Dissent Does Not Die in Darkness:
Network Shutdowns and Collective Action in African Countries

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Research on the role of communication technology in repression and collective action focuses largely on social movements in the West or the Arab Spring. Much less work has analyzed how "networked protest" responds to government efforts to stifle the information flow and the factors underlying these responses, particularly in African states. We explore these dynamics by examining the interactions between deliberate network shutdowns and protest mobilization. We draw on examples from countries in Africa that have executed shutdowns between 2017 and mid-2019. Although the impact of such disruptions on collective action fluctuates across the continent, they are often followed by escalations in the momentum of preexisting protest or a continuation of previous dynamics, and citizens use a variety of strategies to continue mobilizing. We also highlight the importance of varying levels of connectivity, social media penetration, and strong structures of organization and coordination in networked movements' responses to repressive strategies deployed to quell them. The article outlines a picture of activism and repressive practices in the digital age, highlighting the backfire effects of information vacuums.

Keywords: Internet, network shutdowns, information control, human rights, communication technology, social media, Facebook, collective action, social movements, protest, censorship, disinformation, information flows

In mid-2016, protests erupted in Ethiopia in response to lack of sociopolitical reforms, massive deprivation following a period of drought, the economic marginalization of the Oromo ethnic community,

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and alleged human rights abuses against opposition groups. The government responded with a host of emergency measures, banning gestures associated with the movement, implementing curfews, forbidding the viewing of "terrorist media," and restricting access to the Internet and social media nationwide. At the time, an Ethiopian human rights advocate assessed that "with or without the Internet, people already had the urgency of going out to protest and . . . petitioning the government" (Solomon, 2017, para. 14). This encapsulates an increasingly common scenario: Governments shut down communication channels in response to protest or unrest, and activists adapt by using other conduits to express their grievances or mobilize resources.

The goal of this article is to analyze the recent dynamics of network shutdowns and collective action in Africa and identify underexplored variables to be considered for future qualitative and quantitative research. On the governmental side, we highlight both the recurring technical and institutional attributes of shutdowns, using examples from other regions for contrast. On the societal side, we examine fluctuations in protest under information vacuums and the potential role of varying levels of connectivity in the evolution of such resistance. We accomplish this by analyzing daily-level data on peaceful and violent protest from the Armed Conflict and Event Data Project (ACLED; Raleigh, Linke, Hegre, & Karlsen, 2010), focusing on the countries that disrupted access to the Internet, social media, and other digital communication services between 2017 and mid-2019. We illustrate the dynamics of collective action before shutdowns were imposed, during them, and after access was restored. Finally, we present a vignette outlining some of the dynamics at play in greater detail using the "digital siege" (prolonged shutdown) in Sudan between December 2018 and February 2019, evaluating the effects of a months-long disruption of social media on the strategies and intensity of collective action.

There is no scholarly unanimity on the definition of the term *network shutdown*, and many sources use it interchangeably with *Internet shutdown*, *blackout*, *network disruption*, and *kill switch*. For the purposes of this article, a network shutdown is a deliberate, significant disruption of entire channels of electronic communication within a given geographical area and/or affecting a predetermined group of citizens (Access Now, 2020; Rydzak, 2018). We follow Mawii, Srivastava, Lal, and Abraham (2018), Rydzak (2019), and Purdon, Ashraf, and Wagner (2015) in using *network shutdown* because it provides the optimal balance of epistemological usefulness and empirical specificity. This includes reactive social media bans, suspension of fixed and mobile telephone services, deliberate slowdowns (throttling), and complete blackouts of Internet connectivity. Two factors underlie all of these restrictions: disruption to a channel of communication rather than a targeted piece of content (which governments often accomplish via takedown requests) and wide impact radius. The term excludes website blocking that is not focused on impeding multilateral communication, filtering, and other forms of micro-level censorship. We also avoid using the term *Internet shutdown* because such disruptions often cover forms of communication that do not rely on the Internet (e.g., social media sites).

Conceptual and empirical research on "networked protest" and the role of technology in repression and protest has tended to focus on social movements in the West. When it has shifted to Africa, scholars largely have concentrated on the Arab Spring and the states where some of its events unfolded (Wilson & Dunn, 2011). There is limited research on the role of increasing access to technology in the evolution of both collective action and governments' information control strategies in Africa since 2011, when access to

social media across the continent was relatively poor. By and large, the available research also has overlooked the interactions among various forms of social upheaval and governments' efforts to subvert them in the digital space, including through network shutdowns. By late June 2019, 26 of 54 sovereign states in Africa had deliberately disrupted digital communication services or the Internet, one of several practices that governments use to interrupt citizens' access to information, including social media taxes, website takedowns, and punitive actions against bloggers. Globally, more than 450 confirmed shutdowns had been recorded in approximately 50 countries (Access Now, 2020). These new circumstances call for a reevaluation of our understanding of the impact of digital repression and the ways in which activists and citizens adapt to it.

The analysis illustrates divergent effects of network shutdowns on collective action. Although governments generally expect that shutting down communication platforms will weaken collective dissent (as conveyed in most leaked or publicly released shutdown orders known to date), a cross-section of cases reviewed in this article does not lend support to this expectation. In several cases, network shutdowns were followed by surges in preexisting collective action. We also identify differential levels of connectivity, social media penetration, and the traditional organizational structures of collective action as critical to the future study of digital repression.

(Dis)connective Action and Information Flows

The term *disconnective action* refers to the dynamics, strategies, and structures of mobilization in the midst of an information vacuum as well as those generated by that vacuum at any point in time (Rydzak, 2019). Its core statement is that people adapt their strategies of mobilization to conditions of information scarcity and to disrupted information spaces. This mobilization may exhibit distinct dynamics, including changes in centralization, the nature and locus of leadership, and shifts in strategy, all intended to maintain or increase protest momentum (Hassanpour, 2017). This extends the *connective action* paradigm, which describes the ways in which movements and individuals use the affordances of communication technology to build momentum, taking advantage of looser structures, innovative strategies, and highly personalized action frames (Bennett & Segerberg, 2013). Although communication technology allows movements to overcome collective action problems via these features, the proliferation of digital repression means that the connective action framework must be enriched with how protesters respond to emerging threats in the digital age. Network shutdowns are one of the most severe manifestations of such measures, with an impact radius that often envelops entire societies.

Research on mass censorship provides us with insight on the potential backfire effects of information control. In the digital sphere, these effects can be psychological: Users can interpret efforts to suppress information as signs of government weakness, become politicized through anger, or be piqued into unveiling forbidden knowledge in a version of the Streisand effect (Roberts, 2018). Other theories are behavioral: Censorship can lead to a "gateway effect" in which users procure circumvention software to access one kind of restricted information, then continue to other off-limits content (Hobbs & Roberts, 2018). It can also persuade individuals to engage their "strong ties"—close-knit networks—to obtain information and eventually offer active resistance (Lohmann, 1994). In addition, the amplification of popular outrage often relies on harnessing information effectively, which may require an organized, disciplined opposition

(Hess & Martin, 2006). These organizational structures are a potentially important fallback mechanism when channels of communication are disrupted.

Publicly disclosed shutdown orders and court affidavits by regulators show that at least five circumstances are used as grounds for disrupting communication: demonstrations and riots, disinformation, contentious elections, terrorist attacks, and national examinations, for which deliberate leaking of exam material may sometimes acquire subversive political overtones (Xynou, Filastò, & Karanja, 2019). Governments portray shutting down access to social media or the Internet as a legitimate state response to protest and disinformation flows that may lead to chaotic escalations of outrage.2 Shutting down a medium of multilateral digital communication aims to project state power, thwart the unpredictable dynamics of information flows in times of uncertainty, and often, as a corollary, disorient protesters and disrupt coordination.

Empirical studies have disagreed on whether there is a strong link between rapid technological expansion and collective violence, highlighting the importance of context, jurisdiction, and temporality. Some have linked communication technology with higher rates of violent conflict (due to technology's potential to resolve collective action problems), whereas others have argued that it curtails insurgent violence (due to technology's potential to improve reporting; Pierskalla & Hollenbach, 2013; Shapiro & Weidmann, 2015). Although the "liberation technology" paradigm has waned while interest in negative externalities has grown, some recent analyses have advocated for more nuanced views recognizing country- and region-specific dynamics, acknowledging that technology facilitates coordination of social movements without exaggerating its role in their eventual success or demise (Bennett & Segerberg, 2013; Jost et al., 2018).

Nonetheless, the role of technology in collective action across Africa remains underexplored. Comparative analyses of African media environments have revealed rifts in the consistency of use of social media by journalists, largely driven by socioeconomic variables, technological penetration, and the complexity of a country's censorship regime (Lemke & Chala, 2016). In repressive environments, the "digital public sphere" can exploit an existing network of vibrant social ties built by offline collectives; the expansion of these digital spaces can threaten the government's monopoly on power and reveal its fragility (Lamoureaux & Sureau, 2019). Yet, despite the growing awareness of its hazards, the Internet is still often perceived as a vehicle for transparency and public scrutiny, bolstered by positive public views on its impact on politics in some jurisdictions (Silver & Johnson, 2018). Although access is unevenly distributed and public opinion shifts too rapidly across time and space to draw definitive longitudinal conclusions, the Internet polls

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2 This has been challenged normatively by experts who have deemed shutdowns incongruous with acceptable restrictions to freedom of expression and assembly defined under international law (Kaye, 2017; Voule, 2019). This position contrasts with one that condones shutdowns in exceptional circumstances, but states that they be governed by a due diligence process to filter out spurious orders. Authorities face challenges in balancing the protection of human rights with safeguarding national security, as evidenced by social media's role in accelerating disinformation and potentially channeling mass violence (Marchant & Stremlau, 2019). Nonetheless, no government has presented evidence of the necessity of a shutdown in any given circumstance or of strong due diligence processes supporting shutdown orders.

favorably among some journalists and media experts as a reinforcer of civil society and a channel for prodemocratic dissent, especially in relation to legacy media (Salgado, 2014). On the governmental side, a positive correlation seems to exist between social media penetration and good governance, potentially because of the extra layer of "voice and accountability" that the former provides in addition to enabling peaceful protest (Asongu & Odhiambo, 2019).

Although many studies have dealt with the impact of communication technology on conflict and political participation (Manacorda & Tesei, 2016; Warren, 2015), the majority have treated the availability of this technology as a given. But the causal link between mere access to technology and various societal effects is difficult to prove, as is the sequence of events that leads from one to the other.3 Three sources of bias complicate causal inference: the abundance of confounding nontechnological variables, the enormous diversity of uses of technology that can both bolster and hamper collective action, and the fact that connectivity is a continuously changing background feature rather than one fixed in time and space. Thus, it is difficult to isolate the effect of communication technology on human behavior, leading to contradictory conclusions.

Shutdowns, however, are fixed in time and space: They have set start and end times and rough geographical contours that often overlap with administrative divisions. In the affected areas, their effects are indiscriminate and cause widespread damage, with radiating human rights impacts (Rydzak, 2018; S. K. & Lakshané, 2018). The scale of their impact allows us to compare socioeconomic metrics before and after their onset and posit that consistent changes in those metrics can be attributed primarily to the shutdown. Given the collective ramifications of shutdowns, dynamics that might otherwise be too small to make be statistically noticeable may be magnified. Paradoxically, one method of proving or disproving the impact of technology on society may be to examine what happens when access to it is spontaneously extinguished.

Research that links information vacuums to forms and dynamics of resistance is scant, comprising mostly isolated cases and little cross-national comparison. Egypt's disappearance from the global Internet (2011) and the early disruptions in Syria (2011–2012) provided early evidence of the repercussions of network shutdowns. Gohdes (2015) used casualty data from Syria to determine that violence surged during periods of disruption. Hassanpour (2017) analyzed collective action in Egypt and Syria to demonstrate that shutdowns led to a decentralization of protest and the rise of "peripheral leaders" who led individual pockets of resistance, ultimately overwhelming regime forces in Egypt. Jacob and Akpan (2015) explored the backfire effects of the Nigerian military's counterinsurgency strategy of using cell phone shutdowns against Boko Haram; these effects included a strategic shift to a closed, centralized insurgency.

Recent advances in event analysis have led to the emergence of event data sets with high temporal and geographical precision. This has enabled researchers to link events such as popular mobilization with circumstances imposed from above, including network shutdowns. Rydzak (2019) found that geographically targeted shutdowns in India were associated with surges in violent unrest in the days following the onset of the disruption. The frequency of riots on each successive day of turmoil significantly exceeded that of violent

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3 In addition, Internet penetration is not guaranteed to follow an upward trajectory in all states. Uganda's social media tax is thought to have reduced the number of Internet subscriptions by 2.5 million users (Dahir, 2019).

protests that occurred when connectivity was left undisturbed. This backfire effect mirrors previous findings on societal responses to both traditional and digital forms of repression (see Hobbs & Roberts, 2018).

Shutdowns and Disconnected Protest in African Countries: Strategies and Trends

To understand some of the trends in street protest and other mechanisms of resistance during information vacuums in Africa, we must first outline the patterns of digital repression used by governments. Even domestically, shutdowns are almost never a monolithic kill switch, but rather exist on a spectrum of execution that varies along dimensions such as scale, scope, location, duration, and frequency (Marchant & Stremlau, 2019). Which (if any) of these dimensions exhibit common patterns or overarching trends in African countries? Second, which political, socioeconomic, and technological characteristics link countries that have resorted to shutdowns as a measure to achieve their goals? The continent's political structures, internal social relations, rates of economic development, Internet penetration, and usage of media are all far from monolithic. Understanding some of these dynamics will help us distill a *modus operandi* for governments before turning our attention to the civilians and activists that rise against them.

The Disconnectors: Government Strategies and Institutional Attributes

The first deliberate network shutdown known to have occurred in Africa was executed in Guinea in February 2007. Following a surge of protests, President Lansana Conté shuttered most media in the country and ordered all four of Guinea's Internet service providers (ISPs) to suspend services (Collaboration on International ICT Policy in East and Southern Africa, 2019). However, it was the Arab Spring that popularized the tactic as a direct response to social unrest and mass rallies, with widely reported disruptions in Egypt, Libya, and Syria. Dozens of shutdowns have been reported since, stifling the circulation of both true and false information and causing significant damage to economies across the continent (Centre for Intellectual Property and Information Technology Law, 2018).

Based on longitudinal patterns, four main variables characterize different types of shutdowns in the African region: geographical scope, access platform, service usage, and connection quality. All of them interact with sociopolitical trends in a country to shape governments' response (Center for Applied Internet Data Analysis, 2018; Xynou et al., 2019). *Geographical scope* ranges from national-level disruptions, in which a shutdown affects the entire physical territory of a country, to subregions, where only a subset of the population is affected.[4] The *access platform* variable (mobile or desktop) isolates a population of users largely based on economic use of Internet connections.[5] Mobile users are largely the masses, who are more liable to engage in protests, and desktop device users are largely businesses. The apparent balancing act here seems to be that of pushing back against political pressure while maintaining economic production, a common source of political legitimacy. *Service usage type* isolates websites or applications based on what Internet users in a country access and disconnecting those imagined as hostile to the government (often popular social media platforms

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[4] The Gambia, Ethiopia, Democratic Republic of the Congo, Sudan, and Togo have all had national-level Internet disruptions (Center for Applied Internet Data Analysis, 2018).

[5] Ethiopia, for example, shifted from complete national shutdowns to mobile-only disruptions (Xynou et al., 2019).

and diaspora websites). Finally, shutdowns vary by *connection quality*: Disconnection can be complete or partial, the latter of which often involves throttling the connection speed to all or some services to levels that render them inaccessible (Freyburg & Garbe, 2018). Throttling can be attributed to the desire to avoid social outrage and political backlash for disrupting connectivity while limiting what can be achieved on the platforms via low data transfer speed. All of the above variables manifest themselves in hybrid ways, increasingly targeting mobile device access in politically active regions and social media platforms.[6]

The institutional underpinnings of shutdowns differ across Africa. Nonetheless, there are several areas of convergence. First, governments that disrupt access to communication services are overwhelmingly authoritarian or hybrid regimes. Collaboration on International ICT Policy in East and Southern Africa (2019) found that all of the African countries where disruptions occurred between 2014 and early 2019 were classified under those two categories, with no shutdowns in those classified as flawed or full democracies.[7] By June 2019, 26 countries in the authoritarian and hybrid categories had implemented shutdowns, leaving only 17 that had not. Learning occurs among the governments of these countries, manifested by the "migration" of shutdowns as a strategy of information control in times of turmoil or tension (Belson, 2017). The near-simultaneous occurrence of multiple shutdowns in the same geographical region suggests a diffusion effect of shutdowns as an archetypal authoritarian practice that transcends hard divisions between forms of government.

Second, in cases for which attribution has been possible, the proximate actors responsible for shutdowns have largely been part of the executive branch (Access Now, 2020; Collaborations on International ICT Policy in East and Southern Africa, 2019). Shutdown orders consistently come from central authorities in the highest echelons of power. This differs from the institutional configurations that have enabled the proliferation of shutdowns in India, driven by the devolution of authority to executive actors in second-level administrative units (Mawii et al., 2018). Shutdown orders in both the Democratic Republic of the Congo and Cameroon, for instance, have been traced to those countries' respective post and telecommunications regulators (Access Now, 2020). In both countries, as in many repressive states, these institutions are closely linked to the presidency, becoming instrumentalized and used as mechanisms to protect the regime.

Security agencies also play a key role in issuing or facilitating shutdown orders. In Uganda, a Supreme Court case challenging the 2016 presidential election revealed that an election-day social media

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[6] This typology partially mirrors Marchant and Stremlau (2019), who distinguish shutdown duration, breadth, depth, speed, and frequency. Geographical scope equates to breadth, access platform and service usage both relate to depth (one emphasizes the targeting of specific devices, and the other focuses on content targeted based on governments' assessment of the risk they pose to their stability), and connection quality overlaps with speed.

[7] The Democracy Index's typology distinguishes among authoritarian systems (little to no political pluralism, balance of power, or free and fair elections), hybrid regimes (substantial irregularities during elections and weak civil society, rule of law, and courts), flawed democracies (free and fair elections as well as respect for basic civil liberties, with weaknesses), and full democracies (Economist Intelligence Unit, 2017). Globally, the occurrence of shutdowns in states across the democratic spectrum suggests that they should be viewed as an illustration of authoritarian practices irrespective of regime type (see Glasius, 2018).

shutdown had been mandated by the Inspector General of Police, citing a credible threat of "public disharmony, insecurity and breach of peace" (Kiyonga & Lubwama, 2016, para. 6). When authorities claim an existential threat to the government, rank-and-file security units or militias are deployed as protectors and enforcers of the status quo. This goal often takes precedence over facilitating citizens' rights, as in the massacre of peaceful protesters by militias from the Rapid Support Forces in Sudan in June 2019. In this way, shutdowns often act as invisibility cloaks for abuses by street-level security forces. In most cases, however, the ultimate source of the order remains unknown, and governments sometimes claim the disruption was triggered by infrastructural or technical difficulties.[8]

The engagement of national-level decision-making authorities correlates with the wide geographical scope of shutdowns across Africa. Although pinpointing the contours of the areas affected by shutdowns presents technical challenges, most of the cases that took place in the period described here were national in scope or affected multiple areas simultaneously. In addition, whereas some shutdowns were fleeting, many hardened into protracted blackouts that have been likened to sieges because of their tendency to slowly drain local economies and extend well beyond the existence of a material threat to public safety (Rydzak, 2018).[9] Prominent examples of such digital sieges include Cameroon's 93-day Internet shutdown in the Anglophone regions (2017), Sudan's 68-day attempt to quell mobilization before the ouster of Omar al-Bashir (2018–19), and Chad's 16-month disruption of social media across the country (2018–19). Overall, institutional factors represent some of the differences between the disruptions observed in India and those that tend to occur across Africa: extremely frequent, yet ephemeral and targeted shutdowns in the former and relatively infrequent, yet prolonged and countrywide disruptions in the latter.

Aside from a penchant toward authoritarianism and the centralization of decision-making power, a third unifying characteristic is longevity in power. Of the 14 longest-ruling heads of state in Africa as of early 2019, only three—Eritrea's Isaias Afwerki, Djibouti's Ismaïl Omar Guelleh, and Rwanda's Paul Kagame—had not ordered a shutdown during their time in office, which has ranged from 18 to 25 years (Collaborations on International ICT Policy in East and Southern Africa, 2019). Finally, the dynamics of power that lead to shutdowns appear to express themselves in the interaction between authoritarianism and ownership of ISPs. This includes links among state majority ownership of ISPs, investment in ISPs by other repressive states, and propensity for election-related shutdowns (Freyburg & Garbe, 2018). The existence of a small number of telecommunications companies or a single state-owned provider (e.g., Ethio Telecom in Ethiopia) also appears to magnify the likelihood of disruption (Belson, 2017; Freyburg & Garbe, 2018).

The Disconnected: Collective Action During Information Vacuums

How do these trends in information control relate to the dynamics of collective action during deliberate information vacuums in Africa? The ultimate outcome of protests and unrest targeted by

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[8] For instance, in a 2016 interview, President Ali Bongo of Gabon pointed to a "jammed up" mobile network as the cause of Gabon's month-long, methodical, sundown-to-sunup Internet shutdown (Al Jazeera English, 2016).

[9] For example, in December 2019, the UN Special Rapporteur on Freedom of Opinion and Expression called the 2019–20 shutdown in Kashmir a "communications siege" (Kaye, 2019, tweet).

shutdowns varies considerably, from the reaffirmation of the incumbent's hold on power (e.g., Ali Bongo in Gabon) to the collapse of the regime and some or all of its structures. Long-ruling heads of state were ousted following demonstrations and disruptions in Egypt (Hosni Mubarak), the Gambia (Yahya Jammeh), Algeria (Abdelaziz Bouteflika), and Sudan (Omar al-Bashir). Egypt's 2011 shutdown was the catalyst for the propagation of protest to new neighborhoods and cities, led by peripheral actors who did not rely on technology to inspire further dissent (Hassanpour, 2017). Yet, we know next to nothing about how collective action evolves under disrupted communication in other countries in Africa.

Event data on street protest and other confrontations allow us to partially remedy this gap. Using data from ACLED (Raleigh et al., 2010), we examined fluctuations in the levels of peaceful demonstrations and violent riots in all of the countries in Africa that disrupted access to the Internet or social media between January 2017 and the first week of May 2019.[10] The start of the 30-month period was chosen based on strong smartphone user growth in the preceding year; smartphones composed a third of all mobile subscriptions in sub-Saharan Africa at the beginning of 2017 (GSM Association, 2017). The technological landscape of this period is qualitatively different from that of the Arab Spring, when high-speed mobile broadband was nearly nonexistent in Africa. Furthermore, January 2017 was a turning point for reporting on shutdowns and protest, as it marked the beginning of the most widely covered digital siege since the Arab Spring, imposed on Anglophone Cameroon and explicitly targeting the Internet. Reliance on the Internet for protest organization and intentional network shutdowns coincided thereafter. The advantages of using ACLED to analyze this period include the regularity of releases, the variables that could be gleaned from the data (e.g., actors involved), geolocation variables that allowed us to place events in space, and short contextual descriptions.

Some of the dynamics in question are illustrated in Figure 1, which examines periods of partial or complete network shutdown in Algeria, Cameroon, Chad, Democratic Republic of the Congo, and Ethiopia, as well as the periods immediately preceding and succeeding them. This allowed us to contextualize protest dynamics using the broader evolution of mobilization. The cases were chosen to illustrate situations in which citizens were already expressing dissent in the streets. This allowed us to distinguish them from exam-related and preemptive electoral shutdowns, where the links to variations in protest were harder to pinpoint.[11]

The first notable observation is that peaceful demonstrations, which are the norm where riots are the exception, are generally marked by a peak-and-trough regularity, with a concentrated push on one or two days followed by reduced protest activity, an opportunity for leaders to mobilize resources and participants to recover from "protest fatigue" (Woods, Anderson, Guilbert, & Watkin, 2012). Second,

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[10] ACLED collects disaggregated conflict event data from six regions of the world. The data compose dates and locations of demonstrations, riots, battles, violence against civilians, remote violence, and strategic developments associated with a conflict, as well as characteristics such as fatalities and actors involved.

[11] There are empirical challenges associated with selecting cases and detecting patterns based on a predetermined outcome (occurrence of shutdowns). However, this article does not aim to establish statistical links between shutdowns and collective action, but rather to identify underexplored variables for future multivariate analysis and comparative case studies.

shutdowns do not seem to exert a strong and immediately clear effect on protest dynamics in any direction. However, when a shutdown is preceded by a sustained series of demonstrations or riots, its onset generally seems to be followed by either a spike in the same activity or a rough continuation of the patterns that led up to it.

To illustrate, authorities in Democratic Republic of the Congo ordered throttling and shutdowns nationwide in August 2017, during clashes between government forces and the Bundu dia Kongo sect, and in several cities in December 2018, during unrest following contested elections (see Figure 1). Spikes in violence and the continuation of lower-intensity violent dissent were features of the shutdown period in both cases. In Ethiopia, the social media shutdown in December 2017, targeting primarily the Amhara and Oromia regions amid ethnic tensions, completely failed to hinder the patterns of protest that led up to it. The largest number of concurrent peaceful demonstrations—almost all of them concentrated in Oromia—occurred both before the shutdown (November 29) and in the middle of it (December 19). The shutdown period also witnessed a surge in ethnic clashes, particularly in the first few days of the disruptions.

Although the patterns above are not equally discernible in all cases, they reveal that shutting down communication networks is not a guarantee of success in quelling protests, particularly when the latter have already been gathering momentum or are reinforced by organized movements that serve as a backstop. In some cases, shutdowns can also render the security situation more chaotic and less predictable (Jacob & Akpan, 2015). Nonetheless, focusing on protest alone masks the panoply of tactics that activists and citizens use to continue their resistance. During the protracted digital sieges in Cameroon and Chad, those who were able to connect (including citizens using virtual private networks, or VPNs, and diaspora groups) brought international attention to the disruption using the hashtags #BringBackOurInternet (Cameroon) and #Maalla_Gatétou (Chad). Others joined transnational advocacy networks of human rights defenders, using their clout as a bullhorn to draw further attention (see Keck & Sikkink, 1998).[12]

In addition to heightened or sustained street protest, circumvention of shutdowns of selected services via VPNs,[13] and amplification through offline and online advocacy networks, legal experts have taken up litigation against shutdown orders at various levels, often in collaboration with regional or international civil society organizations. Legal challenges have been filed in national courts in Cameroon, Chad, Togo, Uganda, Zimbabwe, and Sudan. Although advocates often face administrative barriers and delays, the shutdown in Zimbabwe was declared illegal by the country's high court, potentially creating a new paradigm for legal action against disruptions (Dzirutwe, 2019).

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[12] Two notable civil society initiatives are the #KeepItOn coalition, led by Access Now, and multiple campaigns (including #BringBackOurInternet) by Internet Sans Frontières.

[13] For example, in Zimbabwe and Uganda, where exponential jumps in VPN searches occurred during social media disruptions and efforts to introduce social media taxes, respectively (Matiashe, 2019).
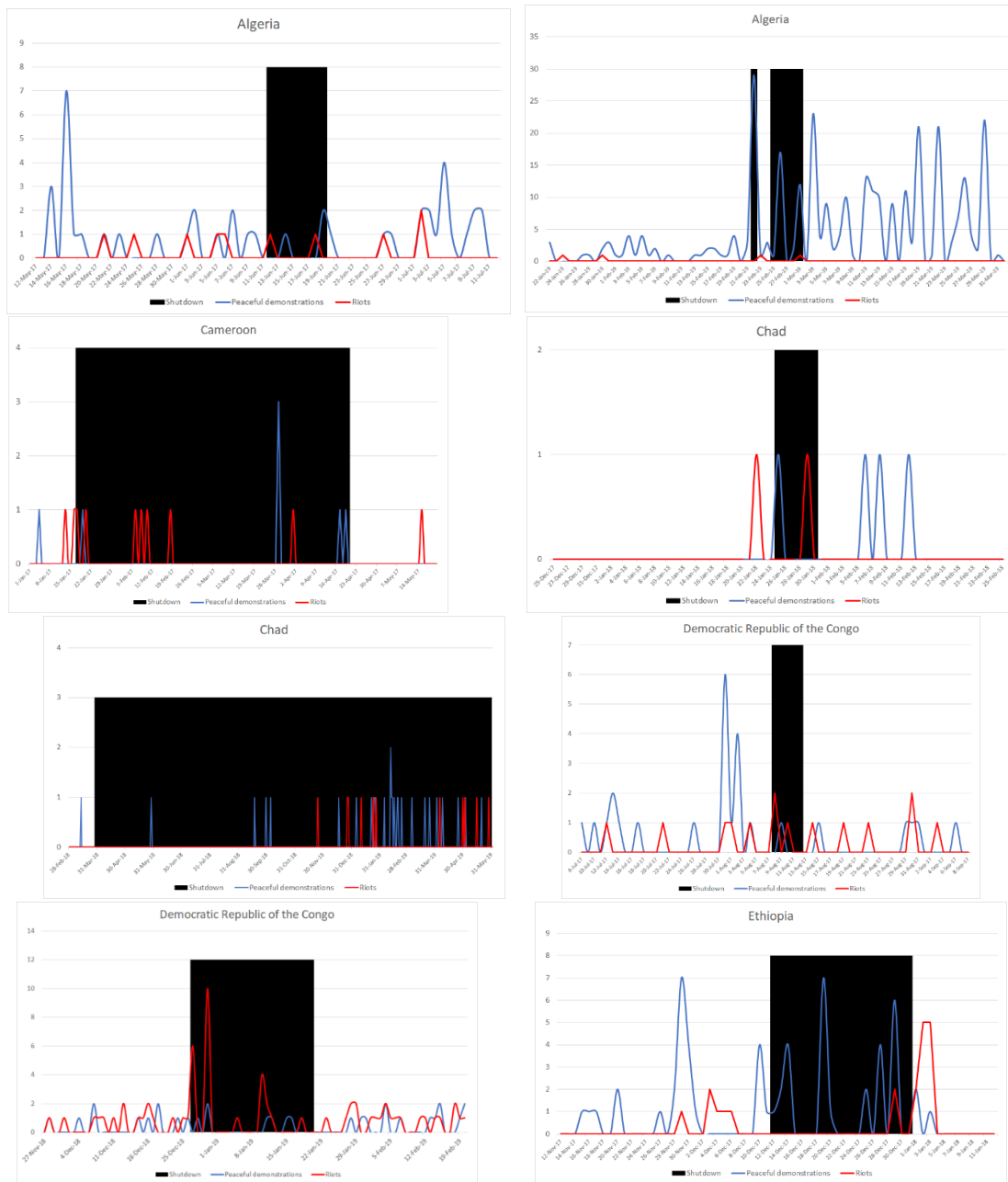
Figure 1. Peaceful demonstrations (blue) and violent riots (red) before, during, and after partial or full network shutdowns in selected countries (Algeria, Cameroon, Chad, Democratic Republic of the Congo, Ethiopia, Sudan). Shutdown periods marked in black are meant to illustrate shutdown duration and do not correspond to the numbers on the y-axis. Chad's social media shutdown was ongoing during data collection and article write-up. Source: ACLED (Raleigh et al., 2010).

The Role of Technological Penetration

One important background variable in evaluating the prominence of social media in collective action is the size of social media audiences. Activists, journalists, and regular people use social media to communicate, organize, frame, and shape their repertoires of contention, or broadcast to domestic or international audiences (Shirky, 2011). However, few analyses have considered the potential domestic reach of a message, which is directly related to the popularity of the medium through which it travels. For instance, although approximately 5% of Egyptians were Facebook users on the eve of the Arab Spring, Twitter's user base was 0.0001% of the population, casting doubt on its mobilizational capacity even among the elite (Gagliardone, Stremlau, & Aynekulu, 2019). It is the combination of different social media channels with more traditional methods of communication that create the "information relays" necessary to scale mobilization (Wilson & Dunn, 2011).

Social media penetration varies widely across Africa, but one trend is apparent: the dominance of Facebook. Figure 2 shows the share of social media users of different platforms in the countries that experienced network shutdowns between January 2017 and May 2019. Facebook commands more than half of the cumulative number of views in every country but Algeria and Zimbabwe, although it still maintains a 45% plurality in the latter.
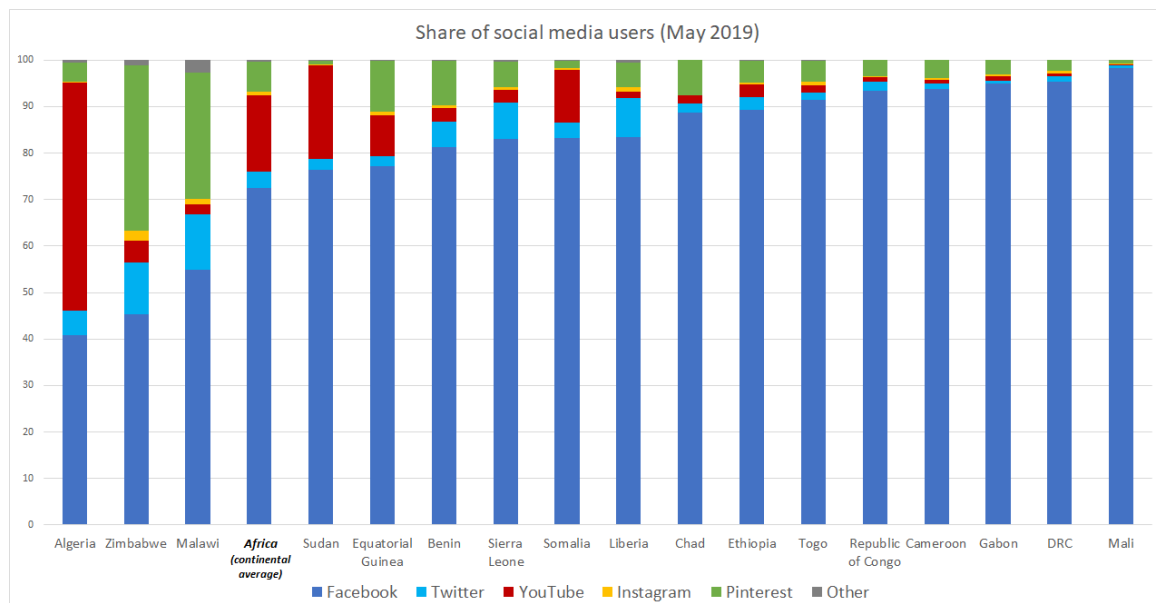

Figure 2. Share of social media user views in May 2019 in countries that experienced shutdowns (2017–2019). Continental average for Africa included. Messaging app WhatsApp not included. Source: StatCounter (2019).

Nevertheless, Facebook's penetration in a given country and its relationship with total Internet connectivity oscillate considerably (see Figure 3). These variations are embodied by Chad and Mali, which lie on opposite sides of the spectrum. Chad has the lowest penetration on both metrics of all 14 countries, its user base truncated by a prolonged social media shutdown that began in March 2018. Mali's Internet connectivity neared 70% in late 2018, but Facebook's penetration is lower than that of Somalia, one of the continent's least connected countries.

Figure 3. Internet and Facebook penetration (% of population): Countries with network shutdowns (2017-19)
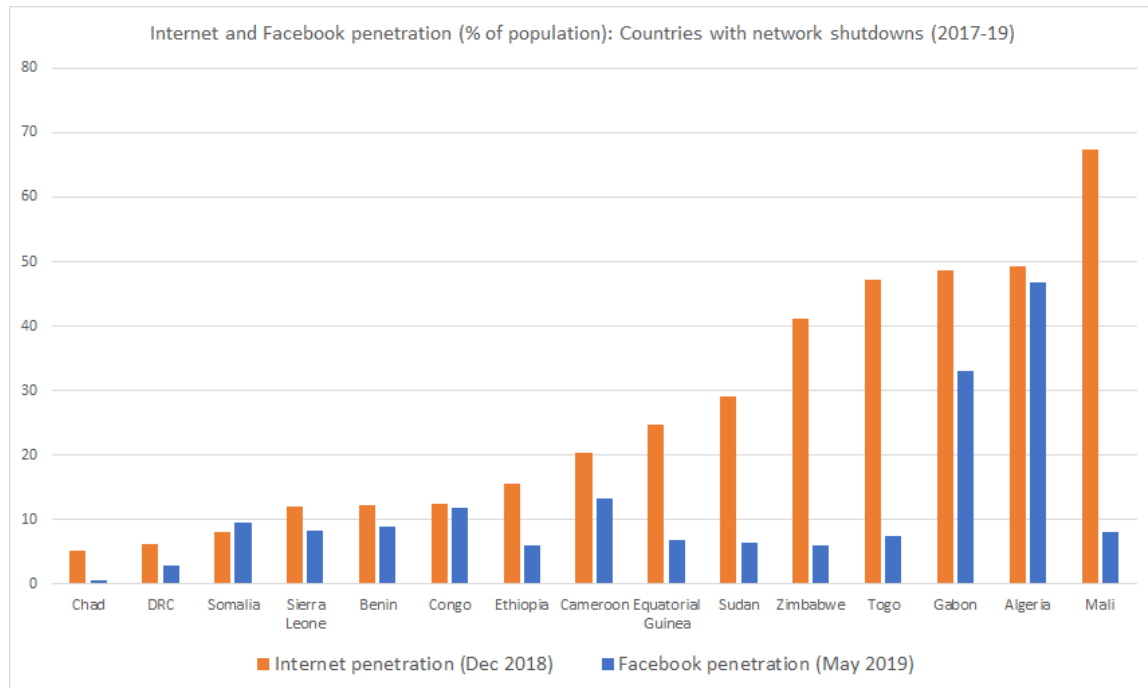
Figure 3. Internet and Facebook penetration for countries that have executed network shutdowns between 2017 and May 2019. Data as of December 2018 (Internet) and May 2019 (Facebook), except Algeria (September 2018 for Facebook). Source: Internet World Stats (n.d.)/International Telecommunications Union (2017) (Internet); Facebook ads platform (Facebook audience). Facebook data for Sudan from Internet World Stats (n.d.). Facebook audience data based on Potential Reach metric for ages 18—65+ and cross-validated with social media marketing and analytics platforms.

If networked protest is driven by access to social media and higher rates of access push leaders to cut off communication, the likeliest country for both a highly connected movement and further digital repression to arise is Gabon, particularly given the precedent set by the 2016 postelection protests. A similar prediction has already come to fruition in Algeria, which has the 12th highest proportion of Internet users in Africa and an almost equal number of those who use Facebook. In February 2019, the Bouteflika regime attempted ineffectually to disrupt connectivity around hotspots of mobilization after the onset of peaceful demonstrations (see Figure 1). In fact, both Algeria's "Smile Revolution" of 2019 and a previous series of protests two years earlier achieved some of their highest frequency of protest during a shutdown. The

peaceful resistance of Algeria's highly connected citizens eventually pushed the crippled Bouteflika regime out of power.[14]

Vignette: Sudan's Interrupted Spring

To illustrate some of these observations, we use the grassroots mobilization against the regime Omar al-Bashir in Sudan (December 2018–April 2019). Sudan is an illustrative case for several reasons. First, the 68-day social media shutdown in this period exemplifies both the short- and long-term dynamics of collective action under a shutdown, enabling us to trace a trajectory as a shutdown evolves into a digital siege. Second, the diversity of restrictive measures applied to date allows future researchers to compare the effects of disrupting social media with those of complete Internet shutdowns interacted with violence by security forces, providing a window for further analysis. Third, Sudan's Internet connectivity (27.8% as of December 2018) lies within 1 percentage point of the median for Africa as a whole (28.5%), and its Facebook penetration (6.1%) is within 5 percentage points of its continental counterpart (11.0%). The conclusions from an analysis of the Sudan case can provide variables that future comparative analysis can build on, for example, by juxtaposing administrative divisions with different protest outcomes within Sudan or comparing across states.

Since the Arab Spring, the "networked public" in Sudan has contended with a regime with complex ambitions for information control. The government has purchased surveillance software, trained and retained a "Cyber Jihad Unit" to monitor communications, and executed multiple network shutdowns in times of unrest (Lamoureaux & Sureau, 2019). Organized efforts to drive collective action online are set up with an awareness of the hostile technological environment whose foundations were set by the Bashir regime. This counterpublic, complemented by hackers and security researchers, builds on preexisting trust networks in offline organizations, amplifying the regime's perception of the Internet as an uncontrollable threat to its legitimacy (Lamoureaux & Sureau, 2019).

The seed of the 2018 movement—a hike in commodity prices—germinated from the northeastern city of Atbara to the rest of the country, including the capital, Khartoum. Demonstrators sought comprehensive economic reform, support from the military, and the resignation of Bashir, who had ruled Sudan since 1989 and dominated the legislature through the National Congress Party. Riots escalated on December 20, concentrated in state capitals and strategic cities, but not Khartoum, where hundreds of protesters were already marching peacefully, only to be violently dispersed by police forces. In the immediate aftermath, Sudanese authorities directed the country's ISPs to disrupt access to social media (NetBlocks, 2018). The primary ISPs—Zain-SDN, MTN, Sudatel, and Kanartel—selectively applied restrictions within their own networks (see Center for Applied Internet Data Analysis, 2018; Ranking Digital Rights, 2019). Ultimately, the partial shutdown remained in place until February 26, 2019, with another attempt to interrupt connectivity on April 11, the day Bashir was forced out of office in a military coup.

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[14] Circumstantial evidence suggests that shutdowns may have long-term effects on the social media user base of a country. A shutdown in Equatorial Guinea in November 2017 coincided with Facebook's user share plummeting from 85% to 20%, then further to 5% in mid-2018. It had only mostly recovered in May 2019 (StatCounter, 2019). This potential "connectivity fatigue" merits further research.

The technological effects of this prolonged disruption were significant. Sudan's fraction of worldwide Google Web search traffic dropped to 52% of its average levels and remained at a similar stratum until the end of February (see Figure 4). Use of social media shifted dramatically. Facebook's share of user views among social media platforms, which averaged 56.26% in the year prior to the shutdown, collapsed to less than 10.0% in January. These dynamics remained in place until the government released its stranglehold on social media (see Figure 5). Relative engagement with Facebook in Sudan returned to a level approximating its former average in March. On June 3, Sudanese paramilitaries executed a massacre of unarmed civilians in the second month of a sit-in urging an end to the military government; in the aftermath, the transitional authorities shut down Internet access entirely on a national level.
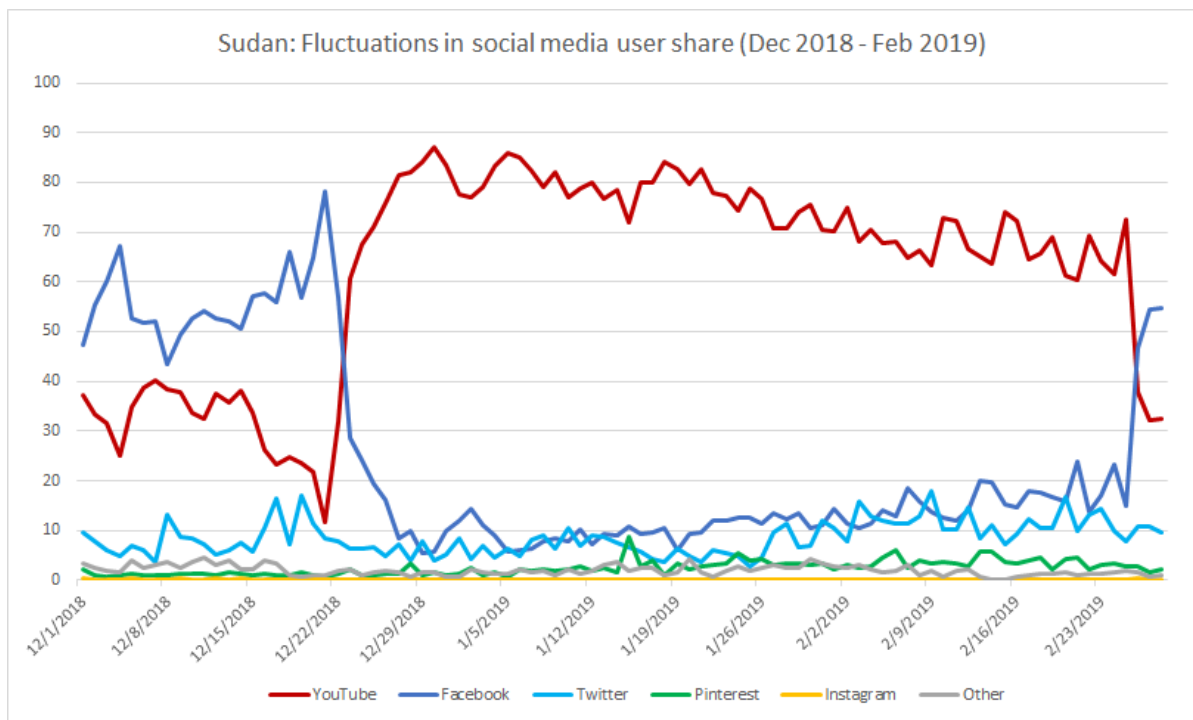

Figure 4. Fraction of worldwide traffic to and from Google products and services in Sudan between November 30, 2018, and June 23, 2019. Periods of network shutdown highlighted. Source: Google (2019).
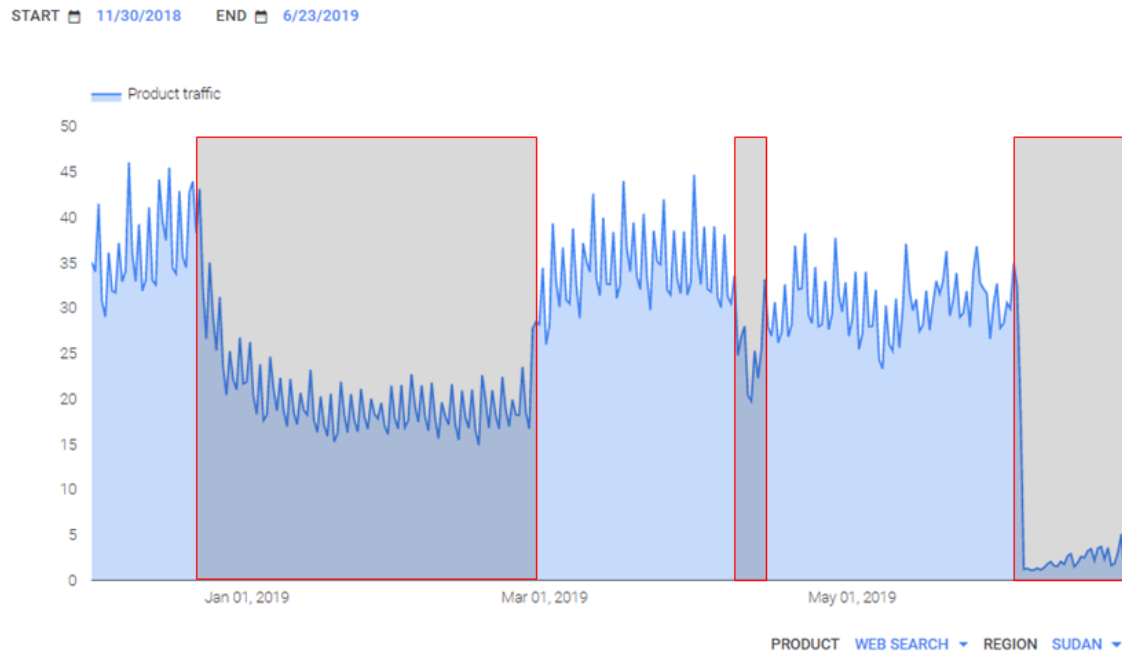
Figure 5. Fluctuations of page views (all devices) for all major social media platforms in Sudan, December 2018—February 2019. Source: StatCounter (2019).

The dynamics of the protests against the Bashir regime and subsequent military rule were unique in several ways (see Figure 6). After an ephemeral surge of violent riots—decentralized and distant from the administrative center of the country—demonstrators rapidly adopted their primary strategy: peaceful, coordinated mobilization that became increasingly concentrated in the capital. Social media were disrupted almost immediately after the movement began in a preemptive effort to stymie protesters' efforts at coordination and recruitment. Indeed, in Khartoum, a portion of the protests was coordinated by a structured group with a history of diverse advocacy, the Sudanese Professionals Association.

The Sudanese Professionals Association, a collective of 17 unions from across the professional spectrum, had previously formed the connective tissue for welfare campaigns thanks to disciplined collective action with broad appeal. The Sudanese regime considered the interaction of organized actors opposed to the government with technology conducive to the accumulation of demonstrators in the streets. Regime spokespersons subsequently attempted to justify the crackdown on social media and news outlets by claiming that political parties and organized infiltrators had attempted to turn the peaceful movement toward calls for violence and regime change.
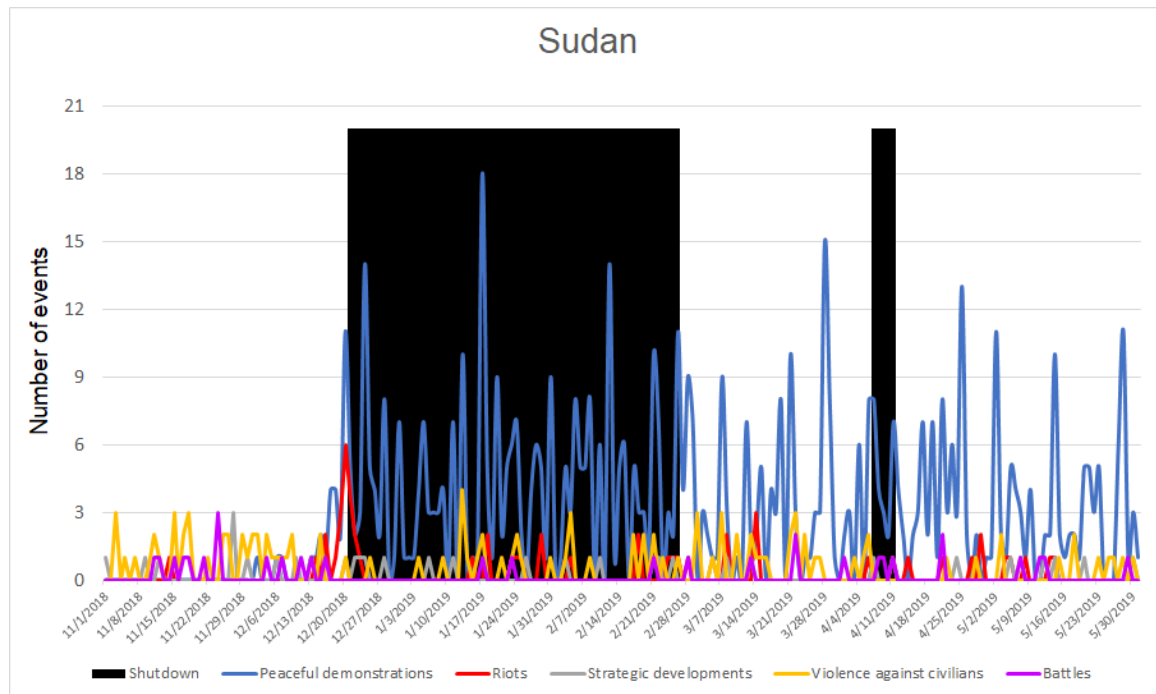
Figure 6. Number of conflict events in Sudan (November 1, 2018—May 31, 2019). Also shown are violence against civilians (yellow), battles (magenta), and strategic developments (gray). Shutdown period marked for illustrative purposes only and does not correspond to y-axis.

The Sudanese Professionals Association and other activists used numerous social media accounts to promote their cause, ultimately converging on the hashtags مدن_السودان_تنتفض# (#Sudan_cities_revolt) and تسقط_بس# (#just_fall). For audiences outside the country, Sudanese civil rights groups supported the hashtags #SudanUprising, #IAmTheSudanRevolution, and #BlueForSudan. Domestically, although many social media users were affected by the social media disruption, activists circumvented it via VPNs and continued to project their message of peaceful resistance through various channels, increasingly targeting the world outside Sudan (Saba & Eltahir, 2019). Internationally, images of protesters created narratives that helped drive foreign media coverage and perpetuate the English-language hashtags, highlighting the prominent role of women in the uprising (Hassan & Kodouda, 2019).

However, shutting down social media did not extinguish peaceful demonstrations in Sudan. Instead, they correlated with a near-disappearance of violence on the part of Sudanese citizens who had filled the streets. The prevalence of nonviolent resistance against a background of partially severed communication channels appears to run counter to the trends identified in India, where shutdowns tended to be followed by escalations in violence (Rydzak, 2019). This signals the diversity of collective action responses to disrupted information spaces as well as the importance of considering factors specific to the country and environment in which events occur, including the characteristics of collective action, the structural underpinnings and strategy of movements, social relations, and socioeconomic variables.

Although the number of protests fluctuated significantly in late December, these fluctuations exhibited similar patterns to the mobilization that took place in March and April—two months that were largely free of large-scale technological restrictions. These dynamics consistently involved a surge in peaceful demonstrations followed by two or three days of cooling and resource mobilization. In fact, ACLED data reveal that only 18 of the 113 days between the beginning and end of the uprising against Bashir witnessed no mass protest activity of any kind. Furthermore, three of the four largest spurts in demonstrations (December 24, January 17, and February 12) occurred in a disrupted communication environment.

Although the demonstrations on all three days mentioned above were geographically scattered across Sudan, the months-long social media disruption also failed to halt another trend: the gradual centralization of protest in Khartoum. Over the course of four months, the proportion of events recorded in the capital increased from 11.0% in December to 30.5% in March, proceeding at the same pace in both the disrupted and nondisrupted digital environment. At first glance, this might contradict Hassanpour's (2017) dispersion hypothesis, according to which certain conditions can cause large-scale disruptions of digital media to decentralize collective action. However, the political circumstances and levels of connectivity in Sudan in 2019 were distinct from those of Egypt and Syria. Moreover, Hassanpour tested the hypothesis on a more granular spatial level, using a shorter window of time to identify the dynamics of decentralization. It is possible that, with prolonged disruptions and disciplined civil society in the vanguard, protests recentralize around the nexus of power as demonstrators opt for more traditional ways of connecting, circumventing disruptions with VPNs when possible. Whether or not a causal relationship exists between network shutdowns and concentration or levels of protest, the least that can be observed is that these dynamics of accretion in Sudan continued apace in the long run.

Conclusions and Further Research

Network shutdowns trigger a series of cascading, often unpredictable effects on human rights (Rydzak, 2018; S. K. & Lakshané, 2018) and economic development (Centre for Intellectual Property and Information Technology Law, 2018; Deloitte, 2016), but also on protest movements themselves and the power structures they defy. In this article, we have outlined some of the regional dynamics of shutdowns in Africa and the ways in which societies respond to them. Our findings indicate a need to update the theory of connective action (Bennett & Segerberg, 2013) with two key conclusions drawn from its mirror image— disconnective action. First, the original theory develops its propositions primarily around modern, postindustrial democracies with extensive access to digital networks that are rarely disrupted in deliberate political maneuvers. Thus, it does not fully account for a universe of authoritarian practices and thus understates societal responses to technological repression. The paradigm of disconnective action, in which individual and collective reactions take place in a setting with partially or fully severed lines of communication, helps to fill this gap and account for new repressive measures that have emerged and proliferated since the Arab Spring. Across the cases we have described, although the impact of such information vacuums on collective action fluctuates significantly, the evidence suggests that the "effectiveness" of shutdowns is questionable at best, that shutdowns are frequently followed by an escalation in the momentum of preexisting protest, and that activists and citizens use a combination of strategies to continue mobilizing.

Second, our findings can enrich the framework of connective action by enabling more precise organizational analyses, taking into account the mix of structures supporting protest movements as well as the varying degrees and modalities of use of digital networks. Empirical observation of network shutdown across time and space indicates that organizationally enabled connective action—a hybrid form between pure self-organizing connective action and conventional, organizationally brokered collective action—can be critical when access to communication networks is disrupted. Strong organizational structures—such as Sudan's Sudanese Professionals Association—become the load-bearing beam that can enforce order and discipline in protest movements when communication is cut, which in turn prevents them from devolving into chaos and violence. Such organizations are aware of affordances such as varying connectivity and access to social media, providing them with a macro-level view of how such resources can bolster the movement without becoming its primary connective fabric (and thus a liability). The months-long demonstrations against the Bashir regime in Sudan, as presented in this study, provide a use case for further theory-building. The interactive effects of organizational strength, formal coordination, differential levels of connectivity, and social media penetration are critical to explore as the connective action paradigm expands into societal responses to restrictions on technology and physical protest in parallel. This study underscores the importance of such variables in developing further research on technologically enabled collective action.

The implications of massive disruptions to communication deserve more scholarly attention. With this exploratory study, we hope to pave the way for more empirically grounded research that will pursue one or more strands of our analysis through statistical analysis and comprehensive qualitative work, building on (and accounting for the shortcomings of) the more panoramic approach presented here. Developing this research agenda will bridge various fields and define a new perimeter within them all.

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