

Propaganda and Protest: Evidence from Post-Cold War Africa*

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Abstract

Does propaganda reduce the probability of popular protest in Africa's contemporary autocracies? To answer this question, we draw on an original dataset of state-run newspapers from 21 African countries, encompassing two languages and roughly 600,000 articles. We find that propaganda diminishes the probability of protest, and that its effects persist over time. By increasing the level of pro-regime propaganda by one standard deviation, autocrats have reduced the probability of protest the following day by 8%. The half-life of this effect is between 4 and 12 days, and between 10% and 20% of the initial effect persists after one month. This temporal persistence is remarkably consistent with campaign advertisements in democracies.

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1 Introduction

Does propaganda work? Scholars increasingly find that it can. In pre-World War II Germany, state radio broadcasts increased support for the Nazi regime and, in historically anti-Semitic regions, the rate at which Jews were denounced and deported to concentration camps.¹ During the 1994 Rwandan genocide, radio broadcasts increased the Tutsi death toll by 10%.² During the 1999 Russian parliamentary election, access to independent television decreased the likelihood of voting for President Vladimir Putin’s United Russia by 8.9 percentage points.³ Today, Chinese students exposed to propaganda in an educational setting are more likely to believe the regime is strong and less willing to engage in political dissent.⁴

Popular protests increasingly constitute the chief threat to autocratic survival, especially in Sub-Saharan Africa, where the rate of military coups has declined dramatically in recent decades.⁵ In this paper, we ask whether pro-regime propaganda has diminished the rate of popular protest in Africa’s contemporary autocracies. To do so, we draw on an original dataset of state-run newspapers from 21 African countries, encompassing two languages and roughly 600,000 articles. To collect this corpus, we scraped online newspaper archives using the Python programming language. When online archives were not available, we manually downloaded articles from Lexis Nexis. We then identified each country’s incumbent executive during the sample period, as well as his political party; we refer to these proper nouns as “identifiers.” Next, we transformed the corpus of articles into time series data by measuring the valence – both positive and negative – of the words immediately surrounding each identifier on a given day. The result is a country-day dataset that records the amount of coverage for the executive and his political party, as well as its tone. In defining propaganda as positive spin rather than objective falsehood, we follow Joseph Goebbels, the chief architect of Nazi Germany’s propaganda apparatus.⁶ Accordingly, in our dataset, more propagandistic coverage presents the regime in a more favorable light. For purposes of comparison, we collected similar data for state-affiliated newspapers in democracies.

Autocrats employ propaganda strategically. Therefore, when estimating the effect of propaganda on the probability of protest, we confront two forms of selection bias. First, autocrats who employ propaganda may be systematically different than those who do not, and in ways that are correlated with the probability of protest. We refer to this as “autocrat selection bias,” and it may

¹Adena et al. (2015).

²Yanagizawa-Drott (2014).

³Enikolopov, Petrova and Zhuravskaya (2011). See also White, Oates and McAllister (2005).

⁴Huang (2015). Propaganda also appears to be important in transitional democracies. Boas and Hidalgo (2011) find that municipal politicians in Brazil regard community radio stations as “spoils of office” and use them to cement future victories. See also McMillan and Zoido (2004), Greene (2011), and Lawson and McCann (2005).

⁵Goemans and Marinov (2014) document this decline and argue that it was caused by pressure from Western creditors.

⁶When crafting propaganda, Joseph Goebbels, architect of Nazi Germany’s propaganda apparatus, favored positive spin over lies because “otherwise the enemy or the facts might expose falsehoods” (Taylor 1998). To measure positive spin, we follow the methods developed in Carter and Carter (2016).

occur for a variety of reasons. Most obviously, the autocrats most likely to employ propaganda may exert particularly strong control over their countries’ media environments, and this degree of control could be associated with higher or lower levels of popular protest. Second, autocrats employ propaganda differently at different times of year, and these moments may be systematically associated with popular protests. We refer to this as “temporal selection bias,” and it too may emerge for a variety of reasons. Carter and Carter (2016) find that the rate of propaganda in African and Asian autocracies rises immediately before elections, when autocrats have a particularly strong incentive to manipulate the beliefs of their citizens.⁷ Additionally, autocratic propaganda apparatuses may provide more positive coverage when there is more genuinely good news: when the unemployment rate is lower or when the economy grows more quickly. If positive coverage indicates genuinely good news rather than pro-regime propaganda – *and* citizens are less likely to protest during these moments – then an estimated relationship between propaganda and protest will be spurious.

To accommodate autocrat selection bias, we employ estimating equations with autocrat-level fixed effects. In so doing, we ask how *changes* in the volume of propaganda on day $t - 1$ condition the probability of protest on day t . To accommodate temporal selection bias, we control for a range of time variant features that may condition whether autocrat i employs propaganda on a given day or during a given year: whether day t falls during an election season or on election day itself, any prevailing political instability, country i ’s history of political instability up to day t , the rate of internet access, as well as a range of economic measures that reflect the living conditions of citizens. We control for the daily amount of genuinely positive developments in country i by measuring the amount of positive less negative coverage it receives in the world’s newspapers of record. As robustness checks, we estimate a series of Markov transition models, which focus exclusively, in turn, on country-days following protests and country-days where no protests occurred on day $t - 1$.

In addition to these baseline models, we draw on recent research in American politics to probe whether the effects of propaganda persist over time. Indeed, scholars increasingly find that political messaging in democracies has the strongest effect on citizens’ beliefs immediately after consumption. Although these effects decline quickly, they tend to persist, with half-lives of roughly one week. We explore whether the effect of pro-regime propaganda on popular protest exhibits similar properties. If propaganda has measurable effects on the rate of protest on day t , is some proportion of the effect still felt in the days or weeks that follow? Put otherwise, does the autocrat’s decision to employ propaganda on day t have a measurable effect on the probability of protest on day $t + 5$ or $t + 15$? To answer this question, we follow Hill et al. (2013), who identify a series of functional forms that fit how memories and beliefs fade over time. Hill et al. (2013) refer to these as decay functions, and, like them, we ask which among several best fit the patterns in our data.

We find that pro-regime propaganda is associated with a substantively meaningful reduction in the probability of popular protest. By increasing the level of pro-regime propaganda by one

⁷See also Carter (2016a).

standard deviation, Africa’s autocrats have reduced the probability of protest the following day by 8%. This effect is relatively durable. Depending on the form of the decay function, the half-life of the effect is between 4 and 12 days. One month later, some 10% to 20% of the initial effect still persists. This temporal signature is strikingly consistent with political messaging in American politics. In short, propaganda in autocracies appears to condition protests much as campaign advertisements in democracies condition voting. Our data do not permit us to identify precisely why propaganda reduces the rate of protest. Indeed, the mechanisms of behavior change in democracies and autocracies may be quite different. It is possible, for instance, that propaganda persuades citizens of the regime’s merits, and hence mitigates the frustration that compels protest. Alternatively, propaganda might constitute a signal, implicitly understood by citizens, about the autocrat’s willingness to employ violence to retain power, which diminishes the probability of protest by increasing its expected costs to citizens. We discuss these mechanisms in more detail in Section 2. In Section 6 we discuss how subsequent research might adjudicate among them. As a placebo, we estimate similar models for our sample of state-affiliated newspapers in democracies; we find no effect on the rate of popular protest.

This paper contributes to the broader literature on autocratic survival. Scholars increasingly recognize that the world’s autocrats *attempt* to discourage mass protests by manipulating their citizens’ informational environments. Social media and domestic newspapers figure prominently in these efforts. King, Pan and Roberts (2013, 2016) find that the Chinese government employs electronic tools to censor online discourse about collective action and, during politically sensitive moments, trumpets the regime’s accomplishments. Munger et al. (2016) show that the Venezuelan government uses Twitter to steer social media discourse away from protests, once they emerge. Carter and Carter (2016) find that autocrats across Africa and Asia sharply increase pro-regime propaganda in state-run newspapers during election seasons. These techniques are well documented, but we know little about whether they actually *achieve* their aims. This paper provides evidence that they do.

In so doing, this paper joins a growing wave of scholarship that locates the origins of autocratic survival in the politics of information and belief. This was once the chief way that scholars explained autocratic durability. As Tullock (1987) put it: “As long as people think that the dictator’s power is secure, it is secure.”⁸ Scholars routinely seek the origins of autocratic survival in formal political institutions: single party regimes⁹ or national legislatures populated by regular elections.¹⁰ But in post-Cold War Africa, autocrats have access neither to the single party regimes of their Cold War era

⁸If beliefs were critical to sustaining an autocrat’s power, so too, scholars concluded, could they bring an autocrat down. This time, scholars drew not on the durability of the 20th century’s most famous dictators, but rather the stunning ease with which they were toppled. Among others, Kuran (1989) famously explained how the Soviet Union could collapse so thoroughly by applying “tipping point” models of collective action developed in the late 1980s and early 1990s.

⁹Brownlee (2007), Slater (2010), Svobik (2012).

¹⁰Lust-Okar (2006), Magaloni (2008), Gandhi and Przeworski (2007), Gandhi (2008), Wright (2008), Blaydes (2008), Gandhi and Lust-Okar (2009).

predecessors nor welcome the nominally democratic institutions mandated by Western creditors. They also lack the easy recourse to repression on which their predecessors often relied.¹¹ Most broadly, our results suggest that the struggle for citizens' beliefs is fundamental to understanding how autocrats survive.

This paper proceeds as follows. Section 2 surveys recent scholarship on political communication in autocracies and democracies, from which we derive our hypotheses for empirical testing. Section 3 introduces our corpus of 21 state-run newspapers and describes our measure of propaganda. Section 4 estimates the effect of pro-regime propaganda upon the rate of popular protest. Section 5 explores to what extent the initial effects of propaganda persist over time. Section 6 concludes with suggestions for future research. In the online appendix we provide additional information about our measure of propaganda and our corpus of newspapers.

2 Theoretical Framework

2.1 Mechanisms of Propaganda and Protest

Autocratic propaganda may alter the beliefs or behaviors of citizens through a variety of mechanisms.¹² In the context of popular unrest, three are particularly salient.

First, pro-regime propaganda may change citizens' beliefs about the autocrat's performance in office. If autocrats regard their citizens as rational Bayesians, they may instruct their propaganda apparatuses to cultivate a reputation for neutrality. By mixing factual reporting with useful fictions, Gentzkow and Shapiro (2006) and Gehlbach and Sonin (2014) show theoretically, autocratic propaganda apparatuses acquire some reputation for credibility, and hence too the capacity to shape their citizens' beliefs. Carter and Carter (2016) show that autocrats across Africa and Asia appear to employ precisely this strategy. State-run newspapers in autocracies, they find, cover their incumbent regimes almost as neutrally as do state-affiliated newspapers in democracies, which are often lauded by Western donors for their journalistic integrity. The exception is during election seasons, when autocrats require their citizens' acquiescence and attempt to secure it with a burst of pro-regime propaganda. If citizens are not rational Bayesians, the scope for propaganda to manipulate beliefs is likely more profound. Citizens may underestimate the biases in media content,¹³ be constrained by memory limitations,¹⁴ or double count reported information.¹⁵

Second, pro-regime propaganda may compel citizens to question the beliefs of *their neighbors*. Even if individuals are not persuaded by pro-regime propaganda, they may have less confidence in their neighbors' ability to distinguish fact from fiction. In autocracies, this alone is sufficient

¹¹See Carter (2016b) and Aronow, Carnegie and Marinov (2012).

¹²In the democratic context, there is considerable evidence that political messaging alters the beliefs of those who consume it. See, for example, DellaVigna and Gentzkow (2010).

¹³Cain, Loewenstein and Moore (2005), Eyster and Rabin (N.d.).

¹⁴Mullainathan, Schwartzstein and Shleifer (2008).

¹⁵DeMarzo, Vayanos and Zwiebel (2003).

to generate widespread popular compliance. Little (2015) shows formally that if citizens believe their neighbors view government propaganda as credible, then it can affect mass behavior without affecting mass beliefs. Citizens engage in “preference falsification” by acquiescing to the regime, like their neighbors, lest they be punished for non-compliance.¹⁶

Even if citizens are unpersuaded by pro-regime propaganda – and citizens know that their neighbors are similarly unpersuaded – propaganda may still reduce the rate of popular protest. The reason is that propaganda may convey information to voters about the autocrat’s willingness to use force to retain power. In particular, citizens may believe that an autocrat who broadcasts obviously false platitudes may also employ violence against citizens. In game theoretic terms, the use of propaganda may convey information about an autocrat’s type.

There is some evidence of this. The Republic of Congo was wracked by a series of civil wars between 1993 and 2003. The most intense round of fighting occurred between June and October 1997, when Denis Sassou Nguesso deposed Pascal Lissouba, the only democratically elected president in Congo’s history. The war killed roughly 1% of the country’s citizens and displaced at least 30%. Sassou Nguesso’s propaganda newspaper, *Les Dépêches de Brazzaville*, frequently casts him as the “apostle of peace,” the “guarantor” of the country’s “cherished” stability. Some Congolese citizens interpret these fulsome allusions as threats: about the violence Sassou Nguesso is willing to employ to retain power. Given the prospect of violence, citizens in autocracies may be particularly sensitive to these signals, and hence be less likely to protest after receiving them.

These three mechanisms yield our first hypothesis.

Hypothesis 1: Propaganda should reduce the contemporaneous probability of popular protest.

2.2 Temporal Dynamics of Propaganda

Social psychologists have long recognized that the effects of persuasive communication are most profound immediately after consumption, and then decline quickly after.¹⁷ This appears to be true for political messaging in democracies. Hill et al. (2013) find that the half-life of American campaign advertisements is roughly one week. Similarly, casualty reports decrease popular support for a war, but only for one to two months at a time.¹⁸ A large experimental study supports these conclusions. Gerber et al. (2011) randomly assigned \$2 million of television and radio advertisements to different media markets in the 2006 Texas gubernatorial race. A tracking poll conducted telephone interviews with 1,000 registered voters each day. Advertisements had strong but short-lived effects on voting preferences, with their effects relatively undetectable a week or two after consumption.

Political communication rarely has long-term effects, these scholars suggest, because it does not elicit “effortful processing” from consumers. That is, citizens generally consume political adver-

¹⁶Kuran (1997); Wedeen (1999). See also Davison (1983).

¹⁷Cook and Flay (1978).

¹⁸Hayes and Myers (2009); Althaus, Bramlett and Gimpel (2012). See also Sides and Vavreck (2013).

tisements in passing, without actively internalizing them. For persuasive communication to have lasting effects on the beliefs of consumers, it must induce individuals to process it actively. If it does not, consumers will revert to their prior beliefs relatively quickly.¹⁹

Our understanding of propaganda is consistent with this general framework, with some important nuances. Each of the three theoretical mechanisms above implies that the effects of propaganda should persist over time. They have different implications, however, for the duration of this persistence. Propaganda that aims to influence beliefs about regime performance is theoretically similar to a campaign advertisement. To illustrate how, in Table 2 we reproduce a series of excerpts from Paul Kagame’s *The New Times*, which cite his efforts to improve infrastructure and help young people “realise their full potential.” They bear a striking resemblance to American campaign advertisements, and hence their persuasive effects may decay at similar rates. If anything, we might expect the persuasive effects of pro-regime propaganda in autocracies to decay *even more quickly* than campaign advertisements in democracies. Each country in our sample is relatively poor, and so the gap between regime promises and citizen welfare tends to be large. Moreover, the welfare gains that occur are generally concentrated among elites. Accordingly, we expect the facade of regime performance to be difficult to maintain. Whatever effect performance propaganda may have, it is likely temporary, undone by economic realities.

If, by contrast, propaganda conditions the rate of popular protest chiefly by signaling the autocrat’s willingness to employ violence, then citizens likely engage in the “effortful processing” that social psychologists regard as critical for propaganda to have durable effects. In this case, we should expect the effects of pro-regime propaganda to persist after the initial signal, and potentially much longer.

In short, although the three theoretical mechanisms above suggest that pro-regime propaganda should diminish the rate of protest, they have different implications for the effect’s persistence. Still, we frame our second hypothesis generally.

Hypothesis 2: The effect of propaganda upon protest will decay over time.

3 Measuring Propaganda

3.1 Identifying and Collecting State-Run Newspapers

To create the dataset, we identified the most widely distributed state-run newspapers for as many autocracies as possible in Africa.²⁰ We then restricted attention to newspapers that are published in English and French, languages for which quantitative text analysis methods are well developed. Moreover, since we speak them fluently, we can identify important colloquialisms. We further

¹⁹Hill et al. (2013).

²⁰We draw our regime classifications from Svobik (2012) and update them through 2015.

restricted attention to state-run newspapers with online archives to facilitate data collection and computational processing.

Although these two restrictions were critical for data collection, each entails a drawback. First, by restricting attention to state-run newspapers in English and French, we were unable to include several prominent propaganda newspapers that are published in Arabic, Portuguese, and widely spoken African languages. Although this restriction may reduce the precision of our statistical estimates, we do not believe it generates bias. We have no reason to believe, for instance, that the Ethiopian government’s propaganda newspaper, *Addis Zemen*, published in Amharic, is systematically different than Yahya Jammeh’s *Daily Observer*. Perhaps more importantly, for countries with multiple politically salient ethnic groups, publishing a propaganda newspaper in a local language would prevent many citizens from consuming it. Hence Denis Sassou Nguesso, who has ruled the Republic of Congo for all but five years since 1979, publishes *Les Dépêches de Brazzaville* in French rather than Lingala, which is spoken mostly by the country’s northerners. By publishing pro-regime propaganda in the language of the European colonizer, Africa’s autocrats implicitly target the urban citizens whose protests, given their proximity to the national capital, are most threatening, and who read English and French at much higher rates than their rural compatriots.²¹ Accordingly, we view the restriction to English and French media as theoretically appropriate, even if, by excluding state-run newspapers in Burundi and Ethiopia, it reduces the precision of our statistical estimates.

Second, by restricting attention to state-run newspapers with online archives, we may leave open the possibility of selection bias. It is possible that state-run newspapers with online archives are systematically different than those without. In particular, autocrats who finance online archives for propaganda newspapers may do so because their populations enjoy higher rates of internet access. If this reflects superior access to information, these citizens could be more likely to protest. If this reflects superior welfare, these citizens might be less likely to protest. We cannot rule this possibility out.

Reflecting the growing prevalence of internet access across the world, however, we found that autocrats who govern Africa’s poorest countries are as likely to maintain online archives as those from more affluent countries. Rather, whether state-run newspapers maintain freely available online archives appears to be more a function of regime type than GDP. We found that the vast majority of autocrats make their state-run newspapers available online, accessible without restriction. Since propaganda is useful only when consumed, most autocrats maximize its distribution, and so seldom regard it as intellectual property. This is consistent with their approach to domestic distribution. Sassou Nguesso is again instructive. *Les Dépêches de Brazzaville* remains Congo’s only daily newspaper, printed in color on high quality paper. At a market price of roughly \$0.20, it is heavily subsidized by the state.²² Its primary competitor is *La Semaine Africaine*, an independent

²¹Bates (1983).

²²Interviews with anonymous journalists. Many claim that *Les Dépêches de Brazzaville* is subsidized by the state oil company.

newspaper that appears twice per week. Constrained by market forces, it sells for roughly \$1.00, despite being printed in black ink on cheap paper. In democracies, we found that state-affiliated newspapers are far more likely to operate as a business, with articles behind a paywall. When newspaper archives were not freely available, we acquired them from Lexis Nexis.

Although our chief theoretical focus is propaganda in autocracies, we include state-affiliated newspapers from democracies as a baseline for comparison. These newspapers are generally holdovers from a previous autocratic regime. In Senegal, for instance, *Le Soleil* was founded in May 1970 by President Leopold Sedar Senghor. Though by some accounts benevolent, Senghor nonetheless tightly circumscribed press freedom, and *Le Soleil* remained the only newspaper that published uninterrupted until the early 1990s. Senegal transitioned to democracy in 2000, when Abdoulaye Wade defeated Senghor’s successor, Abdou Diouf, in an election so lopsided that Diouf chose to step down after two decades rather than suppress protesters. In the years since the democratic transition, the Senegalese state has remained the chief shareholder of *Le Soleil*. While its editorial line remains somewhat pro-regime, it is regarded as far less biased than before the transition.²³

Our final sample includes state-run newspapers from 21 countries from across Africa.²⁴ Of these 21 state-affiliated newspapers, 12 were published under autocratic governments throughout the sample period, seven under democratic governments throughout, and two experienced transitions from autocracy to democracy.²⁵ The sample reflects the heterogeneity of Africa’s autocracies. It includes a police state (Eritrea), a monarchy (Swaziland), and a handful of autocracies governed with nominally democratic institutions (Rwanda, Gambia, and others). A full list of newspapers, by country, language, and regime type, appears in Table 1.

3.2 From Text to Time Series Data on Propaganda

After we finalized our sample of state-run newspapers, we either scraped their online archives using the Python programming language or manually downloaded all available articles from Lexis Nexis. To convert newspaper text into time series data on propaganda, we identified each instance that a newspaper from country i referenced the autocrat or his ruling party on day t .²⁶ For each, we then extracted the 10 words before and after the identifier, a string known as a “concordance segment.” Drawing on standard semantic dictionaries, we measured how fulsome or critical were these 20 words.²⁷ The variable *Positive Coverage_{it}* constitutes our measure of pro-regime propaganda, and it measures the number of fulsome words, less critical words, among the 20, summed for day t .

²³IREX (2014).

²⁴We include a detailed description of all newspapers in our sample in Section 8 of the online appendix.

²⁵We draw our regime classifications from Svobik (2012) and update them through 2015.

²⁶A list of these identifiers appears in Section 9 of the online appendix.

²⁷For English, we used Harvard General Inquirer (2015). For French, we translated the Inquirer. We lowercased and stemmed each word in our corpus, dictionaries, and list of identifiers. We removed numbers, symbols, and punctuation from the corpus before generating the concordance segments from which we extracted our measure of tone. See Grimmer and Stewart (2013) and Lowe et al. (2010).

The result is a country-day dataset that records the amount of coverage for the executive and his political party, as well as its tone. Descriptive statistics for our *Positive Coverage_{it}* variable appear in Table 1.

(1) Country	(2) Newspaper	(3) Language	(4) Coverage	(5) Regime Spell	(6) Country Days	(7) Positive Coverage Mean	(8) Positive Coverage St Dev	(9) Protest Rate
Madagascar	<i>La Vérité</i>	French	2012-15	Aut	2485	0.37	3.95	0.04
Libya	<i>JANA/LANA</i>	English	2014-15	Dem	1592	1.02	2.61	0.43
Guinea	<i>Aminata</i>	French	2012-15	Dem	2220	1.10	3.53	0.18
Morocco	<i>Ag. M. De Presse</i>	French	2013-15	Aut	3287	1.11	2.91	0.18
Burkina Faso	<i>Sidwaya</i>	French	2010-12	Aut	2861	1.47	2.96	0.05
Ghana	<i>Ghanaian Times</i>	English	2013-15	Dem	3287	1.67	3.65	0.01
Tunisia	<i>La Presse</i>	French	2011-12	Dem	1813	1.67	3.64	0.47
Cote d'Ivoire	<i>Fraternité Matin</i>	French	2013-15	Dem	1726	1.96	4.22	0.53
Djibouti	<i>La Nation</i>	French	2013-15	Aut	3287	2.15	3.99	0.00
Eritrea	<i>Hadas Shabait</i>	English	2010-15	Aut	3287	2.66	5.06	0.00
Mali	<i>L'Essor</i>	French	2014-15	Dem	3265	3.18	4.69	0.10
Libya	<i>JANA/LANA</i>	English	2010-11	Aut	1695	5.86	9.78	0.01
Cameroon	<i>Cameroon Tribune</i>	French	2010-15	Aut	3287	6.82	10.84	0.13
Malawi	<i>The Nation</i>	English	2012-15	Dem	3287	6.17	9.76	0.09
Senegal	<i>Le Soleil</i>	French	2010-15	Dem	3287	13.57	16.37	0.09
Rwanda	<i>The New Times</i>	English	2010-15	Aut	3287	16.94	17.07	0.01
Tunisia	<i>La Presse</i>	French	2010-11	Aut	1474	16.18	13.23	0.02
Zambia	<i>The Times</i>	English	2010-15	Dem	3287	17.80	20.13	0.09
Uganda	<i>New Vision</i>	English	2010-13	Aut	3287	18.55	19.08	0.05
Namibia	<i>New Era</i>	English	2010-15	Aut	3287	19.33	20.57	0.01
Swaziland	<i>Swazi Observer</i>	English	2015-15	Aut	3287	22.25	13.53	0.07
Zimbabwe	<i>The Herald</i>	English	2010-15	Aut	3287	30.59	28.70	0.29
Gambia	<i>Daily Observer</i>	English	2009-15	Aut	3287	66.17	41.29	0.00

Table 1: Propaganda Statistics by Country-Regime Spell. For clarity, countries are listed by their mean level of positive coverage for the executive. Democracy spells are recorded in gray.

Gambia's *Daily Observer* registers as the most propagandistic newspaper in our sample. We regard this as unsurprising. Since seizing power in a 1994 coup, President Yahya Jammeh has accumulated among the world's worst human rights records. In 2011, Jammeh announced that he would rule for "one billion years, God willing." A recent USAID report observed that there are only two independent newspapers in the country, and their journalists routinely self-censor to avoid incarceration and, in some cases, assassination. Observed one Gambian journalist:

A cloud of fear to freely express oneself now hovers over the country. Citizens tend to openly express their true opinions only in safe corners.²⁸

Another Gambian journalist said:

²⁸IREX (2014).

The journalists in the state-run media and the pro-government private media are notorious for their lack of objectivity and ethical standards in news coverage and presentation but are never sanctioned or punished for being [biased]. They are not being punished simply because they are vilifying others in the name of and on behalf of the party in government whose [interests] they are promoting.²⁹

According to our measure of propaganda, only Zimbabwe’s *The Herald* and Swaziland’s *Swazi Observer* rival Gambia’s *Daily Observer*. Each regime is among the world’s most closed and most repressive.

By contrast, from Column 6 of Table 1, Mali’s *L’Essor*, is equidistant between the least propagandistic country in the sample and the most propagandistic. Strikingly, its reputation for journalistic integrity is among the strongest in Africa. First published in 1949, *L’Essor* became the organ of the military dictatorship following a 1968 coup. Until Mali’s democratic transition in 1991, *L’Essor*’s coverage was limited to local news, government decrees and speeches, and articles from Soviet and Chinese wire services. After the democratic transition, *L’Essor* was transferred to a state-owned printing house, managed by the Ministry of Communications. One of 15 French daily newspapers, *L’Essor* confronts a competitive media market. The government fosters this competition by exempting all media organizations from taxes. Malian journalists are generally poorly compensated, and hence vulnerable to purchase by politicians, government and opposition alike. One prominent journalist called this “rent-paying journalism.” Another called this “lack of professionalism” the “great scourge of the Malian press.” But journalists generally agree – including from *L’Essor* – that “there is of course no taboo subject.”³⁰

To substantively scale our *Positive Coverage_{it}* variable, Table 2 displays concordance segments from *The New Times*, Rwandan President Paul Kagame’s chief propaganda outlet. We **bold** references to the executive – for Rwanda, either “Kagame” or “RPF,” his political party – and show the 10 words on either side. Positive words are rendered in *blue*, while negative words are rendered in *red*.

The most flattering concordance, listed first, describes a speech in which Kagame thanks supporters for their “continued trust and support.” This concordance contains five positive words surrounding our identifier, “Kagame,” and 0 negative words, so it registers a net positive coverage of 5. Concordance segments with scores of 2, 3, and 4 are also quite positive. They credit the RPF for promoting education, job creation, and urbanization. By contrast, negative concordances feature criticism of the ruling party, sometimes severe. The most critical among them acknowledges that some citizens believe the RPF participated in the 1994 genocide.³¹

To be clear, our measure of propaganda does not distinguish between positive spin and factual good news. Likewise, our measure of propaganda does not explicitly incorporate the use of *justi-*

²⁹IREX (2014).

³⁰IREX (2008).

³¹For a more comprehensive validation of our measure of propaganda, see Section 2 of the online appendix.

Tone	Concordance Segment
5	2010 presidential candidate. In his acceptance speech, President Kagame thanked
	RPF members for their continued trust and support for him. He
4	focus on education as well as job creation. Murayire said RPF 's goal is to enable
	young people realise their full potential
3	about, among other factors, is rapid rural-to-urban migration; which the RPF
	liberation unleashed with the freedoms accorded the people to seek
2	to be. Our history has taught us the right choice. RPF made the choice to work
	hard to achieve the dignity
1	at the National University of Rwanda, said. Omar said the RPF electorate
	appreciated their MPs' previous performance basing on the infrastructure
0	Rwanda to free the people from fear caused by the RPF government. She made
	the statements during an interview at Voice
-1	Kayibanda before him. Yet, there was no guarantee that the RPF government
	would itself not fall in the same trap as
-2	ground in Rwanda. Trevidic's predecessor, Jean-Louis Bruguiere, previously
	accused the RPF of shooting down the plane, a move that led Rwanda
-3	a different story of the genocide in which he blames RPF for the massacres in
	1994 that claimed over one million
-4	all sorts of allegations and fabrications aimed at undermining the RPF party and
	its leadership. In a lecture he held at
-5	opponents and exiled members of the genocidal machinery, Bruguiere accused
	RPF of carrying out the deadly April 6, 1994 attack that

Table 2: Example Concordance Segments. Positive valence words are shown in blue and negative valence words in red. The first column reports our measure of *Positive Coverage*, positive words less negative words in concordance segments centered upon an executive identifier. We employed standard text preprocessing practices. We lowercased and stemmed all words and removed numbers, symbols, and punctuation. For ease of interpretation, we did not preprocess the above concordance segments.

fiction or *comparison* frames: articles that defend the government's record by appealing to past difficulties or current difficulties in neighboring countries. Neither, however, constitutes a threat to inference, as we illustrate in Section 4 of the online appendix.

4 Baseline Estimation

4.1 Protest and Regime Data

Propaganda and protest are both day-level events. Propaganda is distributed in print newspapers, often published daily. Protests occur on specific days, either organized by political activists or having emerged spontaneously. To avoid ecological bias, therefore, we treat the country-day as the

unit of analysis.³²

In constructing our day-level dataset, we build on the work of others. Svobik (2012) provides a roster of the world’s autocrats between 1960 and 2007; it includes the dates of their entry and exit, as well as the means by which they did so. We update these data to 2015 for the countries in our sample. We draw data on state repression and popular protests from the Social Conflict on Africa Database (SCAD), introduced by Salehyan et al. (2012). SCAD records the daily number of repression and protest events throughout the African continent since 1989. Based on an exhaustive search of the Lexis Nexis archive, Salehyan et al. (2012) employed a research team to hand code details about each repression and protest event. The result is the most detailed and complete record yet assembled.³³ The share of days on which a protest event occurred, by country, appears in Table 1. Cha

4.2 Autocrat Selection Bias

Autocrats choose whether to employ propaganda; it is a strategic decision. As a result, autocrats who employ propaganda may be systematically different than those who do not, and in ways that are correlated with the probability of protest. For instance, since propaganda may be most effective when citizens are unaware of it, the autocrats most likely to employ propaganda may exert particularly strong control over their countries’ media environments. In turn, this degree of control could be associated with higher or lower levels of popular protest.

To accommodate the possibility of autocrat selection bias, we employ estimating equations with autocrat-level fixed effects. In so doing, we ask how *changes* in the volume of propaganda over a given time frame affect the probability of protest on day t . Our baseline estimating equation is:

$$\begin{aligned} \Pr(\text{Protest}_{it} = 1) &= \alpha + \beta(\text{Positive Coverage}_{it}) \\ &+ \beta(\text{Positive Coverage}_{it} \times \text{Election Season}_{it}) \\ &+ \kappa X_{it} + \psi W_{is} + \gamma_i + \epsilon \end{aligned} \tag{1}$$

where i indexes country, t indexes day, s indexes year. The vectors X_{it} and W_{is} include all relevant day- and year-level covariates, respectively, which we discuss below. To accommodate any unobserved characteristics by country or year, we include a full set of country-level fixed effects, given by γ_i .

³²Ecological bias arises from aggregating day-level events into larger temporal units, such as the month or year. For more, see King (1997).

³³This is the chief reason that we limit our country sample to Africa: day-level records of protest and repression exist, and are of relatively high quality. The SCAD project recently expanded its country sample to include several Latin American countries, mostly democracies.

4.3 Temporal Selection Bias

Autocrats who routinely employ propaganda may vary it according to the prevailing political environment. Certain temporal windows could make propaganda and protest more common, and thus render any observed relationship spurious. We discuss three such threats to inference below.

4.3.1 Election Seasons

Election seasons are a leading candidate for spurious correlation. Virtually all of Africa’s post-Cold War autocrats govern with nominally democratic political institutions: presidential term limits, multiparty legislatures, and regular elections. They have little choice. As scholars have observed, Western donors virtually require nominally democratic institutions in exchange for development aid and debt relief.³⁴ These regular elections constitute “focal moments” for popular protest. Since elections can help citizens coordinate otherwise dangerous anti-regime behavior, Carter (2016*a*) finds, the probability of popular protest is some three to four times higher during election seasons than on any other day of the calendar year.³⁵ But because winning elections without obvious fraud renders autocrats more secure from popular instability, elite coups, and Western pressure, autocrats also face tremendous incentives to persuade citizens to vote for them. Accordingly, Carter and Carter (2016) observe, pro-regime propaganda is three times as common during election seasons than otherwise.

Since the rate of propaganda and the rate of protest both increase during election season, failing to control for the effect of election season could make it appear that propaganda actually *increased* the probability of protest. To avoid this possibility, we draw from the National Elections Across Democracy and Autocracy (NELDA) dataset. Introduced by Hyde and Marinov (2012), the NELDA dataset records the date of every election around the world between 1960 and 2010. We update the dataset to 2015 for the countries in our sample. Following previous research, we control for whether day t in country i falls within the 15 days before and after election day. We refer to this 30 day period as an *election season*. We also let the effect of *Positive Coverage_{it}* on protest depend on whether day t occurred during an election season.

4.3.2 The “Good News” Effect

A second potential source of temporal selection bias is what we refer to as the “good news” effect. Autocratic propaganda apparatuses may provide more positive coverage when there is more genuinely good news: when the unemployment rate is lower or when the economy grows more quickly. Citizens, of course, are less likely to protest during these moments. We control for a range of economic indicators that reflect living standards: country i ’s real GDP, GDP per capita, employment rate, oil supply, and internet penetration rate. Observed annually, however, these

³⁴Bratton and van de Walle (1997), Dunning (2004), Levitsky and Way (2010), and Goemans and Marinov (2014).

³⁵McFaul (2005), Tucker (2007), Radnitz (2010), Bunce and Wolchik (2011), and Fearon (2011).

economic indicators may be crude. It is possible that good news emerges by the day or week, that the autocrat’s propaganda apparatus reports this news objectively, and that citizens respond by protesting less. In short, annual economic indicators may be unable to totally account for genuine good news, which renders citizen protests less likely.

Table 3: Corpus of Global Newspapers of Record

<i>Al Jazeera English</i>	<i>AllAfrica.com</i>	<i>BBC Monitoring</i>
<i>International New York Times</i>	<i>Newsweek</i>	<i>Oil and Gas Journal</i>
<i>Oil Daily</i>	<i>Petroleum Economist</i>	<i>The Standard (UK)</i>
<i>The Telegraph (UK)</i>	<i>The Mirror (UK)</i>	<i>The Christian Science Monitor</i>
<i>The Courier Mail (Australia)</i>	<i>The Daily Mail (UK)</i>	<i>The Evening Standard (UK)</i>
<i>The Globe and Mail (Canada)</i>	<i>The Washington Post</i>	<i>The Toronto Star</i>
<i>IRIN</i>	<i>UN News Service</i>	<i>USA Today</i>
<i>Wall Street Journal</i>	<i>Agence France Presse</i>	<i>Associated Press</i>
<i>CNN</i>	<i>News Bites – Africa</i>	<i>PR Newswire Africa</i>
<i>United Press International</i>		

To ensure that this possibility does not drive our results, we create the variable $Good\ News_{it}$. We do so much as we did $Positive\ Coverage_{it}$. For each country i , we downloaded from Lexis Nexis every article that references country i from the world’s news organizations of record. We identify 28 such news sources, which appear in Table 3. Then, for each article in the corpus, we identify every mention of country i ’s executive or his ruling political party; as above, we refer to these proper nouns as identifiers. Next, we extract the 20 words *surrounding* each identifier. Using standard semantic dictionaries, we measure how fulsome or critical are these 20 words. The resulting $Good\ News_{it}$ variable, we believe, is as close to an objective measure of “good news,” recorded at the day level, as currently exists.

To assess the measure’s plausibility, we estimate a series of bivariate regressions. The results appear in Table 4. From Model 1, our measures of $Good\ News_{it}$ and $Positive\ Coverage_{it}$ are strongly correlated. We regard this is unsurprising, as autocratic propaganda apparatuses surely capitalize upon – and claim credit for – positive developments. Since our economic indicators are observed at the country-year level, to estimate Models 2 through 4 we calculate annual means of $Good\ News_{it}$. As expected, both measures of GDP are positively correlated with our measure of good news, as is the employment rate. This suggests that global newspapers of record are indeed picking up welfare gains across Africa’s autocracies.

4.3.3 Protest and Repression Histories

A final potential source of temporal selection bias is the recent history of protest and repression. It is possible, for instance, that protests on day $t - 1$ may render continued protests on day t more likely and simultaneously compel the regime to increase propaganda. Likewise, if the autocrat

Table 4: Correlates of $Good\ News_{it}$ in Autocracies

	Model 1 Country-Day	Model 2 Country-Year	Model 3 Country-Year	Model 4 Country-Year
Positive Coverage	0.036** (0.005)			
ln Real GDP Expenditure Side		1.623** (0.563)		
Employment			17.821 [†] (9.005)	
ln GDP Per Capita				1.280 (1.183)
N	10,868	22	22	22
Significance levels:	† : 10%	* : 5%	** : 1%	

employs repression on day $t - 1$, citizens may be particularly angry on day t , rendering propaganda especially useful. Alternatively, in response to repression on day $t - 1$, citizens may be less inclined to protest today, rendering propaganda less critical for the autocrat. To be clear, the first two sources of bias, if unaccounted for, should bias *against* the theoretical mechanisms above, and the third should bias *in favor of* them.

We control for underlying political instability in several ways. First, we control for whether day $t - 1$ witnessed a protest or repression event. Like our measure of protest, we draw data on repression from the SCAD dataset. Second, since these lagged measures of protest and repression may not fully capture prevailing political instability, we also control for the number of days in the preceding week on which a protest occurred. We label this variable *Protest History: Week_{it}*, and we create a similar variable, *Repression History: Week_{it}*, that measures the numbers of days in the preceding week on which an autocrat employed repression. Finally, to ensure that we fully accommodate any latent political instability that could be associated with both protest and propaganda, we also control for the number of days in the preceding month on which a protest occurred. We label this variable *Protest History: Month_{it}*, and we create an analogous *Repression History: Month_{it}* variable similarly. In the online appendix, we control for repression and protest during much wider temporal windows: over the preceding three months, six months, one year, and two years. Descriptive statistics for all variables used in our analysis appear in Table 30 of the online appendix.

4.4 Results

The results appear in Table 5. Across models, pro-regime propaganda on day $t - 1$ renders protests less likely on day t . In particular, each additional positive word about the autocrat, from among the surrounding 20, renders popular protests roughly 2% less likely. This effect is substantively meaningful. The mean level of pro-regime propaganda in our sample is roughly 19 words per day, with a standard deviation of roughly 29 words per day. If an autocrat shifts from an average level of

pro-regime propaganda on day t to a standard deviation greater, then, we estimate, the probability of protest falls by some 8%.

Protests may be correlated across days. It may be much easier, for instance, to sustain a protest once it has emerged than to initiate one in the first place. As a result, the outcome variable in equation (1) may be serially correlated. As a robustness check, we employ a Markov transition framework.³⁶ That is, we restrict attention to country-days where no protests occurred on day $t - 1$, and hence discard country-day observations where some protest event occurred on day $t - 1$. In so doing, we measure the effect of media coverage on the probability that protests *emerged* on a given day t . The results appear in Table 6, and they are essentially identical to the baseline results in Table 5.

For comparison, we reestimate equation (1), now restricting attention to country-days where protests *occurred the day before*. In so doing, we measure the effect of media coverage on the probability that protests *continue*. Propaganda may render ongoing protests less likely to continue for a variety of reasons, already elucidated in Section 2. Propaganda may shape the beliefs of frustrated citizens, or it may signal to frustrated citizens that the regime will employ violence to retain power, and hence discourage continued protests. The results appear in Table 7. Again, we find that each additional positive word about the autocrat renders popular protests roughly 2% less likely. This effect holds in Models 1 through 4, despite the relatively small number of observations: between 179 and 203. Note that the effect is statistically insignificant in Model 5, which includes just 139 observations; the magnitude of the estimated effect, however, is virtually identical to Models 1 through 4.

We find some evidence that pro-regime propaganda does not reduce the rate of protest during the 15 days before and after election day. Across models, the (*Positive Coverage* _{it} \times *Election Season* _{it}) interaction is consistently positive, and often statistically significant. From the odds ratios at the bottom of the panels, the effect of *Positive Coverage* _{it} on the probability of protest is not statistically distinguishable from 0. There are two explanations for this. First, it may genuinely be the case that, during election seasons, pro-regime propaganda has no effect on the probability of protest in our sample. The countries in our sample are among Africa's poorest, their citizens are keen for change, and during election seasons opposition leaders inspire their hopes for a better future. As a result, the constraining effects of propaganda may genuinely fail to overcome popular grievances.

Alternatively, it may also be the case that election seasons are systematically different from other calendar days, and in ways that our model does not fully accommodate. Carter and Carter (2016) show, for instance, that pro-regime propaganda spikes during the 15 days before election day. Likewise, scholars increasingly recognize that election seasons constitute focal points for popular protests, when citizens are engaged and collective action problems more easily overcome.

³⁶For more on Markov transition models, see Epstein et al. (2005).

In this sense, we should expect both pro-regime propaganda and popular protests to be occur simultaneously during election seasons. For the forces that make election seasons so ripe for popular protest also compel autocrats to simultaneously increase pro-regime propaganda. In short, the appropriate counterfactual would be election season days where no propaganda was employed, and we may simply lack sufficient data to estimate propaganda’s effects.

Finally, we reestimate the baseline models above for the sample of state-affiliated newspapers in democracies. The results appear in Section 7 of the online appendix. In all models, the effect of $Positive\ Coverage_{it}$ on the probability of protest is indistinguishable from 0, both outside election seasons and during, which suggests that propaganda has no effect. We regard this as akin to a placebo test. Existing literature suggests we ought not to expect propaganda to be widely employed in democracies, just as popular protests should be a less salient form of political expression. That we find no effect in democracies is thus reassuring.

We conclude with a note of caution. Although we expressed these results in terms of the marginal effect of an additional word of propaganda on day t , these results do not suggest that, in practice, more propaganda would further reduce the probability of protest. As we note above, autocrats employ propaganda by choice. They set the *amount* of propaganda by choice as well.³⁷ Since “propaganda becomes ineffective the moment we are aware of it,” as Goebbels observed, it may well be the case that additional propaganda would undermine the entire effort. In short, we believe that autocrats set the amount of propaganda optimally. The results above make clear that propaganda, as it has been employed, has indeed reduced the rate of protest in Africa’s autocracies. By contrast, the results do not suggest that, if autocrats had employed *even more* propaganda, they could have rendered protest *even less* likely as well.

5 Do the Effects of Propaganda Persist Over Time?

5.1 Functional Forms

To probe whether the effects of pro-regime propaganda persist over time, we follow Hill et al. (2013), who study the effects of political advertisements in the 2000 presidential race and a series of state races in 2006. Drawing on an extensive psychology literature that models memory decay for simple facts and words,³⁸ Hill et al. (2013) identify a series of decay functions that have been found to best describe the persistence of persuasion effects. They then fit these decay functions to their data, and ask which of them best captures “whatever pattern of decay may be present.”

Following Hill et al. (2013), we focus on three functional forms: the power, exponential, and Weibull. The specific functional forms appear in Table 8. In each, the daily probability of protest is a function of two main effects. The first is the effect of pro-regime propaganda on day $t - 1$, which

³⁷Carter and Carter (2016).

³⁸For a review, see Rubin and Wenzel (1996).

Table 5: Protest and Propaganda in Autocracies, Baseline Results

	Model 1 Logit	Model 2 Logit	Model 3 Logit	Model 4 Logit	Model 5 Logit
<i>Day Level Variables</i>					
Positive Coverage	-0.010*	-0.012*	-0.017**	-0.017*	-0.019*
	(0.005)	(0.005)	(0.005)	(0.007)	(0.010)
Election Season		-1.859	-1.902	-1.829	-2.036
		(1.435)	(1.433)	(1.507)	(1.546)
Election		-13.851	-14.192	-13.828	-13.764
		(5,046.571)	(5,024.674)	(4,973.312)	(4,859.315)
Good News			-0.007	-0.006	-0.007
			(0.005)	(0.006)	(0.007)
Protest _{t-1}				2.874**	3.109**
				(0.281)	(0.351)
Repression _{t-1}				-1.313	-0.351
				(1.486)	(2.020)
Protest History: Week				4.155**	4.276**
				(0.751)	(0.907)
Repression History: Week				-0.415	-1.074
				(2.935)	(4.074)
Protest History: Month				-0.075*	-0.100*
				(0.036)	(0.040)
Repression History: Month				0.044	0.033
				(0.098)	(0.109)
<i>Country Level Variables</i>					
ln Real GDP Expenditure Side					24.500
					(19.585)
ln GDP Per Capita					-50.896
					(54.150)
Employment Rate					-50.896
					(54.150)
Oil Supply					-11.254
					(38.746)
Internet					-0.213
					(1.694)
<i>Interaction Terms</i>					
Positive Coverage × Election Season		0.032*	0.038*	0.040*	0.043*
		(0.015)	(0.016)	(0.017)	(0.019)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	7,128	7,128	6,054	6,046	3,375
Significance levels: † : 10% * : 5% ** : 1%					

	Odds ratio of protest per day (with 90% confidence intervals)				
Baseline	0.989	0.988	0.983	0.982	0.980
	(0.98, 0.99)	(0.98, 0.99)	(0.97, 0.99)	(0.97, 0.99)	(0.96, 0.99)
During Election Seasons		0.996	0.996	0.997	0.997
		(0.99, 1.04)	(0.99, 1.04)	(0.99, 1.04)	(0.99, 1.05)

Table 6: Protest and Propaganda in Autocracies, Markov $Protest_{t-1} = 0$

	Model 1 Logit	Model 2 Logit	Model 3 Logit	Model 4 Logit	Model 5 Logit
<i>Day Level Variables</i>					
Positive Coverage	-0.014 [†] (0.008)	-0.018* (0.008)	-0.016 [†] (0.008)	-0.016 [†] (0.008)	-0.022 [†] (0.012)
Election Season		-1.590 (1.479)	-1.556 (1.472)	-1.540 (1.472)	-1.593 (1.493)
Election		-15.079 (8,374.827)	-14.500 (5,055.460)	-15.439 (8,333.785)	-15.177 (8,000.540)
Good News			-0.009 (0.009)	-0.009 (0.009)	-0.003 (0.011)
Protest _{t-1}					
Repression _{t-1}				-16.775 (3,759.150)	-16.811 (6,761.558)
Protest History: Week				2.294 (1.739)	-0.255 (3.860)
Repression History: Week				-0.652 (2.839)	-3.113 (4.734)
Protest History: Month				-0.151 (0.094)	-0.428 [†] (0.234)
Repression History: Month				0.196* (0.090)	0.268* (0.106)
<i>Country Level Variables</i>					
ln Real GDP Expenditure Side					23.229 (20.155)
ln GDP Per Capita					-90.917 (63.183)
Employment Rate					807.121 (639.030)
Oil Supply					-24.643 (57.584)
Internet					-2.336 (2.446)
<i>Interaction Terms</i>					
Positive Coverage × Election Season		0.038* (0.017)	0.037* (0.017)	0.037* (0.017)	0.042* (0.019)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	6,925	6,925	5,875	5,867	3,236
Significance levels: † : 10% * : 5% ** : 1%					

	Odds ratio of protest per day (with 90% confidence intervals)				
Baseline	0.985 (0.97, 0.99)	0.982 (0.96, 0.99)	0.983 (0.97, 0.99)	0.983 (0.97, 0.99)	0.978 (0.96, 0.99)
During Election Seasons		0.994 (0.99, 1.04)	0.995 (0.99, 1.04)	0.995 (0.99, 1.04)	0.994 (0.99, 1.04)

Table 7: Protest and Propaganda in Autocracies, $Protest_{it} = 1$

	Model 1 Logit	Model 2 Logit	Model 3 Logit	Model 4 Logit	Model 5 Logit
<i>Day Level Variables</i>					
Positive Coverage	-0.022 [†] (0.013)	-0.022 [†] (0.013)	-0.022 [†] (0.013)	-0.029 [†] (0.016)	-0.018 (0.026)
Election Season		-18.014 (3,824.425)	-17.034 (2,319.631)	-15.955 (2,319.631)	-34.215 (6,658.019)
Election					
Good News			0.002 (0.010)	-0.004 (0.011)	-0.017 (0.015)
Protest _{t-1}					
Repression _{t-1}				-0.029 (1.998)	16.685 (6,522.639)
Protest History: Week				4.168** (1.210)	4.120** (1.587)
Repression History: Week				-0.859 (8.029)	1.087 (10.326)
Protest History: Month				-0.047 (0.057)	-0.086 (0.066)
Repression History: Month				-0.590 [†] (0.343)	-0.668 (0.425)
<i>Country Level Variables</i>					
ln Real GDP Expenditure Side					567.350 (100,892.400)
ln GDP Per Capita					-1,194.349 (262,991.500)
Employment Rate					9,117.684 (1,898,133.000)
Oil Supply					-1,037.869 (123,032.000)
Internet					-35.236 (6,247.984)
<i>Interaction Terms</i>					
Positive Coverage × Election Season		0.069 (94.829)	0.069 (57.516)	0.059 (57.516)	0.621 (167.928)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	203	203	179	179	139
Significance levels: † : 10% * : 5% ** : 1%					

	Odds ratio of protest per day (with 90% confidence intervals)				
Baseline	0.978 (0.95, 0.99)	0.978 (0.95, 0.99)	0.978 (0.95, 0.99)	0.971 (0.94, 0.97)	0.981 (0.94, 1.20)
During Election Seasons	There are not enough observations to estimate an election season effect				

Table 8: Decay Functions

Distribution	Functional Form
Exponential	$\text{Protest}_t = I \times \sum_{t=0}^T \exp(-\delta \times t) \text{Positive Coverage}_{t-1} + X\beta$
Weibull	$\text{Protest}_t = I \times \sum_{t=0}^T \exp(-\delta \times t) \text{Positive Coverage}_{t-1} + X\beta$
Power	$\text{Protest}_t = I \times \sum_{t=0}^T \exp(t+1)^{-\delta} \text{Positive Coverage}_{t-1} + X\beta$

conditions the probability of protest on day $t - 1$ through its estimated coefficient, I , which Hill et al. (2013) refer to as an impact parameter. The second is the effect of pro-regime propaganda on the days that preceded $t - 1$, which exert the effect I weighted by the value of a decay function on its day. The value of the decay function on a given day is determined by the shape parameter δ , which we estimate with maximum likelihood techniques. Here, to be conservative, we let pro-regime propaganda as temporally distant as 60 days preceding day t condition the probability of protest on day t . The vector X gives the set of covariates from the baseline models, as well as country fixed effects.

5.2 Results

Table 9 presents results for the two key parameters, the impact parameter I and the decay parameter δ , for each of the three functional forms. Figure 1 presents survival rates of pro-regime propaganda influence on the probability of protest, based on the results in Table 9. These survival plots display the percent of propaganda impact from each lagged day (2 to 60) that survives at day $t = 0$, when a protest occurs or does not. Importantly, the impact parameter estimates I are very similar to the baseline results in Tables 5 through 7. An additional word of pro-regime propaganda on day $t - 1$, these decay models suggest, reduces the probability of protest on day t by roughly 1%.

The effects of pro-regime propaganda, we find, are indeed persistent, and in much the same way as campaign advertisements. Using the exponential function, we estimate that the half-life of pro-regime propaganda is roughly 12 days. Using the Weibull and power functions, we find that the half-life of pro-regime propaganda is roughly four days. Depending on the form of the decay function, we find that, 30 days after propaganda is employed, between 10% and 20% of its initial effect persists. These are non-trivial effects. If, by increasing pro-regime propaganda a single standard deviation on day t , an autocrat can reduce the probability of protest on day $t + 1$ by roughly 8%, then some five days later that decision will reduce the probability of protest by roughly 4%.

Table 9: Parametric Decay Estimates in Autocracies

	Model 1 Exponential	Model 2 Weibull	Model 3 Power
Impact	-0.005** (0.001)	-0.009** (0.003)	-0.010** (0.003)
Decay	0.058** (0.015)	0.410** (0.104)	0.676** (0.164)
N	4,217	4,217	4,217
Significance levels:	†† : 20%	† : 10%	* : 5% ** : 1%

6 Conclusion

Propaganda works, we find, and it does so with a temporal signature similar to political messaging in democracies. A one standard deviation increase in propaganda reduces the probability of protest the following day by 8%. The half-life of propaganda in autocracies is 4 to 12 days, similar to the one week half-life of campaign advertisements in democracies. These effects are substantively meaningful and precisely estimated.

This paper suggests a number of directions for future research. Most importantly, it remains unclear *why* propaganda diminishes the rate of protest: that is, which of the mechanisms outlined in Section 2 are most important. Does propaganda shape the beliefs of citizens, and so diminish whatever grievances would otherwise compel them to the streets? Does it cause citizens to view their neighbors as more likely to support the regime, and thereby render collective action more costly to initiate? Does it signal to citizens that the regime is willing to meet protest with repression, and hence discourage protest in the first place? We believe that field experiments may be best suited to adjudicate among these competing explanations.

This paper employs quantitative text analysis to study the effect of autocratic propaganda on popular protest. In a sense, this focus is relatively narrow. For propaganda newspapers contain a vast amount of other information, presumably selected strategically by the autocrat or his appointees to achieve some domestic objective. The quantitative text analysis techniques that we employ above can be easily adapted to study the timing of these signals, as well as their effects. When, for instance, do autocrats issue threats of violence? Do these threats have measurable effects on the probability of protest?

Finally, propaganda may have its most profound effects when it is employed consistently over a sustained period: when it creates an alternate reality that, over time, induces its citizens to relinquish their once held convictions. This paper has focused on the effects of *deviations* from a state-run newspaper’s average level of propaganda. If propaganda is most effective when it is consistently employed, however, these deviations may, in fact, have a weaker effect on the probability of protest than the level of propaganda that an autocrat consistently employs. In this paper, we

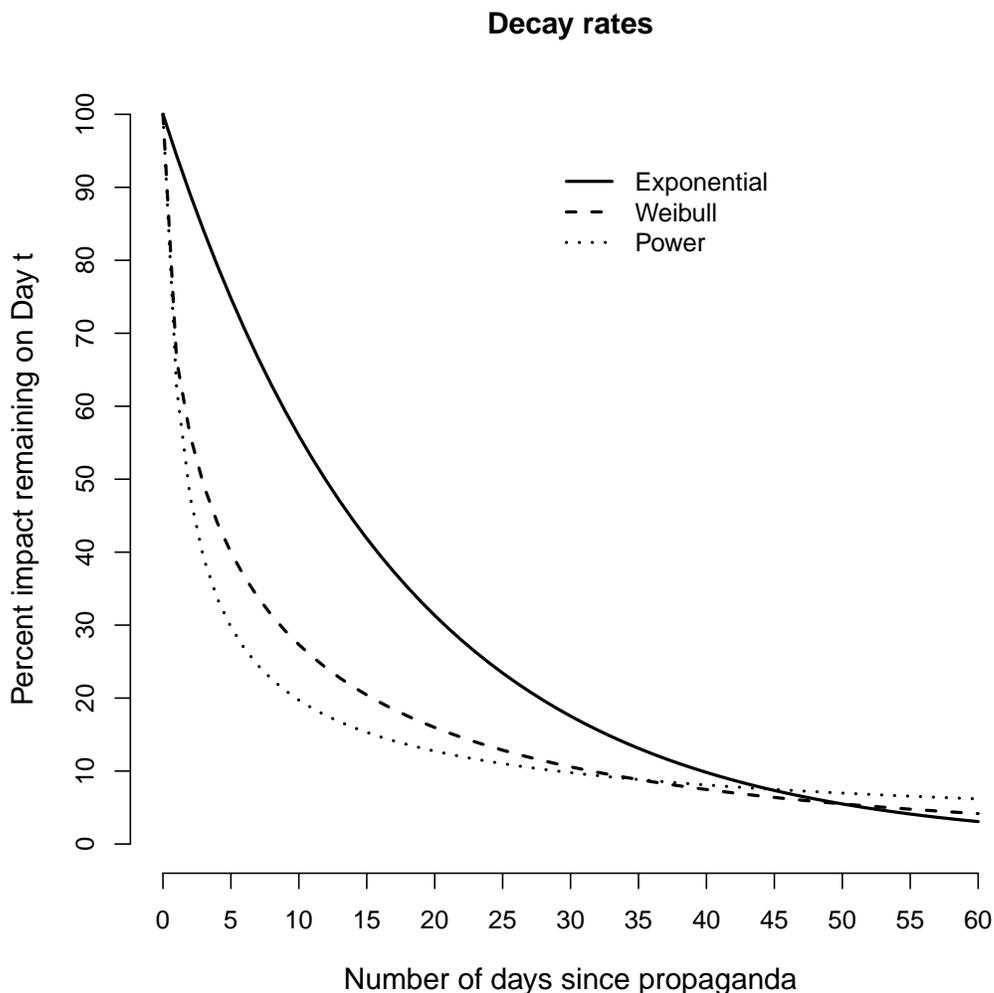


Figure 1: Pro-regime propaganda decay rates in autocracies. Plots show percentage of initial impact that remains at day 0 from each previous day.

used autocrat-level fixed effects, in part, for identification. Future research might consider how to measure sustained propaganda campaigns, and then measure their effects.

Most broadly, this paper insists on the centrality of information and belief to autocratic survival. Perhaps because the concepts are so difficult to measure, the new wave of research on autocratic politics has largely overlooked the centrality of information and beliefs to autocratic survival. Of course, this research has taught us much about the role of institutions: of single parties, in particular, but also how autocrats have learned to survive nominally democratic institutions and, in some cases, use these institutions to advance their interests. Yet this focus on institutions has come at the expense of information and beliefs, which scholars long regarded as *the chief* determinant of

acquiescence – both by the frustrated population and conspiring elites – and, therefore, to autocratic survival. New computational tools make it possible to measure the politics of information and, ultimately, to understand its effects on autocratic survival.

References

- Adena, Maja, Ruben Enikolopov, Maria Petrova, Veronica Santarosa and Ekaterina Zhuravskaya. 2015. "Radio and the Rise of the Nazis in Prewar Germany." *Quarterly Journal of Economics* 130(4):1885–1939.
- Althaus, SL, BH Bramlett and J Gimpel. 2012. "When War Hits Home: The Geography of Military Losses and Support for War in Time and Space." *Journal of Conflict Resolution* 56:382–412.
- Aronow, Peter M., Allison Carnegie and Nikolay Marinov. 2012. "The Effects of Aid on Rights and Governance: Evidence from a Natural Experiment." Available at SSRN: <http://ssrn.com/abstract=2199131>.
- Bates, Robert H. 1983. *Essays on The Political Economy of Rural Africa*. Berkeley: University of California.
- Blaydes, Lisa A. 2008. "Authoritarian Elections and Elite Management: Theory and Evidence from Egypt." Stanford University.
- Boas, Taylor C. and F. Daniel Hidalgo. 2011. "Controlling the Airwaves: Incumbency Advantage and Community Radio in Brazil." *American Journal of Political Science* 55(4):869–885.
- Bratton, Michael and Nicholas van de Walle. 1997. *Democratic Experiments in Africa: Regime Transitions in Comparative Perspective*. New York: Cambridge University.
- Brownlee, Jason. 2007. *Durable Authoritarianism in an Age of Democratization*. New York: Cambridge University.
- Bunce, Valerie and Sharon Wolchik. 2011. *Defeating Authoritarian Leaders in Post-Communist Countries*. New York: Cambridge University.
- Cain, Daylian M., George Loewenstein and Don A. Moore. 2005. "The Dirt on Coming Clean: Perverse Effects of Disclosing Conflicts of Interest." *Journal of Legal Studies* 34(1):1–25.
- Carter, Brett L. 2016a. "Elections, Protests, and Focal Moments: Day-Level Evidence from Post-Cold War Africa." Stanford University.
- Carter, Brett L. 2016b. "Repression and Foreign Aid in Autocracies: Exploiting Debt Relief Negotiations in Post-Cold War Africa." *AidData Working Paper Series* 29.
- Carter, Erin Baggott and Brett L. Carter. 2016. "Honest Propaganda: Evidence from State-Run Newspapers in Africa and Asia." Stanford University.
- Cook, TD and B Flay. 1978. "The Persistence of Experimentally Induced Attitude Change." *Advances in Experimental Social Psychology* 11:1–57.

- Davison, Phillips. 1983. "The Third-Person Effect in Communication." *Public Opinion Quarterly* 47(1):1–15.
- DellaVigna, Stefano and Matthew Gentzkow. 2010. "Persuasion: Empirical Evidence." *Annual Review of Economics* 2:643–669.
- DeMarzo, Peter M., Dimitri Vayanos and Jeffrey Zwiebel. 2003. "Persuasion Bias, Social Influence, and Unidimensional Opinions." *Quarterly Journal of Economics* 118(3):909–968.
- Dunning, Thad. 2004. "Conditioning the Effects of Aid: Cold War Politics, Donor Credibility, and Democracy in Africa." *International Organization* 58(2):409–423.
- Enikolopov, Ruben, Maria Petrova and Ekaterina Zhuravskaya. 2011. "Media and Political Persuasion: Evidence from Russia." *American Economic Review* 101(7):3253–3285.
- Epstein, David, Robert H. Bates, Jack Goldstone, Ida Kristensen and Sharyn O'Halloran. 2005. "Democratic Transitions." *American Journal of Political Science* 59:551–569.
- Eyster, Erik and Matthew Rabin. N.d. "Rational and Naive Herding." *Centre for Economic Policy Research Discussion Paper*. Forthcoming.
- Fearon, James D. 2011. "Self-Enforcing Democracy." *Quarterly Journal of Economics* 126(4):1661–1708.
- Gandhi, Jennifer. 2008. *Political Institutions under Dictatorship*. New York: Cambridge University.
- Gandhi, Jennifer and Adam Przeworski. 2007. "Authoritarian Institutions and the Survival of Autocrats." *Comparative Political Studies* 11:1279–1301.
- Gandhi, Jennifer and Ellen Lust-Okar. 2009. "Elections Under Authoritarianism." *Annual Review of Political Science* 12:403–422.
- Gehlbach, Scott and Konstantin Sonin. 2014. "Government Control of the Media." *Journal of Public Economics* 118:163–171.
- Gentzkow, Matthew and Jesse M. Shapiro. 2006. "Media Bias and Reputation." *Journal of Political Economy* 114(2):280–316.
- Gerber, AS, GJ Gimpel, DP Green and DR Shaw. 2011. "How Large and Long-Lasting are the Persuasive Effects of Televised Campaign Ads? Results from a Randomized Field Experiment." *American Political Science Review* 105:135–150.
- Goemans, Hein and Nikolay Marinov. 2014. "Coups and Democracy." *British Journal of Political Science* 44:799–825.

- Greene, Kenneth F. 2011. "Campaign Persuasion and Nascent Partisanship in Mexico's New Democracy." *American Journal of Political Science* 55(2).
- Grimmer, Justin and Brandon Stewart. 2013. "Text as Data: The Promise and Pitfalls of Automatic Content Analysis Methods for Political Texts." *Political Analysis* 21(3):267–297.
- Harvard General Inquirer. 2015. "Positive and Negative Semantic Dictionaries." <http://www.wjh.harvard.edu/inquirer/>.
- Hayes, AF and T Myers. 2009. "Testing the Proximate Casualties Hypothesis: Local Troop Loss, Attention to News, and Support for Military Intervention." *Mass Communication and Society* 12:379–402.
- Hill, Seth J., James Lo, Lynn Vavreck and John Zaller. 2013. "How Quickly We Forget: The Duration of Persuasion Effects from Mass Communication." *Political Communication* 30:521–547.
- Huang, Haifeng. 2015. "International Knowledge and Domestic Evaluations in a Changing Society: The Case of China." *American Political Science Review* 109(3):613–634.
- Hyde, Susan D. and Nikolay Marinov. 2012. "Which Elections Can Be Lost?" *Political Analysis* 20(2):191–201.
- IREX. 2008. "Media Sustainability Index 2006/2007: Development of Sustainable Independent Media in Africa." Washington, DC: Available at http://pdf.usaid.gov/pdf_docs/pnaea448.pdf.
- IREX. 2014. "Media Sustainability Index 2012." Washington, DC: <https://www.irex.org/sites/default/files/u115/Gambia%202012%20MSI%20Proof.pdf>.
- King, Gary. 1997. *A Solution to the Ecological Inference Problem: Reconstructing Individual Level Behavior from Aggregate Data*. Princeton: Princeton University.
- King, Gary, Jennifer Pan and Margaret E. Roberts. 2013. "How Censorship in China Allows Government Criticism but Silences Collective Expression." *American Political Science Review* 107(2):326–343.
- King, Gary, Jennifer Pan and Margaret E. Roberts. 2016. "How the Chinese Government Fabricates Social Media Posts for Strategic Distraction, not Engaged Argument." Harvard University.
- Kuran, Timur. 1989. "Sparks and Prairie Fires: A Theory of Unanticipated Political Revolution." *Public Choice* 61(1):41–74.
- Kuran, Timur. 1997. *Private Truths, Public Lies: The Social Consequences of Preference Falsification*. Cambridge: Harvard University Press.

- Lawson, Chappell and James A. McCann. 2005. "Television News, Mexico's 2000 Elections and Media Effects in Emerging Democracies." *British Journal of Political Science* 35:1–30.
- Levitsky, Steven and Lucan A. Way. 2010. *Competitive Authoritarianism: Hybrid Regimes After the Cold War*. Cambridge University.
- Little, Andrew T. 2015. "Propaganda and Credulity." Cornell University.
- Lowe, Will, Kenneth Benoit, Slava Mikhaylov and Michael Laver. 2010. "Scaling Policy Preferences from Coded Political Texts." *Legislative Studies Quarterly* XXXVI(1):123–155.
- Lust-Okar, Ellen. 2006. "Elections under Authoritarianism: Preliminary Lessons from Jordan." *Democratization* 13(3):456–471.
- Magaloni, Beatriz. 2008. "Credible Power-Sharing and the Longevity of Authoritarian Rule." *Comparative Political Studies* 41(4):715–741.
- McFaul, Michael. 2005. "Transitions from Postcommunism." *Journal of Democracy* 16(3):5–19.
- McMillan, John and Pablo Zoido. 2004. "How to Subvert Democracy: Montesinos in Peru." *Journal of Economic Perspectives* 18(4):69–92.
- Mullainathan, Sendhil, Joshua Schwartzstein and Andrei Shleifer. 2008. "Coarse Thinking and Persuasion." *Quarterly Journal of Economics* 123(2):577–619.
- Munger, Kevin, Richard Bonneau, John T. Jost, Jonathan Nagler and Joshua A. Tucker. 2016. "Elites Tweet to get Feet off the Streets: Measuring Regime Social Media Strategies During Protest." NYU SMaPP Lab.
- Radnitz, Scott. 2010. "The Color of Money: Privatization, Economic Dispersion, and the Post-Soviet 'Revolutions'." *Comparative Politics* 42(2):127–146.
- Rubin, David C. and Amy Wenzel. 1996. "One Hundred Years of Forgetting." *Psychological Review* 103(4):734–760.
- Salehyan, Idean, Cullen S. Hendrix, Jesse Hamner, Christina Case, Christopher Linebarger, Emily Stull and Jennifer Williams. 2012. "Social Conflict in Africa: A New Database." *International Interactions* 38(4):503–511.
- Sides, J and L Vavreck. 2013. *The Gamble: Choice and Chance in the 2012 Election*. Princeton: Princeton University Press.
- Slater, Dan. 2010. *Ordering Power: Contentious Politics and Authoritarian Leviathans in Southeast Asia*. New York: Princeton University.

- Svolik, Milan W. 2012. *The Politics of Authoritarian Rule*. Cambridge University.
- Taylor, Richard. 1998. *Film Propaganda: Soviet Russia and Nazi Germany*. New York: I.B. Tauris.
- Tucker, Joshua A. 2007. "Enough! Electoral Fraud, Collective Action Problems, and Post-Communist Colored Revolutions." *Perspectives on Politics* 5(3):535–551.
- Tullock, Gordon. 1987. *Autocracy*. New York: Springer.
- Wedeen, Lisa. 1999. *Ambiguities of Domination: Politics, Rhetoric, and Symbols in Contemporary Syria*. Chicago: The University of Chicago.
- White, Stephen, Sarah Oates and Ian McAllister. 2005. "Media Effects and Russian Elections." *British Journal of Political Science* 35(2):191–208.
- Wright, Joseph. 2008. "Do Authoritarian Institutions Constrain? How Legislatures Affect Economic Growth and Investment." *American Journal of Political Science* 52(2):322–343.
- Yanagizawa-Drott, David. 2014. "Propaganda and Conflict: Evidence from the Rwandan Genocide." *Quarterly Journal of Economics* 129(4):1947–1994.