

# Choosing Air Strikes

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## Abstract

Under what conditions do states choose to use only air power? Air strikes are one of many tools states use to promote their interests in the international system. Given that not all policy tools are appropriate for all crises, we explore when states choose to use air strikes as a coercive tool. We empirically test both common perceptions and newly derived hypotheses on the characteristics of states that employ air-only campaigns and the settings in which they do so, using newly collected data on the uses of air power during international crises between 1908 and 2006. Looking at the events that trigger the crises and the salience of the issues at stake, alongside the characteristics of the states involved, provides a clearer picture of when states use air power versus other coercive tools. Our research indicates that air-only campaigns are more likely to be initiated by militarily powerful states, but that in higher stakes crises, states are more likely to use ground troops or ground and air forces in combination.

**Keywords:** air power, coercion, crisis escalation

*“Air power may either end war or end civilization.”*  
– Winston Churchill, 1939

## Introduction

Since the end of the Cold War, many states, including the United States, have increased their reliance on air power. In recent years, states have used air power in a variety of ways and under a diverse set of circumstances. For example, in the 1991 Persian Gulf War, the United States and allies used air strikes in preparation for and in support of ground forces. Used in this manner, air strikes functioned as an additional tool available in pursuit of military victory. Additionally, states often choose to engage in air-only campaigns, in which they bomb targets in their opponent’s homeland without deploying ground forces (or deploying only a very limited number of military personnel in an advisory role) to operate in the target state. The choice by North Atlantic Treaty Organization allies to provide military support for Libyan rebels against the Qaddafi regime is an example of such action. Used in this

way, air power functions less as a tool used within a wider military campaign and more as a coercive instrument in its own right.

Improved targeting technology and the ability to apply force in limited ways has increased the military effectiveness as well as the popularity of air power. However, it remains unclear whether such technical advances have enhanced the strategic effectiveness of air strikes. Assessing the effectiveness of air power becomes even more complicated when domestic political constraints, including their signaling effect to the target state, are also considered. When leaders opt for air strikes alone, are they looking to avoid paying the costs of a ground invasion, or are they taking a step in an incremental coercive process that signals a willingness to pay greater future costs?

In light of such questions, this article focuses on air-only campaigns and the choice to use them in an international crisis. Air strikes can be appealing to states because they allow them to militarily engage their enemies more quickly, but in a more limited way and with a

lower risk of casualties relative to using ground troops. However, singular reliance on air campaigns may lead to the perception of low resolve and low tolerance for military costs. In other words, air-only campaigns have a reputation for being preferred by low-resolve states, unwilling to take on the casualties and other costs of a ground intervention. This creates a paradox around why states opt for air-only campaigns, as these campaigns create advantages, but signal low resolve at the same time.

To address this paradox, we explore the use of air strikes in the context of international crisis escalation. We choose to focus on crises, rather than war, in order to explore the role of air power as an informational tool in conflict escalation. More than ever, Clausewitz's (1984) maxim that war is an extension of diplomacy holds true, and modern military engagements seldom end on the battlefield. Armed conflict is subsequently part of a bargaining process that does not stop when bombs begin falling. Rather, when force is employed, both sides learn about their opponents and the use of air strikes sends information that shapes the final political settlement.

We begin with a brief review of the literature on crisis escalation and the use of air power. We then present our argument about when states will choose to use air power over (or in conjunction with) other types of coercion, how it relates to other popular expectations, and when we expect each to hold true. Following this, we describe the research design and the new data we use to test these hypotheses. Finally, we present the results and discussion of implications for the study of foreign policy behavior in the international system.

## Crisis Escalation and Policy Choice

When an international crisis arises, leaders have a range of coercive tools at their disposal, including traditional diplomacy, economic sanctions, and military force. While many leaders have the capability to use lethal force, such actions seldom mark the beginning or end of a crisis. Notably, decisions regarding which coercive tools to employ turn on a number of variables including the nature of both the crisis and the state's adversary. Subsequently, policy choices must be considered within the context of the broader crisis as similar actions provoke different responses from different adversaries.

During this crisis process, when might air strikes be employed as one such tool? For effective coercion to take place, states must be able to signal both willingness and capacity to take actions necessary to gain compliance (Jentleson 2000). As a crisis escalates, states are forced to consider more intense levels of coercive pressure

in an attempt to gain the desired concessions (Baldwin 1985). However, this process notably retains a threshold effect—tensions must rise to a certain level before leaders will use force or even consider it. Disputes often open with diplomatic action, and as political pressures escalate, one or both states up the ante, thereby opting to use stronger and more controversial (yet still falling short of military force) coercive tools, such as economic sanctions (Baldwin 1985; Morgan 1990; Drury 2001). Should these actions fail to alter the positions of the two sides and escalation increases, the use of military force is likely (Snyder and Deising 1977; Leng 1993). In recent years, however, states with the capability to do so have increased their use of air strikes as an intermediate step prior to committing ground troops.<sup>1</sup>

The reasoning behind using of air strikes as an intermediate step generally reflects a cross-benefit analysis. During an international crisis, leaders must weigh the desire to influence their opponent against the costs that their supporters are willing to bear in order to gain such influence. Stated differently, states want to maximize their coercive influence while also minimizing domestic costs (Morgan and Palmer 2006). States prefer for a crisis to end as quickly as possible while incurring the smallest possible costs (Morgan and Palmer 2006). Leaders recognize the trade-off between the level of coercive pressure applied (whether via sanctions, air strikes, or direct military engagement) and the time needed to force concessions. Economic sanctions regimes, for example, often take time to put in place and to enforce, and while military assault may not bring immediate results, aggressive action can force the issue more quickly.

However, not all types of coercive pressure are appropriate in all situations, as more intense disputes lead opponents to use increasingly hostile forms of coercion. But coercive actions backed by the threat of force (or more force) are costly, and may reflect lower levels of political acceptability by domestic constituents (Drury 2005). This has in turn increased the appeal of air strikes. When used, leaders do not anticipate destroying all economic, military, and political resources of the target, but do see air strikes as indicating a higher level of coercion. Unlike diplomacy or economic sanctions, they can immediately damage the target's military sufficiently to make additional fighting an impossibility or destroy enough resources to threaten the targeted leader's hold on power.

1 The psychological effect of air warfare is important. The airplane has a shock effect that is intended to unnerve an enemy and break the will to resist (Crane 1993).

Once the parties resort to the use of force, military conflict will continue so long as both sides are able to inflict costs on one another while absorbing costs inflicted upon them (Slantchev 2003b). Damage is only meaningful, however, if that damage or the threat of future damage brings about a change in the adversary's position within the conflict and their behavior.<sup>2</sup> Notably, as the costs inflicted by an air campaign increase relative to those absorbed in return, the target's ability to absorb such costs should be diminished and result in altered behavior. This in turn leads to updated beliefs about one another's relative strength and resolve that changes the nature and direction of the international crisis. In this vein, states will continue to fight as long as they believe that pursuing peace will mean accepting an unpalatable settlement. However, diminished capabilities and/or diminished ability to impose costs against an adversary is a reason to stop fighting, making air strikes a useful tool in forcing a state to accept an otherwise unpalatable settlement. In the section that follows, we discuss the particular conditions under which states elect to use air strikes as an intermediate step during an international crisis in hopes of coercing such a change in their adversary's behavior.

### Hypotheses on State Characteristics

Coercion involves raising the costs of resistance or diminishing the benefits of resistance to the point where an adversary yields, despite having the capacity to resist. In practice, all military missions have a coercive element to them of course (Pape 1997).<sup>3</sup> Air power, however, is a foreign policy tool that has been uniquely utilized to affect adversaries' cost-benefit analysis in order to cause a change in behavior, short of total destruction.

As mentioned above, when choosing between coercive foreign policy instruments, states will attempt to minimize costs while maximizing payoffs. The nature of the crisis as well as the nature of the target state will determine their chosen strategy. The coercive tool selected must be appropriate for the stakes of the crisis. Military moves in a crisis should reflect the state's resolve and the scope of its crisis objectives (Craig and George 1995). Domestic political institutions are likely drivers of these policy choices and thus are the first factor we consider.

- 2 If inflicting high costs on the target always led to successful campaigns, then long and destructive air campaigns would always be successful, but we know this is not necessarily the case (Allen 2007; Martinez Machain 2015).
- 3 For example, not since the War in the Pacific has the United States fought a total war to defeat an enemy.

Maintaining a credible coercive strategy requires public support, especially for democracies (Schultz 1999; Bueno de Mesquita et al. 2003). Democratic leaders can suffer a loss of public support when coercive costs rise—both in terms of blood and treasure. Thus, democratic leaders are less willing to engage in high-cost, high-casualty foreign policy actions, all else being equal. Furthermore, Caverley (2009/2010) notes that wealthy industrialized democracies in particular tend to pursue capital and firepower-intensive strategies. Domestic constraints prevent democracies from spending blood rather than treasure, particularly when they fight low-stakes wars. Under this logic, democracies would thus be more likely to choose air-only campaigns as such operations do not require boots on the ground, thereby minimizing the risk of public backlash from military casualties.

Indeed, much previous work argues that democracies prefer to use air-only campaigns over ground interventions as a way to reduce casualties. Examining US uses of force from 1981 to 2005, Eichenberg (2005) finds that Americans, according to public opinion surveys, are more supportive of air strikes than other military alternatives including the use of ground troops. Pape (1996) provides evidence that military and political leaders may choose air power because of fears about casualties, believing air power's public appeal is related to the diminished likelihood of American casualties and collateral damage. Thus, the argument centers on the American public's real or perceived distaste for death as the causal factor driving the United State's reliance on air power. Drawing on such perceptions of low casualty tolerance, we highlight the following common perception:

*Popular Expectation: Democracies are more likely to employ air-only campaigns instead of using ground troops or joint forces as a coercive tool in a crisis.*

This popular perception regarding the relationship between democracies and the use of air power is based on the idea that democracies are more likely to use air power instead of a ground invasion to avoid higher costs. Implicitly, this view restricts the choice of foreign policy tools to one between air power and a ground intervention. However, in reality, states have a full menu of policy choices when attempting to coerce one another (Morgan and Palmer 2006). Given the range of both more and less violent options, are democracies still more likely to choose air power as a coercive tool than other regimes?

Of the states that employ air power, autocracies and democracies make up roughly equal proportions (Allen 2007). Building on the work of Morgan and Palmer (2006), we argue that, contrary to common perceptions, once we control for factors that influence the ability to

use air power, democracies are no more likely than other regimes to use air-only campaigns. Alternatively, we posit that power, political stability, and wealth are the drivers of the decision to use air strikes, rather than regime type.

To arrive at this conclusion, we consider two points. First, we must ascertain whether democratic states are more likely to choose air power over other military and nonmilitary forms of coercion. In the previous section, we acknowledge that democratic publics drive the political limits on the use of all types of force. Even though air-only campaigns may have a lower probability of creating casualties for the attacker, relative to the use of ground forces, air strikes can lead to collateral damage in the target country. Civilian deaths (whether intentional or inadvertent) in the target state can damage popular support for military action and the political leadership in charge (Cronin 2014). For this reason, democratic leaders may actually choose options that are less likely to create *visible* civilian casualties in the target state, such as diplomacy or economic sanctions.<sup>4</sup>

Second, we must ascertain whether democracies are more likely to favor air power over ground forces (or combined operations) once the state has made the decision to use force and bear the costs. On this issue, recent scholarship has found the American public to be more tolerant of casualties than previously thought when both the chances of success and the stakes of the conflict are high (Gartner and Segura 1998; Feaver and Gelpi 2004; Feaver, Gelpi, and Reifler 2006). Gartner (2008) suggests that the rate of casualties, rather than just the overall number of casualties, may also be influential. Therefore, we expect a smaller reluctance to use ground forces than the conventional wisdom would suggest due to their potential for creating a higher rate of casualties. As before, we argue that this logic may be extended to other democracies, given that it is based on democratic institutional characteristics. We know that democracies are not more pacific than autocracies in their general interactions, only in their interactions with each other (e.g., Russett et al. 1995). Thus, if the issue at stake has been determined to be one in which some form of force will be used, we expect democracies to be no more reluctant to use ground forces over air power than autocracies with

similar capabilities. We posit the following alternative hypothesis:

**H1:** *Democracies are no more likely than autocracies to employ air power as a coercive tool in a crisis, relative to other coercive tools.*

While we argue that democratic regime type will not be a key determinant of the use of air-only campaigns, we recognize that domestic factors do matter when leaders are reacting in a crisis, even for nondemocratic leaders. When states engage in an international conflict, they face a trade-off between spending resources abroad on the conflict effort (and providing the public good of a foreign policy victory) and retaining those resources for domestic distribution to their constituents (Bueno de Mesquita et al. 2003). While Bueno de Mesquita et al. (2003) find that democratic states are more likely to expend resources on a war effort than their autocratic counterparts, all leaders prefer to conduct their international coercion (war or otherwise) at the lowest cost with the greatest payoff (Morgan and Palmer 2006).

Air-only campaigns should thus appeal to capital-intensive states. Although capital and labor are imperfect replacements during a crisis, capital-intensive states are more likely to choose a coercive tactic that is capital-heavy, such as an air-only campaign, over a labor-intensive ground invasion as it speaks to their comparative advantage. Notably, we do recognize that there is a correlation between democracy and capital-intensive coercive tactics. As Merom (2003) notes, democracies more often build firepower intensive, low-manpower militaries to reduce the exposure to risks of soldiers and therefore minimize the costs to the median voter. Stated differently, democratic leaders shift the burden of providing for national defense onto the rich by employing capital as a substitute for military labor (Caverley 2009/2010). However, capital rich and labor poor autocracies similarly benefit from exploiting their comparative advantage by utilizing capital for coercive purposes. Air strikes in 2015 by Saudi Arabia in Yemen are one such example.

Significantly, regardless of regime type, wealthier, more capital-intensive states are more likely to use capital-heavy coercion strategies including air-only campaigns. We thus derive our second hypothesis:

**H2:** *States with greater wealth are more likely to employ air power than ground troops or nonviolent methods as a coercive tool in a crisis.*

State policy choices are additionally constrained by their natural resources. States endowed with significant

4 We recognize that the economic hardship caused by economic sanctions can also lead civilian deaths in the target country, but given that this is an issue of perception, we do not believe that these deaths would have as large of an effect on public perception of the leader as deaths through aerial bombing (Drury, Olson, and Van Belle 2005).

resources will have a broader range of options (Clark and Reed 2005; Morgan and Palmer 2006; Clark, Nordstrom, and Reed 2008). Given that leaders of more powerful states will have an absolute advantage directing the use of most policy instruments, their goal will be to select policy instruments that yield the greatest leverage for the lowest cost (Morgan and Palmer 2006). In other words, the leaders of powerful states will choose those foreign policy instruments that they hold a comparative advantage in relative to their immediate opponent(s).

In terms of coercion, some of the more violent coercive foreign policy tools are available only to the most militarily powerful states. In particular, air power has high entry costs that are only available to the most economically powerful states. While many states in the international system have an air force as part of their armed forces, only states with the highest military expenditures have an air force that is capable of effective coercion through an air-only campaign (for example, having the ability to project air power beyond neighboring states requires aircraft carriers, aerial refueling, or foreign air bases, all of which are exclusive to militarily powerful states). Militarily powerful states are able to invest in the development of high-tech weaponry and can employ those weapons in a myriad of ways. Poorer states and militarily weaker states are less likely to employ air strikes because the monetary costs to this type of warfare are higher.

In addition, the relative military strength of the attacker and target may influence the attacker's coercive choices. Previous work has found that powerful states may be more likely to (mistakenly) use coercive diplomacy in an attempt to intimidate weak states (Drury 2005). Furthermore, states do not always mobilize their full power in order to fight with strong states losing about 25 percent of the wars they fight (Sullivan 2007).<sup>5</sup>

What does this mean for the use of air-only campaigns? We argue that more militarily powerful states are significantly more likely than their opponents to choose bounded violent escalation—to escalate to violent forms of coercion, but to keep the conflict limited via intermediary tactics including air power. More aggressive behavior can make the states' threats more credible (Slantchev 2003a). Subsequently, powerful states may take advantage of their greater military capabilities and utilize air

strikes without incurring the costs of mobilizing their full military power.<sup>6</sup>

We thus derive our third hypothesis—states that are more militarily powerful than their opponent will be more likely to use air-only campaigns, in response to both less aggressive approaches such as diplomacy and more violent ones such as a joint force intervention:

**H3:** *States that are militarily stronger compared to the coercive target are more likely to employ air power than ground troops or joint forces as a coercive tool in a crisis.*

## Hypothesis on Issue Salience

Credibility is at a premium in crisis bargaining, and for this reason, we consider the message that air power sends to targeted states. In such situations, all states desire to send signals that indicate a high level of resolve because, not surprisingly, threats made by highly resolved states are more likely to be successful. Notably, the accuracy of such resolve is not important—not all states are highly resolved, yet all states hope to signal that they are. This in turn makes the credibility of such threats difficult to send and receive (Fearon 1994). Coercive powers must be able to signal a willingness and capacity to take the actions needed to gain compliance (Jentleson 2000). More hostile interactions between nations indicate higher levels of tension. As tensions rise, so do the costs of inaction as well as the benefits of action. Tensions must rise to a certain level before leaders will use force or even consider it. Using limited force (and a willingness to absorb costs) can thus theoretically signal a high level of resolve. But in practice, the decision to use air strikes raises questions about the credibility of such a lower commitment coercive tool. When states employ air strikes, what type of signal are they sending?

States employing air power are motivated by the desire that such action is seen by targets as a signal of resolve. Using air power demonstrates a willingness to

- 6 Air power can be used successfully by powerful states in small wars, but these conflicts present unique challenges. Typically, small wars are wars of choice. The strong states' aims are limited or political, and success often requires the weak actor's compliance (Caverley 2009/2010). When stronger states seek political objectives that require compliance (such as policy chances) from the weaker state, materially weaker states can use "resolute noncompliance" to defeat their opponents (Sullivan 2007). When the political goals can be met using brute force, stronger states can impose their will and gain victory more easily.

5 Notably, Merom (2003) argues that only strong democracies lose to weaker opponents, but Sullivan (2007) finds this pattern regardless of regime type.

use deadly force, and so states want such action to indicate keen interest in the issue driving the crisis situation. Therefore, we posit that air-only campaigns actually have more in common with less violent (and less costly in terms of risk to domestic constituents) foreign policy tools such as economic sanctions. In other words, a state's willingness to use sanctions may be a better indicator of its willingness to use an air-only campaign than an air-only campaign would be an indicator of a state's willingness to introduce ground troops into a conflict.

A final factor determining the use of air power in a crisis is the type of demand that accompanies the crisis. For coercion to succeed, coercive powers must carefully consider the nature of the demand made of the adversary, including the size, credibility, and strength of the accompanying threat, and the magnitude of the adversary's desire to resist the demand (George, Hall, and Simons 1971; George and Simon 1994). These three factors are each interrelated and mutually reinforcing. Smaller demands are easier to achieve with only a limited commitment of forces. If air-only campaigns do have more in common with economic sanctions, we should expect them to be used more often than joint forces when issue salience is low. Because adversaries may see the use of air power as a lack of commitment (which would hinder the credibility of an attacker's threat) (Pape 1996), air power alone is unlikely to deliver large concessions. Ground troops may be required to demonstrate sufficient resolve to make credible large demands.

By way of example, the United States attempted to achieve limited demands with limited force in places like Haiti, Somalia, the Balkans, and Iraq (Byman and Waxman 2002). The recognition of lower salience within these conflicts negatively affected coercive credibility. The fact that air strikes do not necessarily require large scale public and allied support for the United States to carry them out can be a double-edged sword for credible coercion. When goals are limited, air power is especially attractive, and for powerful nations, air power can be a means to overcome coalition constraints or limits created by a lack of support in the international community. Likewise, the range and versatility of air strikes make them a potent weapon in this type of situation. However, the desire to keep the conflict limited may also be perceived by others as a coercive weakness, with such circumstances doing little to enhance credibility and leading to the perception that air power is used when the stakes and issue salience are low.

High stakes situations make states more likely to escalate to violent conflict. States that are existentially threatened or that face significant territorial disputes are more willing to use force against a rival (see Holsti 1991; Diehl

1992; Goertz and Diehl 1992; Brecher 1993; Vasquez 1993; Senese 1996; Hensel 2001). Even outside of warfare, recent work has found that issue salience can determine the success of other coercive foreign policy tools including economic sanctions (Ang and Peksen 2007). Here, both the popular perception and our argument line up and suggest our final hypothesis:

**H4:** *Relative to ground troops or joint forces, air power is less likely to be used when issue salience is high.*

## Data and Methods

The existing literature on air power in international crises has suffered unit-of-analysis problems, making the development of a clear and measurable unit of analysis a major contribution of this article. Pape (1996), for example, focuses on war as the unit of analysis, a choice criticized by numerous scholars including Watts (1997), Mueller (1998), Horowitz and Reiter (2001), and Allen (2007)—all of whom offer corrections or supplements to such prior work. Pape's list of cases includes both inter- and intrastate wars and most notably explicates the impact of extrastate wars (e.g., Algerian War of Independence). However, although adding conceptual clarity, the inclusion of these three types of conflict inhibits methodological clarity by muddying the inferences and conclusions that can be drawn from the results. One proposed solution is to carry out the analysis at the operational level, focusing on *how* air power is used in a particular campaign rather than *why*. While this method works well for modern Western militaries, it is not suitable for contexts where conflicts are often ongoing and clear lines do not exist between different operations.

In hopes of providing greater inferential clarity, this project does two things. First, it delineates a clear and rigorous universe of cases. Rather than looking for cases of air power as a starting point, the approach used in the past, we began by looking at international crises generally and then examined how force was employed during the crisis. By beginning with an established universe of cases based on the Interstate Crisis Behavior dataset, the likelihood of selection effects by only collecting the most well-known or largest air campaigns is diminished. Additionally, the list of ICBs was cross-referenced with a list of cases included in previous studies, alongside the case histories provided on the ICB website. This was further checked using a basic keyword search conducted via LexisNexis. If either the ICB case histories or journalistic sources provided evidence of the use of air power, primary and secondary sources were then sought for additional information in order to create a short case history

of the use of airpower in a given crisis.<sup>7</sup> This process determined whether or not air power was utilized at any point in a given crisis and how the air power was employed, including whether or not it was part of a broader military effort.<sup>8</sup>

Second, this project uses the international crisis as the unit of analysis. By focusing on crises, we analyze short, acute events rather than the totality of potentially lengthy wars. This directly addresses the question—what do leaders choose to do when faced with intense crisis pressures and why? As mentioned above, this universe of cases is drawn from the International Conflict Behavior dataset (Brecher 1993) and covers the period from 1918 to 2006. Because we are interested in the choices made by individual states, we employ the ICB2 Actor Level data (Brecher and Wilkenfeld 2000).

The dependent variable—use of air power during an international crisis—is a trichotomous categorical variable ranging from 0 (no force) to 2 (a military effort involving ground troops). We focus on the middle category—cases where air power is used minus ground forces. We employ the foreign policy substitutability literature (Morgan and Palmer 2006) to explore this decision making process—how do leaders attempt to select the most efficient policy tool for a given situation and why? To this end, we employ an independent multinomial probit model to reflect unordered categories of policy options (Alvarez and Nagler 1998; Kropko 2007).<sup>9</sup> Information about the distribution of the capabilities and regime type of the states employing these strategies can be found in the supplemental materials.

## Independent Variables

When considering the choices states make about how and when to use force, we draw on variables highlighted by the escalation and use-of-force literatures. In particular, drawing on the hypotheses discussed above, the likely

drivers of the decision to use air strikes include power, wealth, regime type, and issue salience.

Wealthy states have a broader range of options than do poor ones (Clark, Nordstrom and Reed 2008), and they possess greater influence in the international system (Morgan and Palmer 2006). Poor states are less likely to have the capability to use air strikes and are less likely to employ force of any kind to resolve conflict. Wealth is commensurate with the level of economic development in the crisis state and is measured by energy consumption drawn from the Correlates of War National Capabilities dataset (Singer, Bremer, and Stuckey 1972). Because the relative strength of the crisis actors is also important, we include the power differential score calculated as part of the International Crisis Behavior (ICB) dataset (Brecher et al. 2017).

In light of the literature surrounding democracies and the likelihood of interstate war, we consider how regime type affects a state's choice of coercive foreign policy tool. As discussed above, the suggestion is that democratic states will be less likely to employ the use of air strikes. In order to test this, we include an indicator for regime type, based on Polity IV scores, with a score of 6 on the autodemoc scale functioning as the threshold for democracy (Marshall and Jaggers 2002).<sup>10</sup> Further, we consider the possibility that a uniquely democratic dyad will be less likely to escalate to violence generally. To control for this effect, we included a dichotomous joint democracy variable, coded 1 if both states in a crisis are democratic and 0 for otherwise.

Issue salience may further affect how difficult a crisis will be to resolve. When the nature of the threat is existential, violence is much more likely than if the issue at hand is, for example, largely economic (Holsti 1991; Diehl 1992; Goertz and Diehl 1992; Brecher 1993; Vasquez 1993; Senese 1996; Hensel 2001). We suggest that air strikes, although a means of escalation, are generally viewed as a signal of low resolve more in line with economic sanctions than with group troops. To test this, we include the ICB dataset variable, coded from 0 (economic threat) to 6 (threat to existence).<sup>11</sup>

Lastly, we include a number of control variables expected to affect the willingness of states to use different coercive tools during a crisis. We first consider the location of the crisis, as states are more likely to employ air

- 7 For coalition warfare, we defer to ICB's definitions of the crisis actors. We assess whether each individual actor is an active participant in the air campaign. A full bibliography for the data collection can be requested from the authors.
- 8 For the purposes of this article, we focus only on non-remotely piloted aircraft rather than drone strikes.
- 9 Admittedly, this is an imperfect modeling strategy that does not deal perfectly with the selection process that is occurring concerning the choice to use force, which may be a distinct decision from the choice of which military tool to use. As a robustness check, we include in the supplementary files, in Tables A1 and A2, the results of multinomial logit models. Results remain similar.

- 10 The results presented are robust to other thresholds for democracy.
- 11 In the original coding of the variable, an eighth category—other—was also included but it did not follow the ordering of salience that the other values indicate, so those ten cases were recoded as missing.

**Table 1.** Summary statistics

Variable	Mean	Std. dev.	Min.	Max.	N
Dependent variable	0.548	0.840	0	2	994
Capabilities	0.034	0.062	0	0.384	981
Power differential	4.105	24.006	-42	179	864
Polity score	-0.523	7.592	-10	10	926
Joint democracy	0.05	0.219	0	1	994
ln(energy consumption)	9.439	3.15	0	15.52	961
Crisis location	1.737	1.046	1	4	994
Issue salience	3.302	1.502	0	6	984
Number of actors	6.418	4.843	1	34	994
Protracted crisis	0.589	0.492	0	1	994

power when the crisis is taking place further away from their own territory. This variable is drawn from the ICB data and coded ordinally to reflect distance from the crisis actor to the place where the crisis is occurring—1 (home territory), 2 (subregion), 3 (same continent), and 4 (elsewhere)<sup>12</sup> (Brecher 1993). We also consider whether the number of actors in the crisis is related to the decision to escalate violence. This variable, also pulled from the ICB dataset, provides analysis regarding whether or not the crisis is part of a broader protracted conflict (Brecher 1993). The data used in this article span 1918–2006, during which time there were 994 crisis actors. Notably, the majority of these crisis actors did not use force as a means of crisis resolution. However, air strikes alone were utilized ninety times, and ground forces (including on rare occasions, naval forces) were employed on their own 134 times. A mixture of air strikes and ground forces were used ninety-four times. Descriptive statistics are provided in Table 1.

**Results**

Due to the comparative nature of our hypotheses, we estimate two separate multinomial probit models, one with diplomatic action (nonmilitary) as the reference category and a second one with military action, including ground troops, as the reference category. The results for both models are presented in Table 2. The standard errors are clustered by crisis actors in order to correct for the possibility of heterogeneity. Looking first at the control variables, our findings suggest that more coercive action (either air power or combined forces, as compared to diplomatic approaches) is more likely to be used in protracted

conflicts. Ground forces are more likely to be used (relative to both air power and diplomacy) as the number of crisis actors increases. Likewise, joint democracy makes the use of either air strikes or military action with ground troops less likely, relative to nonviolent actions. However, the location of the crisis does not appear to determine the coercive method chosen.

Turning to our hypotheses, we find support for our first hypothesis that democracies are no more likely to use air strikes, relative to either diplomatic solutions or combined forces, than other regime types. As suggested by Hypothesis 2, we also find that wealthier states are more likely to use air-only campaigns but less likely to use ground forces in comparison to no force. As predicted by Hypothesis 3, we find that relatively more powerful states (relationships where the power differential is greater) are more likely to use air power instead of ground troops in a conflict. Finally, in line with both popular expectations and our fourth hypothesis, as the issue salience of the crisis increases, states are less likely to use air strikes alone than as part of a military action involving ground troops.

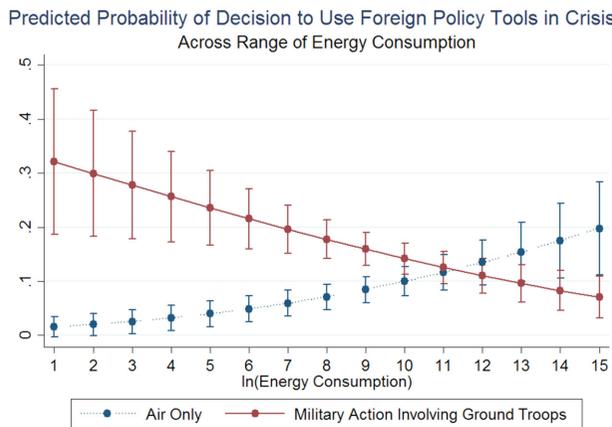
These findings have important policy implications. Potential targets may well be aware that air strikes are a signal of lower interest and lower resolve. Seeing air strikes alone as a response in a crisis situation may subsequently embolden a weaker adversary to hold out in a crisis, rather than make concessions, believing that only states willing to use ground troops are sufficiently resolved to force concessions. To maximize coercive effectiveness, states may need to use air strikes as a complement to ground forces, rather than simply as an intermediary substitute in hopes of avoiding more costly military efforts. To further explore the effect of these key variables on the decision to use air power during a crisis, we present the marginal effects of energy consumption, polity scores, and issue salience. In Figures 1–3 below, we present the predicted probabilities of a state selecting an air-only campaign versus an intervention

12 While *elsewhere* includes any distance not encapsulated by the prior three categories, it generally reflects distance overseas. By way of example, the Korean War in the 1950s for the United States is coded as *elsewhere*.

**Table 2** Multinomial probit results

	Air vs. nonviolent		Ground vs. Nonviolent		Air vs. ground	
Power differential	0.003	(0.003)	-0.005	(0.003)	0.007**	(0.003)
Polity score	0.024	(0.017)	0.007	(0.013)	0.017	(0.021)
Joint democracy	-0.855**	(0.407)	-1.469**	(0.585)	0.614	(0.658)
ln(energy consumption)	0.100***	(0.035)	-0.081***	(0.030)	0.181***	(0.040)
Crisis location	-0.114	(0.104)	-0.034	(0.118)	-0.080	(0.114)
Issue salience	-0.012	(0.053)	0.233***	(0.064)	-0.245***	(0.075)
Number of actors	0.001	(0.021)	0.105***	(0.017)	-0.104***	(0.019)
Protracted crisis	0.654***	(0.239)	1.049***	(0.228)	-0.395	(0.285)
Intercept	-2.701***	(0.372)	-2.424***	(0.365)	-0.278	(0.456)
N	793					
Log-likelihood	-538.3					
$\chi^2_{(16)}$	196.211					

Note: Significance levels: † = 10 percent, \*\* = 5 percent, \*\*\* = 1 percent.



**Figure 1.** Predicted probabilities, across energy consumption

involving ground troops as a way to visualize the comparative nature of the model. In each of the figures, the y-axis reflects the predicted probability of a state using a coercive foreign policy tool of interest (air power or action involving ground troops). All three figures are based on the results from the model where *no force* is the baseline category. To calculate the predicted probabilities, we held all other variables constant at their median. The figures all present 95 percent confidence intervals around their estimates and were created using the “margins” and “marginsplot” commands in Stata.

In Figure 1, the x-axis is the natural log of energy consumption by the state. Figure 1 shows that an increase in wealth, represented by energy consumption, increases the likelihood of using an air-only campaign (represented by the dotted line) in a statistically significant way. Notably, increased wealth is further associated with a decrease in the likelihood of using ground troops (represented by the

solid line). This provides support for Hypothesis 2 that wealthier states are more likely to use air power, rather than either diplomacy or ground forces, during a crisis.

In Figure 2, the x-axis is the state’s Polity 2 score, where higher values represent more democratic states. Figure 2 shows that regime type does not have a statistically significant effect on the choice to use either air-only campaigns or air campaigns involving ground troops as coercive instruments. This null finding runs counter to the popular perception that democracies are more likely to use air-only campaigns as a peaceful alternative relative to their autocratic counterparts. Instead, it provides support for Hypothesis 1—democratic states are no more likely than autocracies to employ air power as a coercive tool during a crisis.

Finally, in Figure 3 the x-axis is issue salience, where lower values represent lower levels of issue saliency during the crisis. This figure indicates that increased issue

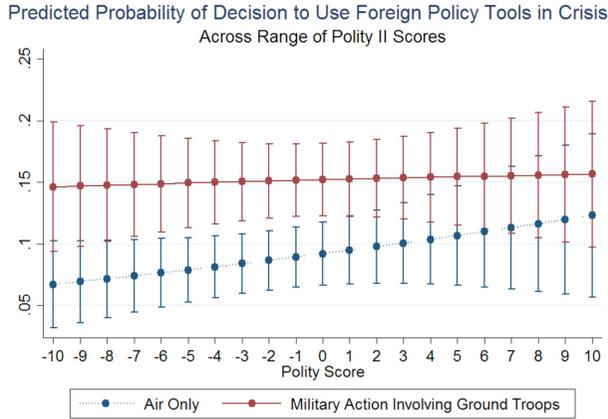


Figure 2. Predicted probabilities, across Polity II scores

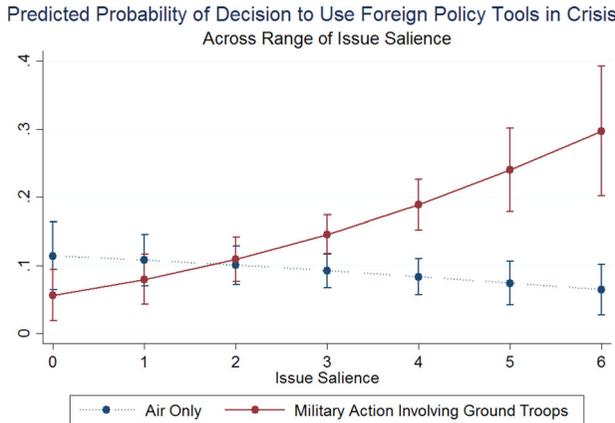


Figure 3. Predicted probabilities, across issue salience

salience does have a significant positive effect on the likelihood of using ground forces, but not air power.<sup>13</sup> This finding confirms Hypothesis 4 and the popular perception that, when states find themselves in a high-salience crisis, they are less likely to rely on air power alone and more likely to engage ground forces. As a matter of context, however, it is noteworthy that the most powerful states are less likely to face high-salience threats, defined as existential threats against their own territory or population. When otherwise strong states are involved in such high-salience crises, more often than not, they are the attacker or are defending an ally facing an existential threat. Regardless, it should not be taken lightly that

strong states are willing to utilize ground troops alongside air power when they respond.

### Conclusion and Future Directions

In this article, we explore the role of air power as a coercive tool, focusing explicitly on the decision to use air strikes over both violent and nonviolent alternatives. We test popular perceptions about the use of air strikes and find that many of them do not hold up empirically. The findings in this article reinforce previous work by [Clark and Reed \(2005\)](#) regarding factors that drive foreign policy substitution, including specifically wealth and military capabilities. As predicted by our hypotheses, air-only campaigns are more frequently used by wealthy states against militarily weaker opponents. Contrary to popular perception about the cost sensitivity of democracies, regime type is not a critical factor in the decision to use

13 In Figure A1 of the supplementary files, we show the substantive effects of issue salience on the different policy tools when the baseline category is the use of ground troops, as represented in Table 3.

air power, once wealth and military capability are taken into account.

Furthermore, we find that air-only campaigns may actually have more in common with nonviolent coercive instruments, including economic sanctions, than they do with other military actions, such as ground invasions. In line with current research, air power is more likely to be used in low-salience crises, suggesting that states use air strikes as a means of escalation. However, they are not necessarily a harbinger of an impending ground invasion as states are likely aware of the limited signal of resolve sent by an air-only campaign and that high-salience crises cannot be resolved in their favor without a stronger signal of resolve.

Much of the existing research has focused on whether or not a particular method or tool of coercion “works.” However, such an approach is overly limiting, as no tool of influence can work in every situation. Beyond effectiveness, we need to consider the context in which foreign policy tools are used. Such efforts have permeated work on economic sanctions and have the potential to be just as important and illuminating for work on air strikes and other forms of limited force.

This article adds to both the literatures on air power as a coercive tool and on foreign policy substitutability by conceptualizing of the choice to use air power not as an isolated one (as previous work has done), but as a relational one contingent on the viability and usefulness of nonviolent alternatives and the use of ground troops. No type of coercive instrument is an easy foreign policy tool to wield because it allows the adversary to make a choice (Freedman 1998). The threats made by the coercer are not the only consideration in a target’s decision calculus. Subsequently, a state’s choice will depend on the targets’s perceptions of the situation, as well as factors not be readily apparent to the coercive state, including domestic pressures against concessions. Our research and findings here add critical value and understanding to this decision calculus. Furthermore, we add to the call for building models that explicitly consider the substitutability of coercive tools despite the empirical challenges involved. Future work should continue to build on efforts that explore how coercive tools can and do work together. Morgan, Palmer, and Zaccariello (2010) find that military force and economic sanctions are more often used as complements rather than substitutes, as do Clark and Reed (2005). Consider this: what impacts do air strikes have on diplomatic efforts, including the peace process in Bosnia or Serbian violence against Kosovo?

In terms of research on air power as a coercive tool, one important future direction is to carefully consider the organization of the data. This project contributes to this

portion of the literature by using the crisis as the unit of analysis. Focusing on the crisis, rather than war, as much previous work has done, allows us to understand the decision to use air power before a conflict has escalated into violence. Further, the increased use of drone strikes allows for the possibility of future research addressing the coercive capacity of aerial campaigns. Are the credibility issues that air-only campaigns have exacerbated by the use of remotely piloted aircraft? Do the same predictors of air-only campaigns hold for drones strikes as well?

We believe that the next step in this research agenda should be to consider the decision to use air power in a dyadic context. While we offer some preliminary analysis of this dynamic by considering the relative capabilities of the target and how that might affect the decision to use air power, further consideration is needed regarding how the actions of a target state may influence the type of coercive tool used against it. Our main focus in this project is on the strategic choices made within the states involved, but the strategic dynamics between the states are also likely to be influential to the manner in which these international crises are resolved.

## Supplementary Information

Supplementary information is available at the *Journal of Global Security Studies* data archive.

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## References

- Allen, Susan Hannah. 2007. “Time Bombs: Estimating the Duration of Coercive Bombing Campaigns.” *Journal of Conflict Resolution* 51 (1): 112–33.
- Alvarez, R. Michael, and Jonathan Nagler. 1998. “When Politics and Models Collide: Estimating Models of Multiparty Elections.” *American Journal of Political Science* 42 (1): 55–96.
- Ang, Adrian U-Jin, and Dursun Peksen. 2007. “When Do Economic Sanctions Work? Asymmetric Perceptions, Issue
- 14 Notably, powerful democracies have found air power particularly appealing, as it allows them to signal a willingness to fight without risking potentially high casualty totals (Byman, Waxman, and Larson 1999; Horowitz and Reiter 2001) For the United States, air power is likely to continue to be one of the preferred instruments for responding to terrorism (Lesser et al. 1999).

- Salience, and Outcomes." *Political Research Quarterly* 60 (1): 135–45.
- Baldwin, David Allen. 1985. *Economic Statecraft*. Princeton, NJ: Princeton University Press.
- Brecher, Michael. 1993. *Crises in World Politics: Theory and Reality*. Oxford: Pergamon Press.
- Brecher, Michael, and Jonathan Wilkenfeld. 2000. *A Study of Crisis*. Ann Arbor: University of Michigan Press.
- Brecher, Michael, Jonathan Wilkenfeld, Kyle Beardsley, Patrick James, and David Quinn. 2017. *International Crisis Behavior Data Codebook, Version 12*. <http://sites.duke.edu/icbdata/data-collections/>.
- Bueno de Mesquita, Bruce, James Morrow, Randolph Siverson, and Alastair Smith. 2003. *The Logic of Political Survival*. Cambridge, MA: MIT Press.
- Byman, Daniel, and Matthew Waxman. 2002. *The Dynamics of Coercion: American Foreign Policy and the Limits of Military Might*. Cambridge: Cambridge University Press.
- Byman, Daniel, Matthew Waxman, and Eric Larson. 1999. *Air Power as a Coercive Instrument*. Santa Monica, CA: Rand Corp.
- Caverley, Jonathan D. Winter 2009/2010. "The Myth of Military Myopia: Democracy, Small Wars, and Vietnam." *International Security* 34 (3): 119–57.
- Clark, David H., and William Reed. 2005. "The Strategic Sources of Foreign Policy Substitution." *American Journal of Political Science* 49 (3): 609–24.
- Clark, David H., Timothy Nordstrom, and William Reed. 2008. "Substitution is in the Variance: Resources and Foreign Policy Choice." *American Journal of Political Science* 52 (4): 763–73.
- Clausewitz, Carl Von. 1984. *On War*, edited and translated by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press.
- Craig, Gordon A., and Alexander L. George. 1995. *Force and Statecraft: Diplomatic Problems of Our Time*. 3rd ed. New York: Oxford University Press.
- Crane, Conrad C. 1993. *Bombs, Cities, and Civilians: American Airpower Strategy in World War II*. Lawrence: University Press of Kansas.
- Cronin, Audrey Kurth. 2014. "The 'War on Terrorism': What Does It Mean to Win?" *Journal of Strategic Studies* 37 (2): 174–97.
- Diehl, Paul F. 1992. "What Are They Fighting for? The Importance of Issues in International Conflict Research." *Journal of Peace Research* 29 (3): 333–44.
- Drury, A. Cooper. 2001. "Sanctions as Coercive Diplomacy: The US President's Decision to Initiate Economic Sanctions." *Political Research Quarterly* 54 (3): 485–508.
- . 2005. *Economic Sanctions and Presidential Decisions: Models of Political Rationality*. New York: Palgrave Macmillan.
- Drury, A. Cooper, Richard Stuart Olson, and Douglas A. Van Belle. 2005. "The Politics of Humanitarian Aid: US Foreign Disaster Assistance, 1964–1995." *Journal of Politics* 67 (2): 454–73.
- Eichenberg, Richard. C. 2005. "Victory Has Many Friends: US Public Opinion and the Use of Military Force, 1981–2005." *International Security* 30 (1): 140–77.
- Fearon, James D. 1994. "Domestic Political Audiences and the Escalation of International Disputes." *American Political Science Review* 88 (3): 577–92.
- Feaver, Peter, and Christopher Gelpi. 2004. *Choosing Your Battles: American Civil-Military Relations and the Use of Force*. Princeton, NJ: Princeton University Press.
- Feaver, Peter, Christopher Gelpi, and Jason Reifler. 2006. "Success Matters: Casualty Sensitivity and the War in Iraq." *International Security* 30 (3): 7–46.
- Lawrence Freedman, ed. 1998. *Strategic Coercion: Concepts and Cases*. New York: Oxford University Press.
- Gartner, Scott Sigmund. 2008. "The Multiple Effects of Casualties on Public Support for War: An Experimental Approach." *American Journal of Political Science* 102 (1): 95–106.
- Gartner, Scott Sigmund, and Gary M. Segura. 1998. "War, Casualties, and Public Opinion." *Journal of Conflict Resolution* 42 (3): 278–300.
- George, Alexander L., David K. Hall, and William E. Simons, eds. 1971. *The Limits of Coercive Diplomacy: Laos, Cuba, Vietnam*. Boston, MA: Little Brown & Company.
- George, Alexander, and William Simons 1994. *The Limits of Coercive Diplomacy*. Oxford: Westview Press.
- Goertz, Gary, and Paul F. Diehl 1992. "The empirical importance of enduring rivalries." *International Interactions* 18 (2): 151–63.
- Hensel, Paul R. 2001. "Contentious Issues and World Politics: The Management of Territorial Claims in the Americas, 1816–1992." *International Studies Quarterly* 45 (1): 81–109.
- Holsti, Kalevi Jaakko. 1991. *Peace and War: Armed Conflicts and International Order, 1648–1989*. New York: Cambridge University Press.
- Horowitz, Michael, and Dan Reiter. 2001. "When Does Aerial Bombing Work? Quantitative Empirical Tests, 1917–1999." *Journal of Conflict Resolution* 45 (2): 147–73.
- Jentleson, Bruce W. 2000. "Economic Sanctions and Post-Cold War Conflicts: Challenges for Theory and Policy." In *International Conflict Resolution after the Cold War*, edited by Daniel Druckman and Paul C. Stern. 123–77. Washington, DC: National Academy Press.
- Kropko, Jonathan. "Choosing Between Multinomial Logit and Multinomial Probit Models for Analysis of Unordered Choice Data." Master's thesis, University of North Carolina at Chapel Hill, 2007.
- Leng, Russell J. 1993. "Reciprocating Influence Strategies in Interstate Crisis Bargaining." *Journal of Conflict Resolution* 37 (1): 3–41.
- Lesser, Ian O., John Arquilla, Bruce Hoffman, David Ronfeldt, and Michele Zanini. 1999. *Countering the New Terrorism*. Santa Monica, CA: RAND Corporation.
- Martinez Machain, Carla. 2015. "Air Campaign Duration and the Interaction of Air and Ground Forces." *International Interactions* 41 (3): 539–64.
- Marshall, Monty G., and Keith Jagers. 2002. *Polity IV Project: Political Regime Characteristics and Transitions, 1800–2002*. College Park: University of Maryland, Center

- for International Development and Conflict Management. <http://www.systemicpeace.org/polityproject.html>.
- Merom, Gil. 2003. *How Democracies Lose Small Wars: State, Society, and the Failures of France in Algeria, Israel in Lebanon, and the United States in Vietnam*. Cambridge: Cambridge University Press.
- Morgan, T. Clifton. 1990. "Issue Linkages in International Crisis Bargaining." *American Journal of Political Science* 34 (2): 311–33.
- Morgan, T. Clifton, and Glenn Palmer. 2006. *A Theory of Foreign Policy*. Princeton, NJ: Princeton University Press.
- Morgan, T. Clifton, Glenn Palmer, and David Zaccariello. 2010. "Are Economic Sanctions a Substitute for the Use of Force?" Access online. [http://www.eisa-net.org/bruga/eisa/files/events/stockholm/midsanx\\_frontendv4.pdf](http://www.eisa-net.org/bruga/eisa/files/events/stockholm/midsanx_frontendv4.pdf).
- Mueller, Karl. 1998. "Strategies of Coercion: Denial, Punishment, and the Future of Air Power." *Security Studies* 7 (3): 182–228.
- Pape, Robert A. 1996. *Bombing to Win: Air Power and Coercion in War*. Ithaca, NY: Cornell University Press.
- . 1997. "The Limits of Precision-Guided Air Power." *Security Studies* 7 (2): 93–114.
- Russett, Bruce, Christopher Layne, David E. Spiro, and Michael W. Doyle. 1995. "The Democratic Peace." *International Security* 19 (4): 164–84.
- Schultz, Kenneth A. 1999. "Do Democratic Institutions Constrain or Inform? Contrasting Two Institutional Perspectives on Democracy and War." *International Organization* 53 (2): 233–66.
- Senese, Paul D. 1996. "Geographical Proximity and Issue Salience: Their Effects on the Escalation of Militarized Interstate Conflict." *Conflict Management and Peace Science* 15 (2): 133–61.
- Singer, J. David, Stuart Bremer, and John Stuckey. 1972. "Capability Distribution, Uncertainty, and Major Power War, 1820–1965." In *Peace, War, and Numbers*, edited by Bruce M. Russett, 19–48. Beverly Hills, CA: Sage Publications.
- Slantchev, Branislav L. 2003a. "The Principle of Convergence in Wartime Negotiations." *American Political Science Review* 97 (4): 621–32.
- . 2003b. "The Power to Hurt: Costly Conflicts with Completely Informed States." *American Political Science Review* 97 (1): 123–33.
- Sullivan, Patricia L. 2007. "War Aims and War Outcomes: Why Powerful States Lose Limited Wars." *Journal of Conflict Resolution* 51 (3): 496–524.
- Vasquez, John A. 1993. *The War Puzzle*. Cambridge: Cambridge University Press.
- Watts, Barry D. 1997. "Ignoring Reality: Problems of Theory and Evidence in Security Studies." *Security Studies* 7 (2): 115–71.