FILTERING REVOLUTION:
Reporting Bias in International Newspaper Coverage of the Libyan Civil War[1]

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Abstract: Reporting bias – the media's tendency to systematically under-report or over-report certain types of events – is a persistent problem for participants and observers of armed conflict. We argue that the nature of reporting bias depends on how news organizations navigate the political context in which they are based. Where government pressure on the media is limited – in democratic regimes – the scope of reporting should reflect conventional media preferences toward novel, large-scale, dramatic developments that challenge the conventional wisdom and highlight the unsustainability of the status quo. Where political constraints on reporting are more onerous – in non-democratic regimes – the scope of coverage will be driven by the conservative preferences of the state, emphasizing the legitimacy and inevitability of the prevailing order. We test these propositions using new data on protest and political violence during the 2011 Libyan uprising and daily newspaper coverage of the Arab Spring from 106 countries. We uncover evidence of a status-quo (i.e. pro-Qaddafi) media bias in non-democratic states, and a revisionist (i.e. pro-rebel) bias in democratic ones. Media coverage in non-democratic states under-reported protests and other non-violent collective action by regime opponents, largely ignored government atrocities, and over-reported those caused by rebels. We find the opposite patterns in democratic states.

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What drives media coverage of political violence and conflict? Do news outlets in different countries respond to the same events in the same ways? Or do they filter information according to the preferences of the political regimes to which they belong? Regime-based reporting bias – distinct from the purported ideological bias routinely debated with respect to media coverage of domestic politics (Genzkow & Shapiro 2006, Baum & Groeling 2008, Groseclose 2012) – is an important problem for participants and observers of conflict. To political actors, media reports provide critical information on the performance and strength of an incumbent regime, the costs associated with collective action, and the benefits offered by the opposition. The press also informs scholarship, generates data, and shapes the public and academic debate about the nature of a particular crisis and the interests at stake. To the extent that systematic differences exist in media reporting of political events, they are likely to carry important consequences for public knowledge, policy and scientific inference (Bennett et al., 2007; Entman, 2004; Hallin & Mancini, 2004; Iyengar & Kinder, 1987; Livingston & Bennett, 2003; McCombs & Shaw, 1972). Until recently, however, data limitations have impeded our ability to uncover sources of reporting bias at competing levels of analysis: within and between countries, within and between individual media outlets, and over time.

Using new data on protest and political violence during the 2011 Libyan uprising and daily newspaper coverage of the Arab Spring from 106 countries, we find that political regime type has a powerful effect on how news organizations respond to events on the ground. In particular, we uncover evidence of a status-quo (i.e. pro-Qaddafi) media bias in non-democratic states, and a revisionist (i.e. pro-rebel) bias in democratic ones. Consistent with an authoritarian interest in delegitimizing political opponents and dissuading emulation efforts at home, media coverage in non-democratic states under-reported protests and other expressions of non-violent collective action by regime opponents, largely ignored government atrocities, and over-reported those caused by rebels. We find the opposite patterns in democratic states.

Our study is organized as follows. Section 1 offers an overview of existing research on reporting bias, and derives several hypotheses on the determinants of wartime news coverage at the national and subnational levels. Section 2 describes our data on foreign policy newspaper coverage and political violence in Libya. Section 3 examines the empirical relationship between news coverage and a range of covariates at the newspaper, daily and country level. Section 4 evaluates these results in the context of broader academic and policy debates on media bias and political unrest, and identifies several directions for future research.

REPORTING BIAS AND COLLECTIVE ACTION

Reporting bias – the tendency to systematically under-report or over-report certain types of events – is a persistent challenge of empirical conflict research.[2] A number of studies have shown that competing media sources may provide alternative accounts of domestic and interstate conflict processes over time, and that these differences may be highly consequential for data analysis and statistical inference (Snyder & Kelly, 1977; Schrodt & Gerner, 1994; Schrodt, Simpson & Gerner, 2001; Reeves et al., 2006; Francisco, 1996).

The sources of reporting bias are numerous and are subjects of a great deal of empirical research. The most basic ones begin with the professional incentives facing individual reporters and their editors. Not every story is equally "newsworthy." Media organizations have a tendency to report more heavily on large-scale, dramatic events (Woolley, 2000; Davenport & Stam, 2006), particularly those involving conflict or "bad news" (Patterson 1996, Sabato 1991, Capella & Jamison 1997, Baum & Groeling 2010a). There is also a tendency to emphasize the novel, unexpected and sensational over the ordinary and mundane (Baum & Groeling 2010a, Snyder & Kelly, 1977).

Physical and cultural proximity – both domestic (Martin 1988, Morton & Warren 1992) and international (Rosengren 1974 & 1977, Shoemaker & Reese 1996) represent an additional key determinant of newsworthiness (Shoemaker, Lee, Han & Cohen 2007). For instance, coverage tends to be regional in focus, with greater attention reserved for stories in certain parts of the world (Hafner-Burton & Ron, 2009), and in certain parts of a country, such as urban centers (Danzger, 1975; Kalyvas, 2004). Journalists and media consumers also tend to lose interest in a conflict over time, and this "coverage fatigue" generates a secular downward trend in the volume of war reporting (Davenport & Stam, 2006). Once coverage fatigue sets in, only a substantial and sustained change in the tenor of events – like the

[2] Snyder & Kelly (1977) distinguish between two types of reporting bias: selection (differential completeness of reporting across different classes of events) and content (differential interpretation of events). In the following analysis, we restrict our focus to the first type of bias – the probability that certain types of events are reported.

U.S. troop surge in Iraq and resulting dramatic decline in violence there – will typically reignite public and media interest in a conflict (Baum & Groeling 2010b).[3]

News organizations, however, are not the only arbiters of newsworthiness. The state in which a media firm is based may have its own preferences about the appropriate breadth, depth and emphasis of news coverage, particularly when the subject is politically sensitive – as civil unrest and war surely are. The extent to which states impose these preferences varies, although nondemocratic regimes are particularly hostile to press freedom (Egorov et al., 2009, Van Belle 2000).

A state may shape the news agenda in one of three ways. The first is through direct ownership and control of media sources.[4] Second, a state may seek to regulate the activity of privately owned media outlets through indirect forms of influence, like licensing requirements, taxation, subsidies, and laws limiting certain forms of expression (Whitten-Woodring & James, 2012).[5] Third, states may create an environment in which media owners and individual journalists face strong incentives to self-censor and avoid "watchdog" reporting of potentially sensitive topics (Bennett et al., 2007; Schudson, 2003; Sigal, 1986; Djankov et al., 2003; Whitten-Woodring & James, 2012). To maintain working relationships with government patrons and sources of information, knowing when to "sit on a story" can be as valuable as "getting the scoop."

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[3] Different types of media sources may also offer different baseline volumes of coverage, due to natural limitations and capabilities presented by a particular medium. In a study of violence in Guatemala, Davenport & Ball (2002) found that newspapers offered more objective and comprehensive coverage of violent events than human rights reports or eyewitness accounts.

[4] Recent research has shown ownership structure to be strongly predictive of variation in coverage. Djankov et al. (2003) find support for the view that government-owned media "distort and manipulate information to entrench the incumbent politicians, preclude voters and consumers from making informed decisions." Leeson (2008) argues that public ownership and direct state control is associated with greater citizen ignorance and apathy. Enikolopov et al. (2008) find that independent TV station access in Russia is associated with a smaller vote share for the governing party, while Hughes & Lawson (2004) find that privately owned Mexican TV stations offer more balanced coverage of political parties.

[5] Gehlbach (2010) offers one such example of indirect control in Russia, where the Kremlin relies on surrogates and economic pressure to restrict the autonomy of electronic and print media firms.

How do these micro-level and state-level sources of reporting bias interact to shape coverage of political conflict? Recent research has shown that – even in very repressive regimes – censorship is not applied uniformly to all types of political unrest (Stein 2013, 2007). For instance, the highly authoritarian regime in Qatar, which as recently as November 2012 sentenced a poet critical of the regime to life in prison (*New York Times 2012*) – allows satellite television station *Al Jazeera* to flourish, free from regime censorship. In a recent study of the Chinese blogosphere, King et al. (2012) show that the Beijing government moves quickly to suppress language that may potentially mobilize collective action, but permits other forms of political speech and regime criticism.

Protest and rebellion represent classic collective action problems, where participation is individually costly, benefits are non-excludable, and individuals prefer to free ride on the contributions of others. Since the price of losing power is greater for dictators than elected officials, non-democratic leaders face strong incentives to suppress any collective action that might result in a change of government. To this end, such regimes may conclude that self-preservation entails suppressing media coverage.

Information on collective action has been shown to promote further collective action (Kuran, 1989; Lohmann, 2002). Media coverage of such activities – and the number of participants involved – increases public awareness of a regime's performance, and transmits informational cues about the extent of popular discontent (Lohmann, 1994), as well as the willingness and capacity of the regime to repress protests (Stein 2007, 2013). Such coverage breaks the appearance of the inevitability of the status quo, raises the opposition's expected share of support, and constrains potential government responses (Kuran, 1989). Confronted with a highly visible protest movement, embattled governments face a stark choice between tolerance – which reduces the expected costs of participation – or repression – which potentially invites backlash mobilization (Francisco, 2004). In this sense, news coverage of a social movement not only facilitates mobilization, but can also serve to legitimize it (Gamson & Wolfsfeld, 1993).

Not all forms of collective action are necessarily threatening to nondemocratic regimes. An emerging literature has argued that limited media freedom can be a useful source of corrective feedback for autocratic rulers. Media coverage of protests directed at local officials, for instance, may inspire more protests, but it also allows a central government to monitor the performance of subordinates and hold them accountable for corruption and mismanagement (Egorov et al., 2009; Lorentzen, 2009; Huang, 2009; Debs, 2007).

Mobilization against peer autocratic regimes, however, is free of these principal-agent dynamics and cannot be so easily manipulated to suit the government's needs. Successful contention in one state, through its example, can raise the opposition's expectations that state authority could be successfully challenged through similar means. As individuals update their prior beliefs about the resilience of seemingly powerful regimes in other polities, they become more likely to attempt emulation efforts at home. Scholars have observed such dynamics during the post-communist "color" revolutionary movements in Serbia, Georgia, Ukraine and Kyrgyzstan (Beissinger, 2007), and in earlier waves of regime contention in Europe, in 1830, 1848 and 1917-19 (Weyland, 2009, 2010).

Foreign political upheavals can generate additional incentives for reporting bias due to the relative difficulties of independent verification (Gentzkow & Shapiro, 2005). Government manipulation of the news – direct or indirect – is commonly known to be possible but cannot be directly observed by the public (Edmond, 2008). A consumer may seek to verify, at a cost, the information she receives from traditional media sources. Yet these costs are relatively high if the direct participants of protest and rebellion are foreign nationals, and there is little information transmission through family connections and informal social networks (Francisco 2004). Although access to alternative media sources not as easily controlled by the state (e.g. internet news feeds, blogs, Tweets) may offer citizens additional means to overcome closed communications, verification remains far more difficult than in cases of domestic protest and conflict, where ex post feedback is more immediately available.[6]

In sum, the nature of reporting bias depends on how media organizations navigate the political context in which they are based. Where government pressure on the media is limited – as is likely to be the case in democratic regimes – the scope of reporting should reflect the "true" preferences of media organizations. These favor coverage of novel, large-scale, dramatic developments that challenge the conventional wisdom and highlight the unsustainability of the status quo. Where political constraints on reporting are more onerous – as is likely in non-democratic regimes – the conservative preferences of the state will drive the scope of coverage. These favor an emphasis on the legitimacy and inevitability of the prevailing order.

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[6] Markets for alternative information sources typically emerge where consumer confidence in traditional media is low. In one recent study, Romanyuk (2011) finds that the scope of differences in the content of online and offline media in OECD countries is greatest where state censorship of offline media is high.

In a revolutionary context such as the Arab Spring, the media-government interaction should produce two distinct – indeed, opposite – patterns of news coverage. In non-democratic states, we should expect a status quo (i.e. pro-incumbent) media bias (Hypothesis 1), defined by less voluminous coverage following incidents of non-violent collective action (e.g. protests and mass demonstrations), more coverage following events that undermine the legitimacy of the political opposition (e.g. rebel-induced civilian casualties), and an avoidance of coverage that challenges the legitimacy of the regime (e.g. government-induced civilian casualties). In democratic states, we should expect a revisionist (i.e. pro-challenger) media bias (Hypothesis 2), favoring reports that emphasize the size, frequency and legitimacy of anti-regime collective action. Table 1 summarizes our theoretical predictions.

[TABLE 1]

LIBYA CIVIL WAR AND NEWSPAPER COVERAGE DATA

The 2011 Libyan Civil War offers a unique opportunity to test these propositions. The popular uprising against the entrenched regime of Colonel Muammar Qaddafi – and subsequent NATO intervention – represent the type of unexpected turn of events that media organizations are likely to find "newsworthy," but non-democratic governments may find threatening. The relatively short duration of the Libyan crisis (less than one year, from the beginning of regional protests to the overthrow of Qaddafi) enables us to track news coverage over the full course of the uprising, with less contamination by coverage fatigue than we might expect in more protracted conflicts, like Syria.

More importantly, the Libyan case presents a hard test for theories of censorship and media bias. The conflict occurred during the height of the Arab Spring, when international media attention was concentrated on North Africa and the Greater Middle East, and an abundance of coverage in offline and online media reduced the costs of verifying suspicious news reports and conspicuous omissions. Under such circumstances, governments and media firms should have felt relatively few incentives to misrepresent the nature of events on the ground, since the high probability of falsification might damage their credibility and reputation (Gentzkow & Shapiro, 2005; Edmond, 2008). If a democratic/non-democratic divergence in reporting can be observed during such a high-visibility crisis, we can expect this relationship to hold under far less onerous circumstances.

To test these propositions, we construct a new dataset from a corpus of 207,729 articles published by 2,322 newspapers in 106 countries between 18 December

2010 (first day of protests in Tunisia, which ignited the Arab Spring) and 23 October 2011 (three days following the capture and death of Muammar Qaddafi). While news coverage certainly appears in various forms of electronic and print media, we confine our current focus to newspapers due to their international prevalence as primary sources of information on political, economic and social events. For instance, a disproportionate share of online news originates with newspapers. Indeed, in March 2013, seven of the 10 most popular online news sources either *are* online versions of print newspapers or feature content that consists primarily of links to online newspapers.[7] We also focus on newspapers in order to collect a consistent and representative data sample across the largest possible set of countries.

[FIGURE 1]

Our sample of 106 countries is shown in Figure 1. For each country, we conducted a census of all daily and weekly newspapers listed in the electronic databases Lexis-Nexis and ISI Emerging Markets. We identified a universe of 2,322 unique and active (i.e. currently in press) newspapers, excluding weekend supplements, inserts, evening editions and similar associated materials.

For each newspaper, we collected every unique article archived in Lexis-Nexis or ISI, containing the term "Libya" (in English or the newspaper's source language) and published between 18 December 2010 and 23 October 2011. These dates mark, respectively, the day of first protests in Tunisia following Mohamed Bouazizi's self-immolation – generally accepted as the beginning of the Arab Spring – and the National Transitional Council's declaration of the liberation of Libya. We found 207,729 such articles in total.

We used this corpus of texts to construct two panel datasets: one at the level of a country-day, and the other at the level of newspaper-day. For the newspaper panels, we created a dummy variable, Publish_{ijt}, coded 1 if newspaper i in country j decided to publish an article on Libya on day t, and 0 otherwise. We created an analogous variable at the country-day level, Publish_{jt}, coded 1 if at least one newspaper in country j published an article on Libya on day t. Figure 2 shows the distribution of this variable across all countries in our sample.[8]

[FIGURE 2]

Because news coverage of foreign policy crises is by necessity event-driven, we sought to formally account for the day-by-day dynamics of those crises. We did so

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[7] Source: ebizmba.com (http://www.ebizmba.com/articles/news-websites).

[8] Technically, the quantity shown in Figure 2 is the proportion of newspaper-days in country j with at least one article on Libya, or $\frac{1}{t}\Sigma_t \frac{1}{i}\Sigma_i \text{Publish}_{ijt}$.

by collecting daily event data on the type, intensity and lethality of insurgent and government violence within Libya. To avoid overlap with our newspaper corpus, we relied on a mutually exclusive ensemble of electronic sources and newswires, including *Al Jazeera*, *BBC News*, *CNN*, *Reuters*, *RIA Novosti*, *Xinhua* and several dozen others. Following best practices in conflict studies (Francisco, 1996; Reeves et al., 2006), we constructed our events data set from a regionally diverse set of news agencies to offset under-reporting in any single source, and draw on media with relatively few space- and advertising-related limitations on the volume of information published.

For each of 1,510 unique events identified during the window of observation, we recorded its location, timing, participants (unarmed civilians, armed rebels, government police or military forces, NATO), type (protest, arrest, use of ground force, use of artillery or air power), technology (selective vs. indiscriminate), and casualties (wounded and killed, grouped by target and perpetrator). We aggregated these data to daily event counts. A weekly time series plot of the violence data, grouped by perpetrator, is shown in Figure 3. The geographic distribution of the violence, disaggregated by type, is shown in Figure 4.

[FIGURE 3] [FIGURE 4]

In addition to the article-, newspaper- and daily-level variables described above, we collected a series of country-level controls, including democracy scores, wealth, geographic distance from Libya, internet access, education, and domestic conflict history. In the appendix we provide a full list of variables considered, their levels of measurement, summary statistics and source documentation.

DESCRIPTIVE STATISTICS

What does an initial glance at the data tell us about differences in reporting between democratic and non-democratic states? During our period of observation (December 18, 2010 – October 23, 2011), an average of 1960 articles were published on Libya in any given country – approximately 6-7 per day. Their distribution, however, was far from uniform. Indeed, given the aforementioned newsworthiness preferences that tend to prevail far more among free, market-based media in democracies than among their typically-less-free counterparts in non-democracies, we would anticipate more coverage of the Libya conflict, all else equal, in democracies. In fact, this is what we find. Although the countries in our sample were about evenly split between democracies and non-democracies – 57 to 55, respectively – a full 92.4 percent (192,119 of 207,729) of all articles were pub-

lished in democratic states.[9] This imbalance is partly due to the vastly more developed media markets of democracies. The average democracy was home to 18-19 newspapers, while the average non-democracy had only 4-5. Yet even within individual newspapers, the divide was apparent. On any given day, an average newspaper in a democratic country had a 10 percent chance of publishing at least one story on Libya. In non-democratic states, this figure was 5 percent. This difference is highly significant ($p<.0001$).[10]

On what sorts of days were newspapers likely to run stories about Libya? Newspapers in both types of countries shared a preference toward reporting on large-scale events, and tended to publish stories following days of heavy fighting. Days on which newspapers provided coverage of Libya were preceded by 3.1 rebel or government operations on average, while the average number of attacks prior to non-publication was 2.2.[11] These statistics were similar for democracies and non-democracies.

The similarities end, however, once we take a deeper look at coverage of specific types of conflict events. Consistent with H2, newspapers in democratic states published stories following higher levels of protest activity than those in non-democratic states.[12] Indeed, consistent with H1, articles in non-democratic states were generally published following below-average levels of protest, highlighting a relatively cautious approach toward expressions of collective action.

A further disparity can be seen in coverage of civilian victimization. Again consistent with H2, newspapers in democratic states tended to run stories following higher levels of government-caused civilian casualties, while, consistent with H1,

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[9] Following standard practice in international relations research, we define Democracy as a Polity2 score of +6 or higher. The Polity2 variable from the Polity IV project is an aggregate democracy variable that runs from -10 (full autocracy) to +10 (full democracy). The Polity IV team recommends treating a Polity2 score of +6 as a lower bound for democracy (Jaggers & Gurr, 1995).

[10] $E[\text{Publish}_{ijt} \mid \text{Democracy}_j = 1] = 0.098$, $E[\text{Publish}_{ijt} \mid \text{Democracy}_j = 0] = 0.049$. Kolmogorov-Smirnov test statistic D = 0.0496, p-value < 2.2e-16.

[11] $E[\text{Civil war violence}_t \mid \text{Publish}_{ijt} = 1] = 3.13$, $E[\text{Civil war violence}_t \mid \text{Publish}_{ijt} = 0] = 2.17$; Kolmogorov-Smirnov test statistic D = 0.1693, p-value < 2.2e-16.

[12] $E[\text{Protest}_t \mid \text{Publish}_{ijt} = 1] = .207$; $E[\text{Protest}_t \mid \text{Publish}_{ijt} = 1, \text{Democracy}_j = 1] = .210$; $E[\text{Protest}_t \mid \text{Publish}_{ijt} = 1, \text{Democracy}_j = 0] = .166$; Kolmogorov-Smirnov test statistic D = 0.0702, p-value < 2.2e-16.

those in non-democratic states published after higher levels of anti-civilian violence by rebels.[13]

This differential attention to the military conduct of the warring parties is consistent with our theoretical expectations about perceptions of the relative legitimacy of incumbents and challengers. To the extent that rebel violence against civilians can be seen as evidence of incompetence or disregard for the population's safety, increased attention to such incidents among media in non-democratic states underscores the preferability and legitimacy of the status quo. Similar practices by pro-Qaddafi forces, meanwhile, may signal the unsustainability or illegitimacy of the status quo to media outlets in democratic states.

While general patterns in the data support our argument about a democratic/non-democratic divergence in reporting of protest and rebellion, we want to be able to draw more general inferences about the probability of news coverage under a variety of counterfactual scenarios. In addition, we want to ensure that these patterns persist when we consider other sources of influence on media coverage – such as coverage fatigue, newspaper ownership characteristics, and potentially relevant country attributes like internet access, education and geographic proximity to Libya. To these ends, we provide a series of more rigorous statistical tests.

EMPIRICAL ANALYSIS

We are interested in uncovering systematic differences between democratic and non-democratic states in newspaper coverage of the Libyan Civil War. If media organizations within non-democratic states indeed have a status quo bias (H1), we should expect them to provide less coverage following incidents of non-violent collective action, and more coverage following events that undermine the legitimacy of the political opposition. If media firms in democratic states have a revisionist bias (H2), we should expect them to exhibit the opposite patterns – more coverage following incidents of non-violent collective action, less coverage following events that undermine the opposition's legitimacy, and more coverage that challenges the le-

[13] E[Rebel-caused civilian casualties$_t$ | Publish$_{ijt}$ = 1, Democracy$_j$ = 1] = 0.533; E[Rebel-caused civilian casualties$_t$ | Publish$_{ijt}$ = 1, Democracy$_j$ = 0] = 0.599; Kolmogorov-Smirnov test statistic D = 0.0054, p-value = 0.797. E[Government-caused civilian casualties$_t$ | Publish$_{ijt}$ = 1, Democracy$_j$ = 1] = 11.297; E[Government-caused civilian casualties$_t$ | Publish$_{ijt}$ = 1, Democracy$_j$ = 0] = 11.210; Kolmogorov-Smirnov test statistic D = 0.0122, p-value = 0.028.

gitimacy of the incumbent. To test these propositions, we estimate mixed effect logit models at two levels of analysis:

Newspaper-day

$$\text{Publish}_{ijt} = \text{logit}^{-1}[\text{Democracy}_j \cdot \alpha + \mathbf{x}_{ijt}\beta + \text{Democracy} \cdot \mathbf{x}_{ijt}\gamma + \mathbf{z}_j\theta + \mathbf{W} \cdot \text{Publish}_{i,t-1}\lambda + u_i + u_t + \varepsilon_{it}]$$

Country-day

$$\text{Publish}_{jt} = \text{logit}^{-1}[\text{Democracy}_j \cdot \alpha + \mathbf{x}_{jt}\beta + \text{Democracy} \cdot \mathbf{x}_{jt}\gamma + \mathbf{z}_j\theta + \text{Publish}_{j,t-1}\rho + u_j + u_t + \varepsilon_{jt}]$$

where the dependent variable, Publish_{ijt}, is an indicator of whether newspaper *i* in country *j* published a story on Libya on day *t*.[14] The lower-order interactive term Democracy_j is a binary indicator of whether county *j* was a democracy in 2010, as defined by a Polity2 score of +6 or higher. We consider two vectors of covariates $\mathbf{x}_{ijt}$ and $\mathbf{z}_j$. **x** includes time-variant measures of conflict intensity (number of protests, civil war violence events, rebel- and government-induced civilian casualties, and NATO strikes on day *t-1*) and newspaper-level attributes (size of newspaper *i*'s ownership network, public ownership dummy).[15] **z** includes time-invariant country-level characteristics (distance of country *j* from Libya, NATO membership, internal conflict years since WWII, education, percent of population with internet access, number of newspapers in country). To capture heterogeneity in coverage across different types of regimes, we interact Democracy with the covariates in **x**.

In addition to the relationships of central theoretical interest, we sought to control for several confounding factors. The first of these involves potential violations of the independence assumption: what newspaper *i* publishes on day *t* is probably not independent of what the same newspaper – or others within the same ownership network – published on day *t-1*. To this end, we include a time-lagged autoregressive term $\mathbf{W} \cdot \text{Publish}_{i,t-1}$, which represents the proportion of co-owned newspapers that featured a Libya news story on day *t-1*.[16]

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[14] On the country-day level, Publish_{jt} indicates whether at least one newspaper in country *j* publishes a story on Libya on day *t*.

[15] On the country-day level, **x** includes newspaper-specific measures aggregated to the country level (e.g. proportion of publicly-owned newspapers in country *j*, average network size in country *j*).

[16] **W** is a row-normalized connectivity matrix of the ownership network shown in the appendix. On the country-day level, we replace the network autoregressive term with a temporally-lagged dependent variable, $\text{Publish}_{j,t-1}$.

Finally, we cannot exclude the possibility that unobserved heterogeneity in newspapers' (or countries') individual attributes, such as editorial idiosyncrasies, niche market characteristics and stylistic norms, could simultaneously drive variation in the explanatory variables and the propensity to publish a story on Libya. If such unobserved characteristics are correlated with the error terms of our models, pooled estimation will produce biased parameter estimates. We therefore include newspaper-level and country-level random effects (u_i, u_j) and time random effects (u_t) to control for bias induced by this unobserved heterogeneity and to examine variation within and across newspapers and countries over time.

[TABLE 2] [TABLE 3] [FIGURE 5]

The results are generally consistent with our theoretical expectations, at both the newspaper-day and country-day levels. Coefficient estimates for these models are reported in Tables 2 and 3. The most theoretically relevant empirical relationships are summarized in Figure 5, which reports changes in the predicted probability of a publication on Libya, under several counterfactual scenarios where a conflict variable of interest (e.g. number of violent incidents on the preceding day) is increased from its 1st to 99th percentile, and all other covariates are held constant at their median values.

As predicted by H2, media firms in democracies responded to non-violent collective action by increasing media coverage, while, consistent with H1, those in non-democracies responded by reducing coverage. In democratic states, a hypothetical increase from 0 to 3 Libyan protests (1st to 99th percentile) was associated with a 21 percent increase (95% CI: +7, +36) in the probability of an article about Libya.[17] In non-democracies, the same counterfactual yielded a 13 percent decrease in probability (95% CI: -25, -0.2). This heterogeneous relationship holds at both levels of analysis.

We also find systematic differences in newspaper responses to civilian victimization, depending on which actors inflicted this violence. On the country-day level, an increase from 0 to 18 rebel-induced civilian casualties was associated with an uptick in newspaper coverage in non-democratic states (+24 percent; 95% CI: +8.5, +41.6), but no significant change in democratic ones (+8 percent; 95% CI: -5.5, +22.4). At the newspaper-day level, the results suggest a difference more of degree than kind. The direction, however, is the same. The probability that an average newspaper in a non-democratic regime published a story on Libya rose by 29 percent (CI: +20, +38) following a spike in rebel-induced collateral damage. Among

[17] These predictions are from the country-day results shown in Figure 5a.

newspapers in democratic states, this increase was about one-third lower, at 20 percent (CI: +16, +24). These results are again consistent with both hypotheses.

Again consistent with both hypotheses, collateral damage by government forces produced the opposite patterns. An increase from 0 to 130 government-caused civilian casualties was followed by a 13 percent increase (CI: +5, +20) in coverage probability in democracies, but a far smaller and only marginally significant increase in non-democracies (+7.4 percent; CI: +0.4, +14.7). This difference is even starker at the newspaper-day level. Outlets in democratic states responded to an increase in civilians killed or wounded by the government with a 2.8 percent increase in probability of publishing a story on Libya (CI: +1.3, +4.3). Given the same counterfactual scenario, newspapers in non-democratic states were neither more nor less likely to publish a story on Libya (+1 percent; CI: -3, +5).

CONCLUSION

Our data offer strong support for both the democratic pro-challenger (H2) and non-democratic pro-incumbent (H1) bias hypotheses. At least in the case of Libya, media in non-democracies evidenced a clear pro-incumbency bias in their news coverage, while their counterparts in democracies demonstrated an opposing, pro-challenger bias. These patterns held across all of our tests, including coverage of government-inflicted civilian casualties and anti-regime protests (more coverage by democracies; less by non-democracies), and coverage of rebel-inflicted civilian casualties (more coverage by non-democracies; less by democracies). Though prior work has found some evidence of these sorts of biases, none have been able to undertake systematic testing of these propositions with similarly comprehensive data.

These findings are potentially important in helping improve our understanding of the framing war fought through the press that frequently accompanies a shooting war "on the ground." While media in democracies are in most cases independent from government influence, they have their own institutional biases – like newsworthiness criteria that emphasize novelty, conflict, proximity, and drama – that tend to result in conflict coverage favoring anti-regime forces, while the self-preservation motive of authoritarian governments, who in most cases influence or control their countries' media, favors coverage that underscores the legitimacy and inevitability of the status quo. In cases of civil wars with the potential to engender foreign intervention, the former can be quite consequential. To the extent the observed democratic pro-challenger bias results in systematically greater international support for intervening in civil conflicts, this could raise the pressure on leaders

to do so, thereby potentially altering the outcomes of such conflicts. Conversely, non-democracies' pro-incumbent bias is clearly aimed at limiting the propensity of external powers to act against their authoritarian counterparts. Their ultimate goal presumably is to reduce the likelihood that they might later suffer a similar fate.

It is difficult to generalize from one civil war, as all wars are unique. However, the Libya case is a difficult test of our theory. Because it occurred at the height of the Arab Spring, intense international attention to the region essentially guaranteed that media coverage would be scrutinized and any systematic biases in coverage exposed. That we found strong evidence of reporting bias despite the watchful eye of the international community suggests that such biases are likely not limited to this case, and if anything, are stronger in less highly scrutinized contexts.

This study represents a first step in better understanding the nature and influence of reporting bias in international conflict. Still to be explored are the effects on reporting bias of different types of media ownership and variations in conflicts themselves. Do networks of media outlets converge in their coverage of civil conflict? Do different types of violence – e.g., systematic vs. indiscriminant – engender qualitatively different responses from media? And do these differences matter in terms of influencing global public attitudes toward intervention? These are just a few of the topics we hope to investigate in future research. Ultimately, our goal is to better define the role of media – as the primary source of information about international events for the vast majority of citizens and leaders alike – in international conflict processes.

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TABLES AND FIGURES

Figure 1. Geographic extent of Libya news coverage data.

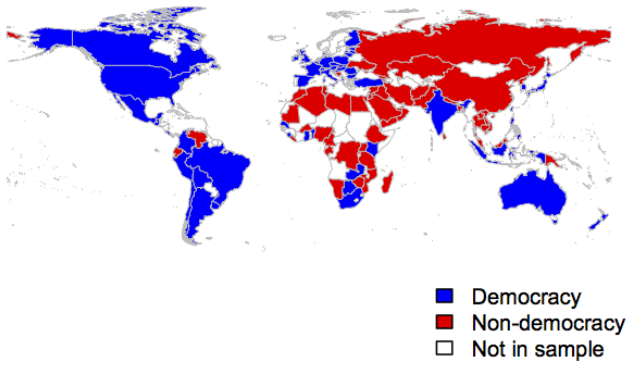


Figure 2. Frequency of newspaper reports on Libyan crisis. Shadings correspond to proportion of newspaper-days with at least one article published.

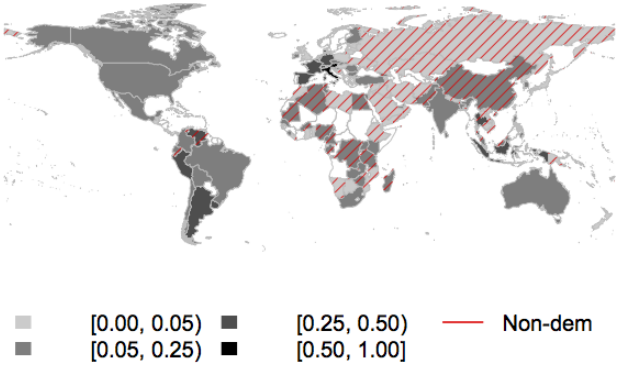


Figure 3. Libyan Civil War violence over time. Vertical bars represent weekly event counts.

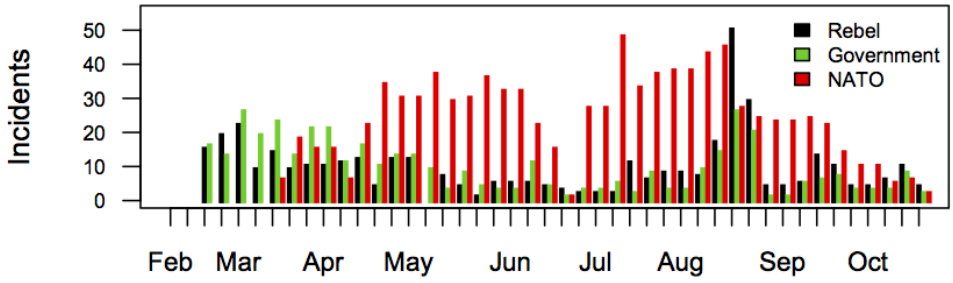
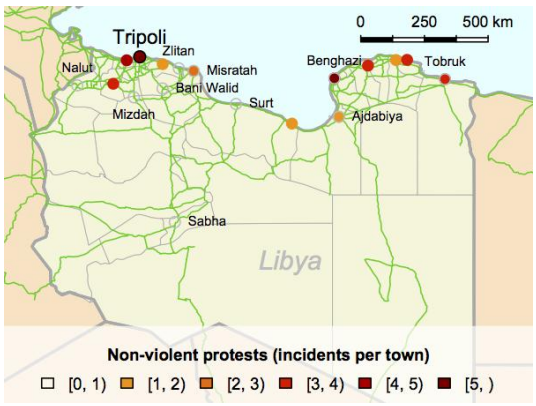
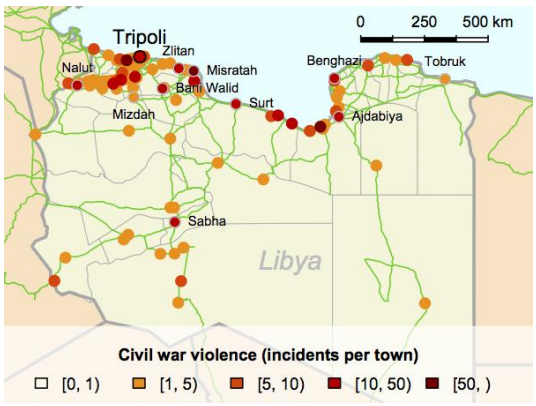
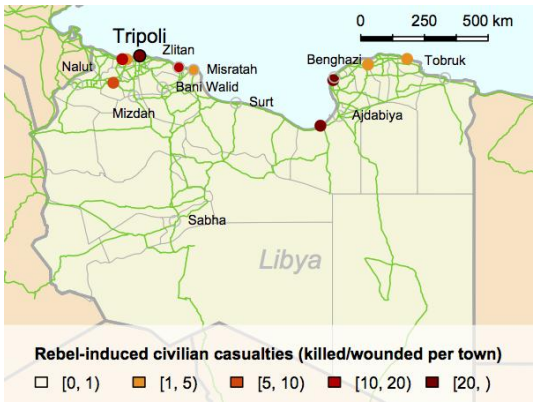
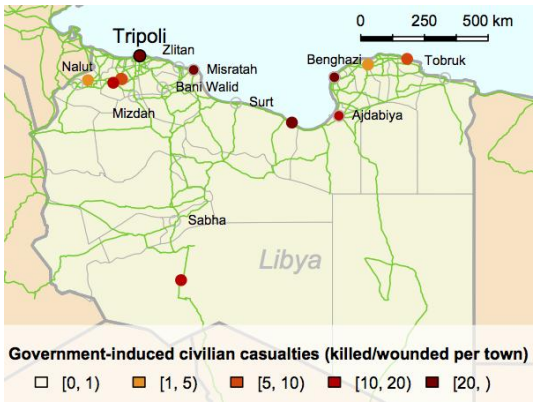


Figure 4. Libyan Civil War violence over space. Colored circles represent number of incidents per town over full duration of conflict.









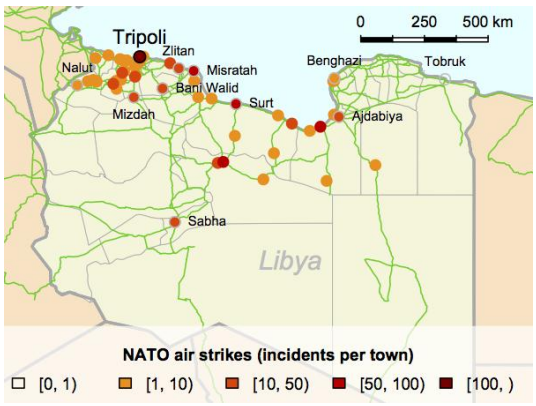


Figure 5. Percent change in probability of Libya coverage. Quantities reported have the following interpretation. How much more/less likely is the publication of an article about Libya on day *t*, if the number of conflict events **x** on day *t-1* were increased from the 1st to the 99th percentile. Actual values associated with this counterfactual are provided as "CF: [1st percentile] to [99th percentile]." White vertical stripes are point estimates. Red and blue bars are 95% confidence intervals.

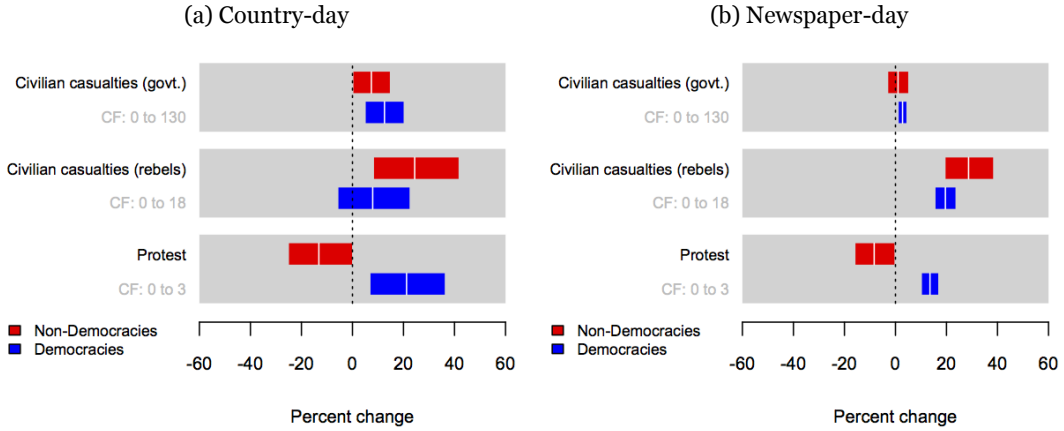


Table 1: Theoretical predictions.

	Low Coverage	High Coverage
Non-Democracy (H_1: pro-incumbent bias)	Events that: • undermine legitimacy of incumbent • support legitimacy of rebels *EXAMPLES: government-induced civilian casualties or non-violent collective action (e.g., protests)*	Events that: • support legitimacy of incumbent • undermine legitimacy of rebels *EXAMPLE: rebel-induced civilian casualties*
Democracy (H_2: pro-challenger bias)	Events that: • support legitimacy of incumbent • undermine legitimacy of rebels *EXAMPLE: Rebel-induced civilian casualties*	Events that: • undermine legitimacy of incumbent • support legitimacy of rebels *EXAMPLES: government-induced civilian casualties or non-violent collective action (e.g., protests)*

Table 2: Regression output for country-day panel data. Mixed effects logit specification. Dependent variable is Publish_{jt} (publication of article on Libya).

Variable	Model 1	Model 2	Model 3	Model 4
(Intercept)	-1.952	-1.952	-1.98	-1.98
	(0.133)***	(0.159)***	(0.133)***	(0.159)***
Publish (t-1)	2.442	2.442	2.442	2.442
	(0.03)***	(0.032)***	(0.03)***	(0.032)***
Democracy	0.067	0.067	0.068	0.068
	(0.06)	(0.069)	(0.061)	(0.069)
Protest	-0.054	-0.054	-0.05	-0.05
	(0.039)	(0.04)	(0.042)	(0.043)
Democracy*Protest	0.132	0.132	0.132	0.132
	(0.054)*	(0.056)*	(0.054)*	(0.056)*
Civil war violence	0.075	0.075	0.074	0.074
	(0.007)***	(0.007)***	(0.008)***	(0.008)***
Democracy*CW violence	-0.001	-0.001	-0.001	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)
NATO strike	-0.004	-0.004	-0.008	-0.008
	(0.009)	(0.009)	(0.01)	(0.01)
Democracy*NATO strike	0.015	0.015	0.015	0.015
	(0.012)	(0.012)	(0.012)	(0.013)
Civilian casualties (by R)	0.014	0.014	0.014	0.014
	(0.007)*	(0.007)*	(0.007)*	(0.007)
Democracy*Civilian (R)	-0.009	-0.009	-0.009	-0.009
	(0.009)	(0.01)	(0.009)	(0.01)
Civilian casualties (by G)	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Democracy*Civilian (R)	4e-4	4e-4	4e-4	4e-4
	(0.001)	(0.001)	(0.001)	(0.001)
Network size	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.003)	(0.002)	(0.003)
Democracy*Network size	0.005	0.005	0.005	0.005
	(0.004)	(0.005)	(0.004)	(0.005)
Public ownership	-0.533	-0.533	-0.533	-0.533
	(0.107)***	(0.128)***	(0.107)***	(0.129)***
Democracy*Public	0.439	0.439	0.437	0.437
	(0.181)*	(0.217)*	(0.182)*	(0.217)*
Distance from Libya	-2e-5	-3e-5	-3e-5	-3e-5
	(5E-6)***	(6E-6)***	(5E-6)***	(6E-6)***
NATO membership	-0.074	-0.074	-0.074	-0.074
	(0.05)	(0.061)	(0.05)	(0.062)
Conflict years since 1945	0.007	0.007	0.007	0.007
	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Years secondary school	0.01	0.01	0.01	0.01
	(0.018)	(0.021)	(0.018)	(0.022)
Percent w/ internet	0.013	0.013	0.013	0.013
	(0.002)***	(0.002)***	(0.002)***	(0.002)***
Number of newspapers	0.025	0.025	0.025	0.025
	(0.001)***	(0.002)***	(0.001)***	(0.002)***
Time	-2e-4	-2e-4		
	(2E-4)	(2E-4)		
$\text{Var}(u_i)$		0.009		0.009
$\text{Var}(u_t)$			0.026	0.026
N	31518	31518	31518	31518
AIC	29485.69	28734.01	29175.59	28412.62

Table 3: Regression output for newspaper-day panel data. Mixed effects logit specification. Dependent variable is Publish_{ijt} (publication of article on Libya).

Variable	Model 5	Model 6	Model 7	Model 8
(Intercept)	-3.245	-3.245	-3.294	-3.294
	(0.044)***	(0.049)***	(0.043)***	(0.048)***
W*Publish (t-1)	3.323	3.323	3.326	3.326
	(0.017)***	(0.018)***	(0.017)***	(0.018)***
Democracy	0.963	0.963	0.961	0.961
	(0.024)***	(0.026)***	(0.025)***	(0.026)***
Protest	-0.03	-0.03	-0.024	-0.024
	(0.021)	(0.02)	(0.021)	(0.021)
Democracy*Protest	0.076	0.076	0.076	0.076
	(0.022)**	(0.022)**	(0.022)**	(0.022)**
Civil war violence	0.071	0.071	0.07	0.07
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
Democracy*CW violence	-0.002	-0.002	-0.002	-0.002
	(0.003)	(0.003)	(0.004)	(0.004)
NATO strike	-0.001	-0.001	-0.007	-0.007
	(0.005)	(0.005)	(0.005)	(0.005)
Democracy*NATO strike	-0.004	-0.004	-0.004	-0.004
	(0.005)	(0.005)	(0.005)	(0.005)
Civilian casualties (by R)	0.015	0.015	0.015	0.015
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
Democracy*Civilian (R)	-0.004	-0.004	-0.004	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)
Civilian casualties (by G)	8E-5	8E-5	1E-4	1E-4
	(3E-4)	(3E-4)	(3E-4)	(3E-4)
Democracy*Civilian (R)	1E-4	1E-4	1E-4	1E-4
	(3E-4)	(3E-4)	(3E-4)	(3E-4)
Network size	0.002	0.002	0.002	0.002
	(0.001)**	(0.001)**	(0.001)**	(0.001)**
Democracy*Network size	-0.015	-0.015	-0.015	-0.015
	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Public ownership	-0.664	-0.664	-0.664	-0.664
	(0.036)***	(0.037)***	(0.036)***	(0.037)***
Democracy*Public	-0.434	-0.434	-0.433	-0.433
	(0.105)***	(0.11)***	(0.105)***	(0.111)***
Distance from Libya	-4E-5	-4E-5	-4E-5	-5E-5
	(2E-6)***	(1E-6)***	(2E-6)***	(2E-6)***
NATO membership	-0.416	-0.416	-0.414	-0.414
	(0.016)***	(0.018)***	(0.016)***	(0.018)***
Conflict years since 1945	-0.014	-0.014	-0.014	-0.014
	(3E-4)***	(3E-4)***	(3E-4)***	(3E-4)***
Years secondary school	0.063	0.063	0.063	0.063
	(0.005)***	(0.006)***	(0.005)***	(0.006)***
Percent w/ internet	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Time	-4E-4	-4E-4		
	(6E-5)***	(6E-5)***		
$\text{Var}(u_i)$		0.009		0.009
$\text{Var}(u_t)$			0.001	0.001
N	706683	706683	706683	706683
AIC	348635.11	318559.8	346912.02	316815.73

Table 4: Summary statistics for newspaper-day panel data. Levels of analysis: *i*: newspaper, *j*: country, *t*: day. Actors: R: rebels, G: government.

Variable	Obs.	Median	Mean	S.D.	Min	Max
Dependent variable (i,j,t)						
Publish	719820	0	0.087	0.281	0	1
Libya conflict events (t)						
Protest	719820	0	0.113	0.599	0	7
Civil war violence	719820	1	2.252	2.955	0	24
NATO strike	719820	2	2.455	2.497	0	10
Civilian casualties (by R)	719820	0	0.432	3.093	0	36
Civilian casualties (by G)	719820	0	5.623	40.423	0	600
Newspaper attributes (i)						
Network size (country mean)	719820	6	22.406	37.560	1	147
Public ownership (county mean)	719820	0	0.065	0.247	0	1
Country attributes (j)						
Democracy	717960	1	0.756	0.429	0	1
Distance from Libya (km)	717960	3171	5071.4	3891.3	0	18073
NATO membership	719820	1	0.561	0.496	0	1
Conflict years since 1945	719820	4	15.571	17.547	0	63
Years of secondary schooling	713930	7	6.614	0.836	4	9
Percent with internet access	711760	24.120	20.265	11.580	0	37.97

Table 5: Summary statistics for country-day panel data. Levels of analysis: *j*: country, *t*: day. Actors: R: rebels, G: government.

Variable	Obs.	Median	Mean	S.D.	Min	Max
Dependent variable (j,t)						
Publish	32860	0	0.413	0.492	0	1
Libya conflict events (t)						
Protest	32860	0	0.113	0.599	0	7
Civil war violence	32860	1	2.252	2.955	0	24
NATO strike	32860	2	2.455	2.497	0	10
Civilian casualties (by R)	32860	0	0.432	3.093	0	36
Civilian casualties (by G)	32860	0	5.623	40.423	0	600
Newspaper attributes (j)						
Network size (country mean)	32860	2.333	6.239	10.546	1	70
Public ownership (county mean)	32860	0	0.105	0.199	0	1
Country attributes (j)						
Democracy	32860	1	0.528	0.499	0	1
Distance from Libya (km)	32860	3729.5	5348.76	3879.35	0	18073
NATO membership	32860	0	0.217	0.412	0	1
Conflict years since 1945	32860	1	8.868	13.685	0	63
Years of secondary schooling	32240	6	6.404	0.925	4	9
Percent with internet access	31930	4.980	9.881	11.183	0	37.97
Number of newspapers	32860	3	12.038	28.598	1	192

Table 6: Summary statistics for Libyan Civil War Data. R: rebels, G: government, C: civilians; C by R: civilians killed/wounded by rebels; C by G: civilians killed/wounded by government; G by R: government killed/wounded by rebels; R by G: rebels killed/wounded by government.

Variable	Obs.	Median	Mean	S.D.	Min	Max	Sum
Protest	1510	0	0.023	0.151	0	1	35
Arrest	1510	0	0.003	0.057	0	1	5
Irregular violence (R)	1510	0	0.062	0.242	0	1	94
Conventional viol (R)	1510	0	0.174	0.379	0	1	262
Irregular violence (G)	1510	0	0.029	0.168	0	1	44
Conventional viol (G)	1510	0	0.201	0.401	0	1	303
NATO strike	1510	1	0.504	0.500	0	1	761
WIA (C by G)	1510	0	0.511	8.367	0	200	771
WIA (C by R)	1510	0	0.035	0.791	0	25	53
WIA (G by R)	1510	0	0.016	0.437	0	12	24
WIA (R by G)	1510	0	1.126	13.160	0	300	1700
KIA (C by G)	1510	0	0.644	15.890	0	600	972
KIA (C by R)	1510	0	0.054	0.952	0	28	81
KIA (G by R)	1510	0	0.371	3.376	0	60	560
KIA (R by G)	1510	0	0.832	8.034	0	261	1257
Latitude	1507	32.027	31.534	1.506	24.167	33.150	
Longitude	1507	14.569	15.207	2.764	9.501	23.976	
Population	1209	128123	277608	368567	3334	1150989	
Elevation	1471	21	-91.908	1586.828	-9999	725	

Sources

ABC News, Afrol News, Agence France Presse, Al Arabiya, Al Jazeera, Al Manar, Associated Press, Australian Associated Press, BBC Arabic, BBC News, Bloomberg, CBC News, CBS News, CNN, Deutsche Presse-Agentur, Ennahar Online, France 24, ITV, libya-alyoum.com, MSNBC, NATO, NBC News, NewsBlog (Guardian), Reuters, RIA Novosti, Russia Today, Sky News, UPI, VOA News, Voice of Russia, Xinhua