent with an anticipatory dynamic. In the previous chapter, I found evidence of an anticipatory dynamic among moderately salient issues, consistent with my argument. Therefore, I expect the LR test to be statistically significant in the sample of moderately salient issues. I also found evidence of an anticipatory effect in the highly salient sample, but the effect was dwarfed in magnitude by the non-anticipatory effect. Nonetheless, it would be unsurprising if we also found evidence of a split population in the highly salient sample, but this is of lesser concern. The moderate salience estimates are the "key" results of interest.

TABLE 6.4. Main Results: Split-Population Survival Model (Svolik's Estimator)

	Model 38 *High*	Model 39 *High*	Model 40 *Moderate*	Model 41 *Moderate*
Claim Spell				
Multiple claims in year†	0.141	-0.180	-0.230	-0.362
MLATCLAIMYR	(0.428)	(0.440)	(0.310)	(0.321)
Democracy (mean)	-0.005	-0.020	0.044	0.021
DEMOCRACY	(0.031)	(0.032)	(0.030)	(0.029)
Interdependence (mean)	0.932	-0.828	1.530	0.496
INTERDEP	(0.988)	(1.146)	(1.049)	(0.932)
Shared IGO mshps.	0.009	-0.008	-0.033***	-0.059***
IGO	(0.008)	(0.010)	(0.010)	(0.012)
Contiguity	0.264	-2.151***	0.443	1.543***
CONTIGUITY	(0.470)	(0.832)	(0.346)	(0.391)
Major power dyad?	1.363***	-1.616**	0.415	0.364
MPDYAD	(0.454)	(0.791)	(0.333)	(0.389)
Militarization count	-0.204***	-0.157***	-0.236***	-0.098
SETTMIL	(0.029)	(0.031)	(0.055)	(0.060)
Linked issue	-0.331	-0.074	-0.682**	-0.629*
LINKED	(0.260)	(0.247)	(0.324)	(0.375)
Territorial issue?				
TERRITORY				
Constant	2.516***	5.222***	4.420***	4.057***
	(0.604)	(1.018)	(0.615)	(0.696)
λ_1	0.166**	0.100	0.234***	0.063
	(0.079)	(0.076)	(0.077)	(0.079)
Truly Peaceful?				
Third party alliance†		-0.510		-3.992***
3PALLY		(1.751)		(1.230)
Power ratio†		-12.155**		-8.593***
POWERRATIO		(6.173)		(2.623)
Democracy (mean)		0.331		0.190
DEMOCRACY		(0.504)		(0.119)
Interdependence (mean)		15.736*		-0.717
INTERDEP		(8.828)		(2.622)
Shared IGO mshps.		0.172**		0.156***
IGO		(0.078)		(0.054)
Contiguity		14.475**		-1.938*
CONTIGUITY		(7.303)		(1.114)
Major power dyad?		15.399**		-2.041**
MPDYAD		(7.613)		(1.015)
Militarization count		-0.992		-0.499***
SETTMIL		(0.831)		(0.192)
Linked issue		1.333		0.888
LINKED		(1.723)		(1.022)
Territorial issue?				
TERRITORY				
Constant		-20.739**		1.411
		(9.781)		(1.976)
Split pop? H_0: $\pi = 0$ (LR stat.)		49.571***		68.203***
N	2228	2228	3455	3455
Log-Likelihood	-324.644	-299.858	-416.201	-382.100

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables; † = instruments
λ: Weibull shape parameter. Unclustered standard errors reported in parentheses.

Table 6.4 displays the main results from the Svolik estimator. The coefficients cannot be interpreted as direct effects, but signage and statistical significance have the usual interpretations. Positively signed coefficients represent factors that increase the probability of an event occurring. Negatively signed coefficients represent factors that decrease the probability of an event occurring. The shaded row contains the LR test for a split population. Two models are reported for each sample: a Weibull model with no split population element, and a Weibull model with a split population element. The LR test is computed using these two models. The highly salient sample shows evidence of a split population (Models 38 and 39). This result is unsurprising, for the reasons I discussed above. More importantly, the moderately salient sample also shows evidence of a split population (Models 40 and 41). In both samples, the LR test is highly significant. The population of peaceful disputes is heterogeneous in each sample. Some of the peaceful disputes had no chance of militarizing, while others could have experienced a militarization, but did not.

Disputes that could have potentially militarized, but did not, have substantive meaning for my argument. Disputants may forgo militarizing a dispute if the costs of doing so outweigh the benefits. That is, disputants form accurate expectations and behave accordingly; an anticipatory dynamic is at work. A strategic delay mechanism would be consistent with this behavior. The other anticipatory mechanism, strategic prevention, does not provide a particularly compelling reason for why disputes remain peaceful; it would only suggest that no commitment problem exists. As discussed in Section 3.3.2.2, strategic prevention provides more a compelling explanation for disputes that militarize than it does for peaceful disputes.

I found no evidence of a strategic delay mechanism in any of the Chapter 5 models. The statistical significance of the LR tests in Table 6.4 suggest a potential reason why: evidence of strategic delay is strongest in the population of peaceful disputes, which the SEM cannot presently accommodate. Additionally, some of the suspicions I voiced in the previous chapter about moderately salient issues find some merit. I found weaker-than-expected evidence of an anticipatory dynamic in Ch. 5. I speculated that the weak evidence could be the product of excluding peaceful disputes from the analysis, as these disputes would also show signs of an anticipatory dynamic.[124] The evidence of a split population supports my suspicion.

Beyond the argument I have made here, we can also see how the presence of a split population has implications for obtaining accurate coefficient estimates. For example, IGO is insignificant in Model 38, which is the simple Weibull model for high salience issues. The number of shared IGO memberships has no effect on the length of claim spells, according to these results. However, accounting for the split population in Model 39 reveals a different story. IGO is statistically significant in both equations, and the results paint IGOs in a positive light. The signage on IGO follows the same pattern in the moderately salient results (Models 40 and 41). IGO is negatively signed in the CLAIM SPELL equation, suggesting that more shared IGO memberships shorten the length of claim spells. At the same time, IGO is positively signed in the TRULY PEACEFUL? equation. Disputed issues are more likely to remain peaceful when disputants share a greater number of IGO memberships. The results are consistent with a story in which IGOs play a mediating role, in which disputants sharing many IGO memberships resolve their disputes quicker and in a peaceful manner. The split population model provides us with a more nuanced view of the way in which IGOs affect disputed issues. Without the split population

[124] A peaceful dispute could also be consistent with non-anticipation, though this would seem less likely. For instance, if a state overestimated the expected duration of a MID, the state would believe that militarization is more costly than it would be in reality. If the overestimated costs outweighed the expected benefits, the state would elect to keep the dispute peaceful.

element, we would draw incorrect conclusions, as our findings would be based on the biased estimates from the simple Weibull models.

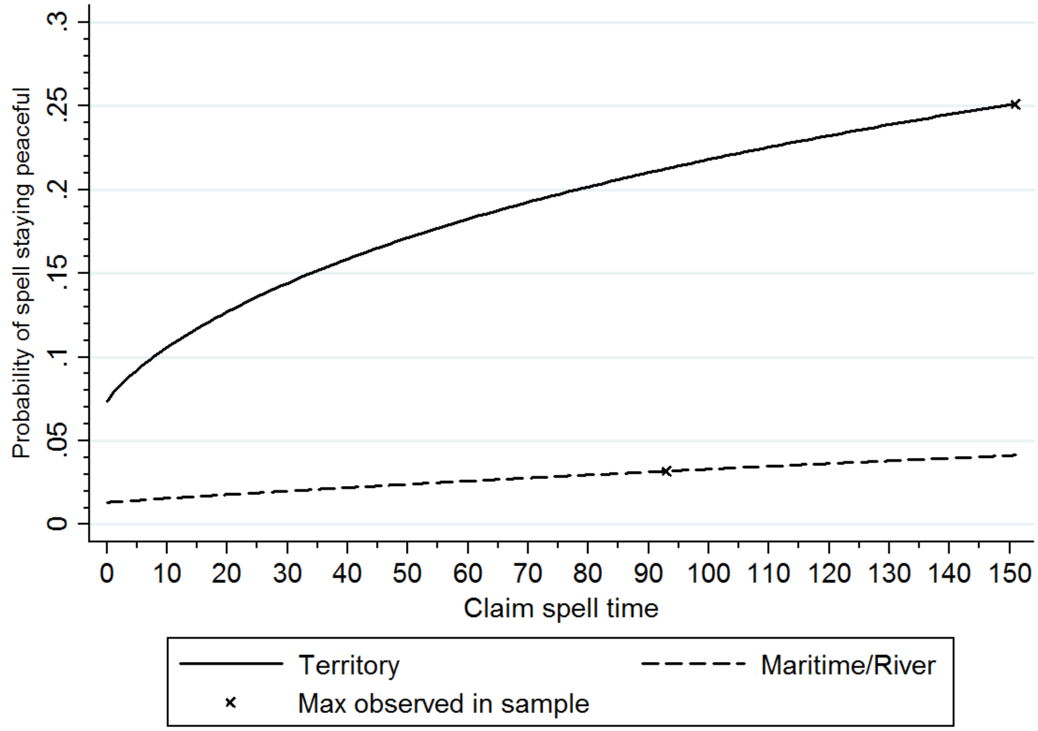
TABLE 6.5. Pooled Results: Split-Population Survival Model (Svolik's Estimator)

	Model 42 *Pooled*	Model 43 *Pooled*
Claim Spell		
Multiple claims in year†	-0.037	-0.115
MLATCLAIMYR	(0.229)	(0.241)
Democracy (mean)	0.008	-0.012
DEMOCRACY	(0.020)	(0.020)
Interdependence (mean)	0.940	0.069
INTERDEP	(0.653)	(0.564)
Shared IGO mshps.	-0.008	-0.025***
IGO	(0.006)	(0.007)
Contiguity	0.224	0.617
CONTIGUITY	(0.256)	(0.433)
Major power dyad?	0.772***	0.809*
MPDYAD	(0.248)	(0.415)
Militarization count	-0.218***	-0.135***
SETTMIL	(0.024)	(0.027)
Linked issue	-0.326*	-0.181
LINKED	(0.189)	(0.234)
Territorial issue?	-0.209	-0.524*
TERRITORY	(0.215)	(0.281)
Constant	3.434***	3.349***
	(0.414)	(0.598)
λ_1	0.200***	0.143***
	(0.055)	(0.053)
Truly Peaceful?		
Third party alliance†		-4.585***
3PALLY		(1.582)
Power ratio†		-9.305***
POWERRATIO		(2.531)
Democracy (mean)		0.293
DEMOCRACY		(0.178)
Interdependence (mean)		-0.767
INTERDEP		(2.546)
Shared IGO mshps.		0.167***
IGO		(0.042)
Contiguity		-0.656
CONTIGUITY		(1.032)
Major power dyad?		-2.522**
MPDYAD		(1.198)
Militarization count		-1.595***
SETTMIL		(0.468)
Linked issue		0.308
LINKED		(1.254)
Territorial issue?		1.453
TERRITORY		(1.186)
Constant		1.114
		(1.882)
Split pop? (LR stat.)		89.681***
N	5683	5683
Log-Likelihood	-749.755	-704.914

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables; † = instruments; λ: Weibull shape parameter.

The split population framework also gives us more nuanced insights into issue salience. The models in Table 6.5 are estimated on the pooled sample of issues, so that we can compare high and moderately salient issues directly. The coefficient on TERRITORY represents any differences across the two groups. I find two things. First, highly salient issues are marginally quicker to militarize than moderately salient issues. This is indicated by the negative and weakly significant TERRITORY coefficient in the CLAIM SPELL equation in Model 43. Second, highly salient issues are *no more likely* to remain peaceful than moderately salient issues. This is indicated by the statistical insignificance of TERRITORY in the TRULY PEACEFUL equation. Contrast the results of Model 43 with those of the simple Weibull, reported as Model 42. Model 42 still shows TERRITORY to have a negative effect on claim spell, but the effect is statistically insignificant.

The non-significance of TERRITORY in the TRULY PEACEFUL equation of Model 43 is perhaps surprising, given the conventional wisdom on the subject. Highly salient issues are believed to more prone to militarization than moderately salient issues, in general. However, TERRITORY's non-significance is less surprising when we consider the earlier analysis involving OVERALLLENGTH. I found that the overall length of territorial claim-dyads did not significantly differ from those of maritime and river claim-dyads. I considered this finding to be a net positive, because it suggested that my argument was more generalizable than suggested at first blush.



Based on estimates from Model 39 (territory) and Model 41 (maritime/river). The difference between the two lines is statistically insignificant, as are the differences between points on the same line.

FIGURE 6.2. The Effect of CLAIM SPELL on TRULY PEACEFUL

Likewise, I interpret Model 43's non-finding for TERRITORY to be helpful. Figure 6.2 plots the effect of increasing values of CLAIM SPELL on the probability of the spell remaining peaceful. From the models in Table 6.4, we already know that none of the differences in the figure are statistically significant. This is also borne out by the graph.[125] Nonetheless, Figure 6.2 illustrates a substantive implication of the non-finding. It shows that claim spells of different lengths are no more or less likely to militarize, regardless of the issue's salience.

[125] I plot the confidence intervals (CIs) on a second, unreported graph to confirm this. Caution should be used in checking for statistical significance graphically (see Esarey and Lawrence 2012). The confidence intervals for each line overlap for all CLAIM SPELL values, indicating that the difference between groups is not statistically significant. The confidence intervals also overlap *within* the same group for all CLAIM SPELL values: e.g., the CI for territorial disputes at CLAIM SPELL = 0 overlaps with the CI for territorial disputes at CLAIM SPELL = 151. The same is true for maritime/river disputes, which indicates that the changes within the group are also statistically insignificant.

This is important because it indicates that the findings from the previous chapter cannot be a function of militarization risk. The analyses in Ch. 5 rely on estimation samples comprised of disputes that militarize only. Of these disputes, the probability that they militarize is equal across salience groupings and equal across claim spell-time, statistically speaking. If the propensity to militarize is spell-time invariant, then underlying changes in militarization risk cannot explain variation in MID duration, nor can it be responsible for differences in conflict dynamics. Of course, a number of possibilities still remain—militarization risk may still vary over ISSUE DURATION. Model 43 is examining CLAIM SPELL, not CLAIM DURATION. Nonetheless, we have eliminated one of many alternative explanations, which necessarily improves our confidence in the SEM results' validity.

We can further unpack the effect of issue salience by adding measures of within-category salience to the specification. Table 6.6 displays the results for the highly salient issue sample (Models 44 and 46) and the moderately salient issue sample (Models 45 and 47).[126] Overall, the LR test for a split population continues to be statistically significant in the models. In the first set of models, I operationalize within-category salience using the raw index described in the previous chapter. I view the raw index as an "absolute" metric of comparison. I find that absolute levels of salience have no effect on the length of an issue's peace spells. The raw index's coefficient in the CLAIM SPELL equation is insignificant in both the highly salient sample (Model 44) and in the moderately salient sample (Model 45). However, higher values of the within-category salience index reduce the probability that both types of dispute will be peaceful. The coefficient for the index is signed negatively and is statistically significant for the TRULY

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[126] I omit the simple Weibull estimates from Table 6.6 to save space.

PEACEFUL equation of both models. While the index's coefficient is strongly significant in the moderately salient sample, it is only weakly significant in the highly salient sample.

TABLE 6.6. Svolik Estimator: Within-Category Salience

	Model 44 *High*	Model 45 *Moderate*	Model 46 *High*	Model 47 *Moderate*
Claim Spell				
Multiple claims in year†	-0.245	-0.567	-0.456	-0.547
MLATCLAIMYR	(0.475)	(0.481)	(0.436)	(0.346)
Democracy (mean)	-0.025	-0.007	-0.032	-0.006
DEMOCRACY	(0.033)	(0.046)	(0.032)	(0.032)
Interdependence (mean)	0.015	0.228	0.030	0.329
INTERDEP	(0.957)	(1.117)	(0.974)	(1.023)
Shared IGO mshps.	0.001	-0.044**	0.002	-0.041***
IGO	(0.009)	(0.017)	(0.009)	(0.012)
Contiguity	-1.239*	1.610***	-1.133	1.546***
CONTIGUITY	(0.746)	(0.420)	(0.728)	(0.384)
Major power dyad?	-0.691	0.784	-0.680	0.858**
MPDYAD	(0.731)	(0.509)	(0.713)	(0.379)
Militarization count	-0.162***	-0.095	-0.176***	-0.102*
SETTMIL	(0.030)	(0.058)	(0.029)	(0.054)
Linked issue	0.234	-1.168***	0.070	-1.198***
LINKED	(0.258)	(0.347)	(0.239)	(0.335)
Within-category salience‡	0.056	0.089	0.188	0.267
	(0.079)	(0.085)	(0.194)	(0.179)
Constant	3.335***	2.934***	3.764***	3.374***
	(1.029)	(0.719)	(0.841)	(0.634)
λ_1	0.072	0.042	0.087	0.032
	(0.077)	(0.074)	(0.076)	(0.072)

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	Model 44 *High*	Model 45 *Moderate*	Model 46 *High*	Model 47 *Moderate*
(continued from previous page)				
Truly Peaceful?				
Third party alliance†	-1.007	-4.810	-3.920	-5.038***
3PALLY	(2.354)	(3.300)	(3.752)	(1.876)
Power ratio†	-23.444	-10.546	-21.142	-10.828**
POWERRATIO	(15.851)	(7.502)	(14.837)	(4.546)
Democracy (mean)	0.422	0.249	0.897	0.236*
DEMOCRACY	(0.289)	(0.266)	(0.555)	(0.141)
Interdependence (mean)	-5.168	1.807	-9.590	2.331
INTERDEP	(6.326)	(3.885)	(8.302)	(3.290)
Shared IGO mshps.	0.192*	0.159***	0.340*	0.159***
IGO	(0.117)	(0.044)	(0.204)	(0.042)
Contiguity	8.979	-1.996*	7.140*	-1.823
CONTIGUITY	(6.530)	(1.194)	(3.975)	(1.126)
Major power dyad?	2.066	-3.918	6.206	-4.264*
MPDYAD	(2.194)	(3.691)	(4.005)	(2.219)
Militarization count	-0.229	-0.423**	-0.781	-0.423**
SETTMIL	(0.490)	(0.205)	(0.994)	(0.189)
Linked issue	-4.607	2.604**	1.431	2.980***
LINKED	(4.528)	(1.049)	(2.351)	(1.128)
Within-category salience‡	-2.924*	-0.906***	-16.610	-2.516***
	(1.768)	(0.264)	(10.903)	(0.736)
Constant	18.945	9.166	-13.056	3.445
	(12.861)	(6.869)	(8.823)	(3.977)
Split pop? (LR stat.)	47.454***	82.232***	53.659***	82.638***
N	2228	3455	2228	3455
Log-Likelihood	-296.890	-373.014	-294.214	-372.665
‡- *Within-cat. sal. measure*	*Raw index*	*Raw index*	*Normalized*	*Normalized*

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables; † = instruments; ‡ = see last row for the measure of within-category salience. λ: Weibull shape parameter. Unclustered standard errors reported in parentheses.

I also estimate a second set of models, adding the normalized salience measure discussed in Section 6.1 as a control. The results using the second specification are reported as Model 46 for highly salient issues and Model 47 for moderately salient issues. I find that normalized salience has an effect on the probability of a moderately salient dispute remaining peaceful. As maritime or river disputes becomes more salient, relative to other disputes of the same type, it is less likely that the dispute will be peaceful. Normalized salience is insignificant in all other instances, including the TRULY PEACEFUL equation in the highly salient sample, where the raw index was weakly significant. I interpret this to mean that absolute levels of salience matter for highly salient issues, but relative levels do not. In moderately salient issues, relative levels of salience matter, but absolute levels do not.

As my main interest is the significance of the split-population statistic, I aim my robustness checks at "breaking" this result. My concern is unobservable factors, other than conflict dynamics, that could be responsible for the statistical significance of the split-population test. This suggests a few basic checks, which are displayed in Table 6.7. First, Svolik's estimator can be identified off functional form. I estimate a set of models with the same set of covariates in each equation. The split population statistic remains significant in the highly salient sample (Model 48) and the moderately salient sample (Model 49). The statistic also remains statistically significant if Models 38 and 40 are reestimated without the insignificant predictors of each equation (not reported here).

Finally, I add a control for whether the dispute is between interstate rivals. State rivals are coded on the basis of perception (Colaresi, Rasler, and Thompson 2007; Thompson and Dreyer 2011; Thompson 2001): they are states which perceive each other as competitors and enemies, where militarization is a real possibility. We might expect that rivalries have latent factors influencing both CLAIM SPELL and TRULY PEACEFUL; controlling for RIVALS acts as a proxy for these factors, removing their potential effect on the split-population statistic. Models 50 and 51 report the RIVALS specifications for highly salient and moderately salient issues, respectively. The split population statistic remains significant in both models.

Interestingly, the RIVALS coefficient is *in*significant in the highly salient sample, and it is significant in the moderately salient sample. Moderately salient disputes between rivals have longer claim spells, indicated by Model 51's positive and statistically significant RIVALS coefficient in the CLAIM SPELL equation. Moderately salient claim spells are also significantly less likely to remain peaceful; RIVALS is negative and statistically significant in Model 51's TRULY PEACEFUL equation. Based on prior research, intuition would perhaps suggest the opposite—RIVALS should matter for highly salient issues, and would maybe matter for moderately salient issues. However, the result makes sense. If conventional wisdom on rivalry is correct, territorial disputes highly correlate with the latent properties of rivalry. There would be little underlying variation left for RIVALS to explain in the highly salient sample, rendering it statistically insignificant. The same is not true for moderately salient issues, hence RIVALS' statistical significance in that sample.

TABLE 6.7. Robustness Checks for Svolik Estimator

	Model 48 *High*	Model 49 *Moderate*	Model 50 *High*	Model 51 *Moderate*
Claim Spell				
Multiple claims in year	-0.042	-0.945***	0.229	-0.371
MLATCLAIMYR	(0.480)	(0.311)	(0.528)	(0.289)
Third party alliance	0.108	-0.364		
3PALLY	(0.448)	(0.387)		
Power ratio	0.227	1.701*		
POWERRATIO	(1.005)	(0.920)		
Democracy (mean)	0.028	-0.001	0.013	0.030
DEMOCRACY	(0.032)	(0.028)	(0.035)	(0.029)
Interdependence (mean)	-0.431	-1.850*	-1.022	1.511
INTERDEP	(1.300)	(1.025)	(1.343)	(1.069)
Shared IGO mshps.	-0.024*	-0.038***	-0.025**	-0.072***
IGO	(0.012)	(0.012)	(0.010)	(0.012)
Contiguity	-1.547	1.802***	-1.511*	2.113***
CONTIGUITY	(1.232)	(0.360)	(0.885)	(0.396)
Major power dyad?	-1.290	1.278**	-0.941	0.675*
MPDYAD	(1.207)	(0.529)	(0.862)	(0.377)
Linked issue	-0.004	-1.705***	0.032	-1.265***
LINKED	(0.267)	(0.317)	(0.284)	(0.347)
Strategic rivals			-0.456	0.941***
RIVALS			(0.351)	(0.346)
Constant	3.290**	2.261**	4.610***	3.774***
	(1.558)	(1.049)	(1.081)	(0.684)
λ_1	0.171**	0.009	0.254***	0.111
	(0.069)	(0.069)	(0.069)	(0.071)

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	Model 48 *High*	Model 49 *Moderate*	Model 50 *High*	Model 51 *Moderate*

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<u>Truly Peaceful?</u>				
Multiple claims in year	3.978**	3.066***		
MLATCLAIMYR	(1.893)	(0.949)		
Third party alliance	0.779	-3.300**	1.404	-5.544***
3PALLY	(1.542)	(1.338)	(1.945)	(1.515)
Power ratio	-9.344***	-9.493***	-8.986**	-6.918***
POWERRATIO	(3.400)	(3.287)	(4.316)	(2.259)
Democracy (mean)	0.345	0.143	0.324	0.211*
DEMOCRACY	(0.225)	(0.095)	(0.251)	(0.117)
Interdependence (mean)	12.314***	9.725***	12.575**	0.264
INTERDEP	(4.739)	(2.473)	(5.291)	(2.464)
Shared IGO mshps.	0.138**	0.106***	0.117**	0.161***
IGO	(0.054)	(0.032)	(0.060)	(0.046)
Contiguity	4.478	-1.457	4.939*	-3.318**
CONTIGUITY	(2.777)	(0.909)	(2.597)	(1.350)
Major power dyad?	6.952**	-2.611*	6.701**	-1.560
MPDYAD	(2.910)	(1.382)	(2.847)	(1.077)
Linked issue	-0.264	3.153***	0.015	1.441
LINKED	(1.006)	(1.096)	(1.083)	(0.969)
Strategic rivals			0.067	-4.227**
RIVALS			(1.242)	(1.677)
Constant	-11.795**	-1.425	-11.866**	0.737
	(4.849)	(2.556)	(4.852)	(2.089)
Split pop? (LR stat.)	166.486***	74.043***	52.435***	78.901***
N	2228	3455	2228	3455
Log-Likelihood	-251.742	-326.153	-311.297	-383.303

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables. λ: Weibull shape parameter; unclustered standard errors in parentheses.

6.2.2 Bivariate Probit with Partial Observability

I also estimate the previous models using a bivariate probit (biprobit) with partial observability, as a robustness check of the split-population results from Svolik's estimator. ρ is the parameter of interest in biprobit models. It represents the unobserved factors correlated with the errors of both equations. It is identical to ρ in SMB's estimator and analogous to α_{ANT} in the SEM. There is no evidence of a split population if ρ is indistinguishable from zero, indicated by the reported LR test statistic. A statistically significant ρ indicates the presence of a split population.

Like Svolik's split population estimator, biprobit models have two equations. Each equation in the biprobit is specified such that it corresponds exactly with each equation in the Svolik estimator. The first biprobit equation models the length of a claim spell, while the second equation models the probability of a Truly Peaceful dispute. Coefficients in a biprobit cannot be interpreted as substantive effects, but signage and significance have meaning. I have inverted the biprobit coefficient signs so that they have the same interpretation as Svolik's estimator. Positive coefficients represent factors with a peace-promoting effect, either by increasing the length of a claim spell (equation 1) or by increasing the probability that the claim-spell is Truly Peaceful (equation 2). Negative coefficients represent factors with a peace-threatening effect. Claim spells are shorter (equation 1) or the probability of a Truly Peaceful claim spell is decreased (equation 2).

TABLE 6.8. Main Results: Biprobit with Partial Observability

	Model 52 *High*	Model 53 *High*	Model 54 *High* SVOLIK	Model 55 *Moderate*	Model 56 *Moderate*
Claim Spell					
Multiple claims in year†	0.149	0.313	0.225	-0.013	-0.166
MLATCLAIMYR	(0.193)	(0.212)	(0.513)	(0.057)	(0.110)
Democracy (mean)	0.032	0.034	0.023	0.101***	0.010
DEMOCRACY	(0.019)	(0.026)	(0.037)	(0.026)	(0.023)
Interdependence (mean)	0.607	-0.254	-1.358	-0.447	-0.270
INTERDEP	(0.635)	(0.848)	(1.372)	(0.845)	(0.999)
Shared IGO mshps.	-0.004	-0.007	-0.029***	-0.025***	-0.030**
IGO	(0.005)	(0.006)	(0.010)	(0.009)	(0.012)
Contiguity	1.464***	-0.799	-2.342*	-1.428***	0.343
CONTIGUITY	(0.558)	(0.513)	(1.312)	(0.292)	(0.256)
Major power dyad?	0.938***	-1.349*	-1.858	-1.254***	-0.054
MPDYAD	(0.323)	(0.737)	(1.292)	(0.284)	(0.290)
Linked issue	0.008	-0.008	0.100	1.112***	-1.024**
LINKED	(0.154)	(0.179)	(0.291)	(0.284)	(0.446)
t	0.671***	0.692***	0.252***	0.850**	0.795***
	(0.037)	(0.040)	(0.070)	(0.059)	(0.051)
Within-cat. sal. index		-0.463***	-0.175**		
		(0.148)	(0.089)		
Normalized sal. index					0.216
NORMSAL					(0.226)
Constant	-0.971	2.637***	6.489***	-0.065	2.343***
	(0.591)	(0.708)	(1.650)	(0.519)	(0.484)

(continued on next page)

	Model 52 *High*	Model 53 *High*	Model 54 *High* SVOLIK	Model 55 *Moderate*	Model 56 *Moderate*
(continued from previous page)					
<u>Truly Peaceful?</u>					
Third party alliance†	0.450	0.148	-0.323	-0.200**	-1.129
3PALLY	(0.813)	(0.569)	(1.782)	(0.092)	(1.122)
Power ratio†	-3.581**	-3.389***	-6.900*	-0.440**	-2.037
POWERRATIO	(1.408)	(1.313)	(3.898)	(0.189)	(2.322)
Democracy (mean)	-0.031	-0.051	0.399	-0.065***	0.028
DEMOCRACY	(0.059)	(0.099)	(0.297)	(0.022)	(0.068)
Interdependence (mean)	1.533	4.395	9.702*	0.549	1.898
INTERDEP	(1.613)	(3.076)	(5.703)	(0.696)	(1.743)
Shared IGO mshps.	0.011	0.021	0.108*	0.013*	0.057*
IGO	(0.019)	(0.019)	(0.064)	(0.008)	(0.031)
Contiguity	-1.941	1.715*	6.144*	1.064***	-0.356
CONTIGUITY	(1.457)	(0.997)	(3.276)	(0.234)	(0.605)
Major power dyad?	-0.822	3.097**	6.949*	0.774***	-0.399
MPDYAD	(0.902)	(1.452)	(3.550)	(0.243)	(0.957)
Linked issue	-0.631	-0.799	0.061	-0.908***	1.778***
LINKED	(0.423)	(0.664)	(1.205)	(0.259)	(0.515)
Within-cat. sal. index		0.230	-0.559		
		(0.523)	(0.342)		
Normalized sal. index					-0.934**
NORMSAL					(0.437)
Constant	-0.971	-1.301	-8.436	-0.065	-2.139
	(0.591)	(2.664)	(6.026)	(0.519)	(1.406)
<u>ρ</u>	0.814	0.561	--	-0.997	-0.715
H_0: $\rho = 0$ (LR statistic)	0.757	0.788	‡ 51.511***	7.368***	27.447***
N	2228	2228	2228	3455	3455
Log-Likelihood	-303.838	-294.905	-307.174	-378.226	-380.520

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, two-tailed for all variables; † = instruments; ‡ = LR statistic for split population (Svolik) Unclustered standard errors reported in parentheses.

Table 6.8 displays the biprobit estimates. As before, the shaded rows contain the parameters of interest for these models, ρ and the LR test statistic. The results are striking. There is no longer evidence of a split population in the highly salient sample. ρ is insignificant (Model 51), even when we control for within-issue salience using the raw index (Model 53). By contrast, ρ is negative and highly significant in the moderately salient sample (Model 55). This is true even when controlling for normalized salience (Model 56). The negative sign means that the unobservables that shorten claim spells are also correlated with a lower probability of militarization.[127] ρ is empirically analogous to the SEM's α_{ANT} in this setting, though it is important to reiterate that ρ and α have different substantive interpretations. The negative ρ is unsurprising in light of the negative α_{ANT} in last chapter's moderately salient SEMs.[128]

The results for within-category salience are different from the Svolik estimates for highly salient issues. Model 53 shows that high salience issues with higher raw index values experience shorter claim spells. The index's coefficient is negative and significant in the CLAIM SPELL equation. Model 53 also shows that the raw index has no effect on the probability that the dispute stays peaceful. Contrast these results with those from the comparable Svolik model (Model 44): the raw index had no effect on a claim spell's length, but it did have a weak, negative effect on the dispute remaining peaceful. Part of the reason for the difference has to do with control variables. The Svolik models control for SETTMIL, but the biprobit models do not, as they do not converge consistently when SETTMIL is included. Model 54 reruns Model 44

[127] The reverse also holds: unobservables that lengthen claim spells also are correlated with an increased probability of militarization.

[128] It is also unsurprising in light of the negative sign on the *other* α, $\alpha_{\sim\text{ANT}}$, in the moderately salient SEM results. It follows that, if both α's are negative in the moderately salient sample, then ρ will likely be negative, too. Additionally, the positive (but insignificant) ρ in the highly salient sample also makes sense. The highly salient sample has oppositely signed α's in the SEM. In these models, the positive $\alpha_{\sim\text{ANT}}$ is larger in magnitude than the negative α_{ANT}. *Ex ante*, we would expect ρ to be positively signed for the highly salient results, but we should be biased toward finding insignificance because the negative α_{ANT} will attenuate ρ's value toward zero. What we obtain for highly salient issues is exactly this: a positive, but insignificant, ρ.

without SETTMIL using Svolik's estimator, and its within-salience estimates better match those of Model 53. What this suggests is that the raw index is picking up some aspect of disputes with multiple militarizations. When we are able to control for repeated militarizations, we are purging that effect from the raw index's coefficient. The result is a more accurate estimate of within-salience's effect. Whether the difference is also the product of the different modeling strategies is unclear from these models. Further investigation is warranted.

Normalized salience behaves the same in the biprobit and Svolik results for moderately salient issues. Model 56 reports the biprobit results, which are comparable to Model 47 from the Svolik results. In the biprobit results, normalized salience has no effect on the length of a claim spell in disputes over maritime and river issues. The coefficient for NORMSAL is insignificant in the CLAIM SPELL equation. However, as normalized salience increases, moderately salient disputes are less likely to remain peaceful. NORMSAL is negative and significant in the TRULY PEACEFUL equation, as it was in the same equation of Model 47.

On the whole, the biprobit estimates give us reason to be cautiously optimistic about the Svolik results. The sample of moderately salient issues consistently shows evidence of a split population, which I have argued is indicative of anticipatory dynamics. The results for highly salient issues are more suspect, as the split-population test statistic varies in significance depending on the estimation strategy.

6.3 CONCLUSION

In layman's terms, what have Chs. 5 and 6 shown? Highly salient issues are prone to non-anticipation, and moderately salient issues are prone to anticipation. In this conclusion, I recap my key findings by taking four different tacks.

6.3.1 Chs. 5 and 6's Collective Results

In this chapter, I found support for Hypothesis 2.1: peaceful disputes showed evidence of an anticipatory dynamic. I used a series of split population models for empirical testing, since these models are designed to investigate heterogeneous populations. In this case, the population of peaceful disputes is heterogeneous: some of the peaceful disputes had no risk of militarizing, but some of them could have militarized and did not. An anticipatory dynamic suggests the latter. In particular, the evidence of anticipation was strongest in the sample of disputes over maritime and river issues. This is consistent with Hypothesis 3.0 and my argument, in general.

Additionally, by using a split population setup, I showed that there is a difference between a dispute *being* at risk for militarization and *when* an at-risk dispute will militarize (Table 6.4, illustrated in Figure 6.2). In conjunction with Chapter 5's analysis, the resulting implication is that a dispute's risk of militarizing may stay constant across time, but the potential militarization's length need *not* stay constant. Territorial disputes illustrate this implication well. They are no more likely to experience militarization than maritime and river disputes, as demonstrated by Chapter 6's analyses. However, if a territorial dispute does militarize, MIDs occurring later in the dispute will be longer lasting, as indicated by the SEM results from Ch. 5.

6.3.2 Conflict Dynamics and Overall Salience

In the sample of territorial claim-dyads, I have shown more broadly that non-anticipatory dynamics predominate. Evidentiary support comes from Chapter 5's SEMs (Table 5.1). $\alpha_{\sim ANT}$ was statistically significant from zero, and was significantly larger in magnitude than the coefficient representing anticipatory dynamics (α_{ANT}). The support is robust to different operationalizations of CLAIM DURATION, in which I vary the variable's time horizon (Table 5.4, Table 5.7). I used Figure 5.3 to illustrate and discuss these different operationalizations and their varying time horizons.

In the sample of maritime and river claim-dyads, I show that anticipatory dynamics predominate (Table 5.1). The SEM estimates show that α_{ANT} is larger in absolute size than $\alpha_{\sim ANT}$ by a significant degree. The statistical support is strongest when the coding of the issue-time dependent variable has short time-horizons. The support is weaker when the time horizon lengthens, as I would expect. I also find support for the claim in Chapter 6. The split population analyses show that anticipatory dynamics are present among peaceful dyads. In particular, the maritime and river claim-dyads have the most robust evidence of anticipatory dynamics, while the evidence for territorial claim-dyads is sometimes weaker.

6.3.3 Within-Category Issue Salience

Perhaps surprisingly, given the significant effects of overall salience, I find that within-category salience has mostly insignificant effects. I measure within-category salience in two ways. First, I use an *absolute* metric of comparison (i.e., the raw salience index; see p. 121). I found that absolute levels of within-category salience do not affect conflict dynamics. Adding the raw salience index as a control does not affect the α's in Ch. 5's SEM results (Table 5.6). The same SEM models also show that the raw index does not always have a significant effect on both CLAIM DURATION and MID DURATION, depending on the sample. Higher values of the raw index increase CLAIM DURATION in both highly and moderately salient issues. By contrast, higher raw index values have no effect on MID DURATION in the highly salient sample; higher raw index values only increase MID DURATION in the moderately salient sample.

Additionally, the relationship between the raw index and CLAIM DURATION disappears when I use an alternative operationalization for CLAIM DURATION. I find that within-category salience has no effect on CLAIM SPELL in both samples of issues, evidenced by the Svolik models in this chapter (Table 6.6). However, the same models show that, for disputes over moderately salient issues, higher values of within-category salience decrease the likelihood that a claim-dyad-spell is Truly Peaceful. A similar truth holds for disputes over highly salient issues, but the result is weaker.

The second way I measure within-category salience uses a *relative* measure of comparison (NORMSAL, see p. 156). The relative measure is the normalized value of the raw index, computed for each category of issue. Normalization is necessary to make sound comparisons across salience groupings, as the composition of the raw index varies by issue type. When I employ the normalized index, a different story emerges. Claim-dyads that are more important, relative to other claim-dyads of that issue type, are less likely to be Truly Peaceful. The result, supported by both the Svolik (Table 6.6) and biprobit models (Table 6.8), is only true for disputes over moderately salient issues. Additionally, higher values of normalized issue salience are associated with longer overall maritime and river claim-dyads (Table 6.2). Overall, the various analyses show that the measurement of "within-category salience" matters, both substantively and empirically.

6.3.4 Dependent Variable Coding

Finally, the two empirical chapters show that dependent variable coding matters, speaking to the importance of sound research design and measurement. In general, a variable's coding must reflect the substantive argument being made. My different operationalizations for CLAIM DURATION were illustrated in Figure 5.3. Here, the effects of one of the non-anticipatory mechanisms—issue indivisibility—manifests only in the longer term. To detect evidence of these effects, the dependent variable must be coded with a sufficiently long time horizon. I found evidence consistent with this when I ran the SEM with ISSUE DURATION, instead of CLAIM DURATION (Table 5.4, Model 10).

By contrast, my proposed anticipatory mechanisms manifest quickly, becoming evident in the short term. Variables with longer time horizons may wash out these shorter-term effects. Accordingly, the dependent variable coding should pick up these immediate fluctuations. When I shift to a CLAIM SPELL coding, with its shorter time horizons to capture the shorter manifestation period, the evidence of an anticipatory dynamic strengthens.

What do these findings mean? What substantive implications can we draw from them? I reflect on both questions in the final, concluding chapter.

7.0 CONCLUSION

At its core, this dissertation has examined conflict dynamics. What I have principally shown is that disputes involving territorial issues exhibit fundamentally different patterns of militarized behavior than disputes involving maritime and river issues. This is a feat in its own right, as it challenges our current ideas about conflict dynamics. Although both groups have an equal opportunity to militarize, MIDs over territory last longer as the dispute itself lasts longer. By contrast, I show that when militarizations begin have no effect on how long militarizations last in maritime and river disputes, once I correct for the effect of expectations.

Different audiences will find different aspects of this project interesting. To newspaper reporter writing an article on this project's findings, the article's overly sensationalist headline would read, "Leaders blinded by emotions! Incapable of making sound decisions!" From a game-theoretic perspective, the project tests for—and finds evidence of—systematic deviations from the predictions of rationalist models of war. From a domestic politics perspective, the project discusses defective decision making over certain types of issues. Instead of focusing on one or two cases, I take stock of decision making in many cases using empirical methods, indicating whether the insights gleaned from the "usual" case studies are generalizable or whether they are exceptions to the rule. The truth, of course, is a nuanced combination of all these.

What implications stem from these findings, both for real world politics and for academic research? I begin by highlighting the major contributions of this dissertation. I then address real-world implications, followed by additional implications for academic research. Along the way, I note future avenues for research.

7.1 MAJOR CONTRIBUTIONS

In looking at how international disputes evolve, I developed a typology of dynamic ideal-types. The typology is one of the fundamental contributions of this project. It provides a new framework for thinking theoretically about *any* bargaining process. Here, I focused on interstate disputes and militarized behavior. The predominant view of bargaining in scholarly work on militarized conflict is a game-theoretic, rationalist one. Conflict-as-process arguments are typically viewed as different, wholly outside the realm of rationalist thought.

I challenge this belief. I show that each viewpoint has a common set of tenets, which the typology makes evident. Game-theoretic and conflict-as-process arguments both suggest that militarized conflict is avoidable when states have enough information about the dispute and can interpret it correctly. When these conditions are both met, I call this an "anticipatory" dynamic.

The difference between the two arguments lies in their explanation for militarized conflict. Game-theoretic works primarily focus on the availability of information. On the other hand, conflict-as-process arguments emphasize the ability to interpret information correctly, which is taken as given in game-theoretic stories. Instead of being two different coins, game-theoretic and conflict-as-process arguments are different sides of the same coin. To emphasize this fact, I assigned the same label—a “non-anticipatory dynamic”—to all explanations for militarized conflict, regardless of which argument they originated from.

Game-theoretic work is notable for its clear explanation for why conflict occurs. Similarly, I provide a preliminary set of clear explanations for non-anticipatory dynamics arising from conflict-as-process stories. The two explanations address why information availability or processing problems can lead to militarized conflict, even when states (and their decision makers) are self-interested and wish to avoid such a costly outcome. First, time pressures lead to militarized behavior by limiting the amount of time for deliberation, which encourages a hasty survey of the situation and rushed decisions. There may not be enough time to gather information about the various alternatives or enough time to digest the information, if the information exists. Second, issue indivisibility yields militarizations when rhetoric and emotions regarding the dispute build over time. While visible in the long run, the emotional buildups are hard to detect in the short term because they occur so gradually. The buildup subtly transforms the cognitive structures used by state decision makers to filter information and judge its importance, affecting decision makers’ ability to interpret information correctly (in the objective sense).

The majority of game-theoretic work assumes that states usually interpret information correctly. My argument could be interpreted by some as an attack on the intrinsic usefulness of game-theoretic insights. Nothing could be further from the truth. The aim of any theory is to enhance our understanding of some phenomenon of interest, which we do by providing a deliberate simplification of the world. The validity of these simplifying assumptions is more tenuous in some cases than we would like. Yet, we do so in the hope of gaining purchase over some puzzle by honing in on the ‘key’ pieces of the process. This simplification, and its ensuing insights, is something that game-theoretic work has done very well. My argument simply highlights where game-theoretic assumptions have the highest propensity of being violated. Such cases are perhaps in the minority, which is why some empirical analyses are supportive of rationalist arguments. I show that the violations are not distributed randomly across cases—all types of disputed issues are not the same, e.g.—such that deviations from predicted behavior occur systematically. Both the deviant and non-deviant cases are therefore important, because in comparing them, we gain an opportunity to uncover new substantive insights (Gerring 2007).

7.2 REAL-WORLD IMPLICATIONS

A number of real-world implications also follow from the argument I advance. First, if territorial, maritime, and river issues are all equally at risk for experiencing a militarization, then perhaps we need to care just as much about keeping maritime and river disputes peaceful, too. This is somewhat contrary to the intense focus on territorial disputes that has characterized most issues-based research to date. It may be the case that disputes over maritime and river issues are less likely to experience *higher intensity* militarizations (e.g., war) than territorial issues. This is a possibility that I do not explore here, but leave to future research. Further, to keep the peace, most have focused on ways to increase the costs of fighting, so as to make military conflict less palatable. An additional implication of my substantive argument is that lessening the value of the issue being disputed could also aid prevention efforts, since value acts as a discounting factor for militarization costs. I discuss this in more detail in Section 7.3. Thinking about possible ways to lessen an issue's value, and whether the ways would be effective or efficient, is another question left for future research.

Second, decision makers do not appear to be wholly "blinded by emotion." They appear to be thoughtful, rational beings. In both the sample of territorial disputes and the sample of maritime and river disputes, I found evidence of an anticipatory dynamic. The caveat is that, in territorial disputes, the anticipatory element is overpowered by the non-anticipatory element. From this, one could conclude that decision makers are trying to form accurate expectations for decisions over any type of issue, but their ability to do so is impaired in territorial disputes. A natural extension is to delve into the causes of the impairment. Throughout the project—Chapter 3, in particular—I have offered several possible causes, but discriminating among them was beyond my scope here. Anecdotal evidence suggests a role for domestic politics, in that the mass publics become mobilized and "enraged," limiting leaders' ability to take a moderate tack in the long run. This is true in democracies and non-democracies alike. Exploring how such mobilizations take place can provide further insight into counteracting them. For example, international organizations that mediate disagreements may be able to work more actively to provide domestic cover to politicians (e.g., Allee and Huth 2006; Vreeland 2003). This is one of the first areas that I intend to examine in post-dissertation work.

Third, the timing of mediation attempts might matter. From my analysis here, we know that when a territorial dispute militarizes has a strong effect on how long the militarization lasts. Generalizing this insight about "when," it stands to reason that a similar truth may hold for mediation attempts: when do mediation attempts occur in a dispute, and does "when" influence their success? For disputes over territorial issues, mediations occurring earlier may be more effective than those occurring later. However, research on mediation has not considered this possibility fully. *If* extant work considers the question of "when," it usually examines when mediation attempts occur relative to an ongoing militarization (e.g., Regan 2002). Alternatively, studies have focused on the time elapsed since a previous mediation attempt over an issue to predict the occurrence of future mediation attempts (e.g., Shannon 2009). In both scenarios, there is no consideration of when the mediation attempt occurs in the context of the disputed issue, on the whole.

The importance of "when" in territorial disputes has additional implications for studies of mediation, as these findings are indicative of path dependence. The occurrence and sequence of past events influence those occurring in the future. This is indicated by the impact of CLAIM DURATION on MID DURATION in my analyses of territorial disputes ($\alpha_{\sim ANT}$): the length of MIDs is affected by the sequence of preceding peaceful years. The path dependence of territorial disputes leads to a number of related questions. Do events occurring early in a dispute's lifetime affect how long the dispute takes to resolve, overall? Do early events have a long-term effect on the success or failure of future mediation attempts? Do early events affect the timing of these future mediation attempts? Any of these answers would be of interest to real-world practitioners looking to bring peace to some of the world's hotspots.

Fourth, disputed issues and militarization patterns may be connected in other ways. Earlier, I make the simplifying assumption that interstate disputes arise in a more-or-less random fashion, independently of states' militarized behavior toward one another. Yet, we can think of instances in which disputes may have begun *precisely* because states were already prone to militarized behavior: Argentina and Chile fought repeatedly throughout the 19th century over several parts of their disputed Andean border, influencing the initiation of another territorial dispute over island ownership in the Beagle Channel in 1904. Understanding this facet of interstate behavior casts light on the ways in which the interplay between context and militarized behavior can be leveraged, better equipping negotiators with potential strategies to successfully reach peaceful settlements. The potential findings would also speak to multiple research agendas in interstate conflict, including recent work on cross-dispute linkages (Wiegand 2011a, 2011b), bilateral cooperation and issue linkage (Wiegand and Powell 2011), and interstate rivalries (Mitchell and Thies 2011; Rasler and Thompson 2006). I leave this, too, as a question for future research.

Finally, the framework I have developed using militarized conflict between states should apply to militarized conflict *within* states. I hope to use my research to open a new line of inquiry into the causes of civil conflicts. In refining our notion of disputed issues and dynamics in a civil conflict setting, we will be in a better position to enhance the effectiveness of our resolution strategies. We can help smoothen the transition in post-conflict societies.

7.3 ACADEMIC RESEARCH IMPLICATIONS

This dissertation also has several implications for the academic study of interstate conflict, as well as other phenomena of interest. First and foremost, this project shows the importance of interdependence in studies of militarized conflict. The factors that affect whether and when a militarization begins also affect how long it lasts. In general, some empirical analyses acknowledge the connectivity among different militarization outcomes (e.g., Clark and Reed 2003; Huth 1996b; Reed 2000; Senese 2005; Senese and Vasquez 2008; Signorino 2002, 2003; Slantchev 2003, 2004). However, the majority of existing research eschews the connectivity, opening the door for biased empirical estimates and potentially invalid conclusions.

My analysis also takes a step farther, in that it allows for some outcome y_i to directly influence y_j, another outcome of interest. Among the research that does account for possible dependence among different conflict outcomes, the relationship between y_i and y_j is instead captured through correlated error terms. For instance, Reed (2000) was among the first of recent times to note the connectivity among conflict outcomes, and the connectivity's ramifications for empirical analysis. He examines militarization onset and whether the militarization escalates to interstate war. However, Reed models the connectivity in terms of unobservable, latent factors—the same unobservable factors that cause a dispute to militarize are also responsible for the militarization escalating to war. The analysis does not consider whether a militarization's underlying propensity to *escalate* to war has a direct effect on the *initial* decision to militarize at all. Yet, this story is precisely what a game-theoretic explanation would suggest.

Second—and related to the first—I draw particular attention to the importance of time dependence. The effect of time dependency on the accuracy of empirical estimates is widely promulgated and accepted in the discipline. A variety of techniques exist to correct for the effects of "time." The inclusion of splines is among the better-known strategies in interstate conflict research (Beck, Katz, and Tucker 1998). A spline approach, and many of the other approaches, treat time dependence as a nuisance to estimation: if unaccounted for, it can affect the accuracy of estimates for our variable of interest (e.g., joint democracy, trade, shared IGO memberships). I show that "time," broadly understood, matters. Time has *substantive* implications which are largely unexplored because of the current nuisance perspective.[129] I also address scholars' current conceptualization of "time" (Beck, Katz, and Tucker 1998; Beck 2010; Carter and Signorino 2010a, 2010b; Licht 2011). I show that how we conceptualize time is important for furthering our understanding of conflict processes. Should it be conceptualized as the amount of time since the last militarization between two states (i.e., gap time, like CLAIM

[129] See Carter and Signorino (2010a, 2010b) and Beck (2010) for a recent discussion on this broader point.

SPELL), which comports with the current spline approach? Or, as I argue, should we conceptualize "time" as the amount of time since the start of the overarching disputed issue (i.e., total time, like CLAIM DURATION)?

More importantly, I have shown that questions *pertaining* to time—such as a MID's duration—may be characterized not only by time dependence, but by time *inter*dependence.[130] While time dependence suggests that some t affects y_j, interdependence further suggests that y_j also affects t. Here, CLAIM DURATION affected MID DURATION, but was also affected *by* MID DURATION. Analogs exist elsewhere in research on militarized conflict, like using the length of a civil war to explain the length of post-war peace (e.g., Fortna 2008). If a post-war peace is expected to be long lasting, disputants may try to strengthen their bargaining position by continuing to fight, so as to obtain as much of the disputed good as possible (e.g., Fearon 1998).

The potential for time interdependence is not exclusive to conflict scholars, though. Other subfields have questions involving the interplay between two duration times. Scholars interested in parliamentary democracies have wondered if how long a government survives is affected by the lengthiness of the negotiations to form its ruling coalition (e.g., Diermeier and Stevenson 2000; King et al. 1990; Warwick 1992). American politics scholars are interested in how long candidates last before withdrawing from the US presidential primary (e.g., Damore, Hansford, and Barghothi 2010; Norrander 2000, 2006); one factor could be how early a candidate declares his or her candidacy in the preceding year. The empirical strategies for accommodating time interdependence are different than those concerning time dependence. Choosing the correct strategy thus becomes imperative. Simply being aware that a choice *exists* is an important first step.

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[130] Time interdependence is synonymous with "duration interdependence."

Third, I show the serious, crippling effects that arise from ignoring time interdependence. For proof, look no further than my findings regarding MID duration. Extant work on MID duration has primarily focused on state-, geography-, and militarization-specific factors (e.g., Bennett and Stam 1996, 2004; Bueno de Mesquita, Koch, and Siverson 2004; Goemans 2000; Koch 2009; Shannon, Morey, and Boehmke 2010; Slantchev 2004; Stanley and Sawyer 2009). I show that dispute-specific factors also matter by demonstrating that *when* certain disputes militarize (i.e., CLAIM DURATION) affects the length of these militarizations. This suggests that extant work on MID duration has omitted a relevant variable, which could potentially affect the validity of their results. Analyses that include CLAIM DURATION as a control variable are free of this omitted variable bias. However, analyses failing to account for CLAIM DURATION's interdependence with MID duration will be tainted by another type of bias—simultaneity bias. In Chapter 5, we saw the effects first hand when I replicated Krustev's (2006) and Shannon, Morey, and Boehmke's (2010) studies of MID duration. The main variables of interest in both articles were not related to "time", but by controlling for time with the appropriate econometric technique, the coefficients of interest changed significantly. The summarizing paragraph from that section bears repeating: scholars interested in durations of any sort should carefully think about (a) whether there is a potential 'time' variable associated with their process of interest, (b) whether time elapsed has an effect on the duration, and (c) the relationship between their *x*'s of interest and time elapsed. Researchers can then take the appropriate methodological steps to ensure that their analyses are valid.

In Section 7.1, I discussed my argument's implications for game-theoretic research. Specifically, my typology of dynamic ideal-types recognizes availability of relevant information and perfect/near-perfect information processing as being joint, crucial conditions for an anticipatory dynamic. I demonstrate the existence of scenarios in which each condition is likely to be violated, thus providing several explanations as to why disputes may militarize. Game-theoretic work, by contrast, normally takes perfect or near-perfect processing capabilities as given. By recognizing the importance of this condition, and laying out the logic in a rigorous way, my typology makes it clear that game-theoretic work overlooks some of these scenarios.

My results also speak to game-theoretic work on conflict in other respects. My findings from the SEM analysis are consistent with territorial issues' indivisibility, be it actual or perceived, changing over the course of the dispute. The change is responsible for the form of non-anticipation we observe (issue indivisibility). What this suggests more broadly is that the value of territorial issues may differ across the dispute. However, current game-theoretic work holds an issue's value constant. Relaxing this assumption could impact the conclusions drawn from these models. For instance, when I relax the assumption in the basic bargaining model used in Chs. 2 and 3, we see that issue value acts as a discount factor for the costs of fighting. This means that states may believe the benefits of militarization outweigh its costs for disputes over valuable issues, even in the face of extremely costly militarizations. Allowing an issue's value to vary in formal models may produce additional insights into the processes behind militarized conflict.

Finally, my work also speaks to scholars investigating interstate rivalries. Research on rivalry often analyzes militarization patterns over an entire dyad (e.g., Figure 4.1, Panel A); it does not distinguish by the disputed issue underlying each militarization (e.g., Figure 4.1, Panel B). I show that certain elements of the disputed issue are relevant to understanding not only individual militarization, but the overall pattern of militarization between states. A dispute-centric setup may be useful as an alternative framework for the examination of rivalry dynamics.

This dovetails with recent calls for an "issue rivalry" conceptualization for recurrent conflict research, where conflict patterns are examined over specific disputes between states (Mitchell and Thies 2011).

As a whole, the argument I have advanced in this dissertation speaks to one of the quintessential puzzles of politics: when making decisions, do decision makers have an eye on the future as they perform cost-benefit analyses, or are they "blinded" by history? For international disputes over issues, I show that history is key for decisions regarding disputes over territorial issues, while decisions regarding disputes over issues of lesser importance are influenced the most by considerations about the future. The insight should be generalizable to any international or domestic bargaining situation. We begin by considering attributes of the disputed good, such as how long it has been disputed, and its salience level. Next, we consider the actions available to actors, the costliness of these actions, and the resultant outcomes. We can then proceed to actor-specific characteristics. In short, my framework suggests an additional perspective for analyzing events other than militarized conflict or for understanding aspects of the domestic decision-making process, potentially yielding new insights that will further our understanding of political processes.

APPENDIX A

GLOSSARY OF TERMS

Anticipatory dynamic: characterized by outcomes consistent with rational expectations; two conditions are met: the availability of relevant information and the ability to correctly process it (p. 25)

Claim duration: the number of months elapsed between the start of a claim-dyad and a MID; total-time formulation; equivalent to Segment AB in Figure 2.1, also abbreviated as *t*, contrast with CLAIM SPELL and ISSUE DURATION (pp. 36, 83; fn. 76). See also Figure 5.3.

Claim spell: records the number of months that pass between the initiation of a claim-dyad and the start of a MID over that claim; gap-time formulation, contrast with CLAIM DURATION and ISSUE DURATION (p. 127; fn. 76). See also Figure 5.3.

Claim-dyad: main unit in all statistical analyses; represents one disagreement over the allocation of a given issue with State *i* as initiator of the disagreement and State *j* as the target (i.e., directed state pairs) (p. 78)

Dispute: when official representatives of one state's government make explicit statements or claims that either (a) challenge the status quo regarding the issue or (b) are counter to the explicit statements or claims made by the official representatives of another state's government; also referred to as "disputed issue" (p. 37)

Disputed issue: *see dispute*

Dynamic ideal-type: describes the relationship between the behavior of self-interested actors (actions, *a*) and how actions combine to yield an observed outcome (*o*) (p. 10)

Expectations, rational: describes the causal process yielding some outcome of interest; formally, actors exhibiting behavior consistent with rational expectations will make efficient use of all available information in the present to form unbiased expectations about an outcome in the future (p. 14)

Intangible salience: the importance of an issue due to the indirectly observable goals associated with it (p. 39)

Issue duration: the number of months elapsed between the start of the *first* claim-dyad over an issue and a MID; contrast with CLAIM DURATION and CLAIM SPELL (p. 117). See also Figure 5.3.

Issue: the collection of stakes seen as satisfying a state's goals; an issue can experience multiple claim-dyads; operationalized using the Issue Correlates of War data on territorial, maritime, and river disputes (pp. 39, 77)

MID duration: the number of months that MID lasts, based on the MID's recorded start and end dates; equivalent to Segment BC in Figure 2.1 (p. 84)

Militarization: military force of any sort, employed by one state toward another (e.g., verbal threats, mobilization of forces, engaging in active combat); operationalized as a militarized interstate dispute (MID) (pp. 12, 77)

Non-anticipatory dynamic: characterized by outcomes that are *in*consistent with rational expectations; states have a dearth of available information with which to form their expectations and/or they do not have near-perfect information processing capabilities (p. 28)

Normalized index (within-issue salience): issue-specific *z*-scores, computing the raw index's mean and standard deviation *for each issue type*; a normalized score equal to 0 represents the "average" issue within each group, positive values represent disputes of greater importance, relative to the average issue of that type, and negative values represent disputes of lesser importance, relative to the average issue of that type (p. 156)

Overall issue salience: the general importance of an issue "to the state's leadership or…[to] a substantial portion of its population," based on whether the issue has a relatively high or low amount of both tangible and intangible salience (Hensel et al. 2008, 121) (p. 40)

Rational expectations: *see expectations, rational*

Raw index (within-issue salience): issue-specific salience variables from the Issue Correlates of War data, which are coded as an index ranging from 0-12; the components of the index vary by issue type (displayed in Table 5.5); absolute measure of issue salience (p. 121)

Tangible salience: the importance of an issue due to the directly observable goals associated with it (p. 39)

Truly Peaceful: claim-dyads that could not have militarized, as states lack the requisite military capacity to do so; the risk of dispute militarization is practically zero (pp. 26, 95)

APPENDIX B

REFERENCE LIST OF SAMPLE DISPUTES, BY CLAIM-DYADS

Claim-dyads with 0 MIDs appear in the split-population sample only. The "MIDs" column contains the count of MIDs in the SEM sample. This number is not necessarily equal to the total count MIDs over the claim-dyad.

Symbol Key:
+ Claim-dyad still ongoing as of 12/2001.

TABLE B.1. List of Territorial Disputes in Sample

Dyad	Dispute Name	Chal.	Start	End	MIDs
USA-UKG	Alaska	UKG	1872	1903	1
USA-CAN	Wrangel Island	CAN	1922	1924	0
CAN-RUS	Wrangel Island	CAN	1922	1924	0
CAN-UKG	Labrador	CAN	1920	1927	0
USA-MEX	El Chamizal	MEX	1895	1963	0
USA-CAN	Ellesmere Island	CAN	1922	1926	0
CAN-NOR	Sverdrup Islands	CAN	1922	1930	0
CAN-DEN	Hans Island	CAN	1971	2001	0+
NOR-DEN	Eastern Greenland	DEN	1921	1933	0
HAI-DOM	Río Massacre	HAI	1934	1935	0
HON-COL	Serranilla Bank and Bajo Nuevo	HON	1982	1986	0
NIC-COL	San Andrés y Providencia	NIC	1979	2001	2+
MEX-FRN	Clipperton Island	MEX	1897	1934	0
GUA-UKG	Belize	GUA	1868	1981	2
BLZ-GUA	Belize	GUA	1981	2001	5+
GUA-UKG	Ranguana and Sapodilla	GUA	1981	1981	0
BLZ-GUA	Ranguana and Sapodilla	GUA	1981	2001	0+
HON-UKG	Ranguana and Sapodilla	HON	1981	1981	0

(continued on next page)

Dyad	Dispute Name	Chal.	Start	End	MIDs
	(continued from previous page)				
BLZ-HON	Ranguana and Sapodilla	HON	1981	2001	0^+
GUA-SAL	Cordillera Monte Cristo	GUA	1935	1938	1
HON-SAL	Bolsones	SAL	1899	1992	1
HON-SAL	Conejo Island	SAL	2000	2001	0^+
HON-NIC	Cayo Sur - Media Luna	NIC	1998	2001	1^+
USA-NIC	Mangles (Corn) Islands	NIC	1965	1971	0
COL-VEN	Los Monjes	COL	1951	2001	3^+
COL-PER	Leticia	PER	1932	1935	1
VEN-UKG	Essequibo	VEN	1951	1966	0
VEN-GUY	Essequibo	VEN	1966	2001	7^+
GUY-NTH	Corentyn/New River Triangle	NTH	1966	1975	0
GUY-SUR	Corentyn/New River Triangle	SUR	1975	2001	2^+
SUR-FRN	Maroni	SUR	1975	2001	0^+
ECU-PER	Oriente-Mainas	ECU	1854	1945	2
ECU-PER	Cordillera del Cóndor	ECU	1947	1998	12
BOL-PAR	Chaco Boreal	BOL	1878	1938	10
PER-CHL	Tacna-Arica	PER	1884	1929	2
CHL-ARG	Los Andes	CHL	1896	1904	1
CHL-ARG	Beagle Channel	ARG	1904	1985	19
CHL-ARG	Palena/Continental Glaciers	CHL	1903	1998	0
ARG-URU	Río de La Plata	ARG	1882	1973	1
ARG-UKG	Falkland Is. and Dependencies	ARG	1841	2001	3^+
UKG-IRE	Northern Ireland	IRE	1922	1998	0
UKG-IRE	Treaty Ports	IRE	1927	1938	0
UKG-FRN	Ecrehos and Minquiers	FRN	1886	1953	0
UKG-SPN	Gibraltar	SPN	1816	2001	1^+
NTH-GFR	Elten and Tudderen	GFR	1955	1963	0
FRN-GFR	Saar (Sarre)	GFR	1955	1957	0
GFR-GDR	German Reunification	GFR	1955	1972	0
USA-RUS	West Berlin	RUS	1948	1971	2
GFR-GDR	West Berlin	GDR	1958	1972	2

NOTE: To obtain sufficient data, territorial claims starting before 1885 are excluded from the SEM sample unless they experience at least two MIDs after 1885.

TABLE B.2. List of River Disputes in Sample

Dyad	Dispute Name	Chal.	Start	End	MIDs
USA-CAN	St. Lawrence River (Niagara): *Chicago Diversion*	CAN	1925	1932	0
USA-UKG	Milk River (St. Mary's): *St. Mary's Diversion*	UKG	1902	1909	0
USA-UKG	Milk River (St. Mary's): *Milk River Diversion*	USA	1904	1909	0
USA-CAN	Red River (Souris): *Garrison Diversion*	CAN	1973	1986	0
USA-CAN	Red River (Souris-Sheyenne): *Devil's Lake Diversion*	CAN	1997	2001	0[+]
USA-CAN	Souris River: *Rafferty-Alameda Dam*	CAN	1989	1992	0
USA-CAN	Columbia River (Kootenay-Frasier): *Libby Dam*	CAN	1951	1961	0
USA-CAN	Skagit River: *High Ross Dam*	CAN	1972	1984	0
USA-CAN	Taku River: *Tulsequah Chief Mine*	USA	1998	2001	0[+]
USA-MEX	Colorado River: *Alamo Canal*	MEX	1901	1904	0
USA-MEX	Colorado River: *Colorado Apportionment*	MEX	1905	1944	0
USA-MEX	Colorado River: *Wellton-Mohawk Salinity*	MEX	1961	1973	0
USA-MEX	Colorado River: *All-American Canal Sealing*	MEX	1989	1999	0
USA-MEX	Río Grande: *Upper Río Grande*	MEX	1900	1906	0
USA-MEX	Río Grande: *Lower Río Grande*	USA	1924	1944	0
NIC-COS	San Juan River: *San Juan Navigation*	COS	1982	2001	1[+]
ECU-PER	Napo River: *Petroecuador Oil Spill*	PER	1992	1992	0
BRA-ARG	Iguazú River: *Segredo Reservoir*	ARG	1998	1998	0
BRA-ARG	Paraná River: *Itaipú Dam*	ARG	1972	1979	0
PAR-ARG	Paraná River: *Yacyreta Dam*	PAR	1973	1979	0
PAR-ARG	Pilcomayo River: *Lower Pilcomayo Diversion*	PAR	1980	1983	0

(continued on next page)

Dyad	Dispute Name	Chal.	Start	End	MIDs
	(continued from previous page)				
ARG-URU	Uruguay River (La Plata): *Uruguay River Border*	ARG	1900	1973	1
BOL-CHL	Silala River: *Silala Fees (Ductec)*	CHL	1999	2001	0^+
NTH-BEL	Meuse: *Albert Canal*	NTH	1930	1937	0
NTH-FRN	Rhine: *Alsace Salt Releases*	NTH	1979	1982	0
SPN-POR	Douro-Tagus-Guadiana: *National Hydrological Plan*	POR	1993	2000	0
SYR-ISR	Jordan River: *Lake Huleh Diversion*	SYR	1951	1951	1
JOR-ISR	Jordan River: *Lake Huleh Diversion*	JOR	1951	1953	0
SYR-ISR	Jordan River: *DMZ Diversion*	SYR	1953	1954	1
LEB-ISR	Jordan River: *National Water Carrier*	LEB	1956	1966	0
SYR-ISR	Jordan River: *National Water Carrier*	SYR	1956	1958	0
EGY-ISR	Jordan River: *National Water Carrier*	EGY	1959	1961	0
SYR-ISR	Jordan River: *National Water Carrier*	SYR	1961	1966	0
JOR-ISR	Jordan River: *National Water Carrier*	JOR	1956	1966	0
JOR-ISR	Jordan River: *Sewage Dumping*	JOR	1989	1989	0
JOR-ISR	Jordan River: *West Bank Allocation*	JOR	1989	1989	0
LEB-ISR	Hasbani-Baniyas (Jordan): *Jordan Headwaters Diversion*	ISR	1964	1966	0
SYR-ISR	Hasbani-Baniyas (Jordan): *Jordan Headwaters Diversion*	ISR	1964	1966	1
JOR-ISR	Hasbani-Baniyas (Jordan): *Jordan Headwaters Diversion*	ISR	1964	1966	0
SYR-ISR	Yarmuk River (Jordan): *Bunger Plan*	ISR	1953	1956	0
JOR-ISR	Yarmuk River (Jordan): *Bunger Plan*	ISR	1953	1956	0
SYR-ISR	Yarmuk River (Jordan): *Unity Dam*	ISR	1987	1998	0

(continued on next page)

Dyad	Dispute Name	Chal.	Start	End	MIDs
	(continued from previous page)				
JOR-ISR	Yarmuk River (Jordan): *Unity Dam*	ISR	1987	1998	0
JOR-ISR	East Ghor Canal (Yarmuk/Jordan): *East Ghor Canal*	ISR	1969	1969	0
JOR-ISR	East Ghor Canal (Yarmuk/Jordan): *East Ghor Canal*	JOR	1976	1994	0
JOR-ISR	East Ghor Canal (Yarmuk/Jordan): *East Ghor Canal*	ISR	1999	1999	0
SYR-JOR	Yarmuk River: *Yarmuk Diversions*	JOR	1987	1987	0
SYR-JOR	Yarmuk River: *Yarmuk Diversions*	JOR	1992	1998	0
SYR-ISR	Yarmuk River: *Golan Heights Dam*	SYR	1997	1998	0
JOR-ISR	Yarmuk River: *Golan Heights Dam*	JOR	1997	1998	0
SYR-JOR	Yarmuk River: *Mafraq Spill*	SYR	2000	2000	0
TUR-SYR	Euphrates River: *Absolute Sovereignty*	SYR	1964	2001	0^+
TUR-SYR	Euphrates River: *Keban Dam*	SYR	1964	1966	0
IRQ-SYR	Euphrates River: *Tabqa (Thawrah) Dam*	IRQ	1975	1975	0
TUR-SYR	Euphrates River: *Lake Assad*	SYR	1983	1983	0
TUR-SYR	Euphrates River: *Ataturk Dam*	SYR	1984	1990	0
TUR-IRQ	Euphrates River: *Ataturk Dam*	IRQ	1990	1990	0
TUR-SYR	Euphrates River: *Karakaya Dam*	SYR	1986	1986	0
IRQ-SYR	Euphrates River: *Iraqi Allocation*	IRQ	1988	1990	0
TUR-SYR	Euphrates River: *Birecik Dam*	SYR	1995	2001	2^+
TUR-IRQ	Tigris/Euphrates Rivers: *Iraqi Allocation*	IRQ	1988	2001	0^+
IRN-IRQ	Shatt al-Arab: *Thalweg and Navigation*	IRN	1932	1937	1
IRN-IRQ	Shatt al-Arab: *Thalweg and Navigation*	IRN	1953	1954	1

(continued on next page)

Dyad	Dispute Name	Chal.	Start	End	MIDs
(continued from previous page)					
IRN-IRQ	Shatt al-Arab: *Thalweg and Navigation*	IRQ	1958	1975	4
IRN-IRQ	Shatt al-Arab: *Thalweg and Navigation*	IRN	1959	1975	2
IRN-IRQ	Shatt al-Arab: *Thalweg and Navigation*	IRQ	1979	1990	1
TUR-SYR	Orontes River: *Syrian Dam Plan*	TUR	1956	1958	0
TUR-EGY	Orontes River: *Syrian Dam Plan*	TUR	1958	1961	0

TABLE B.3. List of Maritime Disputes in Sample

Dyad	Dispute Name	Chal.	Start	End	MIDs
USA-UKG	Dixon Entrance	UKG	1900	1919	0
USA-CAN	Dixon Entrance	CAN	1920	2001	1^+
USA-CAN	Northwest Passage	USA	1969	2001	0^+
USA-CAN	Beaufort Sea	USA	1920	2001	0^+
CAN-USA	US-Canada Pacific Salmon	CAN	1914	1999	3
USA-CAN	Gulf of Maine	CAN	1976	1984	0
USA-MEX	US-Mexico Tuna	USA	1975	1997	0
USA-MEX	US-Mexico Tuna	USA	1979	2000	0
USA-UKG	Rum War	UKG	1921	1935	0
USA-RUS	Bering Sea	RUS	1900	2001	2^+
USA-RUS	Mid-Atlantic Coast	RUS	1965	1990	1
USA-RUS	US-USSR Pacific Coast	RUS	1965	1990	0
CAN-FRN	St. Pierre and Miquelon	CAN	1971	2001	2^+
CAN-DEN	Canada-Denmark Northwest Atlantic	CAN	1971	2001	0^+
CAN-RUS	Canada-USSR Fishing	RUS	1969	1976	0
CAN-JPN	Canada-Japan Pacific Coast	CAN	1938	1938	0
CAN-SPN	Turbot War	SPN	1994	1995	1
HON-NIC	Gulf of Fonseca	HON	1912	2001	5^+
HON-NIC	Honduras-Nicaragua Caribbean Sea	NIC	1999	2001	1^+
GUA-UKG	Sapodilla (Zapatillo) Cays	GUA	1975	1981	0
BLZ-GUA	Sapodilla (Zapatillo) Cays	GUA	1981	2001	0^+
HON-UKG	Sapodilla (Zapatillo) Cays	HON	1981	1981	0
BLZ-HON	Sapodilla (Zapatillo) Cays	HON	1981	2001	0^+
MEX-GUA	Mexico-Guatemala Fishing	MEX	1956	1976	1
USA-PAN	Panama Canal Zone Outlets	USA	1959	1995	1
USA-COL	Quita Sueno-Roncador-Serrana	COL	1900	1972	0
NIC-COL	San Andres and Providencia	NIC	1979	2001	0^+
JAM-COL	Serranilla Bank and Bajo Nuevo	JAM	1982	2001	0^+
HON-COL	Serranilla Bank and Bajo Nuevo	HON	1982	1986	0
USA-ECU	Ecuadorian Pacific Claims	USA	1952	2001	8^+
USA-PER	Peruvian Pacific Claims	USA	1947	2001	4^+
USA-CHL	Chilean Pacific Claims	USA	1952	1986	1
USA-BRA	US-Brazil Shrimp	USA	1970	1993	0
TRI-VEN	Gulf of Paria	VEN	1962	2001	3^+
VEN-UKG	Essequibo	VEN	1951	1966	0
VEN-GUY	Essequibo	VEN	1966	2001	0^+
COL-VEN	Gulf of Venezuela	COL	1955	2001	4^+

(continued on next page)

Dyad	Dispute Name	Chal.	Start	End	MIDs
	(continued from previous page)				
UKG-NTH	Courantyne	NTH	1900	1966	0
GUY-NTH	Courantyne	NTH	1966	1975	0
GUY-SUR	Courantyne	SUR	1975	2001	1^+
BRA-FRN	Lobster War	FRN	1963	1964	1
CHL-ARG	Beagle Channel	ARG	1900	1985	5
ARG-RUS	Argentina-USSR Fishing Dispute	RUS	1967	1986	2
ARG-BUL	Argentina-USSR Fishing Dispute	BUL	1967	1986	1
ARG-UKG	Falklands	ARG	1966	2001	4^+
UKG-ICE	Cod War (3-4 miles)	UKG	1952	1956	0
FRN-ICE	Cod War (3-4 miles)	FRN	1953	1956	0
UKG-ICE	Cod War (12 miles)	UKG	1958	1961	2
NTH-ICE	Cod War (12 miles)	NTH	1958	1961	0
BEL-ICE	Cod War (12 miles)	BEL	1958	1961	0
FRN-ICE	Cod War (12 miles)	FRN	1958	1961	0
SPN-ICE	Cod War (12 miles)	SPN	1958	1961	0
GFR-ICE	Cod War (12 miles)	GFR	1958	1961	0
DEN-ICE	Cod War (12 miles)	DEN	1958	1961	0
UKG-ICE	Cod War (50 miles)	UKG	1971	1973	1
GFR-ICE	Cod War (50 miles)	GFR	1971	1973	0
UKG-ICE	Cod War (200 miles)	UKG	1975	1976	1
GFR-ICE	Cod War (200 miles)	GFR	1975	1975	0
DEN-ICE	Faroe Islands/Greenland	DEN	1976	1997	0
UKG-DEN	Faroe Islands/Greenland	DEN	1958	1964	1
NOR-DEN	Jan Mayen	DEN	1958	1997	2
SWD-DEN	Sweden-Denmark Continental Shelf	SWD	1978	1983	0
FRN-SPN	Bay of Biscay	FRN	1976	2001	1^+
GFR-DEN	German Bay	GFR	1966	1971	0
NTH-GFR	German Bay	GFR	1966	1971	0
GFR-DEN	Greenland Waters	DEN	1982	1982	0
IRE-NTH	Irish 50 Mile	NTH	1959	1977	0
UKG-IRE	UK-Irish Free State	UKG	1929	1929	0
IRE-SPN	Irish Box	SPN	1984	2001	2^+
UKG-DEN	North Sea Herring	UKG	1977	1984	0
NOR-ICE	Iceland-Norway Fishing	ICE	1979	2001	0^+
UKG-NOR	UK-Norway 4 Mile	UKG	1911	1951	0
UKG-NOR	UK-Norway 12 Mile	UKG	1960	1960	0
UKG-NOR	Norwegian No-trawling	UKG	1974	1975	0
FRN-NOR	Norwegian No-trawling	FRN	1974	1975	0
GFR-NOR	Norwegian No-trawling	GFR	1974	1975	0

(continued on next page)

Dyad	Dispute Name	Chal.	Start	End	MIDs
	(continued from previous page)				
UKG-BEL	UK-Belgium Fishing	UKG	1927	2000	0
UKG-IRE	UK-Ireland Delimitation	UKG	1977	1988	0
GDR-POL	Poland-East Germany Continental Shelf	POL	1985	1989	0
GRC-TUR	Aegean Sea	GRC	1964	2001	12^{+}
RUS-DEN	Sea of Okhotsk	POL	1991	2001	2
RUS-SWD	Baltic Sea	SWD	1950	1989	1
RUS-DEN	Baltic Sea	DEN	1950	1954	0
POL-SWD	Baltic Sea	POL	1977	1989	0
LAT-LIT	Baltic Sea	LAT	1991	2001	0^{+}
RUS-LIT	Baltic Sea	RUS	1991	1997	0
GDR-POL	Baltic Sea	GDR	1985	1989	0
ROM-UKR	Black Sea	ROM	1995	2001	0^{+}
BUL-TUR	Black Sea	TUR	1983	1997	0
RUS-UKR	Black Sea	UKR	1993	2001	1^{+}
NOR-ICE	Barents Sea	ICE	1998	1999	0
RUS-ICE	Barents Sea	ICE	1998	1999	0
RUS-TUR	Bosphorus and Dardanelles	RUS	1994	2001	0^{+}
AZE-TKM	Caspian Sea	TKM	1991	2001	0^{+}
IRN-TKM	Caspian Sea	TKM	1991	2001	0^{+}
RUS-EST	Gulf of Finland	EST	1991	1999	0
EST-LAT	Gulf of Riga	EST	1991	1996	0
POL-RUS	Bering Sea	POL	1992	1995	0
CRO-BOS	Port of Ploce	CRO	1994	2001	0^{+}
USA-RUS	White Sea	USA	1911	1911	0
UKG-RUS	White Sea	UKG	1911	1911	0
RUS-NOR	White Sea	NOR	1911	1911	0
RUS-JPN	White Sea	JPN	1911	1911	0

APPENDIX C

TECHNICAL APPENDIX

Appendix C contains technical details for four different estimators:

1. Milan Svolik's split population survival model (2008)
2. Biprobit with partial observability (hereafter, "biprobit")
3. Jude Hays and Aya Kachi's interdependent duration simultaneous equation model (2009, hereafter "H&K")
4. Frederick Boehmke, Daniel Morey, and Megan Shannon's duration-based model with sample selection (2006, hereafter "BMS")

C.1 SPLIT POPULATION SURVIVAL (SVOLIK)

Svolik (2008) develops a split population survival model to investigate democratic consolidation and authoritarian backsliding. His key insight is that all observed democracies are not alike. Some democracies have no chance of experiencing an authoritarian reversal ("consolidated" democracies, like Sweden and the US), whereas other democracies are still at risk ("transitional" democracies, like Thailand in 2001 [p. 153]). Formally, the population of observed democracies is heterogeneous, not homogenous—the risk of authoritarian reversal is not the same for all democracies. Svolik's split population survival model gives him leverage over two important questions. First, what factors influence *whether* an observed democracy is consolidated or transitional? Second, what factors influence *when* a democratic regime will backslide into authoritarian rule?

I face a similar problem for my question about CLAIM DURATION. If a dispute does not experience a militarization, is it because (a) there is truly little chance of a militarization occurring or (b) there is a chance of militarization, but one has yet to occur? The second possibility would be consistent with an anticipatory dynamic, which makes

The log-likelihood for Svolik's estimator is as follows (2008, 157). I have modified his notation for my application to y_1, CLAIM DURATION. Let δ_m represent whether a claim-dyad experiences a MID. Let P represent whether a disputed issue has no chance of militarizing, and is therefore "truly" peaceful (P = 1). We know that any disputed issue that experiences a MID (i.e., $\delta_m = 1$) cannot be truly peaceful, so P = 0. However, we cannot be sure about the value of P for issues that have not yet experienced a MID ($\delta_m = 0$). For the population of cases for which $\delta_m = 0$, some may be "truly" peaceful disputes (P = 1), but others could experience a militarization sometime in the future (P = 0). That is, P is unobservable when $\delta_m = 0$, which is problematic because we have reason to believe that P = 1 for some of these cases and P = 0 for others—a split population.[131] We can denote the probability that a dispute is truly peaceful as π, making $\Pr(P = 1) = \pi$ and $\Pr(P = 0) = (1 - \pi)$

[131] The presence of a split population for the $\delta_m = 0$ cases is one difference between Svolik's estimator and BMS's estimator. BMS treat the population of $\delta_m = 0$ cases as homogenous.

The duration portion of the model has the same form as standard survival models.[132] Let t represent the time at which a dispute militarizes. Let T represent the total amount of time that the dispute is observed and is therefore in the dataset. For observations where we observe a failure ($\delta_m = 1$, which necessarily means $P = 0$), the density function enters the log-likelihood function, $f(t \mid P = 0)$.[133] For observations where we have not observed a failure ($\delta_m = 0$), the observation is potentially right censored. Observations with right-censored durations enter the log-likelihood through the survival function, $S(T \mid P = 0)$. The survival function is equal to $1 - F(T \mid P = 0)$, where F is the cumulative distribution function.

We now have all the requisite parts to formally write out the log-likelihood function for Svolik's split population survival estimator (2008, 157):

$$\ln L = \sum_{i=1}^{N} \delta_{m_i} \ln[(1-\pi)\, f(t_i|P_i = 0)] + \left(1 - \delta_{m_i}\right) \ln[\pi + (1-\pi) S(T_i|P_i = 0)] \qquad [1]$$

The log-likelihood has two major terms.

- The first term, $\delta_{m_i} \ln[(1-\pi)\, f(t_i|P_i = 0)] \equiv \delta_{m_i}\left[\ln(1-\pi) + \ln\left(f(t_i|P_i = 0)\right)\right]$, represents disputes where we have observed a MID ($\delta_m = 1$, and therefore, $P = 0$). If we have observed $P = 0$, then the log-likelihood must be equal to the probability that the dispute is not Truly Peaceful, $(1 - \pi)$, times the density function, $f(t \mid P = 0)$.
- The second term, $\left(1 - \delta_{m_i}\right) \ln[\pi + (1-\pi) S(T_i|P_i = 0)]$, represents disputes where we have not observed a MID ($\delta_m = 0$). The term has two elements to capture the split population.

[132] See Box-Steffensmeier and Jones (2004, 12–19).
[133] Svolik uses two different functional forms: a Weibull function $\left(f(t) = \theta\lambda(\theta t)^{\lambda-1} \exp\left[-(\theta t)^{\lambda}\right]\right)$ and a log-logistic function $\left(f(t) = \frac{\theta\lambda(\theta t)^{\lambda-1}}{\left(1+(\theta t)^{\lambda}\right)^2}\right)$, where θ is a scale parameter and λ is a shape parameter (Box-Steffensmeier and Jones 2004, 26, 33). The main difference between the two models is the monotonicity of the hazard rate. Weibull models have a monotonic hazard rate, while log-logistics have a non-monotonic hazard rate.

- The first element represents the case where $P = 1$—that is, we have not observed a MID because the dispute is truly peaceful (π).
- The second element represents the alternative scenario. The dispute is not truly peaceful ($P = 0$), but we simply have not observed a MID *yet.* The dispute's duration is simply right censored. This can be expressed by the probability that $P = 0$, $(1 - \pi)$, times the survival function, $S(T \mid P = 0)$.

C.2 BIVARIATE PROBIT WITH PARTIAL OBSERVABILITY

The general concept of a "split population," discussed in the context of Svolik's estimator in the previous section, applies here as well. The simple diagram below illustrates the intuition behind split population.

TABLE C.1. Split Population Diagram

		Dispute at risk of experiencing militarization?	
		No (0)	*Yes (1)*
Disputants willing to militarize the dispute?	*No (0)*	No militarization observed	No militarization observed
	Yes (1)	No militarization observed	Militarization observed

The split-population element of the bivariate probit model with partial observability has been discussed by many in political science, as discussed in Section 4.2.2.1. For reference purposes, I provide the estimator's log-likelihood function here. The log-likelihood function for a bivariate probit with partial observability is equal to (Poirier 1980):

$$\ln L = \sum_{i=1}^{N} \delta_{m_i} \ln\left[\Phi_2\left(X_{1_i}\beta_1, X_{2_i}\beta_2; \rho\right)\right] + \left(1 - \delta_{m_i}\right) \ln\left[1 - \Phi_2\left(X_{1_i}\beta_1, X_{2_i}\beta_2; \rho\right)\right] \qquad [2]$$

where δ_{m_i} is coded 1 if militarization is observed and 0 otherwise.

The first term, $\delta_{m_i} \ln\left[\Phi_2\left(X_{1_i}\beta_1, X_{2_i}\beta_2; \rho\right)\right]$, thus represents the observations that experience a militarization. The second term in the log-likelihood, $\left(1 - \delta_{m_i}\right) \ln\left[1 - \Phi_2\left(X_{1_i}\beta_1, X_{2_i}\beta_2; \rho\right)\right]$, represents the disputes in which no militarization is observed. This is the "partial observability" portion of the model. We cannot observe the reason why a dispute stays peaceful. It could be because the dispute was never at risk for militarization (e.g., disputants lack the ability to militarize the dispute), represented by "No" column in Table C.1. It could also be because disputants are unwilling to militarize the dispute (e.g., an anticipatory dynamic), represented by the "No" row in Table C.1. Since we cannot distinguish among the three cells in which no militarization occurs, we group them all together, which is what the second term in the log-likelihood captures. We simply say that the probability that a dispute will *not* militarize is equal to one minus the probability that the observation *will* militarize.

C.3 INTERDEPENDENT DURATION SEM (H&K)

Hays and Kachi (2009) develop a log-linear model of interdependent continuous-time durations. Its general structural form is:

$$\begin{aligned} y_1 &= \alpha_1 y_2 + X\beta_1 + \lambda_1^{-1}\varepsilon_1 \\ y_2 &= \alpha_2 y_1 + X\beta_2 + \lambda_2^{-1}\varepsilon_2 \end{aligned} \qquad [3]$$

where X = set of exogenous covariates and ε = i.i.d. idiosyncratic error with a Type-I Extreme Value (minimum) distribution. X is technically comprised of three sets of covariates: $\{S, Z_1, Z_2\}$. S contains the covariates appearing in both equations. Z_1 and Z_2 contain the instruments: the covariates which only appear in the first or second equation, respectively. The dependent variables are assumed to follow a Weibull distribution, with each y_i having its own shape parameter, λ_i.

The reciprocal relationship between y_1 and y_2 makes this a nonrecursive SEM. We can rewrite both equations so that all the y's are on the left-hand side of the equation. The reduced-form equations are:

$$\begin{aligned} y_1 &= \frac{\alpha_1(X\beta_2 + \lambda_2^{-1}\varepsilon_2) + X\beta_1 + \lambda_1^{-1}\varepsilon_1}{(1-\alpha_1\alpha_2)} \equiv \left(\frac{\alpha_1(X\beta_2) + X\beta_1}{(1-\alpha_1\alpha_2)} + \frac{\alpha_1(\lambda_2^{-1}\varepsilon_2) + \lambda_1^{-1}\varepsilon_1}{(1-\alpha_1\alpha_2)}\right) \\ y_2 &= \frac{\alpha_2(X\beta_1 + \lambda_1^{-1}\varepsilon_1) + X\beta_2 + \lambda_2^{-1}\varepsilon_2}{(1-\alpha_1\alpha_2)} \\ &\equiv \left(\frac{\alpha_2(X\beta_1) + X\beta_2}{(1-\alpha_1\alpha_2)} + \frac{\alpha_2(\lambda_1^{-1}\varepsilon_1) + \lambda_2^{-1}\varepsilon_2}{(1-\alpha_1\alpha_2)}\right) \end{aligned} \qquad [4]$$

In matrix form:

$$\boldsymbol{y} = (\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{X\beta} + \boldsymbol{v}$$

where $\boldsymbol{v} = \boldsymbol{L}(\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{\varepsilon}$

In doing so, we can see how each y is influenced by its counterpart through the $(1-\alpha_1\alpha_2)$ term in the denominator.

The $\boldsymbol{A}$ and $\boldsymbol{\beta}$ matrices represent the effect of the right-hand-side variables on the dependent variable in each equation. Table C.2 shows how the two matrices yield the direct, indirect, and total effect of an independent variable on y, generalizable to any system of equations with the above form. I also derive the specific effects for the two-equation SEM case in the last column of the table. I focus on the effects of the endogenous variables, since my hypothesis tests are based on the α's. Cell [r,c] of a given effect matrix is equivalent to the _____ effect of y_c on y_r For example, the second row, first column of the direct effect matrix is equal to α_2. Ergo, the direct effect of y_1 on y_2 is equal to α_2 (i.e., $\alpha_{\sim\mathrm{ANT}}$)

TABLE C.2. Matrices and Independent Variable Effects

Matrix form: $\boldsymbol{y} = \boldsymbol{A}\boldsymbol{y} + \boldsymbol{\beta}\boldsymbol{X} + \boldsymbol{L}\boldsymbol{\varepsilon}$			*Two-Equation SEM: Endogenous Variable Effects* (y_1, y_2)
Effect on DV	*Type of Independent Variable*		
	ENDOGENOUS ($\boldsymbol{y}$)	EXOGENOUS ($\boldsymbol{x}$)	
Direct Effect	$\boldsymbol{A}$	$\boldsymbol{\beta}$	$\begin{bmatrix} 0 & \alpha_1 \\ \alpha_2 & 0 \end{bmatrix}$
Indirect Effect	$(\boldsymbol{I} - \boldsymbol{A})^{-1} - \boldsymbol{I} - \boldsymbol{A}$	$(\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{\beta} - \boldsymbol{\beta}$	$\begin{bmatrix} \frac{\alpha_1\alpha_2}{(1-\alpha_1\alpha_2)} & \frac{{\alpha_1}^2\alpha_2}{(1-\alpha_1\alpha_2)} \\ \frac{{\alpha_2}^2\alpha_1}{(1-\alpha_1\alpha_2)} & \frac{\alpha_1\alpha_2}{(1-\alpha_1\alpha_2)} \end{bmatrix}$
Total Effect	$(\boldsymbol{I} - \boldsymbol{A})^{-1} - \boldsymbol{I}$	$(\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{\beta}$	$\begin{bmatrix} \frac{\alpha_1\alpha_2}{(1-\alpha_1\alpha_2)} & \frac{\alpha_1}{(1-\alpha_1\alpha_2)} \\ \frac{\alpha_2}{(1-\alpha_1\alpha_2)} & \frac{\alpha_1\alpha_2}{(1-\alpha_1\alpha_2)} \end{bmatrix}$

Source: Paxton, Hipp, Marquart-Pyatt (2011, 95).
I = identity matrix (*k* x *k*, where *k* = number of equations)

In a linear model, the direct, indirect, and total effects are equivalent to substantive effects on *y* and can be interpreted as such. This is not the case for non-linear models, such as H&K's SEM. The direct, indirect, and total effects are equivalent to the effect on ln(*y*), not *y*. To obtain substantive effects on *y* in non-linear models, the coefficients must be transformed. In H&K's model:[134]

$$\begin{aligned} \ln(y_1) &= \alpha_1(\ln(y_2)) + X\beta_1 + \lambda_1^{-1}\varepsilon_1 \equiv y_1 = \exp\{\alpha_1(\ln(y_2)) + X\beta_1 + \lambda_1^{-1}\varepsilon_1\} \\ \ln(y_2) &= \alpha_2(\ln(y_1)) + X\beta_2 + \lambda_2^{-1}\varepsilon_2 \equiv y_2 = \exp\{\alpha_2(\ln(y_1)) + X\beta_2 + \lambda_2^{-1}\varepsilon_2\} \end{aligned} \qquad [5]$$

In particular, notice how all terms on the right-hand-side are summed before being exponentiated. What this means is that we cannot obtain the effect of a specific *x* on *y* without also picking values for the other covariates. This is a common refrain for practitioners of limited

[134] As an aside, [5] also illustrates that the α's are interpretable as elasticities (Gujarati 2002, 175–177). For instance, we could say that a 1 percent increase in y_2 produces a α_1 percent change in y_1.

dependent variable models like logit and probit, which are also non-linear. The Clarify package in Stata (King, Tomz, and Wittenberg 2000; Tomz, Wittenberg, and King 2001) has become a ubiquitous tool for obtaining interpretable effects from a wide variety of linear and non-linear models.

For interpreting the SEM, I use a procedure akin to Clarify. I obtain interpretable effects through simulation. Segments of my code build off the Clarify commands. However, generating predicted values of *y* from a model in which DV = ln(*y*) has an important wrinkle.[135] It arises when one realizes that (Greene 2012, 82):

$$E(y|X) \neq \exp(E(\ln(y)\,|X)) \qquad [6]$$

Or, as Kennedy (2003, 40) states more eloquently: $E(g(x)) \neq g(E(x))$ when $g(x) \neq x$ (i.e., $g(x)$ is a non-linear function). We cannot simply exponentiate the expectation of ln(*y*), in a similar way as we did in [5].

Greene (2012, 82) shows that the conditional mean of *y*, when working from ln(*y*), is instead equal to:

$$\begin{aligned} E(y|X) &= E(\exp(X\beta + \sigma\varepsilon)\,|x) \\ E(y|X) &= \exp(X\beta) * E(\exp(\sigma\varepsilon)|x) \end{aligned} \qquad [7]$$

The key becomes finding a consistent way to estimate the second term involving the error. Preferably, the procedure is not specific to a particular set of distributional assumptions for ε.

A common way to do so is Duan's (1983) smearing estimator. When the errors are homoskedastic, Duan's estimator amounts to:

[135] The phrase "predicted values" refers to generating values of *y* from *x* values that (1) are present in the sample (equivalent to Stata's `predict`) or (2) are counterfactuals, in the sense that they may not represent actual rows in the dataset (equivalent to the Clarify suite's `setx mean`, e.g., in Stata.)

$$E(\exp(\sigma\varepsilon)\,|x) = \frac{1}{N}\sum_{i=1}^{N}\exp(\varepsilon_i) \qquad [8]$$

Or, in English: perform the SEM (in which DV = ln(y)), obtain the residuals. Exponentiate them, and then average the exponentiated residuals over the entire sample.[136] Take the computed average, and use that value for $E(\exp(\sigma\varepsilon)|x)$. This yields the quantity of interest for my SEM prediction code:

$$E(y|X) = \exp(X\beta) * \left[\frac{1}{N}\sum_{i=1}^{N}\exp(\varepsilon_i)\right] \equiv \frac{1}{N}\sum_{i=1}^{N}\exp(X_i\beta + \varepsilon_i) \qquad [9]$$

I compute the predicted values for y_1 and y_2 through Monte Carlo simulation. I take 1000 draws from the coefficient matrix, which includes both α and βs.[137] For each s set of simulated coefficients, I then form two independent n x 1 error vectors, ε_1 and ε_2, from n draws on a Type I Extreme Value distribution (minimum).[138] Next, I choose the x values at which the predictions should be calculated. Finally, I use the reduced-form version of the SEM ([4]) to generate the predicted y_1 and y_2.[139] The final expression becomes:

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[136] The averaging "smears" the idiosyncrasies over the entire sample, hence the name.
[137] The draws are pulled from a normal distribution of α and βs, with variances appropriate to the coefficient in question (i.e., V(α) or V(β)).
[138] In Stata, repeated twice: `gen epsilon = ln(-ln(1-runiform()))`
[139] We cannot use the structural form of the SEM in [3] to generate the predicted y's, because the structural form has $\boldsymbol{y}$ on the right-hand side of the model. One cannot use $\boldsymbol{y}$ to form predictions of $\boldsymbol{y}$. We can only use exogenous factors: the exogenous covariates (X's) and the idiosyncratic errors (ε's).

$$E(y_1|X) = \frac{1}{N}\sum_{i=1}^{N} \exp\left\{\frac{\alpha_1[s](X\beta_2[s]) + X\beta_1[s]}{(1-\alpha_1[s]\alpha_2[s])} + \left(\left[\frac{\lambda_1^{-1}[s]}{(1-\alpha_1[s]\alpha_2[s])} * \varepsilon_{1_i}\right] + \left[\frac{\alpha_1[s]\lambda_2^{-1}[s]}{(1-\alpha_1[s]\alpha_2[s])} * \varepsilon_{2_i}\right]\right)\right\}$$

$$E(y_2|X) = \frac{1}{N}\sum_{i=1}^{N} \exp\left\{\frac{\alpha_2[s](X\beta_1[s]) + X\beta_2[s]}{(1-\alpha_1[s]\alpha_2[s])} + \left(\left[\frac{\lambda_2^{-1}[s]}{(1-\alpha_1[s]\alpha_2[s])} * \varepsilon_{2_i}\right] + \left[\frac{\alpha_2[s]\lambda_1^{-1}[s]}{(1-\alpha_1[s]\alpha_2[s])} * \varepsilon_{1_i}\right]\right)\right\} \quad [10]$$

For each observation *i*, note that the desired *x* values (*X*) and all the parameter values amount to scalars, if we are computing counterfactual predictions. The only values that vary across *i* are the ε's. The average value of a scalar is equal to the scalar itself, which makes [10] equivalent to [9]. This same principle holds for in-sample predictions, where *X* will also vary by *i*.

The setup also allows us to observe how the predicted *y*'s react when the errors are shocked. We can "shock" an error by adding 1 to its ε vector.[140] Call this ($\varepsilon + 1$). Since ($\varepsilon + 1$) is multiplied by λ, its standard deviation, the shock propagates through the model as a one-standard deviation change in that error. Note again the interdependent nature of the model, as a shock to ε_1 affects not only y_1 ([10], $E(y_1|X)$, second term), but y_2 as well ([10], $E(y_2|X)$, third term).

Hays and Kachi derive the likelihood for their interdependent duration SEM estimator using change-of-variables theorem. The theorem solves for the joint distribution of y_1 and y_2—the key quantity for the likelihood—by exploiting what we know about the ε's: they have a Type-I Extreme Value distribution, and they are i.i.d. As a result, H&K's log-likelihood takes the form:

[140] In Stata: `gen ep_shocked = (ln(-ln(1-runiform()))) + 1`

$$\ln L = \sum_{i=1}^{N} \ln f\left(\varepsilon_{1_i}\right) + \ln f\left(\varepsilon_{2_i}\right) + \ln|\det(\mathbf{J})| \qquad [11]$$

where $\boldsymbol{J}$ is the Jacobian matrix for $\boldsymbol{\varepsilon}$. With covariates, H&K's log-likelihood is equivalent to (2009, 9):[141]

$$\begin{aligned}\ln L = \sum_{i=1}^{N} &\lambda_1\left(y_{1_i} - \alpha_1 y_{2_i} - X_{1_i}\beta_1\right) - \exp\left[\lambda_1\left(y_{1_i} - \alpha_1 y_{2_i} - X_{1_i}\beta_1\right)\right] \\ &+ \lambda_2\left(y_{2_i} - \alpha_2 y_{1_i} - X_{2_i}\beta_2\right) - \exp\left[\lambda_2\left(y_{2_i} - \alpha_2 y_{1_i} - X_{2_i}\beta_2\right)\right] \\ &+ \ln\left(\frac{\lambda_1\lambda_2}{y_{1_i}^* y_{2_i}^*}|1 - \alpha_1\alpha_2|\right)\end{aligned} \qquad [12]$$

The variance-covariance matrix of the reduced-form errors is equal to:

$$V(\boldsymbol{v}) = (\boldsymbol{L}(\boldsymbol{I} - \boldsymbol{A})^{-1})' * (\boldsymbol{L}(\boldsymbol{I} - \boldsymbol{A})^{-1}) \qquad [13]$$

In the two-equation case, this comes out to be:

$$V(\boldsymbol{v}) = \begin{bmatrix} \alpha_2^2 D^{-1} & \alpha_1\alpha_2 D^{-1} \\ \alpha_1\alpha_2 D^{-1} & \alpha_1^2 D^{-1} \end{bmatrix} \qquad [14]$$

where $D = (\lambda_1^2 + \lambda_2^2) + [(-2\lambda_1 - 2\lambda_2)\alpha_1\alpha_2] + [(\lambda_1^2 + \lambda_2^2)\alpha_1^2\alpha_2^2]$.

C.4 DURATION WITH SAMPLE SELECTION (BMS)

Boehmke, Morey, and Shannon (2006) are also worried about interdependence, in a way, when they formulate their estimator for continuous-time durations with sample selection. BMS have

[141] Note that y is shorthand for $\ln(y^*)$, where y^* represents the unlogged duration.

two dependent variables: y_s, a binary selection indicator, and y_1, the continuous duration. Notice how BMS's estimator is more similar to Svolik's than H&K's, in that there is only a single duration DV, not two. If we continue to use Svolik's democratic consolidation example, BMS are concerned about the sample of states with democratic regimes. The same factors that influence whether a state is democratic (y_s = 1) may also influence the longevity of that democratic regime (y_1; in Svolik's model, the timing of democratic reversals). For my application, the easiest comparison involves MID duration. We only observe MID DURATION if a dispute militarizes, and the same factors that influence MID initiation may also influence how long the MID lasts.

To solve for their likelihood function, BMS use copulas. Copulas derive the joint distribution of y_1 and y_2 by using the known marginal *univariate* distributions of each y (Trivedi and Zimmer 2007, 3). BMS's log-likelihood function takes the general form (2006, 196):

$$\ln L = \sum_{i=1}^{N} \ln f\left(y_{s_i}, y_{1_i}^*\right)$$
$$\ln L = \sum_{i=1}^{N} \ln\left(f\left(y_{s_i}\right)\right) + \ln\left(f\left(y_{1_i}^*\right)\right) + \ln\left\{1 + \alpha\left[2F\left(y_{s_i}\right) - 1\right]\left[2F\left(y_{1_i}^*\right) - 1\right]\right\} \quad [15]$$

The second line substitutes the copula into the expression.[142] BMS use an exponential distribution for $f(y_s)$ and a Weibull distribution for $f(y_1^*)$.[143] Like before, f represents a density function, while F represents a distribution function.

α represents the dependence between y_s and y_1. In results tables, ρ is normally reported in lieu of α. ρ is the correlation between the errors of the two equations, and is equal to $\alpha/4$

[142] BMS use the Farlie-Gumbel-Morgenstern copula (2006, 195). Its simplicity makes it one of the more commonly used copula forms (Prieger 2002; Trivedi and Zimmer 2007, 15).
[143] See p. 196 of BMS (2006) for their full log-likelihood expression. It is not pivotal to understanding the rest of this discussion.

(Boehmke, Morey, and Shannon 2006, 195). A key difference between BMS and H&K is that BMS's estimator has a single dependency parameter (α), while H&K's estimator has two dependency parameters (α_1, α_2). Characterized in this way, it becomes evident that α represents the *association* between the two dependent variables, while α_1 and α_2 "unpack" α by estimating the *directional, direct effect* of one dependent variable on the other.

BMS's use of copulas to derive their log-likelihood marks an important point of departure from H&K, who used change-of-variables. The distinction between the two derivation strategies is relevant because they impact the dependence structures (the α's). In general, a copula-based approach imposes more restrictions on the dependence structure than a change-of-variable approach. Recognizing this, Hays and Kachi compare the dependence structure of their SEM to that of a copula-derived model with two durations. They show that the two models are only equivalent when (Hays and Kachi 2009, 5, 9):

$$\alpha = \frac{|1-\alpha_1\alpha_2|-1}{4\exp\left(-y_1^{*(\lambda_1)}-y_2^{*(\lambda_2)}\right)-2\exp\left(-y_1^{*(\lambda_1)}\right)-2\exp\left(-y_2^{*(\lambda_2)}\right)+1} \quad [16]$$

That is, a copula interdependence structure will be the same as H&K's only when the copula's α is equal to the expression on the right. The right-hand quantity includes not only α_1 and α_2, the two dependence parameters from the SEM (as we would expect), but it also includes the Weibull shape parameters (λ_1, λ_2) and the unlogged durations (y_1^*, y_2^*). [16] demonstrates the multitude of conditions that must coalesce to yield a copula dependence structure equivalent to H&K's.

APPENDIX D

CHAPTER 5, MAIN RESULTS – FURTHER ROBUSTNESS CHECKS

The main results from Chapter 5 are robust to a number of alternative specifications, which are reported in Table D.1. In the main results (Table 5.1), $\alpha_{\sim ANT}$ was positively signed and statistically significant in the highly salient sample comprised of disputes over territorial issues, while α_{ANT} was negatively signed and statistically significant in the sample of moderately salient sample comprised of disputes over maritime and river issues.

First, the results are not sensitive to the selection of instruments (Table D.1, (1)-(4)). For instance, the SEM can technically be identified off functional form (the assumptions about the distribution about the idiosyncratic errors) and off the common set of seven control variables, as the value of the controls in each equation are recorded at different points in time.[144] At best, these assumptions are tenuous, which is why I use instruments to identify the SEM. However, by temporarily accepting them, we can include all four instruments as regressors in *both* equations, allowing us to see if the main results are sensitive to the choice of instruments. The first four models of Table D.1 show that $\alpha_{\sim ANT}$ stays positive and statistically significant in the

[144] E.g., the value of the control variables is recorded at Figure 2.1, Point A (or Point C) for the CLAIM DURATION equation, and Figure 2.1, Point B for the MID DURATION equation.

territorial sample, and α_{ANT} stays negative and statistically significant in the maritime/river sample.

In addition, I rerun the analyses while excluding certain types of MIDs (Table D.1, (5)-(6). For example, militarizations involving only threats tend to be extremely short, raising questions about whether my argument would apply to these types of militarizations. To check this possibility, I focus solely on militarizations involving additional activities, such as troop mobilizations or border clashes, and exclude militarizations involving only threats of military force from the estimation samples. I check two different sample exclusion scenarios; in both, $\alpha_{\sim\text{ANT}}$ remains positive and statistically significant in the highly salient sample, but α_{ANT} is no longer statistically significant in the moderately salient sample.[145]

Finally, I deliberately used as few control variables as possible (Ray 2003), in order to reduce the estimating burden on the SEM: each sample size is somewhat small, and the SEM estimates a number of ancillary parameters. I used extant research to choose my controls, but one can imagine additional variables that may also impact MID DURATION, for instance. Examples include the distance between *i* and *j*, whether *i* and *j* are allies, the number of previous peaceful settlement attempts over the dispute, and whether *i* and *j* are engaged in disputes over other issues. Using the main specifications as a baseline, the results are unaltered if I add each variable to the right-hand side of both equations (Table D.1, (7)-(13)). Further, switching to a "weak-link" operationalization of democracy or interdependence has no effect on the results (Table D.1, (14)-(15)). This is a common way to operationalize these variables in previous research.

[145] In Section 5.2.3, I discussed the potential reasons behind the weakly/non-significant anticipatory results in the moderately salient sample. Those reasons still apply here.

TABLE D.1. Abbreviated Robustness Results (CLAIM DURATION Coding)

Issue Sample		Main Models	*Instruments* (1) PWRRAT in y_1	(2) ALLY3P in y_1	(3) MLATCL in y_2	(4) FUNCTFORM	*List of Instruments in Reference Models*
High OS	α_{ANT}	-0.077*	-0.072*	-0.060	-0.077*	-0.069*	y_1: CLAIM DURATION
		(0.056)	(0.055)	(0.060)	(0.056)	(0.054)	MLATCLAIM
	$\alpha_{\sim ANT}$	0.291**	0.286**	0.270**	0.293**	0.283**	
		(0.143)	(0.144)	(0.149)	(0.144)	(0.143)	
	$Wald_{1T}$	0.046	0.047	0.052	0.045	0.047	
	N	81	81	81	81	81	
Moderate OS	α_{ANT}	-0.130*	-0.137*	-0.128*	-0.132*	-0.131*	y_2: MID DURATION
		(0.093)	(0.089)	(0.093)	(0.093)	(0.084)	MLATMID
	$\alpha_{\sim ANT}$	-0.101	-0.097	-0.102	-0.097	-0.097	POWERRATIO
		(0.095)	(0.093)	(0.096)	(0.096)	(0.093)	ALLY3P
	$Wald_{1T}$	0.432	0.402	0.437	0.417	0.412	
	N	94	94	94	94	94	

Issue Sample		*Sample Exclusions* (5) ~THREATS	(6) ~(SEIZ|CLASH)	*Controls (Added to Both Equations)* (7) FMIDCNT	(8) MILRUNTIME	(9) DISTANCE	(10) ALLY	(11) PSETTLE
High OS	α_{ANT}	-0.095*	-0.084*	-0.080*	-0.064*	-0.077*	-0.074	-0.026
		(0.060)	(0.061)	(0.053)	(0.050)	(0.058)	(0.060)	(0.054)
	$\alpha_{\sim ANT}$	0.360**	0.507**	0.294**	0.352***	0.287**	0.301**	0.245**
		(0.156)	(0.261)	(0.141)	(0.126)	(0.174)	(0.145)	(0.146)
	$Wald_{1T}$	0.025	0.034	0.045	0.006	0.081	0.037	0.045
	N	79	58	81	81	81	81	81
Moderate OS	α_{ANT}	-0.127	-0.142	-0.123*	-0.093	-0.127*	-0.129*	-0.100
		(0.103)	(0.125)	(0.090)	(0.095)	(0.094)	(0.094)	(0.094)
	$\alpha_{\sim ANT}$	-0.087	-0.139	-0.110	-0.081	-0.106	-0.103	-0.124
		(0.096)	(0.120)	(0.089)	(0.094)	(0.099)	(0.097)	(0.100)
	$Wald_{1T}$	0.410	0.496	0.466	0.471	0.451	0.439	0.446
	N	89	59	94	94	94	94	94

		Controls (Added to Both Equations) (12) OTHERISS	(13) DEMSW7	(14) DEM_L	(15) $INTERDEP_L$
High OS	α_{ANT}	-0.055	-0.080*	-0.056	-0.074*
		(0.054)	(0.057)	(0.054)	(0.055)
	$\alpha_{\sim ANT}$	0.273**	0.283**	0.188*	0.268**
		(0.146)	(0.145)	(0.130)	(0.147)
	$Wald_{1T}$	0.046	0.056	0.130	0.068
	N	81	81	81	81
Moderate OS	α_{ANT}	-0.129*	-0.130*	-0.117	-0.139*
		(0.090)	(0.094)	(0.094)	(0.094)
	$\alpha_{\sim ANT}$	-0.098	-0.100	-0.123	-0.087
		(0.087)	(0.097)	(0.097)	(0.098)
	$Wald_{1T}$	0.421	0.430	0.486	0.380
	N	94	94	94	94

* = $p \leq 0.10$, ** = $p \leq 0.05$, *** = $p \leq 0.01$, one-tailed. Shaded rows indicate the key parameter of interest for each sample. Main models (used as baseline specifications): Table 5.1, Model 1 (high salience); Table 5.1, Model 3 (moderate salience). Unclustered standard errors reported in parentheses.

(interpretation key on next page)

<u>Interpretation Key</u>:
(1). PWRRAT: POWERRATIO; added as regressor to y_1 (in addition to its inclusion in y_2)
(2). ALLY3P: added as regressor to y_1 (in addition to its inclusion in y_2)
(3). MLATCL: MLATCLAIM; added as regressor to y_2 (in addition to its inclusion in y_1)
(4). FUNCTFORM: SEM identified off functional form assumption and control variables in the MID DURATION equation. All four instruments are included as regressors in both equations.
(5). ~THREATS: excludes MIDs that do not escalate beyond threats of force
(6). ~(SEIZ|CLASH): excludes MIDs from seizures of property or border clashes
(7). FMIDCNT: count of fatal MIDs over this claim-dyad, to date
(8). MILRUNTIME: time spent in MIDs over this claim-dyad, to date; exchanged for SETTMIL
(9). DISTANCE: capital-to-capital distance in miles, logged
(10). ALLY: 1 if state pair has defensive, offensive, or neutrality pact in place at *t*; 0 otherwise
(11). PSETTLE: running count of peaceful settlement attempts over the claim-dyad to date
(12). OTHERISS: number of other ongoing claims between the two states at *t*, inspired by Mitchell and Thies (2011)
(13). DEMSW7: democratization. Coded 1 if either state has Polity2 ≥ 7 in *t* and the same state had Polity2 < 7 in $t - 5$
(14). DEM_L: Weak-link coding instead of dyadic mean. Lowest Polity2 score in the dyad
(15). INTERDEP_L: Weak-link coding instead of dyadic mean. Lowest dyadic value of (total dyadic trade/state GDP)

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