

City University of New York (CUNY)

CUNY Academic Works

Publications and Research

Hunter College

2016

Uncertainty and War Duration

Zachary C. Shirkey
CUNY Hunter College

[How does access to this work benefit you? Let us know!](#)

More information about this work at: https://academicworks.cuny.edu/hc_pubs/409

Discover additional works at: <https://academicworks.cuny.edu>

This work is made publicly available by the City University of New York (CUNY).
Contact: AcademicWorks@cuny.edu

ANALYTICAL ESSAY

Uncertainty and War Duration

ZACHARY C. SHIRKEY

Hunter College, CUNY

This article argues that private information plays an important role in explaining long wars. Existing rationalist explanations of long, intensely fought wars focus on commitment problems rather than private information as the cause of such wars. Commitment-problem explanations of long wars claim that while private information can explain short wars, battles and exchanges of offers for settlement should quickly reveal private information, thereby leading to an early peace. Commitment problems, on the other hand, may take years to resolve and therefore can explain long, intense wars for unitary actors. However, while commitment problems are an important explanation for long wars, private information can endure deep into lengthy conflicts because states create new private information during wars and because states often disagree about their relative ability to bear costs rather than their relative military capabilities. I explore this argument in cases on the end of the First World War and the Iran–Iraq War.

Keywords: war duration, commitment problems, uncertainty

Why do wars last as long as they do? Why do some rage for years, while others last only a few months or days? The question matters because longer wars have serious consequences. They produce more fatalities (Small and Singer 1982; Goemans 2000; Lacina 2006; Shirkey 2012; Weisiger 2013) and are a greater threat to regime stability than are shorter wars (Bueno de Mesquita 1992). Attempts to explain war duration have produced answers based on domestic politics (Goemans 2000), psychology (Dolan 2014), and strategy (Bennett and Stam 1996). Within the bargaining research program, a view has emerged that long, intensely fought wars—where long wars are those that last two or more years—are best explained by the inability of one or more of the belligerent parties to credibly commit to honoring a peace agreement (Reiter 2009; Weisiger 2013). While commitment problems are a compelling explanation of many lengthy conflicts, an exclusive focus on commitment problems misses the role that private information plays in many long wars even after battles and exchanges of offers have revealed much information. Without accounting for private information, the terminations of wars such as the Vietnam War and Iran–Iraq War cannot be explained as the belligerents were just as unable to credibly commit at the end of those wars as at their beginning. Likewise, accounting for private information helps understand the strategies adopted late in long wars, such as Iraq’s decision to shift from the defensive to the offensive in 1988 during the Iran–Iraq War.

While scholars agree that private information plays an important role in shorter wars, given sufficient time, private information held ante bellum is revealed by battles and exchanges of offers for settlement (Weisiger 2013). Even though, as will be discussed in what follows, noisy signals and information processing biases can delay the revelation of private information, such delays cannot prevent the revelation of private information forever—certainly not for more than two years. Thus, if private information remains an important motive for continued fighting deep into long wars, new explanations of how private information could have persisted for so long are needed.

This article argues that private information can persist deep into long wars for two reasons. First, states create new private information over the course of wars by introducing new strategies and military technologies and by entering ongoing wars. Second, belligerents often disagree not about their relative military capabilities but about their abilities to bear costs because of private information they hold about their cost tolerances. Disagreements about costs can lead to divergent expectations about the likely outcome of a war. This in turn provides an incentive for fighting. A focus on costs rather than on the balance of forces means that battlefield results are potentially uninformative and that states' expectations can diverge even given extended, intense fighting. As will be argued subsequently, private-information explanations of long wars apply best in wars between highly resolved states, in wars where belligerents believe they can win thanks to economic or domestic politics advantages, or in wars where relatively powerful, but recently militarily untested, states intervene.

Accounting for enduring private information has three advantages. First, it enhances our understanding of why wars last as long as they do. Second, it helps explain the strategies of many belligerent states late in wars. Finally, it allows us to understand how some wars fought over commitment problems were terminated without a resolution of the commitment problem.

This is not to claim that work on commitment problems is flawed. The findings that commitment problems are an important cause of wars, and especially of long, severe wars, is well supported by theory, case studies, and statistical evidence (Copeland 2000; Powell 2006, 2012; Reiter 2009; Weisiger 2013). The very success of this research agenda, however, has obscured the important role that private information can play in long wars. By bringing private information back into our understanding of long wars, we can better explain decisions made by leaders about when to continue fighting and when to negotiate. This is true even in wars characterized by commitment problems as commitment problems and private information can work in conjunction with each other (Powell 2006; Reiter 2009; Wolford, Reiter, and Carrubba 2011).

This argument is explored in short cases on the First World War in the winter of 1917–18 and the Iran–Iraq War of 1980–88. These cases were chosen as they are difficult cases for the argument that private information can endure deep into wars. Both wars featured long, intense combat, suggesting that states' expectations for future fighting would have converged as states had fought repeated battles without breaking the military stalemate. Finally, Reiter (2009) and Weisiger (2013) each use one of these cases to argue that the persistent fighting is best explained by commitment problems. Thus, if the argument for enduring private information holds up in these cases, it should hold up in other cases as well.

While the cases are both interstate wars, the arguments are also applicable to civil wars. This is because the factors that cause private information to endure deep into wars—military intervention, technological and strategic innovations, and a focus on costs rather than the military balance—are as likely to be present in civil wars as in interstate wars. Before discussing the importance of private information in encouraging belligerents to wage wars well after the initial encounters are over and states have exchanged many offers and counteroffers, the

argument that commitment problems are causal of lengthy conflicts will be reviewed.

The Bargaining Model and War Duration

The bargaining model argues that there are three important causes of war among unitary actors that do not value war in and of itself: private information with incentives to misrepresent that information, commitment problems, and indivisibility (Fearon 1995).¹ Of course, war can occur in other ways if assumptions about rationality (McDermott 2004; Mitzen and Schweller 2011; Krebs and Rapport 2012) and states being unitary actors (Bueno de Mesquita et al. 2004; Chiozza and Goemans 2004; Weeks 2012; McManus 2014) are relaxed. In particular, domestic politics approaches have suggested that leaders may prolong wars owing to high personal stakes in or private benefits from the war (Goemans 2000; Mitchell and Prins 2004; Stanley 2009; Croco 2011)² or an inability to construct a domestic coalition that would both accept a peace settlement and retain the top leader (Stanley 2009; Stanley and Sawyer 2009). Likewise, psychological approaches have suggested biases and a focus on sunk costs may lead to delays in updating expectations (Stanley 2009). Still, these three causes of war for unitary actors have formed the core of the bargaining model's investigations into war initiation and duration. Of these causes, indivisibility can largely be dismissed because few things are truly indivisible, and even those that are could be resolved through side payments (Fearon 1995; Gartzke 1999).³ Additionally, many supposed issues of indivisibility are really commitment problems (Powell 2006). Thus, a great deal of work on war builds off the concepts of private information and commitment problems.

In addition to concluding that private information and commitment problems are important causes of war, the bargaining literature has also argued that in order for war to end, the cause of that war must be dealt with or removed (Blainey 1973; Gartzke 1999). Thus, wars driven by private information end when sufficient information has been revealed to allow states' bargaining ranges to overlap (Wittman 1979; Fearon 1995; Filson and Werner 2002; Powell 2004; Slantchev 2004; Reiter 2009), whereas wars caused by commitment problems end when the side that could not credibly commit is no longer in a position to renege. This could occur in a number of ways, including state death, regime change, outside third-party enforcement, the destruction of much of the good that is at stake, or a large degradation of the state's power (Walter 1997; Leventoglu and Slantchev 2007; Powell 2006, 2012; Reiter 2009; Stanley 2009; Weisiger 2013). In other words, wars tend to end endogenously and provide the mechanism for their own termination (Blainey 1973; Slantchev 2004). Given this, it may be possible to draw connections between causes of war and the likely lengths of those wars.

Many scholars using the bargaining model argue that longer wars are likely to have been caused by commitment problems. This claim comes in a strong form, most clearly articulated by Weisiger (2013), and a weak form, presented by Reiter (2009). The strong form argues that battles, given sufficiently intense fighting⁴ and exchanges of offers for settlement, would reveal private information reasonably quickly (Bueno de Mesquita, Morrow, and Zorick 1997; Powell 2004, 2006, 2012; Weisiger 2013). Such information includes, but is not limited to, states' initial strategies, the size and technological sophistication of their militaries, the

¹There are other rational causes of war with unitary actors such as very high costs to peace, very high risk acceptance, or coordination problems, but these have not been found to be empirically significant (Weisiger 2013).

²See Weisiger (2013) for a critique of the diversionary war argument.

³See Toft (2006) for the argument that indivisibility is an important cause of war.

⁴Low-intensity conflicts, such as guerilla wars, last longer than more intense conventional wars (Bennett and Stam 1996) because they reveal information slowly (Weisiger 2013).

quality of their generalship, and information about states' reservation prices. Thus, it is argued that wars fought over uncertainty caused by states bluffing about private information held ante bellum are fairly short as this sort of information cannot be kept secret for long in war. This is true even though updating may be imperfect or slow because of noisy or ambiguous information from battles or other events (Slantchev 2004; Stanley 2009) as the observed signals would vary around the true value, allowing states to deduce the true value after a reasonable amount of time. Yet, of course, many wars go on for years, suggesting that private information is not their cause, hence the conclusion that commitment problems are the cause of long wars.

The weak form of the argument is more probabilistic in its claims about private information and commitment problems as they relate to war duration. Reiter (2009) allows that private information can play a role in longer wars, claiming only that long, intensely fought wars are substantially more likely to be driven by commitment problems than by private information. Yet, the mechanisms Reiter presents for how private information could endure deep into wars are insufficient. Reiter's first mechanism is that of noisy signals. While noise certainly could delay the convergence of beliefs, as discussed earlier, even very noisy signals convey information (Slantchev 2004; Stanley 2009; Weisiger 2013), and it is not clear how noise could delay convergence indefinitely. Indeed, even if noise obscured the true military balance, it is not clear why noise would prevent belligerent states' expectations from converging unless the belligerents were getting *consistently different* signals from the battlefield, something noise alone cannot bring about as it would vary randomly around the true value of the underlying parameter. In other words, if both sides received the same noisy signal on average, their estimates about the true value of the parameter would converge. Even if they received different signals, as long as the signals did not consistently suggest to each state that it was doing better than its opponent, states' bargaining ranges would overlap. It is not clear, outside of psychological biases, why states would consistently receive more favorable information from the battlefield about their performance than their opponent would. Indeed, Reiter quite correctly suggests that, if anything, states are more likely to be aware of how badly they have been hurt than their opponents are, so a consistent, positive bias in signals from the battlefield would not occur.⁵ Thus, noise cannot explain protracted fighting.

Reiter's second mechanism is that leaders may be reluctant to end wars even when faced with negative information from the battlefield owing to concerns that opponents will renege on agreements or that accepting defeat will signal weakness leading to further demands. While these are sound concerns that could extend wars, both of these supporting logics ultimately come from commitment problems rather than private information. First, a concern that an opponent would simply increase demands in response to concessions is a classic example of a commitment problem. Second, a concern that making an offer would convey information to one's opponent requires two unlikely conditions to hold in order to be the result of private information rather than a commitment problem. One, it must be explained why the losing side is consistently getting more negative information from the battlefield about its own performance than the winning side is getting about the losing side's performance. While information received from battles likely would not be identical, it is not clear why it would consistently differ in a given direction. It is impossible to consistently hide defeats from an opponent for many years. Two, it must be explained why the winning side is not making offers. Any such offers would have to be accepted or rejected—ignoring an offer or

⁵If each side consistently received negatively biased signals, states' estimates would not converge. However, the information each state received would indicate it was likely to do worse than its opponent expected, making that opponent's offers for settlement attractive.

making a counteroffer is akin to rejection. Such offers would either be acceptable to the losing side or not depending on how they fit with the losing side's information about its own performance. Given that the central contention is that the losing side is receiving private information that is leading it to have a lower estimation of its own performance than its opponent's estimate of that same performance, the opponent's offers would be attractive. For the war to continue, the losing side must reject the offer. Yet, rejections of offers that are appropriate given a state's available information about the relative balance of forces cannot be explained in terms of private information because only concerns that the offering state would renege and exploit any information gained from the acceptance would justify declining the generous terms. Such concerns are commitment problems. Thus, while Reiter allows a role for private information in long wars, in practice he relies on commitment problems to explain long, intensely fought wars between unitary, rational actors.

This conclusion about the centrality of commitment problems as a cause of long wars hinges on the belief that private information is revealed reasonably quickly in wars. Whether or not this view is correct is debatable, though, as argued previously, failure to reveal private information cannot be explained by noise alone. I will argue in what follows that there are two reasons private information can persist deep into wars. First, states create new private information over the course of wars. As states have very strong incentives to hide or misrepresent that new private information, it can lead to divergent expectations, thereby prolonging wars. Second, states could hold private information *ante bellum* about their ability to bear costs or mobilize resources over the course of a long, attritional conflict while agreeing about their likely relative military performances. If so, it is unlikely that such information would be revealed quickly as it would not be tested directly on the battlefield. It is not that battles would send noisy signals, but rather they would be uninformative. Provided both sides could stave off military collapse indefinitely, such wars could rage for years even when credible commitments are possible. Before discussing these two mechanisms for how private information endures deep into wars, however, I will show how an exclusive focus on commitment problems creates a puzzle—that wars fought over commitment problems sometimes end without resolving the commitment problem that caused the war—and show that allowing for enduring private information can resolve this puzzle.

The Puzzle of Stalemated Wars Caused by Commitment Problems

Wars fought over commitment problems sometimes end in draws years after they began without a resolution of the commitment problem that supposedly caused them.⁶ This violates the notion that the cause of a war must be eliminated in order for the war to end. It will be argued that these wars' terminations cannot be explained without learning, where learning means the updating of expectations in the light of new information or, as Levy (1994, 283) puts it, "a change of beliefs (or degree of confidence in one's beliefs) . . . as a result of observation and interpretation of experience." Such learning thus requires uncertainty and can occur as the result of the revelation of private information.

To show why this strongly suggests that private information endures deep into wars, it is necessary to briefly think through the notion of causation. One way to conceptualize a cause is that the presence of some factor, either by itself or in conjunction with other factors, brought about an event. Given this, if a commitment problem caused a war, it is not immediately clear why states would end the war prior to eliminating the commitment problem. Indeed, this violates the

⁶In other words, there is no third-party guarantor, the stake has not been destroyed, and neither side's strength has been so degraded where it can now credibly commit.

notion that the causes of a war must be intimately linked to why that war ends (Blainey 1973; Gartzke 1999). If a war ends without the removal of a cause, why should we believe that the unchanging factor was a cause?

Let us assume, however, that commitment problems did cause the wars in question. For instance, the United States fought the Vietnam War out of fears that North Vietnam would not only overrun South Vietnam but also spread its influence throughout Southeast Asia. The United States eventually exited the war after it became stalemated, even though the commitment problem endured. The United States was not convinced that the Paris Peace Accords would hold, and in fact they did not. North Vietnam conquered South Vietnam and occupied Cambodia as well. What this example suggests is that wars and states' participation in wars motivated by commitment problems can end without resolution of the commitment problem. This in turn implies that the commitment problem could not have been a *sufficient* cause of the war. In other words, the commitment problem must have caused the war in conjunction with something else rather than by itself. Such joint causation is not a problem for rationalists, as commitment problems and private information with incentives to misrepresent exist widely throughout the world without causing war. This means that they are not inherently sufficient causes. Rather, within the rationalist framework, the presence of at least one of the factors discussed by Fearon (1995) is *necessary* for war between unitary states. While these factors may cause war by preventing a mutually acceptable bargain from being struck, they only do so if the prospective benefits of the war appear to be worth the costs. This will not always be the case.

Work on commitment problems acknowledges the role of costs and that sufficiently large expected costs can bring about peace even given commitment problems (Reiter 2009; Weisiger 2013). Reiter (2009, 38) discusses this at some length saying:

*Assuming that the costs of continuing the war are non-trivial . . . a belligerent, even if it doubts the credibility of an adversary's commitment to a war-ending settlement, becomes more likely to lower its war aims and seek war termination as its chances for improving its military prospects in the future approach zero.*⁷

So how does this relate to private information? If a state began a war due to a commitment problem, it must have initially believed that the costs would be sufficiently low to warrant going to war. To cease fighting later without a credible commitment, the same state must learn much in the manner Reiter describes above that the costs of removing the commitment problem were actually too high to warrant continued fighting.

How could such a change in beliefs occur unless uncertainty had existed as to the probable costs of the war? It could not. Rather, states must have expected that they could eliminate the commitment problem at a reasonable cost. The dashing of such expectations would logically lead to peace. Yet, this change in beliefs means learning occurred. Such learning in the rationalist model of war generally occurs after the revelation of private information and is associated with the convergence of previously divergent expectations among the belligerent states. This explanation in turn suggests that private information must be able to endure deep into long, intensely fought conflicts.

An advocate of the commitment problem position might argue that the commitment problem presented a situation where it was worth taking a gamble on war, even though the belligerent states had similar estimates of which side would win or of the probable costs. Thus, while the losing state would not have gambled if it knew the result in advance, it would be unsurprised by the result. In other

⁷Emphasis in original. This claim is formally derived in Wolford, Reiter, and Carrubba (2011).

words, only a very narrow sort of uncertainty would exist and defeat would lead to disappointment rather than learning that the state had overestimated its chances. Such an argument is logically consistent and may well explain the negotiated settlements of some wars fought over commitment problems.

The simplest and mostly likely conclusion, however, is that uncertainty about relative capabilities and cost tolerances can endure years into conflicts due to the mechanisms described subsequently. Perhaps the most common scenario would be that one or both belligerent states learn that the costs of removing the commitment problem through war were prohibitively high, though this could be coupled with other sorts of learning—such as discovering an opponent’s ability to adapt and change tactics. As will be discussed in the second case, the negotiated settlement of the Iran–Iraq War, and in particular the genuine surprise among the Iranian leadership at Iraq’s military effectiveness in 1988 combined with the growing realization that continued fighting would have exorbitant costs, provides a nice example of these dynamics. Thus, genuine learning can occur even in wars driven by commitment problems and is often central to their termination. How does private information continue to exist so that such learning can occur after years of intense combat?

How Private Information Persists

As suggested by the stalemated termination of wars caused by commitment problems, it is a mistake to dismiss the role of private information in prolonging wars. While much of the private information held by belligerents *ante bellum* will be revealed quite quickly, certain types of private information may persist or be introduced deep into wars. This is true for two reasons. First, new strategies and technologies, military intervention, and states leaving the war all may create new private information over the course of a war. Second, when the main disagreement between states is about the likely costs of war and each side’s ability to bear those costs, battles may cease to be informative. I will address these two factors in turn.

The Creation of New Uncertainty

The first way informational mechanisms may extend conflicts is that states may create new private information over the course of a war. As incentives to misrepresent that private information are, if anything, strengthened by war, the creation of new private information would lead belligerents’ expectations for the future course of the war to diverge. Even researchers who focus on commitment problems as an explanation for long wars acknowledge this (Reiter 2009, 18).

Much as with alliance stability, events that cause changes in the distribution of power or level of threat faced affect state behavior (Leeds and Savun 2007). The key is that the information conveyed by the event must be private. New information that is public would not lead to divergent expectations and in fact may often cause belligerents’ expectations to converge.⁸ Significant divergences in expectations are most likely to occur when it is hard to sort out the implications of an event. This condition is often met when events occur within a belligerent power (or its allies) as the belligerent would be able and have incentives to hide many of the particulars of the event from its opponents. Likewise, if several things happened that cut in opposite directions as to how they affect the military balance, the overall level of new uncertainty could be quite high. Assuming unitary actors,

⁸New private information could lead to convergent expectations, but since the information would be private, the convergence would have to occur with the various parties holding different information sets. While not likely, drawing similar conclusions from different sets of information is possible.

two types of events in particular are prone to producing divergent expectations owing to private information: changes in strategy or military technology and military intervention by outside actors.⁹ In such scenarios, each side would have significant private information about their capabilities and reasons to suspect they would perform better in upcoming battles than their opponents expected. Much as with private information held ante bellum, expectations would converge after the new belligerent states participated in a number of battles or states employed their new technologies and strategies in combat. Indeed, as will be seen subsequently in the case of the Iran–Iraq War, the revelation of new private information by battles can lead to a rapid convergence of expectations and war termination, even though during the period the new information remained private it prolonged the war. I will discuss these two factors in turn.

First, new tactics, strategies, and military technologies could introduce new private information (Goemans 2000). Such changes could alter the relative balance of forces. As the side with the new strategy or technology would have a better sense of its likely impact—indeed prior to deployment only one side may even be aware of a strategy’s or technology’s existence—such private information would cause the two sides’ expectations about the course of the war to diverge, thereby creating an obstacle to settlement. Thus, more fighting would be required to clear up this divergence of expectations.

The shift of British efforts in late 1778 from the northern to the southern American colonies during the American Revolutionary War is a good example of such a shift in strategy. While it had become clear over several years of combat that the British were unable to force a decisive conclusion to the war in the North, the British believed they could exploit the greater Loyalist sympathies in the southern colonies to hold territories that British regular forces could seize. Given the danger of publicly declaring loyalist sympathies prior to the arrival of British regular troops, both sides had private information on the likely loyalty of the populace and varying estimates about how many loyalists there were. Using this new strategy, the British believed they could win the war (Wallace 1951). It took several more years of fighting to reveal that this strategy was also bound to fail. As suggested by the example, there is a limit to how much states can improve their military performance during a war. Still, such improvements do occur, and history is filled with wars whose tides have dramatically turned. Weisiger (2013) argues that, in general, such developments would cancel out as some would lead toward peace while others would lead toward war. While this is likely true across a sufficiently large sample of wars, within an individual war the trend could skew sharply in one direction or the other.

Second, states—or indeed nonstate actors—leaving or joining the war could add new private information. Of these two factors, joining is more likely to add meaningful private information. Earlier battles and negotiations would have given a sense of the capabilities the exiting actor is taking with it. Thus, belligerents could make reasonably solid estimates about the future course of a war minus the actor ceasing hostilities. Joining, however, is more problematic and could create significant uncertainty. Though the entry into the war of the new state would be known to all, its exact military capabilities would not be public information any more than the capabilities of the original belligerents were public at the beginning of the war. Furthermore, if states intervene on each side of the conflict, it might be hard to determine not only how much but even in which direction the balance of forces has shifted. Intervention would also create uncertainty about the new belligerents’ demands, their willingness to bear costs, the likely geographic scope of the war, or even the strategies likely to be employed (Vasquez

⁹Changes in the composition of belligerents’ governments could also introduce private information (Stanley 2009).

and Rundlett 2015).¹⁰ As with the initial belligerents ante bellum, there would be much unknown about a joiner's capabilities and reservation price as it would yet to have fought battles, which could reveal its private information. Additionally, the side the intervener is joining would have a better sense of its new ally's capabilities than would its opponents, meaning the expectations of the joining state's allies would diverge from those of their opponents. As will be seen in what follows, the American entry into the First World War introduced a great deal of private information about American capabilities.

This logic implies at least two testable hypotheses: one, wars characterized by military intervention are likely to be longer than those that do not experience military intervention; and two, wars with military interventions on both sides of the conflict are likely to last longer than those with military interventions on only one side. Shirkey (2012) finds support for both hypotheses and argues that the introduction of new private information into the conflict is what causes the relationship between longer wars and military intervention. The fact that two-sided military intervention increases a war's duration more than one-sided military intervention strongly indicates that uncertainty about which side will win plays an important role in lengthening conflicts.

Thus, states can create new private information over the course of a war. Events such as military intervention and the creation of new strategies and military technologies are particularly likely to create new private information. States gaining allies or developing new strategies and tactics would be privy to more information as to the likely effects of these developments than their opponents would be. This new private information would in turn lead to divergent expectations about the future course of the war, thereby delaying settlement even in conflicts that have raged for years.

Uninformative Events

The second reason uncertainty could be responsible for extended conflict is that events may not lead to a convergence of expectations. Within wars, battles are one of the main ways information is revealed as they are good, if imperfect, indicators of each side's relative military strength. When states fight because they disagree about their relative military strength, battles reveal information and lead to a convergence of expectations. This in turn leads to peace. Yet, it is possible that battles will not be informative even for fully rational states. This is because states' expectations can diverge for reasons other than differing estimates of relative military capabilities. Sullivan (2012) argues that there are three paths to victory: rendering your opponent unable to resist, convincing your opponent that you can render them unable to resist, and convincing your opponent that the costs of obtaining their political objectives are too high. While the first two of these paths to victory hinge directly on beliefs about which side is likely to prevail militarily and thus are influenced by battlefield results, the third mechanism—that of imposing costs—need not depend on the outcome of battles.

Langlois and Langlois (2012) show that when states agree about the probable outcome of battles but are uncertain of each other's costs, battles cease to be informative and extended attritional wars with no negotiation for long periods are the result. Fearon (2013) also finds that when both sides in a conflict are uninformed, it is possible to have long, attritional conflicts even when credible commitments are possible. A state's tolerance for costs is inherently less observable than a state's destructive capacity. While the latter is in many ways directly observable in battle, a state's tolerance for costs is not. Rather, all a battle says about a

¹⁰These demands would not always be more extreme than those of the initial belligerents, but as long as some of the demands were either new or more extreme, they would complicate bargaining.

state's tolerance for costs is that the state's threshold has yet to be reached (Sullivan 2012). These arguments help explain Bennett and Stam's (1996) finding that attritional wars last longer than do other types of intensely fought wars.

The key is that while states' expectations diverge due to private information about costs, battles are not well suited to reveal that specific type of private information. As suggested by Langlois and Langlois (2012), these sorts of uninformative battles seem to be particularly likely in wars where each side believes it can better sustain the costs of war than can the other side. States may well hold private information about their costs from war—both political and economic. It may be quite hard for a state to gauge an opponent's economic resiliency during a war until a great deal of time has passed. Certainly, states take steps to hide their costs both for military reasons and to improve their bargaining positions. For instance, the British during the Second World War did their best to keep the Germans in the dark about the effectiveness of bombing raids and the levels of their reserves of food and raw materials. Even elite and public opinion may be hard to judge, especially, though not only, in authoritarian states. While such costs cannot be hidden by states forever, they can take a very long time to be revealed—far longer than it takes for the relative balance of military forces to be revealed. Given that states can often avoid military collapse for years, lengthy attritional combat may be needed to resolve such bargaining impasses, even when states can credibly commit to a settlement. Thus, if the key uncertainties are each side's resolve or their non-military capacity to wage war, battles may say little, and the standard for what is needed to bring about a convergence of expectations would be quite high.

When Private Information Is Likely to Endure

When are the aforementioned mechanisms most likely to matter? Alas, predicting exactly when new private information would be introduced into wars is quite difficult. For example, while interventions in the first few months of a war are somewhat predictable (Shirkey 2009; Melin and Koch 2010; Joyce, Ghosn, and Bayer 2014), such early interventions would not lengthen wars as the interveners' private information would be revealed at the same time as the private information held ante bellum by the initial belligerents. Later interventions would lengthen wars as additional battles would be required to reveal the new private information they introduce. Unfortunately, these later interventions appear to be driven by unexpected events (Shirkey 2009), meaning it is impossible to predict them with significant lead time. Likewise, predicting the exact timing of technological innovations is extremely difficult as scientific advances tend to occur through paradigm shifts not couched in previous theory and are therefore unpredictable (Kuhn 1962). Even real-world applications of existing scientific principles advance by leaps rather than in a steady fashion, making them equally hard to predict (Tushman and Anderson 1986).

Happily, if pinpoint precision is not required, general predictions can be made about when new private information lengthens wars. Provided the necessary preconditions for a long war exist—namely, the rapid military collapse of either side is unlikely—it is possible to determine in which wars new private information and uninformative battles are most likely to play roles in extending combat. This permissive condition is likely to be determined by factors not directly connected to private information, such as near power parity, rough terrain, or other factors that limit states' ability to project military power into their opponent's territory (Bennett and Stam 1996). Once this permissive condition is met—and it often is, as most wars, even short ones, end in negotiated settlements rather than total military collapses (Wagner 2007)—three factors make it more likely that

states would choose to continue fighting due to private information or uninformative battles rather than accept an early settlement.

First, wars where both sides believe they will win because of factors that are not observable on the battlefield, such as superior resolve or a more resilient economy, are likely to produce uninformative battles because states are not basing their divergent expectations on estimates of their relative military prowess. In such wars, states would target their opponents' perceived relative weaknesses—their societies and economies rather than their militaries—making battles uninformative. Furthermore, by their very nature, attritional conflicts are characterized by costly, indecisive battles. This means that states employing attritional strategies would expect such battles. Thus, these indecisive battles would be uninformative, as expected, and would not especially discourage or encourage either side.

Second, the conditions for strategic and technological innovation are more likely to arise in wars between highly resolved states. This is because innovation involves a number of costs beyond technological research, notably disruptions to organizational procedures, and even social changes (Isaacson, Layne, and Arquilla 1999). Furthermore, during wars, additional fighting would be required to buy time for and test whether the new strategies or technologies were effective on the battlefield. High levels of resolve mean that states would be willing to pay these costs. Though high resolve does not guarantee innovation, it does make states more disposed to be willing to try to innovate. This in turn raises the odds innovation will occur.

Third, new private information is likely to extend conflicts where belligerents have significantly divergent expectations about the likely impact of intervention. Such scenarios arise when the intervening state is powerful enough to alter the course of the war and where there are legitimate questions about that state's military potential. Such questions are more likely to arise if the intervening power has not fought a war recently and there are significant differences between the state's peacetime military and its military potential when fully mobilized.¹¹ Both of these factors would work to obscure a state's true military power, thereby leading to divergent expectations regarding the intervening state's impact on the war. For instance, when the United States entered the First World War in 1917, it had not fought a war in nearly two decades, had a peacetime army smaller than that of Portugal despite the United States' very large population, and had not fully mobilized to wage a war since its civil war in the 1860s. Thus, it was quite possible for states to draw decidedly different conclusions about the US military's likely impact on the conflict.

How unexpected the intervention is does not matter. While uncertainty about an intervention could play a role in lengthening a conflict *prior* to that intervention, once a state intervenes, all parties would update their expectations accordingly. Rather, in order for new private information to be responsible for lengthening the conflict, states must disagree about the likely effects of the intervention *after* the intervention occurs. Taken together, these logics suggest that new private information and uninformative battles are most likely to play a role in attritional conflicts, in wars between highly resolved states, and in wars where the effects of military intervention are unclear.

¹¹This assumes the intervener cannot rapidly overwhelm its adversaries but can influence the war's outcome.

Enduring Uncertainty in the First World War and the Iran–Iraq War

I examine these arguments about new private information and uninformative battles in what follows in two case studies. First, the creation of new private information is examined in a case on British, French, and German decision making prior to the last year of the First World War. Second, uninformative battles resulting from states disagreeing about costs rather than about the balance of forces are examined in the Iran–Iraq War, though the case also features the creation of new private information. This case is also an example of a war caused by commitment problems and ending without a resolution of those problems. The Iran–Iraq War ended when private information about relative costs was revealed, as was private information about new Iraqi capabilities.

I chose these two cases as they are hard cases. Reiter (2009) and Weisiger (2013) respectively use them to argue that long, intensely fought wars are best explained by commitment problems, and indeed commitment problems played an important role in both wars. Additionally, persistent, intense attritional combat characterized both wars. Thus, it could be assumed that by those wars' later stages, states were certain as to the likely future course of the war, and little room for learning existed. Indeed, in the popular imagination, continued fighting late in the First World War is often met with puzzlement, as it should have been clear that any offensive would simply result in further stalemate and pointless deaths. Likewise, in the Iran–Iraq War, by 1986 the front lines had become ossified. Broader opinion assumed that the Iranians had an advantage thanks to their superior resources and morale in the ongoing attritional combat but that future battles would mirror those of the previous six years. Neither state anticipated new developments. Therefore, finding enduring private information in these wars would be strong support for this work's argument as these long, intensely fought wars are the last place one would expect to find it. Finally, both cases are well known, making it easier to evaluate the claim that these cases fit with the arguments outlined earlier.

What would enduring private information in long wars look like and how would such wars differ from long wars characterized *solely* by commitment problems? Private information would cause belligerent states' expectations for the future course of the war to diverge, whereas with commitment problems alone, the two sides would roughly agree on the probability that a given side will win by late in the war. The side less likely to win might see it as worth the gamble to continue fighting but would only be disappointed and not surprised if the gamble failed.¹² Genuine disagreement about the probable result and balance of forces would exist only if there was uncertainty in the form of private information. Private information would cause events to occur that truly surprised leaders and went strongly against their expectations. Finally, given private information, wars would terminate as that private information was revealed and expectations converged, whereas with wars caused solely by commitment problems converging expectations would not play a significant role in the termination of lengthy, intensely fought wars. Wars caused solely by commitment problems would terminate when leaders believed their opponent could credibly commit. If elites favored war termination even though they believed their opponent could not credibly commit, that would strongly suggest that other factors, such as private information, were at work in lengthening the war and it was the revelation of that private information that led to the termination of the war.

¹²This is analogous to a gambler's being disappointed, but not surprised, that a long shot bet did not pan out.

New Uncertainty on the Western Front

The Western Front in the winter of 1917–18 during the First World War serves as a good example of the creation of new private information. Though both commitment problems (Reiter 2009) and domestic politics (Goemans 2000) likely played a role in convincing the belligerents to keep fighting, much uncertainty about the likely future course of fighting also existed late in the war and contributed to decisions to fight in 1918. While the Western Front was deadlocked from late 1914 through the end of 1917 and repeated battles had shown that neither side could make any significant headway in its offensives, it was not clear in late 1917 that 1918 would be characterized by more of the bloody, attritional stalemate into which the front had devolved. Rather, the British and French believed that if they could survive early 1918, the arrival of US troops in force would result in ultimate victory in 1919. German expectations diverged from those of the Entente. The Germans believed that, thanks to new tactics and a brief window of force superiority, they could achieve a breakthrough in early 1918 before sufficient numbers of Americans arrived to turn the tide. The successes of the German Spring Offensive and the Entente's counteroffensive prove that these expectations that 1918 would be different were correct, though of course ultimately giving more credence to the Entente's beliefs than those of the Germans.

The commitment-problem literature argues that repeated battles from 1914 to 1917 had shown that neither side could achieve a breakthrough on the Western Front and that exchanges of offers had made each alliance's negotiating position clear. Prior fighting had revealed each side's resolve and capabilities, and therefore, no meaningful private information remained. Thus, only commitment problems can explain why the war continued into 1918 (Reiter 2009). Indeed, by the end of 1917, because of a series of defeats on all fronts,¹³ the British and French governments had conceded internally that it was impossible to score a decisive victory given the current belligerents (Goemans 2000, 156–58). This inability of the French and British to achieve a breakthrough on their own in 1918 was acknowledged by General Philippe Pétain, the Commander in Chief of the French army, in a December 1917 directive on Allied strategy:

The Entente Powers will reach numerical superiority only when sufficient American troops can enter the line. Until that time, it will be necessary for us, unless we wish to use up our forces irretrievably, to assume a waiting attitude. (Reiter 2009, 173)

Therefore, it is argued that uncertainty could not play any role in explaining the fighting that occurred in 1918 as it seems quite clear based on previous years how the fighting would go.

This, however, is wrong. First, the tactics and strategy of trench warfare had evolved over the course of the war in both the Central Powers' and Entente's militaries. Coordination between advancing infantry and supporting artillery had improved through the implementation of the rolling barrage. Additionally, infantry had learned to advance while taking fewer casualties per yard by using cover, concealment, and suppressive fire (Biddle 2006, 32–35).¹⁴ True, these tactical advances were somewhat countered by the implementation of the strategy of defense in depth, but by March 1918, movement on the Western Front was once again possible.

¹³These include the Russian and Romanian surrenders, British defeats at Arras and Passchendaele, the failure of France's Nivelle Offensive, and the Italian rout at Caporetto.

¹⁴Improved leadership at the small group level was vital for the implementation of these new tactics. Logistics had also improved, allowing artillery shells to be delivered to the front faster and in greater numbers (Biddle 2006, 32–35).

Second, the exit of Russia and Romania from the war and the entry of the United States altered the forces available to both sides. Russia's and Romania's exits freed forty German divisions from the Eastern Front for use in France, while the American entry meant that this advantage would be more than countered by the end of 1918 and overwhelmed come 1919 (Biddle 2006, 82). This temporary German advantage was compounded by the Italians' disastrous defeat at Caporetto, which not only forced the Italians onto the defensive but required the sending of British and French troops into Italy to shore up the line there (Falls 1959, 308–10). Thus, the Germans would have a brief advantage in manpower in early 1918 but would ultimately be outnumbered if the war did not end before the Americans deployed in force.

It was unclear whether the German Spring Offensive, using these new tactics and troops freed from the Eastern Front by the Russian surrender, would be able to overwhelm the British and French before the Americans would be available in large numbers (Stevenson 2005, 109). Certainly, Berlin believed it could win the war in the window available (Falls 1959, 331; Stevenson 2005, 112–13). General Erich Ludendorff, officially the quartermaster general of the Germany army but its chief strategist and *de facto* commander, saw the war as won. Though he knew it would require striking early in 1918, he believed that the Germans could break through and force peace on the Entente before the Americans were fully ready. In a letter to a friend, he wrote:

I have to thank you for your last elaborate letter of 26 November. Since then our strategic situation has improved further [i.e., the Russian armistice]. Now the High Command has been relieved of the pressure on the Western Front. I believe we have won the war for Germany. But we should not deceive ourselves. An enormous task still remains. First, I have to set up the Western Front again, build there a balance of forces and then—strike. (Goemans 2000, 260)

The head of operations for the German General Staff saw the situation similarly. He argued that it was necessary “to deliver an annihilating blow to the British before American aid can become effective” (Reiter 2009, 172). The Germans acted on these beliefs, launching several large offensives that are collectively known as the Spring Offensive. They achieved local success but ultimately failed. Still, the Germans retained hopes they could triumph before US troop numbers began to tell and continued to plan new offensives as late as July. They did not believe the war was irrevocably lost until late September (Falls 1959, 342).

In the end, the Germans were quite surprised by how fast American forces arrived in France in May and June 1918 in response to the Spring Offensive. By June 1918, the faster-than-expected arrival of the Americans had turned a German advantage of 300,000 troops into a 200,000 troop deficit, upsetting the Germans' strategy (Martin 1994, 178). This led to much acrimony and finger pointing within the German High Command, indicating that the development had shocked and upset the Germans (Martin 1994, 180). The head of intelligence on foreign armies in the German General Staff, Major von Rauch, admitted his surprise to Ludendorff in a letter written in September 1918 defending his overall performance. Von Rauch claimed that he had underestimated the rate at which the Americans could arrive for four reasons (Potts and Spaulding 1936, Document 3; Martin 1994, 167, 180, and 193). First, the Entente had been able to produce more war materiel in Europe than expected, freeing shipping to transport men rather than equipment. Second, the German U-boats had been less effective than expected in inflicting losses on troop transports. Third, the Entente had made more use of impounded neutral and German shipping than expected. Fourth, the British freed up more of their own shipping for American use, in part by reducing imports, something the Germans felt was impossible. Ironically, von

Rauch had been more bullish on potential American capabilities than many other Germans. The *Militär-Wochenblatt*, a major German military journal, in December 1917 expected the United States to only be able to deploy a few hundred thousand troops to France. In 1918, the journal was pleased by the presence of US forces in the front lines, believing this indicated that the Entente was desperate and that the British and French were overestimating the Americans' capabilities (Martin 1994, 166–67). Therefore, increased Entente troop transport capabilities and the significant American contributions in 1918 truly surprised the Germans and ultimately led to their defeat.

Entente expectations in late 1917 were somewhat different. British and French leaders knew spring would bring the German assault. They believed their lines would hold until sufficient American troops were available. Though Entente discussions suggest this belief was less than iron clad, British and French statements on the likely American contribution must be taken with some skepticism as those states hoped to limit the Americans' influence at the bargaining table. Both the British and French often underplayed the potential American contribution, and the British even withheld shipping to limit American leverage, relenting only when things became quite dire during the Spring Offensive (Goemans 2000, 204–05). Despite this tendency to try to limit American influence, statements by Entente leaders clearly show that they believed American contributions meant the Entente would win the war. General William Robertson, Chief of the British Imperial General Staff, pointed to the importance of the Americans in the coming year, arguing that

The conclusion is that we must be prepared for a great battle, or rather series of battles, early in the coming year which we will have to fight defensively; that, being on the defensive, we shall have difficulty in deciding where the enemy's main attack will fall; that we must be prepared for losses on the ground, prisoners and guns If we defeat the enemy's offensive, as we may reasonably hope to do if we make suitable and adequate preparations and do not send our reserves off in the wrong directions, how much nearer shall we be to getting a favourable peace? This depends not only upon ourselves but also upon the extent to which the other members of the Entente keep in the field, and upon when America can enter in force If we do this, and if we determine to endure, and if our allies do likewise, until America is ready, we may hope to get eventually a favourable peace. (Goemans 2000, 208)

The French held similar views and, like the British, believed if they could simply hold out until 1919, they would win the war with the aid of the Americans. French Prime Minister Georges Clemenceau said as much when briefing the French president and parliament in December 1917. He stated:

I believe that the Germans will make their greatest effort since the beginning of the war, greater than at Verdun. There is no doubt of it. . . . But, if we hold them, the Germans might not wait any longer before offering peace terms which might be acceptable to us. . . . The German interest is to make a peace in 1918, while ours is to make peace in 1919 when we will have an indisputable victory. . . . If we speak of peace today it would be disastrous, unless we are offered terms in keeping with our dignity. . . . We cannot afford to make a single further mistake, or to run any more risks. We will still lose men in remaining on the defensive, but fewer than if we took the offensive, because we do not have the means. We must hold on, we must endure. . . . I do not wish at this time to risk the outcome of the war on an offensive. (Goemans 2000, 163)

Clearly, the allies believed victory depended on withstanding the coming German assault until American numbers could tell late in 1918 and into 1919. While Entente estimates of American capabilities were largely in line with those of the Germans prior to the increase in shipping in May 1918 (Martin 1994, 162, 166, and 174–75), this was likely a result of trying to limit American leverage at

the bargaining table. Ultimately, the Americans proved stouter in defense than expected by the Germans while performing below average in offensives as was expected (Potts and Spaulding 1936, Document 4, 9). Despite the occasional downplaying of the Americans, most Entente leaders believed they could hold out until the Americans could substantially contribute and that the American contribution would ultimately win the war.

All told, great uncertainty remained in the winter of 1917–18. There was significant disagreement as to the net effects of the Russian exit and American entry. While the Entente and Central Powers agreed on the existence of a temporary German advantage that would be reversed by the Americans' arrival, they disagreed about the likely course of the war. Owing to private information about their shipping capacity and production capabilities as well as greater confidence in their defensive abilities, Entente leaders believed they could hold out during the period of German ascendancy. In contrast, the Germans believed that they would triumph in this period thanks to their numerical superiority, new offensive tactics, ability to strike in places that would catch the Entente by surprise, and their lower estimation of the likely American contribution. Thus, the Germans believed the developments of 1917 meant they could win in 1918, whereas the British and French believed those same developments favored an eventual Entente victory. Ultimately, the Entente view proved more correct, even overly pessimistic since the Entente won in November 1918, not in 1919. Still, throughout the spring of 1918, it was touch and go, and the issue remained very much in doubt even in mid-1918. It was not until the collapse of the Balkan front and the launching of four coordinated Allied assaults in the West on September 28, 1918 that the Germans stopped believing they could win (Stevenson 2005, 115–16 and 130).

Therefore, while the battles of 1914 through 1917 made it clear that a replay of those battles would result in continued stalemate, the battles in 1918 were not to be a replay as the relative balance of forces on the Western Front had changed and the tactics used would be different. Though much information had been revealed, significant uncertainty and private information remained owing to the surrender of Russia, the creation of new tactics, and the entrance of the United States into the war. None of this is to say that commitment problems (Reiter 2009) or domestic German politics (Goemans 2000) did not play a role in why fighting occurred in 1918; they did. Rather, the point is that events created important new private information about relative military capabilities over the course of 1917 and that German and Entente leaders disagreed about the course fighting in 1918 would take. These disagreements and new private information help explain why fighting occurred in 1918 and the form that fighting took.

Enduring Uncertainty in the Iran–Iraq War

The Iran–Iraq War of 1980–88 developed out of border disagreements and especially a dispute over control of the vital Shatt al-Arab waterway. It proved to be one of the longest and deadliest interstate wars of the post-1945 era. The argument that the war was fought over commitment problems—first Iraq invading in 1980 out of preventive motives to take advantage of Iran's moment of weakness following the Iranian Revolution and then Iran counterinvading in 1982 to remove Iraq's president, Saddam Hussein, as he was considered an implacable enemy—is a very strong one (Takeyh 2010; Weisiger 2013). Yet, the war ended without either side eliminating the commitment problem that motivated its belligerency, despite the war's being very long and intense. This is puzzling from a purely commitment-problem point of view. Ultimately, we cannot understand the end of the war without accounting for revealed information—in particular the

surprising series of Iraqi victories in 1988 and Iran's realization that it was less able to bear the costs of war than anticipated.

Saddam initiated the war out of preventive motives. He directed the Iraqi army to invade Iran on September 22, 1980 in hopes of taking advantage of Iran's disorder in the wake of the Iranian Revolution and because he believed the long-term balance of power was turning against him. Better to strike now and seize disputed territory along the Shatt al-Arab and in Khuzestan while he had a temporary advantage than wait until Iran could dictate terms in its favor (Hiro 1991, 39; Takeyh 2010; Weisiger 2013). Saddam expected rapid success and indeed the invasion was initially moderately successful (Hiro 1991, 42–45; Johnson 2011, 49–54). The Iraqi invasion, however, bogged down as it reached Iranian cities and Saddam attempted to negotiate a settlement in his favor (Hiro 1991, 47; Johnson 2011, 52–60).

This portion of the war fits well with the existing bargaining literature on war duration as it relates to both commitment problems and revealed information. Saddam launched a preventive war out of concern for the sort of future power shifts the commitment-problem literature discusses, and when he learned that his expectations about victory were badly wrong, he *quickly* attempted to terminate the war (Weisiger 2013, 154).

The Iranians, however, not only believed they now had the upper hand (Takeyh 2010, 371; Johnson 2011, 60) but also that Saddam was incorrigibly aggressive and would simply attack again given the opportunity. Thus, the Iranians believed that Saddam and his regime had to be removed from power to ensure future Iranian security (Chubin and Tripp 1988, 49; Takeyh 2010, 369–72; Johnson 2011, 68; Weisiger 2013, 156). Akbar Hashemi Rafsanjani, Chairman of the Iranian Parliament, made this explicit in early 1981, stating publicly that the “Removal of Saddam Hussein’s regime is our strategic goal on which we will not compromise” (Hiro 1991, 51). For this reason, Iran refused to negotiate and, after it had expelled Iraqi forces from Iran, launched a counter invasion of Iraq in 1982. Again, this is consistent with existing bargaining explanations of war duration as Iranian leaders did not believe Saddam or his Ba’athist regime could credibly commit to any peace settlement and thus aimed to remove the regime from power. Finally, the Iranian leadership was optimistic that its military’s superior morale and numbers would be able to defeat the better-equipped Iraqis. These views are illustrated by Rafsanjani’s rebuffing of Yasser Arafat’s offer at mediation, stating that “As we are sure of victory and do not want to reward aggression, we refuse to negotiate.” (Takeyh 2010, 369).

This, however, is where existing bargaining explanations on war duration run into trouble. Iran persisted in its campaign against Iraq from its invasion in 1982 all the way until 1988. This is puzzling from the perspective of the standard bargaining framework. Such long wars are not explainable by revealed information as expectations in an intensely fought war—something the Iran–Iraq War most definitely was—rationally would converge rather quickly as private information is revealed by repeated battles. Yet, Iran ultimately agreed to peace after years of conflict without in any way reducing the perceived commitment problem posed by Saddam and his Ba’athist regime as the Iraqi military was in many ways more robust at the conflict’s end than at its beginning (Chubin 1989, 9). Thus, if the Iranian counterinvasion was driven by a commitment problem, it was not resolved. Given that the war was intensely fought over many years, all private information would have been revealed well before the war’s termination and thus cannot be causal of peace. Yet, if that is so, how is it that the war came to an end?

The answer is that Iran learned that it could not impose a total defeat on Iraq at a reasonable cost (Chubin 1989, 8; Weisiger 2013, 153) and, indeed, that it might lose the war. Yet, this begs the question of how Iran learned this if we

accept that states agreed about the future course and probable costs of the war after the war's early stages. In fact, uncertainty about whether Iran could ultimately impose its will on Iraq through a grinding attritional strategy and how costly such a strategy would be remained until 1988 when the Iraqis regained the upper hand, leading the Iranians to seek peace. This uncertainty existed because both sides held private information about their costs and Iraq held private information about new tactics and strategies it was developing. This in turn led to divergent expectations and continued fighting. When fighting in 1988 revealed this private information, Iranian and Iraqi expectations rapidly converged, leading directly to the war's termination. In other words, the revealing of private information rather than the removal of the commitment problem caused the war to end. To demonstrate this, I will briefly summarize the course of the war from 1982 through 1986, with the events of 1987–88 explored in more detail.

The 1982 Iranian counteroffensive was initially successful, largely driving Iraqi forces from Iranian territory and taking the conflict onto Iraqi soil (Hiro 1991, 53–64). From 1982 until 1986, Iran made slow and very slight headway against the Iraqi defenses using attritional strategies (Chubin and Tripp 1988, 46–47; Johnson 2011, 110–12). Never did any individual offensive obtain a breakthrough, but Iran consistently held the initiative. The Iranian leadership believed it would win in the end and refused to negotiate with Saddam (Hiro 1991, 88–141; Johnson 2011, 72–112). Then, in February 1986, Iran overran the Fao Peninsula as part of a three-pronged offensive. This gain convinced many both in Iran and in the broader world that Iran's attrition strategy was bound to ultimately succeed (Chubin and Tripp 1988, 36–49; Hiro 1991, 167–71; Takeyh 2010, 375; Johnson 2011, 113–15). The Iranian leadership was so encouraged that it announced the coming twelve months would be “a year of decision” (Chubin 1989, 9), while Jeffery Record's analysis was typical of the beliefs of many in the West. He argued as follows:

The longer the war lasts, the greater the prospects for a decisive Iranian victory. Iran has three times the population of Iraq, and Iranian forces, though less well-equipped, appear to be much more highly motivated than those of Iraq. In February 1986 Iran launched a series of offensives that succeeded in gaining firm control of the Shatt al-Arab waterway. Iraqi counterattacks, which deliberately sought to avoid high casualty rates for fear of undermining already tepid popular support for the war, relied primarily upon artillery fire and failed to dislodge Iranian forces. According to some Western observers of the conflict, Iraqi military leadership borders on the incompetent, and Iraqi troops, especially infantry, have little motivation. (Record 1986, 44, n4)

Thus, as of mid-1986, the general expectation of the Iranian leadership and much of the world was that Iran would ultimately win through attrition, in no small part because of a belief that its larger and more motivated populace would better allow Iran to bear the costs of war.

These expectations would prove to be ill founded. Iran made little headway over the remainder of 1986 through mid-1987 (Chubin and Tripp 1988, 47; Hiro 1991, 180–85; Johnson 2011, 152–56). Iran was unable to overwhelm the Iraqis and exploit its victory in the Fao Peninsula. While the closed nature of the Iranian government and lack of access to internal debates make it hard to know for certain what factors played the largest roles in Iranian decision making (Weisiger 2013, 155), the evidence suggests that by autumn 1987, Tehran despaired of achieving military victory and thus began to reconsider its insistence on total victory and the removal of Saddam (Chubin 1989, 12).¹⁵

¹⁵Ali Khamenei, the president of Iran, and Rafsanjani seem to have been the first high-ranking leaders to favor peace. Ayatollah Ruhollah Khomeini and the Revolutionary Guard took longer to come around (Takeyh 2010, 377).

The lack of movement at the front was not the regime's only concern. The demands of attritional warfare had led to manpower shortages, especially among skilled infantry. After missing its recruiting targets, Iran largely abandoned major offensive operations in the second half of 1987 (Johnson 2011, 158). The war had also led to falling morale at home, draft evasion, and insufficient labor levels in agriculture (Chubin 1989, 9–11; Takeyh 2010, 380).¹⁶ On top of this, there was a lack of supplies and ammunition (Chubin 1989, 10–15). These shortages of military materiel were a result of a strained economy, falling oil revenues, and international pressure designed to curtail Iran's ability to purchase military equipment abroad (Chubin and Tripp 1988, 125; Chubin 1989, 9; Hiro 1991, 193–95; Johnson 2011, 157 and 175–76). Finally, growing conflict with the United States in the Persian Gulf was siphoning off Iranian assets (Chubin and Tripp 1988, 48; Chubin 1989, 10–14; Hiro 1991, 189 and 243–48; Takeyh 2010, 378–80). These negative trends were particularly disconcerting as they ran directly counter to the factors that had given the Iranians optimism earlier in the war: greater numbers, the superior élan of their troops, and rising oil revenues (Hiro 1991, 69, 86). Meanwhile, Iraqi society refused to crack, contrary to Iranian expectations. This caused Iran to shift from a belief that it was better able than Iraq to bear the costs of war to a position where it was uncertain that it could continue to bear the costs. As is consistent with the second mechanism for how private information endures, this information was revealed, not by battles, but rather by other political and economic indicators that were slow to shift.

Rafsanjani's public expression of doubt exposed this change in Iranian thinking. While he still said the goal was the removal of Saddam, he now stated that Iran hoped to accomplish this by occupying swaths of Iraqi territory, which would lead to the Iraqi people overthrowing the regime, rather than having the Iranian military smash through the Iraqi lines. At the same time, he expressed concerns that Iraq would try to involve foreign powers in the conflict and that the war was becoming too costly economically (Hiro 1991, 188; Johnson 2011, 156–57). Most importantly, he called the strategy of attrition into question, stating that if Iraq could match Iran's rate of mobilization, "a war of attrition can be dangerous as our enemies can use time against us" (Johnson 2011, 157). Despite these misgivings, the Iranian military still maintained control of the Shatt al-Arab, and Tehran hoped for a favorable peace settlement. Thus, the war dragged on.

The stalemate was shattered in early 1988 by a series of surprisingly successful Iraqi offensives. First, the Iraqis retook the Fao Peninsula in just thirty-five hours in April, shocking the Iranians, who did not believe Iraq was capable of undertaking an offensive, let alone retaking significant territory (Chubin 1989, 12–14; Hiro 1991, 203; Johnson 2011, 160; Talmadge 2013, 197). This was followed in late May by successful Iraqi offensives, especially in the Shalamche region (Hiro 1991, 206). These offensives inflicted serious casualties on the Iranians and destroyed 10 percent of Iran's military equipment (Johnson 2011, 161).

Furthermore, while the Iranians had been able to defeat superiorly armed Iraqi forces in the early 1980s (Talmadge 2013, 193–96), the Iraqis now began to employ their forces far more effectively. Previously, Saddam had limited the freedom of his commanders and the training of his troops out of fear that a highly effective and independent military might overthrow him, but by 1986, Saddam began to perceive that an Iranian victory was more of a threat to his survival than his own domestic problems (Talmadge 2013). Improved Iraqi training, information sharing, and the promotion of the best generals allowed the Iraqis to engage in successful combined arms maneuvers by 1987 and 1988, something they were completely incapable of in the early 1980s (Talmadge 2013). The United States

¹⁶The agricultural labor force had been reduced by 10 percent since the war's onset (Chubin and Tripp 1988, 130).

had noted Iraq's inability to effectively use its equipment early in the war. A National Security Agency assessment in 1982 concluded that "equipment shortages have not been a major factor in Iraq's battlefield reverses Iraqi failures to date have been due mainly to weak leadership, morale, tactics, and intelligence weaknesses" (Talmadge 2013, 194). In an assessment that remained secret until after the fall of Baghdad in 2003, Saddam admitted as much to his generals in 1984 stating that

As for artillery, it is certain that we see some negatives in all the phases. There are negatives in the accuracy, coordination and usage. The concentration is inaccurate and not hitting the target. . . . In the discipline of the artillery I believe it is one of those areas where we are still in need of someone to teach us. (Talmadge 2013, 195)

This and even more dire assessments, especially after the 1986 defeat in the Fao Peninsula, led the Iraqis to work hard to address these deficiencies. Thus, when Saddam unleashed his 1988 offensive, his army performed far better than it had earlier in the war due to better use of terrain and coordination between artillery, armor, and infantry units.

The implications of this growth in Iraqi war fighting capabilities had been unclear to the Iranians, who had remained optimistic about their prospects through all of 1986 and much of 1987. In part, this was because Iraq remained steadfastly on the defensive in the latter half of 1987, even after Iran had lost the initiative. This allowed the Iraqis to surprise the Iranians with a series of offensives in the first half of 1988—offensives that had been planned over the previous two years (Johnson 2011, 162). Additionally, as it was unknown that Saddam had determined his military was using its equipment poorly, the Iranians had little reason to suspect he had given more freedom to his commanders or that the improved training had resulted in far greater proficiency at combined arms operations. Thus, this private information gave the Iraqis a reason to fight on in hopes that the war would turn in their favor, while Iran expected the war to continue as before as the Iranians were unaware of the Iraqi improvements. When Iran became aware of these Iraqi advantages and the results they brought on the battlefield, Iran quickly sought peace.

The surprising defeats led Iran's Supreme Leader, Ayatollah Ruhollah Khomeini, to elevate Rafsanjani to head the military on June 2 in order to facilitate Khomeini's decision to seek a ceasefire. In the meantime, the defeats continued. In June, an Iranian counteroffensive failed, leading to a further decline in Iranian recruitment (Johnson 2011, 161–62). An additional Iraqi victory at Majnoon on June 25 made it clear the Iraqis had achieved military superiority (Hiro 1991, 209; Johnson 2011, 162). The Iraqis advanced steadily, and on July 14, Iran pulled all of its remaining troops out of Iraq and accepted the UN ceasefire proposal (Hiro 1991, 241–42; Johnson 2011, 175–76). These setbacks had led directly to Iran's decision to seek a ceasefire that essentially reestablished the status quo ante bellum (Johnson 2011, 175–76; Weisiger 2013, 153–54). The manner in which these reversals caught Iran off guard and the Iranian decision to negotiate strongly suggest Iranian learning and the updating of their expectations.

The decision to seek peace was especially bitter for Khomeini. In a private letter to other elites in the regime justifying his decision to seek peace, he compared the decision to "drinking a chalice of poison" (Fathi 2006). In the letter, he made it clear that he sought peace not because he believed the threat Iraq posed had been dealt with but rather that continuing the war would be exceedingly costly. He cited a senior commander who said victory would require five more years of fighting and an additional "350 infantry brigades, 2,500 tanks, [and] 300 fighter planes" (Fathi 2006). Khomeini also expressed fears that further conflict risked the overthrow of the regime—either at the hands of the Iraqi army or owing to

internal unrest (Meir Amit Intelligence and Terrorism Information Center 2012). In Khomeini's mind, the commitment problem posed by Saddam's Iraq was still very real; it was just too costly to eliminate.

Thus, while the length and severity of the war cannot be understood without considering commitment problems, the end of the war cannot be understood without accounting for learning and revealed private information. The increasing costs of the war and, in particular, the series of Iraqi victories in 1988 drove home to the Iranian leadership that they could not decisively win the war. It became clear that Iraq had found ways to increase its edge in war materiel and come sufficiently close to matching Iran's mobilization efforts to make that edge in materiel count. The increase in Iraq's edge in military hardware is impressive. In 1984, Iraq had a 2.5:1 advantage in tanks and a 4:1 advantage in planes and was at a slight 3:4 disadvantage in artillery tubes. By 1988, Iraq's advantage in tanks had increased to 4:1 and in planes to 10:1, and the disadvantage in artillery had been turned into a 3:1 advantage (Chubin 1989, 9).

That the Iranians were in fact surprised by the war's outcome can in part be seen in how Iranian leaders currently describe their view of the war. All modern Iranian politicians invariably say they had qualms about the counterinvasion of Iraq in 1982, despite the fact there was almost no disagreement about the decision at the time. And in an act of significant historical revisionism, some in Iran today suggest that even Khomeini was against the invasion (Takeyh 2010, 370). All of this is to strongly suggest that if the Iranians had known in 1982 how the war would end in 1988, they would not have invaded and, furthermore, that they would have sought peace in 1986 when Iran was at the pinnacle of its military success. More importantly, it is not simply to say that Iran felt the commitment problem posed by Saddam was worth a bet that it could win the war, and when it was clear that that had failed, the Iranians gave up. Especially after taking the Fao Peninsula, the Iranians believed the Iraqi military had shot its bolt and was incapable of successful, sustained offensive operations. It is not that the Iranians were disappointed that a gamble had not gone their way. Rather, Iraq's 1988 offensives truly and deeply surprised the Iranians. Thus, though commitment problems motivated the Iranians, significant private information existed resulting in divergent expectations even in the post-1982 period.

Finally, until the late 1980s, the Iranian leadership believed their society would be more able to bear the costs of war than would Saddam's Iraq. Repeated battles provided little information one way or the other about this belief. Only when the Iraqi economy and populace showed no signs of cracking while Iranian recruitment targets were being missed by significant margins and the Iranian economy was faltering in 1987 did the Iranian regime update its beliefs about winning through its relative abilities to bear the costs of war. Once this happened, the Iranian regime lowered its war aims and began to consider peace without victory.

Clearly, uncertainty about Iran's ability to win a war of attrition persisted years into the conflict because battles revealed little about each side's ability to bear the costs of war. Likewise, Iraq's buildup of equipment and improved tactics created new private information about Iraqi capabilities. The revelation of this private information to Iran once and for all answered the question if Iran could grind Iraq down in a war of attrition at an acceptable cost with a resounding no. This led directly to the 1988 ceasefire and the termination of the war. Thus, despite the length and intensity of the Iran-Iraq War, uncertainty about costs and the balance of forces remained important factors until the very end of the conflict.

Conclusion

Private information can persist deep into wars because of military intervention or the adoption of new strategies and technologies. Additionally, it can persist

because no event has occurred that might reveal information about what is leading to diverging expectations and how the war will proceed. This is especially true when states have different beliefs about their relative abilities to bear the costs of war as battles are often uninformative when it comes to costs. This means that wars can end because of the revelation of private information, even if those wars have lasted for years and are being fought in part over commitment problems. If we dismiss the role of private information in long wars, the bargaining literature cannot explain the termination of long wars that end without the resolution of commitment problems, as shown by the Iran–Iraq War. Nor, as shown by the First World War, can the literature fully explain belligerents' choices of strategy and grand strategy without taking private information into account.¹⁷

None of this is to suggest that commitment problems are a poor explanation of long conflicts.¹⁸ The commitment-problem literature yields many important insights into the behavior of belligerent states and is helpful in explaining protracted wars. Rather, it is to argue that commitment problems are not the only possible explanation of long, intensely fought wars within the bargaining framework. Though commitment problems likely play a role in the majority of such wars, private information plays a vital role as well. As has been shown in formal work on war initiation, commitment-problem and informational explanations can work hand in hand. Applying the commitment problem–information synthesis to the entire course of wars, including long wars, and not just to their beginnings, is certainly feasible. While in practice it may create some thorny challenges—in particular, designing formal models to account for the introduction of new private information may be quite difficult—it is crucial. Failure to do so will deprive the field of potentially valuable insights into the later stages of long wars. Recognizing that significant uncertainty can endure deep into wars makes international conflicts more complex but also more fully explainable. To do so would be to the field's benefit.

Acknowledgments

I am deeply grateful to David Landy, Michael Lee, Alex Weisiger, and several anonymous reviewers for their advice.

References

- BENNETT, D. SCOTT, AND ALLAN C. STAM. 1996. "The Duration of Interstate Wars, 1816–1985." *American Political Science Review* 90(2): 239–57.
- BIDDLE, STEPHEN. 2006. *Military Power: Explaining Victory and Defeat in Modern Battle*. Princeton, NJ: Princeton University Press.
- BLAINEY, GEORGE. 1973. *The Causes of War*. New York: Free Press.
- BUENO DE MESQUITA, BRUCE, JAMES D. MORROW, RANDOLPH M. SIVERTON, AND ALASTAIR SMITH. 2004. "Testing Novel Implications from the Selectorate Theory of War." *World Politics* 56(3): 363–88.
- BUENO DE MESQUITA, BRUCE, JAMES D. MORROW, AND ETHAN R. ZORICK. 1997. "Capabilities, Perception, and Escalation." *American Political Science Review* 91(1): 15–27.
- BUENO DE MESQUITA, BRUCE, RANDOLPH M. SIVERTON, AND GARY WOLLER. 1992. "War and the Fate of Regimes: A Comparative Analysis." *American Political Science Review* 86(3): 638–46.
- CHIOZZA, GIACOMO, AND HEIN E. GOEMANS. 2004. "International Conflict and the Tenure of Leaders: Is War Still *Ex Post* Inefficient?" *American Journal of Political Science* 48(3): 604–19.
- CHUBIN, SHAHRAM. 1989. "Iran and the War: from Stalemate to Ceasefire." In *The Gulf War: Regional and International Dimensions*, edited by Hanns W. Maull and Otto Pick. New York: St. Martin's Press.

¹⁷Importantly, though Rafsanjani gained influence in the Iranian government late in the Iran–Iraq War and the Germans elevated Prince Max von Baden to the chancellorship near the end of the First World War, in both cases the decision to seek peace had already been made. Thus, the desire for peace caused the governmental changes, not the other way around.

¹⁸Nor is it to suggest that domestic politics or psychological factors are unimportant.

- CHUBIN, SHAHRAM, AND CHARLES TRIPP. 1988. *Iran and Iraq at War*. Boulder, CO: Westview Press.
- COPELAND, DALE. 2000. *The Origins of Major War*. Ithaca, NY: Cornell University Press.
- CROCO, SARAH. 2011. The Decider's Dilemma: Leader Culpability, War Outcomes, and Domestic Punishment. *American Political Science Review* 105(3): 457–77.
- DOLAN, THOMAS M. 2014. "Emotion and Strategic Learning in War." *Foreign Policy Analysis*. Published electronically August 27, 2014. doi:10.1111/fpa.12052.
- FALLS, CYRIL. 1959. *The Great War*. New York: Capricorn Books.
- FATHI, NAZILA. 2006. "An Old Letter Casts Doubts on Iran's Goal for Uranium." *New York Times*, October 4. <http://www.nytimes.com/2006/10/05/world/middleeast/05iran.html>.
- FEARON, JAMES. 1995. "Rationalist Explanations for War." *International Organization* 49(3): 379–414.
- . "Fighting Rather than Bargaining" (unpublished manuscript, 2013), PDF file.
- FILSON, DARREN, AND SUZANNE WERNER. 2002. "A Bargaining Model of War and Peace." *American Journal of Political Science* 46(4): 819–38.
- GARTZKE, ERIK. 1999. "War is in the Error Term." *International Organization* 53(3): 567–87.
- GOEMANS, HEIN E. 2000. *War and Punishment: The Causes of War Termination and the First World War*. Princeton, NJ: Princeton University Press.
- HIRO, DILIP. 1991. *The Longest War: The Iran-Iraq Military Conflict*. New York: Routledge.
- ISAACSON, JEFFREY A., CHRISTOPHER LAYNE, AND JOHN ARQUILLA. 1999. *Predicting Military Innovation*. Santa Monica, CA: RAND.
- JOHNSON, ROB. 2011. *The Iran-Iraq War*. New York: Palgrave MacMillan.
- JOYCE, KYLE A., FATEN GHOSN, AND BAYER REŞAT. 2014. "When and Whom to Join: The Expansion of Ongoing Violent Interstate Conflicts." *British Journal of Political Science* 44(1): 205–38.
- KREBS, RONALD R., AND AARON RAPPORT. 2012. "International Relations and the Psychology of Time Horizons." *International Studies Quarterly* 56(3): 530–43.
- KUHN, THOMAS S. 1962. *The Structure of Scientific Revolutions*. Chicago, IL: University of Chicago Press.
- LACINA, BETHANY. 2006. Explaining the Severity of Civil Wars. *Journal of Conflict Resolution* 50(2): 276–89.
- LANGLOIS, CATHERINE, AND JEAN-PIERRE LANGLOIS. "Should Rational States Really Bargain While They Fight?" (unpublished manuscript, 2012), PDF file.
- LEEDS, BRETT ASHLEY, AND BURCU SAVUN. 2007. "Terminating Alliances: Why Do State Abrogate Agreements?" *Journal of Politics* 69(4): 1118–32.
- LEVENTOGLU, BAHAR, AND BRANISLAV L. SLANTCHEV. 2007. "The Armed Peace: A Punctuated Equilibrium Theory of War." *American Journal of Political Science* 51(4): 755–71.
- LEVY, JACK S. 1994. "Learning and Foreign Policy: Sweeping a Conceptual Minefield." *International Organization* 48(2): 279–312.
- MARTIN, GREGORY. 1994. "German Strategy and Military Assessments of the American Expeditionary Force (AEF), 1917–18." *War in History* 1(2): 160–96.
- McDERMOTT, ROSE. 2004. "Prospect Theory in Political Science: Gains and Losses from the First Decade." *Political Psychology* 2(4): 691–706.
- McMANUS, ROSEANNE W. 2014. "Fighting Words: The Effectiveness of Statements of Resolve in International Conflict." *Journal of Peace Research* 51(6): 726–40.
- MEIR AMIT INTELLIGENCE AND TERRORISM INFORMATION CENTER. 2012. "Why Did Ayatollah Khomeini Agree to Drink from the Poisoned Chalice?" May 9. <http://www.terrorism-info.org.il/en/article/20392>.
- MELIN, MOLLY M., AND MICHAEL T. KOCH. 2010. "Jumping into the Fray: Alliances, Power, Institutions, and the Timing of Conflict Expansion." *International Interactions* 36(1): 1–27.
- MITCHELL, SARA McLAUGHLIN, AND BRANDON C. PRINS. 2004. "Rivalry and Diversionary Uses of Force." *Journal of Conflict Resolution* 48(6): 937–61.
- MITZEN, JENNIFER, AND RANDALL L. SCHWELLER. 2011. "Knowing the Unknown Unknowns: Misplaced Certainty and the Onset of War." *Security Studies* 20(1): 2–35.
- POTTS, F. G., AND OLIVER L. SPAULDING. 1936. "German Estimates of American Troops, 1917–1918: Translated from the German." *US Army Military History Institute*.
- POWELL, ROBERT. 2004. "Bargaining and Learning While Fighting." *American Journal of Political Science* 48(2): 344–61.
- . 2006. "War as a Commitment Problem." *International Organization* 60(1): 169–203.
- . 2012. "Persistent Fighting and Shifting Power." *American Journal of Political Science* 56(3): 620–37.
- RECORD, JEFFREY. 1986. "The US Central Command: Towards What Purpose?" *Strategic Review* 14(2): 44–50.
- REITER, DAN. 2009. *How Wars End*. Princeton, NJ: Princeton University Press.
- SHIRKEY, ZACHARY C. 2009. *Is This a Private Fight or Can Anybody Join? The Spread of Interstate War*. Burlington, VT: Ashgate.

- . 2012. “When and How Many: The Effects of Third Party Joining on Casualties and Duration in Interstate Wars.” *Journal of Peace Research* 49(2): 321–34.
- SLANTCHEV, BRANISLAV. 2004. “How Initiators End Their Wars: The Duration of Warfare and the Terms of Peace.” *American Journal of Political Science* 48(4): 813–29.
- SMALL, MELVIN, AND J. DAVID SINGER. 1982. *Resort to Arms: International and Civil Wars, 1816–1980*. Beverly Hills, CA: Sage.
- STANLEY, ELIZABETH A. 2009. *Paths to Peace: Domestic Coalition Shifts, War Termination and the Korean War*. Palo Alto, CA: Stanford University Press.
- STANLEY, ELIZABETH A., AND JOHN P. SAWYER. 2009. “The Equifinity of War Termination: Multiple Paths to Ending War.” *Journal of Conflict Resolution* 53(5): 651–76.
- STEVENSON, DAVID. 2005. “1918 Revisited.” *Journal of Strategic Studies* 28(1): 107–39.
- SULLIVAN, PATRICIA. 2012. *Who Wins? Predicting Strategic Success and Failure in Armed Conflict*. Oxford: Oxford University Press.
- TAKEYH, RAY. 2010. “The Iran-Iraq War: A Reassessment.” *Middle East Journal* 64(3): 365–83.
- TALMADGE, CAITLIN. 2013. “The Puzzle of Personalist Performance: Iraqi Battlefield Effectiveness in the Iran-Iraq War.” *Security Studies* 22(2): 180–221.
- TOFT, MONICA DUFFY. 2006. “Issue Indivisibility and Time Horizons as Rationalist Explanations of War.” *Security Studies* 15(1): 34–69.
- TUSHMAN, MICHAEL L., AND PHILIP ANDERSON. 1986. “Technological Discontinuities and Organizational Environments.” *Administrative Science Quarterly* 31(3): 439–65.
- VASQUEZ, JOHN, AND ASHLEA RUNDLETT. 2015. “Alliances as a Necessary Condition of Multiparty Wars.” *Journal of Conflict Resolution*. Published electronically February 23, 2015. doi:10.1177/0022002715569770.
- WAGNER, R. HARRISON. 2007. *War and the State: The Theory of International Politics*. Ann Arbor: University of Michigan Press.
- WALLACE, WILLARD M. 1951. *Appeal to Arms: A Military History of the American Revolution*. New York, NY: Quadrangle.
- WALTER, BARBARA. 1997. “The Critical Barrier to Civil War Settlement.” *International Organization* 51(3): 335–64.
- WEEKS, JESSICA. 2012. “Strongmen and Straw Men: Authoritarian Regimes and the Initiation of International Conflict.” *American Political Science Review* 106(2): 326–47.
- WEISIGER, ALEX. 2013. *Logics of War: Explanations for Limited and Unlimited Conflicts*. Ithaca, NY: Cornell University Press.
- WITTMAN, DONALD. 1979. “How War Ends: A Rationalist Model Approach.” *Journal of Conflict Resolution* 24(3): 741–61.
- WOLFORD, SCOTT, DAN REITER, AND CLIFFORD J. CARRUBBA. 2011. “Information, Commitment, and War.” *Journal of Conflict Resolution* 55(4): 556–79.