Article

the International Communication Gazette

the International Communication Gazette
0(0) 1–20

DOI: 10.1177/1748048518825323
journals.sagepub.com/home/gaz
SAGE

Emerging media, political protests, and government repression in autocracies and democracies from 1995 to 2012

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Abstract
This study empirically analyzed the relationships between emerging media as tools in fomenting anti-government protest as well as government repression of political opposition. Using a dataset of 162 democratic and autocratic countries over 18 years, potential differences between these phenomena were examined. The results of a series of analytic models suggest that higher levels of internet and mobile phones are positively associated with more instances of both political protests and political repression, which have increased dramatically in recent years. The differences between democratic and autocratic countries' emerging media and sociopolitical instability trends are explored and discussed.

Keywords
Democracy and autocracy, emerging media, liberation and repression, sociopolitical instability

While the internet was once hailed by many as a force of liberation and a socio-technical innovation set almost naturally against repression and surveillance (Castells, 2009; Shirky, 2008), we have begun to understand the complexity of the social and political implications of these omnipresent technologies. The aura of the democratic and liberating potential of emerging media is fading as the

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theoretical and empirical analyses of the rapid expansion of text messaging, smart phones, and social media platforms continues to grow. The popular protests that ousted dictators during the Arab Spring provided, some argued, resounding evidence for the collective action enhancing potential of emerging media, even in authoritarian countries (Howard and Hussain, 2013; Shirky, 2011). Yet, the aftermath of many of the 2011 protests as well as the 2016 US and European elections revealed how these same technologies can be used to identify and stifle political opposition, and flood newsfeeds with propaganda and misinformation (Brooking and Singer, 2016; Kim et al., 2018; Rod and Weidmann, 2015).

The revelations by Edward Snowden about the global surveillance programs by the US and many other governments brought to light the extent with which governments possess the ability to track people's digital activities (Dencik and Cable, 2017). This ability allows governments to identify political opposition and take measures to counter or silence them through overt or covert measures, including flooding the conversations with distractions and false information (Kim et al., 2018; King et al., 2017; Vosoughi et al., 2018). Much of the scholarship and popular commentary regarding information and communication technologies (ICTs)—particularly internet resources and mobile phones—and collective action support the notion that these technologies are instruments of liberation (see Bimber et al., 2005; Garrett, 2006; Howard and Hussain, 2013; Shirky, 2011); however, recent sociopolitical events have uncovered evidence of the sophistication of governments and other powerful groups to use these tools for surveillance, propaganda, and disinformation campaigns aimed at disrupting collective action (Brooking and Singer, 2016; King et al., 2017; Marwick and Lewis, 2017).

ICTs were long thought to be inherently pro-social in terms of their civic capacity, but now we are confronted with the reality of the potentially nefarious ways in which they can contribute to repression and conflict escalation, it is important to analyze the macro-level relationships of these technologies and sociopolitical events across countries. This study therefore proceeds by analyzing instances of sociopolitical instability such as anti-government protests and government repression of political opposition, in both democracies and autocracies, in order to gain a clearer understanding of the sociopolitical uses and impacts of emerging media technologies during a critical phase of their diffusion and adoption. The results of this study thus contribute to an important theoretical framework of a more nuanced and representative interpretation of the sociopolitical tensions taking place in contemporary society inundated with media.

Emerging media, activism, and governance

The ways in which ICTs affect social change continues to intrigue the research community. We use the term ICTs as well as emerging media to refer to the internet and mobile phones and all the communication and information exchanges that those technologies enable, including social media, messaging applications, and

other tools that contribute to the networked public sphere. As we begin to understand the challenges and complexities of our interconnected, online lives, we need to continue to grasp at understanding the sociopolitical potential of ICTs as the uses of such technologies are not decidedly democratic or authoritarian (Aday et al., 2010; Bailard, 2014; Corrales and Westhoff, 2006; Deibert and Rohozinski, 2010; Diamond, 2010; King et al., 2013; Lynch, 2011; Schoemaker, 2014). Still, there remain important grounds for discovery of the societal and political effects of ICTs with regard to activists, autocrats, and democrats. Competing forces in the perpetual political struggles all devote special importance to digital resources, and ICTs have particular influences on these interactions (Bennett and Segerberg, 2013; Karatzogianni, 2015; Tufekci, 2017).

Many scholars argue that the diffusion of emerging media in countries provides citizens access to information and the means to communicate and mobilize in ways that influences attitudes towards liberalism (Bennett and Segerberg, 2013; Castells, 2007, 2012; Shirky, 2008, 2011). Having access to this 'networked sphere' (Tufekci, 2017) could eventually lead to behaviors that advocate for increased freedoms, such as more civil liberties, fairer political contests, and free speech. Protests and other anti-government demonstrations are the most visible and arguably most effective means by which individuals and groups may agitate governments for more rights and freedoms (Chenoweth and Stephan, 2011). Digital networks can amplify messages and movement awareness, thus increasing the amount of people that receive messages and potentially participate in acts of civil disobedience or governmental resistance (Bimber et al., 2005; Castells, 2009, 2012; Garrett, 2006; Shirky, 2008, 2011; Tufekci, 2017).

Importantly, Bimber et al. (2005) updated Olson's (1965) seminal work on collective action, which emphasized how vital information sharing technologies and communication costs are in organizing contentious activities. In the contemporary emerging media environment, ICTs can aid with reducing the costs of information and the challenges of organizing, thus amplifying the potential of collective action (Bimber et al., 2005; Howard and Hussain, 2013; Lynch, 2011; Tufekci, 2017). Generally speaking, communication and media technologies increase the volume, speed, and reach of information and communication, which could increase the scope of the audience and the scale of the collective action (Bimber et al., 2005; Garrett, 2006; Lynch, 2011; McAdam et al., 2001; Tarrow, 2005; Tufekci, 2017).

Commonly, collective action and emerging media are associated with nonviolent methods of resistance such as protests or sit-ins. Groshek and Christensen (2016), found that when comparing instances of major nonviolent and violent political conflict in countries, the countries with higher levels of emerging media and press freedoms were more likely to experience nonviolent rather than violent conflict.

Some recent research, however, have demonstrated similar relationships between ICTs and sociopolitical instability that included armed resistance and insurgencies. Using spatially disaggregated data, Pierskalla and Hollenbach (2013) found a positive correlation between violent conflict and mobile phone signal availability in

Africa. Expanding on that study but focusing on ethnic groups, Bailard (2015) found that in certain states mobile phone diffusion increased probabilities of ethnic violent conflict targeted towards the government from 2007 to 2009. All of these studies supported the propositions that ICTs lower organization barriers and communication costs but they also make an important distinction that not all ICT-assisted and government-targeted collective actions are inherently nonviolent, pro-social, or democratic.

Additionally, Bailard (2012a, 2012b, 2014) demonstrated how the internet can contribute to people vying for democracy by allowing individuals access to information to learn about democratic procedures in other countries. Once the information becomes accessible and interpretable, individuals potentially judge the quality of democratic practices of their own governments. This could contribute to motivate individuals to politically engage. Consequently, however, in some cases increased access to information that reveals, for example, rampant election corruption could contribute to people becoming hopeless and apathetic, contributing to them disengaging politically (Bailard, 2014).

Given the potential for ICTs to enable collective action, some scholars have examined why governments, particularly authoritarian governments, would allow, or even encourage the development of emerging media access and technologies. In this body of work, economic benefits are a common explanation for nondemocratic governments' willingness to gamble with its hold on power (Kedzie and Aragon, 2002). Higher gross domestic product (GDP) in authoritarian countries is related to higher internet adoption rates (Corrales and Westhoff, 2006), and a sound and growing economy is one of the best predictors of state sociopolitical stability (Blattman and Miguel, 2010). Consequently, some experts argue that governments are willing to risk loosening their grip on communication controls in order to reap the monetary rewards that accompany joining the global economy by modernizing communication systems. Although economic growth is a main consideration, there are other possible benefits for those in power to enable the diffusion of ICTs in the forms of political control and repression.

The scholarship on authoritarian governments' success or failure focuses on the necessities of maintaining the support of societal elites and the approval of the population. A dictator must address the problems of power-sharing with societal elites by way of policy or resource disbursements, and to control the population in an effort to suppress popular uprisings and emerging political leaders (Svolik, 2012). The problems of power-sharing with regime elites have been the primary targets of researchers (e.g., Bueno de Mesquita et al., 2004; Bueno de Mesquita and Smith, 2011; Magaloni, 2008, 2010). Importantly for this study, suppression of political opposition is less researched.

The sociopolitical benefits of emerging communication technologies often have been assumed to primarily empower dissidents against governments (Aday et al., 2010). While in some cases activists have demonstrated striking effectiveness at challenging regimes (Howard and Hussain, 2013; Shirky, 2011; Karatzogianni, 2015), governments, too, have shown technological savviness by

infiltrating, high-jacking, and overpowering collective action campaigns (King et al., 2013, 2017; Morozov, 2009, 2011). Governments, after all, maintain monopolies on the majority of state resources, are in charge of the operational functions of communication technology infrastructures and are able to use intelligence services and law enforcement agencies to directly repress protesters. Aided by digital records, governments can shut down online communication capabilities and counter activist information by employing pro-government bloggers and social media misinformation strategies (Aday et al., 2010; Deibert and Rohozinski, 2010; King et al., 2013, 2017).

Governments have a major influence over what the internet infrastructure and online experiences in their countries look like. Given this, we often expect technologies and politics to work in harmony towards more democratic norms, but technology and politics were not explicitly built to work together (Papacharissi and Trevey, 2018). Along those lines, Poell and van Dijck (2015) criticize the belief in the pro-social nature of the internet as its primary purposes are commercial. The researchers argued that activists' gaining independence from legacy media such as television and newspapers by way of social media does not mean that they have control over the networked sphere within which they operate. 'Media power has neither been transferred to the public, nor to activists for that matter; instead, power has partly shifted to the technological mechanisms and algorithmic selections operated by large social media corporations (Facebook, Twitter, Google)' argued Poell and van Dijck (2015: 534).

Through the use of digital devices and services, people surrender, knowingly or not, their privacy in an unprecedented fashion. Technology companies such as Google, Apple, Facebook, Amazon and Microsoft (see Smyrnaios, 2018) internet service providers, and telecommunication companies collect massive amounts of user data: browsing history, social media connections, communication records, shopping habits, and more. These data are used to build digital profiles of users. Governments can access this information and gain insight into people's activities, political attitudes, and behaviors (Dencik and Cable, 2017; Greenwald, 2014; Rosenberg et al., 2018; van Dijk, 2006). In this sense, where digital technologies were once prophesized to be power tools of liberation can also serve as high functioning tracking devices for traditional power institutions.

Governments can use technologies to censor content, counter criticisms, produce propaganda and misinformation campaigns, cut-off internet and mobile phone access, and identify political opposition. These dynamics are vibrant in China, which hosts a digital media environment that is well developed, complex, and widely researched. By analyzing China's social media landscape, King et al. (2013) tested two theories of online censorship. The *state critique theory* suggests that criticism of the government is not allowed and freedom of expression is severely limited. Alternatively, the *collective action potential theory* posits that some criticism is allowed, and that the government is primarily concerned with discourse that could induce collective action. The results of their analysis strongly supported collective action potential theory. Indeed, in analyzing millions of social

media posts on hundreds of different platforms, they found that criticism of the government on social media outlets in China were often tolerated, or at least ignored. The regime did, however, take seriously collective action discourse and activities, particularly in the form of popular protests. The government observed the collective action discourse and used it to identify political opposition, likely deemed threats to security and stability, and suppressed it.

More effective suppression capabilities could help explain the resilience of authoritarianism in the digital age (Marshall and Cole, 2014; Papacharissi and Trevey, 2018). Along these lines, Rod and Weidmann (2015) found support for more repression in more wired countries. Using cross-national data from 1993 to 2010, they found that countries with higher levels of press censorship also had higher levels of internet penetration rates. In other words, governments concerned about controlling the flow of information had higher levels of in-country internet rates. Furthermore, in that same study, they did not find supporting evidence of the internet impacting democratic change. They analyzed instances of autocratic and democratic changes from 2006 to 2010 in low- and high-Internet-penetration countries and found that democratic shifts occurred more in low-penetration countries than in the high-penetration countries. In fact, in the countries that were in the high internet adopter group, shifts toward autocracy were more common. These findings provide support for receptiveness to technologies from governments that historically like to control the communications in their countries.

Identifying potential challengers and grievances among the population are major focal points for governments. Although governments are wary about popular protests, some scholars argue that authoritarian governments allow small-scale protests as a means of identifying political opposition and use the suppression of such as a way of strengthening the regime (Chen, 2012; Dimitrov, 2008; Lorentzen, 2013). In authoritarian countries without a free media system, collective action, online and offline, could provide important feedback to the regime as well as ways to identify adversaries.

Repression of political opposition by way of arresting cyber-dissidents as well as on the ground protesters sends a strong signal to the rest of society about the consequences of anti-government actions. Tufekci (2017) described the structure of networked protests as being more visible and quick to grow, but ultimately more frail and likely to dissolve. Karatzogianni (2015), too, argued that the internet activism has entered a phase where it is commonplace and may increasingly become ineffective and inconsequential. Taken together with the massive increase in divisive misinformation campaigns in liberal democracies, orchestrated in many cases by foreign governments including Russia (Kim et al., 2018), it is increasingly likely that governments see the value in repressing networked protest as well as deluding the online discussions with misinformation campaigns (King et al., 2017).

Given the complex relationship of sociopolitical dynamics and ICTs, much more research is needed. Studying the types of sociopolitical instability in a country in relation to the levels of internet and mobile phone diffusion can tell us more about the sociopolitical risks and benefits of using ICTs and where liberation and

repression acts intersect with one another. In order to continue exploring the contours of these relationships in greater detail, we begin by posing the following research questions:

> **RQ1**: To what extent do acts of political liberation (anti-government protest) and government repression (political purges) correspond across this timeframe in both democracies and autocracies?

> **RQ2**: How have emerging media rates, levels of anti-government protest, and instances of government repression shifted over time, and do trends vary across democracies and autocracies?

Continuing, if collective action organizers and participants are successfully using emerging media platforms to formulate public displays of sociopolitical agitation, emerging media penetration rates should be higher in countries that experience more instances of sociopolitical instability that are targeted against the government, thus:

> **H1**: Countries with higher levels of emerging media are more likely to have higher levels of anti-government demonstrations, regardless of regime status as democratic or autocratic.

Yet on the contrary, or in addition to, if governments use digital technologies to assist with the identification and eventual suppression of political opposition, then emerging media penetration rates in countries should be correlated with observable instances of government repression of political opposition. That is:

> **H2**: Countries with higher levels of emerging media are more likely to have more instances of government repression of political opposition, particularly in autocracies as opposed to democracies.

Methods and data

For the purposes of the study, the focus was on instances of sociopolitical instability that could reasonably be deemed acts of attempted liberation by the population (anti-government demonstrations) or government repression in the form of arresting or killing political opposition. The primary concepts of these analyses were the presence of emerging media communication technologies, where we define emerging media as internet and mobile phone diffusion in a given country and how these ICTs correlated to sociopolitical instability. Additionally, countries were analyzed by government type by grouping each into a category of either democracy or autocracy. There were 162 countries over an 18-year time period. Of those countries, 1878 country-years were democratic, with a Polity 2 score of at least 1 or

more. Additionally, 1038 country-years were autocratic, with a Polity 2 score of 0 or less.

The unit of analysis for data collection for sociopolitical instability was the nation-year. Data were collected from various organizations including the Banks' Cross-Polity Time-Series Database, the Polity IV data base, the United Nations, the World Bank, and Freedom House. Using a variety of statistical models, including factorial analysis of variance (ANOVA), cross-time negative binomial regression, and Poisson regression models, cross-national, aggregate-level data analyses were conducted to gain greater understanding of emerging media systems characteristics in countries as related to sociopolitical instability types, specifically anti-government demonstrations and government political repression.

In short, this dataset is a compilation of indicators from leading agencies to examine patterns in the relationships between how emerging media may facilitate acts of protest as well as potentially trigger governmental political purges against social movements, as differentiated across democracies and autocracies. Although aggregated national-level measures have limitations, many reputable organizations compile dependable global data appropriate for analyzing global phenomena using cross-national analyses (van Dijk, 2005). As such, analyses relating to the diffusion of ICTs over time can provide important insight into sociopolitical undercurrents at the country level.

Variables

Sociopolitical instability. These variables come from the Banks' Cross-Polity Time-Series Database, which includes data on 197 countries from 1995 to 2012, and maintain variables of domestic conflict behavior. The main dependent variables were anti-government demonstrations, used to analyze acts of liberation, and purges (repression), used to analyze acts of repression.

Anti-government demonstrations. One hundred or more people peacefully assembled in public with the intention of airing grievances regarding policies or opposition to authority. This does not include instances of anti-foreign occupation or intervention.

Government repression. Political purges were used as proxies for by way of targeted oppression of political opposition by way of imprisonment or death. Political opposition could be within the existing government or member of opposing party or group.

Emerging media diffusion. The World Bank indicators for internet and mobile phone were used for the emerging media variables and included the years 1995–2012. The start date of 1995 was selected because this was the year when the internet became commonly commercially viable and available (Groshek, 2009). Additionally, in the World Bank data used here, the years preceding 1995 had substantially more missing data cases, presenting data analyses issues in countries when it could reasonably be inferred that the internet was not yet available. The

internet and mobile phone data were measured by penetration rate by country on a per capita basis (i.e., a rate per 100 people). In instances where data were not readily available, which were few, data were entered from the Banks' Cross-Polity Time-Series Database. When it was clear that in prior years that diffusion rates were approximately zero, missing data were imputed. To allow for the most variance, a simple additive scale was applied to the analyses. This approach allows for accounting for instances in which individuals may have access to online emerging media devices that may or may not be wireless.

Media freedom restriction. The Freedom House organization maintains a wide-ranging dataset that ranks media freedoms at the country level for most countries in the world. The organization uses a cross-national index to examine events in each country over the course of a year and evaluates the level of internet, print, and broadcast freedom in each country around the world. On an annual basis, a rating on a continuous scale is given. For the purposes of this study and to make the variable more intuitive, we reverse coded so that Not Free = 0 to Free = 100.

Democracy. To operationalize autocracy and democracy levels, the 'Polity 2' score was used, which comes from the commonly used Polity IV database (Marshall and Cole, 2014). The Polity IV database measures national-level government types with polity scores ranging from −10 (full autocracy) to + 10 (full democracy). The 'Polity 2' score 'is a multi-component historically informed measure of fair political competitiveness, formalized constrains on the abuse of power, and citizens' ability to freely exercise civil liberties that is drawn from the Polity IV database to model national-level democracy' (Groshek and Bachman, 2014: 22). Countries were considered democratic that had a Polity 2 score of 1 to 10 (1878 country-years). A country was considered autocratic if it had a Polity 2 score of 0 to −10 (1038 country-years). In the few instances were there were missing data, data from Freedom House's country freedom rankings were adapted and input.

Income. This variable was comprised of income data from the World Bank and are cross-national GDP per capita numbers. Again here, in the rare occurrence where that data were not available, data from the Banks' Cross-Polity Time-Series Database measuring GDP per capita figures were used.

Urbanism. Urbanism figures were acquired from the World Bank's data measurement of population density. Urbanism refers to the geographic and physical proximity of citizens to one another (see Groshek, 2009). Some other measures of urbanism take into account additional infrastructure factors such as fixed landline telephones, but the data used here are based strictly on population density per square kilometer. Still, even with this potential limitation, this variable reasonably approximates the contact and information sharing capabilities of spatially based physical networks.

Population. In order to add another control variable for regression model improvement, overall population figures from the World Bank were used. These figures were used without adjustment. Figures from the Banks' Cross-Polity Time-

Series Database on the same simple population numbers were used to supplement instances of missing data, which were few.

Models

We began our analyses by examining categorical relationships and comparisons of means as relatively straightforward indicators of linkages between our key variables of interest. Following this strategy, and on the basis of extensive pretesting in fitting a variety of regression models to the data to address each specific research question or hypotheses, we arrived at a number of analyses that best fit the data using incidence rate ratios (IRRs) to identify the likelihood of acts of liberation or repression using a combination of negative binomial and Poisson regression models.

Findings

This study began by examining the interrelationship between acts of political liberation and government repression themselves, both in democracies and autocracies. Here, both anti-government protests and political purges were set as binaries and then cross-tabulated. In democratic countries (where the Polity 2 score was 1 or more) there was a clear relationship where political purges were far more frequent in cases where there were also anti-government protests (5.0%) than when there were no such protests (0.6%). This relationship was statistically significant (χ^2 (df: 1) = 44.82, $p = .000$) and even more prevalent in autocracies (χ^2 (df: 1) = 38.85, $p = .000$), where 12.1% of all anti-government protests co-occurred with political purges, and just 1.9% of anti-government protests had no corresponding act of government repression.

At this binary level, these findings not only suggest a tightly formed relationship between anti-government protest and political purges but also that there is a statistically significant difference between democracies and autocracies (Mantel-Haenszel χ^2 (df: 1) = 17.27, $p = .000$) in the tension of liberation and repression processes. Specifically, when democracies experience anti-government demonstrations, government repression is noticeably less frequent than in autocracies. While these findings make intuitive sense, in addressing RQ1, they also outline how the relatively rare counts of liberation and repression events are intrinsically central to the contestation of power and the eventual change or maintenance of those existing structures. The next research question thus proceeds to examine those patterns over time.

In these analyses, the average levels of emerging media are summarized over time for democracies and autocracies as those overlay trends in full counts (not binary categorizations) of anti-government demonstrations and political purges in the 18-year timeframe considered here. As shown in Table 1, it is clear that in both democracies and autocracies the combined diffusion of internet and mobile phone

Table 1. Instances of acts of political liberation and government repression and levels of emerging media diffusion in democracies and autocracies over time.

Year	Repression democracies	Repression autocracies	Protests democracies	Protests autocracies	Media democracies	Media autocracies
1995	2	4	76	27	3.47	.63
1996	3	6	74	19	5.75	1.03
1997	0	3	83	18	9.23	1.80
1998	0	0	50	42	14.81	2.63
1999	0	0	42	16	22.06	4.07
2000	1	0	72	20	32.62	6.70
2001	1	0	45	8	40.95	9.90
2002	0	1	51	18	49.18	13.71
2003	1	0	45	19	56.66	17.78
2004	1	0	51	32	65.63	23.52
2005	2	3	50	28	74.62	30.19
2006	0	0	42	19	87.13	41.03
2007	0	0	40	11	100.00	53.80
2008	1	0	41	22	111.21	66.52
2009	2	3	47	32	120.51	79.51
2010	0	0	29	13	129.66	93.91
2011	11	18	182	300	139.84	103.73
2012	16	11	193	127	146.64	115.37
Total	Sum = 41	Sum = 49	Sum = 1213	Sum = 771	$M = 69.63$	$M = 33.74$

Note: Political purges and anti-government protest figures are summed instances per year. Emerging media (internet and mobile phone) rates are combined and per 100 citizens.

access has increased positively on a nearly uninterrupted trajectory over time. A factorial ANOVA found both main effects for time and regime type as well as an interaction ($F(17, 2{,}880) = 3.97$, $p < .001$, partial $\eta^2 = .023$) where the differences between emerging media in democracies and autocracies is significantly different when modeled over time.

When looking at the distribution of summed political purges and anti-government protests over time, it was also clear that these events, when counted as discrete events, varied substantially over time in democracies and autocracies alike. In terms of anti-government demonstrations, these events actually became most frequent in 2011 and 2012 in both democracies and autocracies with main effects and interactions of regime type and time ($F(17, 2{,}880) = 5.41$, $p < .001$, partial $\eta^2 = .031$) that were not due to chance. Similarly, dramatic upticks in the number of political purges were seen in the last two years of this dataset and showed a statistically significant interaction with time ($F(17, 2{,}880) = 3.49$,

$p < .001$, partial $\eta^2 = .020$) such that the relative distribution of these events were not uniform across democracies and autocracies.

Thus, in answering RQ2, these results provide essential background for how emerging media rates, levels of anti-government protest, and instances of government repression have shifted over time, and identified that these trends do, indeed, vary across democracies and autocracies. These analyses, as generally summarized in Table 1, have also situated the instances of anti-government protest and political purges as discrete, stochastic events that interrelate with one another but that do not follow a normal distribution or appear stationary.

In further exploring the contours of these phenomena with greater detail, as well as connecting empirical data with analyses that control for additional factors, this study proceeded to model anti-government demonstrations with a cross-time negative binomial regression model that was most appropriate for the over-dispersion of this dependent variable, where the mean (0.68) was considerably less than the variance (8.41).

When modeled just for democratic country-years, this regression indicated that instances of anti-government demonstrations were related several key factors, the most prominent of which was political purges (IRR = 7.29, $p < .001$), when as reported as an IRR, suggests that cases where there are political purges are expected to have a rate 7.29 times greater of anti-government demonstrations. This model also demonstrated higher levels of internet and mobile diffusion (IRR = 0.84, $p < .001$) were significantly related to anti-government demonstrations while controlling for other germane factors, but in this instance the IRR expects that for each percent increase in emerging media, there were would be a decrease in anti-government protest by a factor of 0.84 ($p < .001$). Greater press freedom was also negatively related to anti-government protest (IRR = 0.47, $p < .01$) but other independent variables, namely income (IRR = 1.31, $p < .001$) and population (IRR = 1.30, $p < .001$) were significant factors in cultivating increased anti-government protest in democracies. The full model is summarized in Table 2.

Interestingly, when shifting to autocracies and again applying a cross-time negative binomial regression model, there was a positive relationship between the number of anti-government protests and emerging media diffusion such that each percent increase in internet and mobile phone penetration is expected to increase anti-government demonstrations by a factor of 1.32 ($p < .001$). This finding along with the positive relationship with political purges (IRR = 12.60, $p < .001$) suggests that within this sample of autocratic nation-years during this timeframe, there was a greater incidence of anti-government protest where there were higher levels of internet and mobile phone access—and where there have been political purges. Other significant factors included more urban populations (IRR = 1.22, $p < .05$) and larger overall populations (IRR = 1.44, $p < .001$), and sequentially higher levels of democracy within these autocratic nations positively increased the likelihood of anti-government protest (IRR = 1.55, $p \leq .10$), which is also summarized in Table 2.

Table 2. Cross-time negative binomial regression models for anti-government demonstrations (liberation) in democracies and autocracies.

	Democracies		Autocracies	
Variables	IRR	Std. Err.	IRR	Std. Err.
Government repression	7.30***	2.15	12.60***	4.70
Internet and mobile phone	0.84***	0.04	1.32***	0.10
Media freedom	0.47**	0.12	1.17	0.20
Democracy	0.35#	0.23	1.55#	0.42
Urbanism	1.01	0.06	1.22*	0.10
Income (GDP)	1.31***	0.10	0.85	0.10
Population	1.30***	0.06	1.44	0.10
Constant	0.13	0.21	0.00	0.00
N	1,868		1,038	

Note: Incidence rate ratios reported were derived using random effect operators for region and time. The independent variables were transformed using a natural logarithm (ln) to normalize variables and model non-linear relationships (incidence rate ratio (IRR) < 1.0 signifies negative relationship).
#$p < .10$, *$p < .05$, **$p < .01$, ***$p \leq .001$.

Altogether, in terms of H1 and the notion of liberation technology, these analyses do suggest that autocratic countries with higher levels of emerging media are more likely to have more frequent anti-government demonstrations. The prediction within this hypothesis, however, that regime status as democratic or autocratic would not shape the impact of emerging media in anti-government protest was unsupported because in democratic nation-years, increased levels of emerging media were actually related to a *decrease* in anti-government protest.

Next, this study tested the repression technology perspective of Hypothesis 2, that countries with higher levels of emerging media are more likely to have more instances of government purges on political opposition, particularly in autocracies as opposed to democracies. As the distribution of political purges closely matched that of a Poisson distribution where the conditional mean of the sequence (0.030) was roughly equivalent to its variance (0.045), and that indicators can considered conceptually to be individual counts of discrete events, as is the case here. This analysis began by modeling just democratic country-years and found that the rate of political purges increased by a factor of 1.62 ($p < .01$) for each percent increase in emerging media diffusion. Although anti-government protest ($IRR = 7.29$, $p < .001$) was the only other positive factor in cultivating political purges as shown in Table 3, increasing press freedom in democracies decreased political purges by a factor of 0.13 ($p < .05$), suggesting that press freedom itself remained a check on instances of governmental purges, whereas emerging media diffusion itself explicitly did not—in fact increasing that likelihood.

Yet in following the expectations of H2, autocracies were still shown to engage emerging media for the purpose of enacting political purges to a greater extent than

Table 3. Cross-time Poisson regression models for government purges (repression) in democracies and autocracies.

	Democracies		Autocracies	
Variables	IRR	Std. Err.	IRR	Std. Err.
Anti-government demonstrations	5.14***	1.40	3.15***	0.61
Internet and mobile phone	1.62*	0.31	1.86***	0.34
Media freedom	0.13*	0.10	0.74	0.22
Democracy	0.84	1.62	0.54	0.30
urbanism	0.94	0.17	1.31#	0.22
income (GDP)	0.84	0.20	0.42***	0.11
Population	1.02	0.16	1.11	0.14
Constant	13.34	60.86	0.42	1.26
N	1,868		1,038	

Note: Incidence rate ratios reported were derived using random effects operators for region and time. The independent variables were transformed using a natural logarithm (ln) to normalize variables and model non-linear relationships (incidence rate ratio (IRR) < 1.0 signifies negative relationship).
#$p < .10$, *$p < .05$, ***$p \leq .001$.

democracies. Specifically, when modeling autocratic countries in a separate cross-time Poisson regression model, each percent increase in emerging media was related the expected rate of political purges increasing by a factor of 1.86 ($p < .001$), which is slightly greater than that of democracies. Still, this model shared anti-government protest (IRR = 3.15, $p < .001$) as a significant factor, and while press freedom was not significant among autocratic countries, increased wealth by GDP per capita was related to decreasing political purges by a factor of 0.42 ($p < .001$), suggesting a certain dimensionality to instances of political repression. The full model summarizing these results is summarized in Table 3 and offer general support for Hypothesis 2, though the results also signal the distance from autocracies to democracies in terms of their using of emerging media for repressive purposes is perhaps less than typically envisioned.

Discussion and conclusion

One of the main discussions in the communication field has been the role of ICTs as democratizing agents. Technology as a tool of liberation is an attractive notion and inspires hope for bottom-up democratic trends powered by the grassroots mobilization of ordinary citizens. Much research has provided convincing evidence that ICTs can lower communication costs and increase information sharing, two key ingredients in successful collective action campaigns that often contribute to increased freedoms in societies (Bimber et al., 2005; Castells, 2009, 2012; Garret, 2006; Shirky, 2008, 2011).

Meanwhile, over the past several years, governments have been quietly using communication technologies to listen to and watch individuals' digital activities in an effort to anticipate and blunt dissident actions or monitor potential security threats. The extent that governments have been surveying and censoring citizens was largely speculative and not widely discussed until information leaks brought the issue to the forefront of public attention (Greenwald, 2014). Now that the public are increasingly aware of massive government surveillance, the chilling effect and apathy towards privacy rights are among the concerning consequences (Dencik and Cable, 2017). Although scholars such as Morozov (2009, 2011) have been making arguments for the effective use of ICTs by governments to maintain and strengthen their power positions by repressing political opposition, much of the earlier evidence was speculative and anecdotal.

Therefore, the study reported here empirically analyzed whether emerging media were instruments of liberation and/or repression and whether there were differences between these phenomena in democratic and autocratic countries. Analyzing sociopolitical instability types and instances in relation to emerging media traits and government types in countries is an important step in understanding the role of ICTs in power negotiations between governments and their citizenries.

Few studies have analyzed the phenomena of anti-government protests and government repression together and within the framework that the study reported here has. While the present study has the typical limitations of macro-level research such as not being able to infer specific individual level use of emerging media by protesters and repressive governments, through the use of relatively advanced statistical models there was statistically significant evidence for general support of the tested hypotheses.

The anti-government demonstrations and governmental political repression analyzed here were clearly linked and further shaped by emerging media diffusion. In exploring the research questions, these analyses produced evidence that emerging media rates, anti-government demonstrations, and government repression have shifted over time and that these phenomena varied between autocracies and democracies. Although anti-government protests and government repression were strongly related, the next strongest predictors of these events were higher levels of emerging media diffusion in those countries where such events took place in nearly all models.

The exception of the positive relationship between emerging media and acts of liberation was in democracies with higher levels of emerging media. In democracies, higher levels of emerging media were negatively associated with incidences of anti-government demonstrations, which puts forth the possibility that avenues exist in democracies for exercising grievances, such as elections and a greater tolerance for freedom of expression. Along these lines, anti-government demonstrations were more likely in democracies that had greater levels of media restrictions where it could be expected that these protests were a push back against limits imposed on certain civil liberties within those nations.

The findings of this study therefore provide partial support for the position that aligns with the argument that participation and communication barriers are lowered by the availability of emerging media (Bennett and Segerber, 2013; Bimber et al., 2012). Specifically, in autocracies, higher levels of internet and mobile phone availability positively predicted instances of anti-government demonstrations. Along these lines, anti-government demonstrations were more likely in democracies that had greater levels of media freedom restrictions. In autocracies, higher levels of internet and mobile phone access were positively related to anti-government demonstrations. Media freedoms in autocracies, however, were not statistically significant. Media freedoms not being a factor in anti-government protests in autocracies while higher levels of emerging media were, offers important insight into the potential of ICTs assisting with information circulation and collective action organization in autocratic countries. This finding supports the notion that individuals can use ICTs to circumvent censorship in authoritarian countries when motivated to do so in efforts to organize collective action.

Nevertheless, the findings reported here do not indicate clear support for ICTs being inherently democratic. The statistical analyses conducted here presented evidence that in countries with higher levels of emerging media, governments of all types—democracies and autocracies—overtly repressed political opposition. While anti-government demonstrations were not as likely to occur in democracies with higher levels of emerging media, interestingly, democratic governments were nearly as likely to repress political opposition as autocratic governments.

The notion that government repression of political opposition through ICTs was an instrument only applied by authoritarian governments does not hold, as this study provided evidence that repression was wielded by democratic and autocratic governments alike. Of specific interest here are the nations of Turkey in 2011 and 2012 and Russia in 2012, both of which were democratic states that featured emerging media rates of over 100% and that had multiple acts of government repression in those years. These findings thus clearly illustrate that the (governmental) actors that control the communication networks maintain strong positions of power (van Dijk, 2006) and are able to leverage those technologies to their gain. Governments remain the gatekeepers of the development of communication networks in most, but not all nations. Therefore, maintaining the monopoly on the approval of the development of communication networks in countries empowers governments to use technologies to maintain the balance of power in societies. Media freedoms in democracies, however, do seem to be a deterrent against government repression, as media freedoms in this study were negatively related to purges.

Taken altogether, the main contributions of this study are to advance the body of knowledge, particularly in explicating the ways that emerging media can be used in sociopolitical struggles for power. The dramatic increase in the number of anti-government demonstrations and governmental repression in 2011 and 2012 was in no small part due to the Arab Spring, the Occupy events, and the pro-democracy

protests in China. Howard and Hussain's (2013) insightful analysis outlined the importance of ICTs in the Arab Spring, and while it has been widely speculated that emerging media were fundamental to the international spread of the news of these events that inspired the Occupy protests, many of those same protests were met with fierce government repression. This study offers evidence that the countries where these events took place also had more accessible levels of emerging media, and these media were engaged for liberation and repressive goals.

Broad ranging governmental internet and media censorship and surveillance continue to be a primary concern regarding the potential flourishing of democracy and activism (Dencik and Cable, 2017). The ongoing analyses of the 2016 US and European elections and research on the Chinese government, however, shine light on the emphasis that governments and interest groups place on propaganda and misinformation campaigns that aim to inflame conflicts and confuse discourse (King et al., 2017; Marwick and Lewis, 2017; Thompson and Vogelstein, 2018).

It is outside the scope of this study to hypothesize how ICTs are being used and effect the sociopolitical conflicts in countries; nonetheless, establishing that the relationship exists at an aggregate-country level is an important piece of the puzzle. In the future, it will be beneficial for researchers to continue to analyze these phenomena as concurrent and multilayered, and the analyses presented here start to model data thusly. Still, a limitation to researching these types of events, particularly government repression, is the lack of perfectly complete and up-to-date data. Government repression data are difficult to collect because all instances of repression may not be publicly observable. Moreover, it is possible that instances of government repression may be underreported where emerging media are not readily available and press freedoms restricted. Gathering reliable data and analyzing instances of anti-government protests and government repression coupled with media characteristics has important implications for future policies and the understanding of the successes and failures of collective action and government stability.

That being said, the findings in this study nevertheless bridge an important, vital gap in the theoretical development of the ways that communication and media technologies impact power relations and negotiations in societies (Deibert and Rohozinski, 2010; Diamond, 2010; King et al., 2013, 2017; Lynch, 2011). The contributions here help place emerging media as effective tools for both the potential to assist with liberation movements as well as governments' efforts to repress political opposition. This is an important caveat and synthesis provided to overarching theoretical frameworks and adds to understanding the complexities that these technologies bring to our social and political realities.

Authors' Note

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Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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