A TOTAL ECLIPSE OF THE NET:

THE DYNAMICS OF NETWORK SHUTDOWNS AND COLLECTIVE ACTION RESPONSES

by

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As members of the Dissertation Committee, we certify that we have read the dissertation prepared by ***Jan Andrzej Rydzak***, titled ***A Total Eclipse of the Net: The Dynamics of Network Shutdowns and Collective Action Responses*** and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

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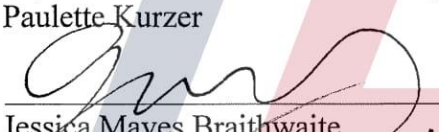

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SIGNED: Jan Andrzej Rydzak

Acknowledgments

Just before finishing this dissertation, I read a book by an elderly Polish man who, at 67, became the first person to kayak across the Atlantic – at its widest point, no less. The vast, borderless ocean was liberating, he said, but the journey was agonizing at times, with colossal waves, scorching sunlight, and an equipment failure that left him incommunicado for months. The journey was slow: with no sail and no oars, he relied exclusively on his forearms to paddle through the squalls and the currents and the sharks. While the quest for the PhD is free from those threats to bodily integrity, it resembles paddling through the ocean in more ways than one. Friendly winds are always helpful, as they certainly were for me. But they can only push a hapless researcher so far in his or her resolve to push on; the rest is the thought of those who were there at the start of the journey, those at the end of it, and those encountered along the way. How to condense six years of elation and dejection, community and isolation, confidence and self-doubt, into a few pages celebrating those who helped you survive such an expedition?

In 2014, when I stumbled upon the seed that grew into this dissertation, my professors and colleagues had reason for skepticism. Technology was not our institutional focus, and there had only been a handful of high-impact network shutdowns in the world. I am grateful to all of the faculty members who believed in me and in this research agenda enough to help me contribute to our collective knowledge about it. The members of my dissertation committee – Paulette Kurzer, Alex Braithwaite, Jess Maves Braithwaite, and Jen Cyr – displayed extraordinary patience with me as I navigated the waters of an emerging phenomenon, and helped steer me to the right anchor points in the social sciences. Paulette and Alex graciously offered joint advisorship at a critical moment, helping to balance the various currents running through the dissertation and returning to me with feedback at superhuman speed despite having plenty on their plates. I am also grateful to Pat Willerton for the friendship and energy with which he has imbued me and many others. The mental image of his open door symbolizes what he stands for to me – openness, curiosity, and eagerness to listen to one's stories. Nancy Sharkey graciously welcomed me to the Journalism minor, where all my professors infused me with imagination. David Cuillier, besides representing the J-School on my comps committee, gave me one of the most heartwarming moments in grad school after my lecture in his course. I am also eternally grateful to the SGPP staff and everyone at International Student Services for doing what they do exceptionally well – something which, especially when dealing with me, was sometimes an utterly thankless job. Pat Rhyner in particular has been my dear friend from the beginning, and has been a pillar of support in countless ways, countless times.

Much of this dissertation materialized thanks to the direct or indirect engagement of other colleagues, and the inspiration I drew from them. Jackie Kerr and Patricia Vargas-León have been stalwarts of support for several years now. The organizers and participants of the conferences I've frequented provided vital insight throughout the writing process. Among the explorers of similar

topics, I am intellectually indebted to many whose imprint is present in this manuscript, including (but certainly not limited to) Jason Abbott, Derrick Cogburn, Lisa Garbe, Rongbin Han, Navid Hassanpour, Adam Hoffman, Maryam Humayun, Amy Johnson, Philipp Lutscher, Maria Repnikova, Kris Ruijgrok, Zeynep Tufekci, Ari Waldman, and Joss Wright. Several colleagues offered to help with the chapter on India, including Ashutosh Kumar, Anne Leiser, and Sanjog Sahu. The organizers and participants of the 2016 Oxford Internet Institute Summer Doctoral Programme were enormously inspiring, and I could not list one without listing them all; however, Vicki Nash went beyond the call of duty both on a personal and organizational level, and I will never forget that. With his 2011 study, Phil Howard laid the groundwork for my first piece – and, by extension, the other two. Larry Diamond and Eileen Donahoe gave me the final, most important kick I needed to finish the dissertation, and I am excitedly looking forward to working with them at the Global Digital Policy Incubator. Barbara Hlibowicka-Węglarz, my intellectual and personal role model, was ever-present in my mind throughout these years. Several of those listed above form a small circle of researchers tackling shutdowns; I hope this dissertation convinces them that it's worth it.

The team representing the Global Network Initiative – Judith Lichtenberg, Rocío Campos, Kath Cummins, Jason Pielemeier, Chris Sheehy, and David Sullivan – enabled one of the most fascinating and gratifying experiences of my professional life through the Google Policy Fellowship. This experience not only launched me into the heart of the digital rights community, but also allowed me to bring my research to the public through a report on human rights and shutdowns. Most importantly, the GNI team showed me how hard work can mix seamlessly with the spirit of collaboration and friendship. Among human rights defenders, powerful voices have risen to call attention to shutdowns, many of which occur in their own countries. While they are too many to enumerate, all of them conduct impressive work that provided me with the fuel to persist. Natalia Szczucka at the European Commission gave me one of the best examples of leadership I have seen so far. A highly effective boss, colleague, and affectionate friend rolled into one, she is living proof that hierarchies need not be rigid and that the best work flows from engaging everyone in the team with the same level of respect. My colleagues at the EC – Malwina Gałęzowska-Raźny, Dagna Lewandowska, Kasia Sumisławska, Rafał Szyndlauer, and Magda Żelazny-Stokłosa – were a wonderfully inspiring team; I was lucky to work with them all.

Two associations have been my lifelines in Tucson. In September 2012, I joined the International Student Association, and that decision unlocked some of the closest and most rewarding friendships I have made to date. ISA quickly turned into a labor of love whose goal was to expand students' cultural horizons, expose them to Arizona's unique environment, and build bridges between American and foreign students on campus. Our outings didn't just save us all from the ironic fate of suffering Vitamin D deficiency in Arizona; they were a chance to meet the world. The energy radiating through each gathering continues to circulate in me and motivate my work. The members of ISA who most defined my path know who they are – it's something I've expressed (and, in one case, sang) to them many a time. The other group is the Lajkonik Polish Dance Ensemble. A

collective of wool-clad devotees of Slavic mountain dances is probably not the first thing you'd expect to see (let alone join) in the Sonoran Desert. Yet through years of antics onstage and off, Lajkonik has become a home and source of support like no other, and it was poignant that my very last Tucson experience was away from the Old Pueblo, but with them. Although I'm grateful to every one of them, I must single out Joanna Schmit, Matthew Schmit, and Amy Robertson for forging order out of chaos and pulling everyone together. They have the unique ability to be present whenever a member of the group needs support or reaches a milestone, despite having active and highly engaged lives of their own. Thanks to their efforts, Lajkonik is not just a group of Pole dancers; it is a family.

One of the most gratifying experiences in such a long road is seeing one's students turn into friends and co-conspirators, and watch as they scale the mountains of adulthood to achieve their goals in life. One terrible trio merits special distinction: Sophie Jones, Colin Pedron, and Laura Peñalver. Rarely have I met students with whom I've connected so thoroughly and who have displayed such an ideal blend of openness, curiosity, and a dash of madness. I am proud to have them as friends. Their creativity, energy, and intelligence will help them thrive in any environment, on whatever continent, before and after the purely hypothetical apocalypse.

My final two years of graduate school were shared every day with my roommates and friends, Martin Formánek and Keith Jones. I could not have asked for a better duo. We synchronized flawlessly, exchanged reflections deep and shallow, and always had something to tell one another about the latest buzz in the world of science. (I only escaped once they started writing equations on the board.) Martin and I had known each other for a while, but after two years of cohabitation, mutual support, venting sessions, and spontaneous animal rescues, I know that I now have two great friends for life. (It is also only fair that we should split the Nobel when either of them inevitably wins it, in the name of vicarious inspiration.) José García was the first person I ever *didn't* meet in Tucson – and his wonderful Mom, Lourdes, was the first person I *did* meet. From the first *Dzień dobry Jan*, I knew I was dealing with somebody who was incredibly open and welcoming – a fact that only became more apparent through time. José is a unique person born into a unique family, and all of them have the effortless ability to make others feel at home. Shemal Shroff was and is a brother in arms like no other, from the moment we unfurled the flag of Arizona to welcome the Sun at Gates Pass, through every heart-to-heart conversation in the late-night blackness, to reflections on evergreen friendship in my homeland. Many of my fellow grad students were also there along the way as friends, and I hope I manage(d) to lift them up as much as they have me. Roman Nikolaev went out of his way many times to meet with me, sharing true friendship and inspiring stories of round-the-world galumphings. I'm also especially thankful to Emily Bell, Paul Bezerra, Cristina Chenal, Cheryl Ellenwood, Megan Hauser, Sangmi Jeong, Nicolás Liendo, Fío López-Jiménez, Tomás Olivier, Nick Thorne, Ariel Wohl, and Huan Zhang. Many of my friends back home cheered me on despite likely coming to the conclusion that I was hiding in the Bahamas. Artur Bulak, Ania Cizel, Ika Dykowska, Dorotka Elmy, Ula Juran, Chia Luen Lee, Joe Lyss, Lino Matos, Kasia Olejnik,

Milenka Popielarz, Monika Szablińska, Eda Targońska, and Paulina Tuczapska were all lighthouses of friendship, silently guiding my progress at different moments simply by virtue of being there. So, too, were my brothers, Stas Filatov and Tudor Costea, and the Mirossay-Thibault family, whose warmth and kindness set both a course and a destination for my life long ago – and continues to do so today. I will thank them, and others who infused me with hope from afar, in person.

I have a place forever carved out in my heart for Debbie Schmidt, Jan-Torge Schindler, and Andri Taruna – a collective known as the Fabulous Four. The instant bond that formed when we first met worked like Gorilla Glue without the noxious side effects. Every step, every mile driven, every bout of uncontrolled laughter, and every exchange of reflections has felt like the beginning of a new adventure. Whole chapters could not cover the breadth and weight of our memories together, and such chapters would probably devolve at some point into a library of babble filled with nonsense humor about *Lord of the Rings* characters. Debbie, fearless huntress of nebulae, shared my unhealthy obsession with exploring the unexplored, finding wonder in dilapidated ruins, and embracing ideas and excursions most people would have found insane. Her compassion and humility know no bounds. JT, stargazer extraordinaire, has been a beacon of friendship and support; his serene positivity inspired me every time we caught up on the trials and tribulations of life and graduate school. Andri brought his charm and curiosity everywhere, infecting all those around him with his laugh and fun-loving spirit. As I write these words, six years to the day have passed since we met, and I am very grateful for his friendship. All three of them are at the end of their own PhD journeys, and it is fitting that we should finish together what we started together. All three have star-strewn futures replete with good deeds and fulfillment. All three awakened in me the joy of being alive.

Everything begins and ends with family. For six years, most of mine has been an ocean away, rooting for me every day, petrified by my lows and electrified by my highs. I am who I am thanks to my Mom. Every next step I take on the road, every new word of every new language, and every approach to treating other human beings in my life can be traced back to her. I can only strive to replicate the aura she extends to everyone who interacts with her. My sister Maria and her husband Alex have been incredibly supportive, and I love them more than I should ever express in person. (They must not find this manuscript.) Maciek Chojnowski, the Greatest Of All Time and my brother from now until forever, welcomed the Grand Canyon State into his heart and proved that distance and time are meaningless when bonds are unbreakable. And finally, one person has brightened my road, mind, and spirit unflinchingly every step of the way. Her patience is extraordinary, her love boundless and effervescent, her charm irresistible, and her quiet energy gives me strength to fight for better and better days. Hoa, without you, none of this would exist, and my journey across the Atlantic would have been a much less colorful, directionless drift.

Dedication

To my Nana, Anna Maria Grossman,
for filling my life with warmth, curiosity, and wanderlust,
and to Hoa,
for being my beacon of serenity and love
and for the daily reminder that I was "almost there"
until I finally got there.

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Abstract

At what juncture do governments begin or cease to overtly interfere with digital networks? Does large-scale suppression of communication technology affect traditional collective action in the streets? This dissertation first explores the conditions under which states face and resolve the *dictator's dilemma* (Kedzie 1997) – a conundrum in which allowing for the development of communication technology and stifling it may both enable collective action and exert pernicious effects on the government's ability to stay in power. I then proceed to investigate the effects of network shutdowns – deliberate, large-scale blackouts of digital communication – on collective action, building on established theoretical work on resource mobilization and the repression-dissent nexus.

In the first empirical chapter, I find that, between 1995 and 2011, the pace of expansion of Internet access – but not cell phone penetration – was a strong predictor of the frequency of government-initiated interference in telecommunications. However, these dynamics are not linear: at an annual pace of expansion of approximately 7 percent, interventions into digital content peak and begin to decline. In this period, governments that presided over very rapid expansion of communication networks appeared to refrain from visibly interfering with digital information flows. I describe the tipping point in this uneven trajectory as a *digital threshold*. The study also reveals that restrictions to digital communication in the period leading up to the Arab Spring do not seem to be related to government propensity to repress the population physically, but are positively related to other limitations to free expression.

Egypt's government created a critical juncture during the Arab Spring in the first complete Internet shutdown aimed at suppressing protest. After 2011, the use of network shutdowns as a means of controlling collective action spread rapidly, transforming into a form of digital repression with a wide impact radius. In the second empirical chapter, I advance the narrative of digital repression into the period between the Arab Spring and 2016 through a detailed, daily-level study of network shutdowns and collective action. During a network shutdown, a key socio-organizational resource is abruptly withdrawn, creating a low-information

environment where collective action takes on distinct trajectories. The study focuses on the temporal dynamics of disconnected protest, acknowledging that new, blanket forms of repression may produce different dynamics of collective action in the short and long term. Using a global sample, I demonstrate that network shutdowns are linked to a surge of protest in the short run, but maintaining the blackout beyond the first week leads to a *digital siege*, which is associated with lower rates of protest. This dual finding contrasts with established scholarship on the 'repression-dissent nexus,' which generally agrees that continued repression brings bout a temporary decline in protests followed by a re-emergence in the long run. In this way, *disconnective action* is qualitatively different from its traditional counterpart, which benefits from the affordances of communication technology to build momentum as *connective action* (Bennett & Segerberg 2013).

In the third empirical chpater, I pursue these dynamics further by conducting a subnational, quantitative study of India. In addition to a diverse array of collective action endeavors and high incidence of protest, India registers the highest number of shutdowns of any country, with approximately 230 events between 2012 and mid-2018 (SFLC 2018). Where Chapter 3 focused on temporality, here I turn my attention to the strategy and structure of disconnective action. I use daily event data, disaggregated by state, to demonstrate that violent mobilization increases in frequency during a blackout and that protesters may execute a tactical shift to non-violent methods only when blackouts are paired with state violence. At the same time, shutdowns disrupt the typical growth trajectory of non-violent protest, which is affected by the information vacuum. Furthermore, when collective action is broken down according to its primary organizing actors, shutdowns appear to have a disruptive, yet inconsistent effect, both on collective action organized by structured actors and more loosely organized, 'leaderless' protest.

Both in India and in other parts of the world, shutdowns enable more uncertain and chaotic interaction between security forces and demonstrators, compounded by considerable socioeconomic costs. As a whole, this dissertation demonstrates how established theories of interactions between repression and dissent can be extended to new repressive phenomena, and how these phenomena resonate in collective action in the streets.

Chapter 1

Introduction

"What is your name?"

"Blind people do not need a name, I am my voice, nothing else matters."

– José Saramago, *Blindness*

The uprisings that spread across the Middle East and North Africa in 2011 were broadcast instantaneously and in real time to social media feeds across the world. Media outlets from television to radio relayed scenes of joy and horror from Cairo's Tahrir Square, recorded by one-person film crews whose only equipment was a mobile phone. When Hosni Mubarak, Egypt's long-time dictator, made history by severing the country's access to the Internet completely, makeshift communication channels were hastily deployed by activists within and outside Egypt to assure observers that mass protest continued unabated. The brutal death of Libyan strongman Muammar Gaddafi was also captured on video by rebel fighters and disseminated on social media before reports of his death surfaced in traditional outlets. The downfall of four dictatorships in the space of ten months – in Tunisia, Egypt, Libya, and Yemen – was quickly linked to the prolific use of social media and other communication technologies in the course of organizing and sustaining protest in all four contexts. Social movements worldwide expressed elation at the prospects that ground-level digital communication opened for a "new public sphere": increasing government accountability, safeguarding human rights, simplifying saturated bureaucracies, improving decision-making mechanisms, and spearheading collective action (Castells 2015). Numerous scholars responded in line with the enthusiasm of digital activists, identifying new means of communication as *liberation technologies* while occasionally warning that governments could eventually adopt heavy restrictions to thwart the

democratizing potential of these technologies (Diamond & Plattner 2012, Howard & Hussain 2013).

Seven years after the Arab Spring, the prevailing focus of analysis has shifted dramatically. By the latter part of the decade, the *Journal of Democracy*, where the seeds were sown for the liberation technology paradigm (Diamond 2010), was publishing pieces with titles such as "Can Democracy Survive the Internet?" (Persily 2017). The disappointing long-term outcomes of the Arab uprisings and the emergence of countervailing forces – cyberespionage, state-sponsored hacking, macro-scale surveillance projects – have led analysts to acknowledge that they had been overly optimistic about the effectiveness of *connective action* (Bennett & Segerberg 2013). Digital communication appears to have no universally empowering or universally crippling effect on collective undertakings, and their importance may be contingent on circumstances that emerge in each country. While this has tempered levels of confidence among both activists and scholars, it has also woken repressive governments up to the realization that the free flow of information can be an existential threat to their survival. Governments in Russia, Iran, and especially China have pursued national security strategies with the aim of creating a walled-off Internet that follows Westphalian ideals of state sovereignty and robust national borders. Transnational flows of surveillance software have increased the capacity of repressive regimes to track citizens, dissidents, and civil society actors (Marczak et al. 2017). The Islamic State and other terrorist groups have used encrypted communication and disseminated high-quality propaganda videos via social media to recruit thousands into their ranks. And governments in more than 40 countries have executed complete digital communication blackouts on more than 200 occasions, primarily in an effort to stifle collective action. This dissertation addresses this last emerging trend.

Three strands have recently dominated the discussion on the pernicious sociopolitical impact of communication technology, eclipsing the narrative of liberation technology. First, the sociopolitical effects of digital communication – and social media in particular – are not universally positive. Threats to privacy, disinformation, and misinformation have dominated this strand, particularly in the aftermath of the 2016 elections in the U.S. and the Brexit

campaign (Tucker et al. 2018, Howard & Bradshaw 2017, Bennett & Livingston 2018). A research agenda is forming around the political effects of false news and other agents of online information wars. Researchers have called attention to the cheapening of social movements via slacktivism, or low-engagement political activity via digital channels, and the low effectiveness of 'weak ties' in driving collective action within a networked structure (Tufekci 2017, Diani 2013). The second strand focuses on government censorship, whether via filtering, surveillance, legal mechanisms, or wholesale blocking. Though abundant evidence has been produced on the dynamics of this process in individual countries (e.g., King et al. 2017, Bergren & Bailard 2017, Rahimi 2011), the sociopolitical effects of these methods of information control are rarely tackled, and the interactions between methods of control and methods of resistance are only beginning to be revealed. Finally, a third strand, heavily investigated by the intelligence and international security communities, analyzes the use of technology by terror groups and militant actors (Klausen 2015). Militants routinely take advantage of the affordances of communication technology to support their 'dark networks' (Raab & Milward 2003), often distorting but mirroring the ways technology is used in social movements. All three strands have generated more work in communication studies, information science, sociology, and (arguably) computer science than in political science.

Does widespread access to the Internet, social media, and affordable mobile phones enable or detract from collective action? While this question has given rise to much research (Pierskalla & Hollenbach 2013, Valenzuela 2013, Shapiro & Weidmann 2015, Joseph & Poznansky 2018), this dissertation turns away from the mere presence of new technologies as instigators of collective action and toward communication blackouts as socially and technologically disruptive events that can be placed in time and space. This approach enables us to better identify the sociopolitical effects of technology in different settings by observing what happens when access to it is spontaneously withdrawn. Grievances are generated not only by precarious socioeconomic conditions or other environmental factors, but also by specific incidents that (re)channel the rage of ordinary citizens; here, disruptions to connectivity are framed as such incidents. With a dual focus on the technologies of repression and the mobilization they aim to

suppress (but may instead invigorate), this dissertation sits at the confluence of the first two strands mentioned above. In the chapters that follow, I simultaneously pursue the utility of technologies for collective action and repression using the unconventional setting of information vacuums.

The section below discusses the theoretical construct that lies at the root of the dissertation – the collective action problem (Olson 1965). I briefly present the original problem and the primary school of thought on protest as a realization of collective action on which I draw (resource mobilization), outline existing work on the nexus between repression and dissent, and finally highlight the ways in which communication technology has been found to moderate and respond to the collective action problem. In each section, I also point out the dissertation's contributions to scholarship on the subject. **Table 1.1** summarizes some of the key research foci that inform the chapters to follow and briefly describes the ways in which communication technology fits into them.

Table 1.1 Summary of research foci underlying the dissertation and existing links to scholarship on technology and collective action.

Research focus	*Main findings*	*Contributions of technology*
Collective action problem *E.g.,* Olson 1965	Rational individuals have no incentive to pursue collective goals that might differ from their own except in certain unique circumstances. Large groups weaken collective action, primarily due to increased organizational costs and fragmentation of interests.	*Connective action* can overcome the collective action problem through looser organizational control and personalized identity-building. Large groups can be recruited due to reduced organizational costs. Connective action may also accelerate existing processes of political participation in addition to creating new ones. *E.g.,* Bennett & Segerberg 2013, Tufekci & Wilson 2012, Lupia & Sin 2003, Howard & Hussain 2013
Collective identity and collective action *E.g.,* Klandermans et al. 2002, Polletta & Jasper 2001	The formation of a collective identity is critical to the success of collective action.	Technology can assist in rapidly assembling crowds into collective action without prior collective identity-building. The formation of a cohesive collective identity can follow the main thrust of collective action rather than precede it. *E.g.,* Anduiza et al. 2014
Information cascades and network effects in collective action *E.g.,* Lohmann 1994, McAdam 1986	Strong ties built on trust and pre-existing social groupings persuade people to join collective action more effectively than weak ties.	Communication technology allows peripheral members of collective action efforts to play important messenger roles in the process via information sharing, which greatly increases reach via repeated exposure. Weak ties thus play at least some part in connective action, but the exact mix of strong and weak ties needed to achieve success is still in question. *E.g.,* González-Bailón et al. 2011, Barberá et al. 2015, Hassanpour 2017
Grievance *E.g.,* Gurr 1970	Mobilization is the result of accumulated socioeconomic grievances and relative deprivation; all groups theoretically have similar chances of success at the outset.	Communication technology creates new outlets for the expression of grievance and awareness raising. It is not merely a conduit, but a resource in itself. Its effects may be especially pronounced in closed information societies (e.g., authoritarian regimes) because it creates opportunities for expression and knowledge acquisition that are otherwise lacking. *E.g.,* Shirky 2008, Diamond & Plattner 2012, Warren 2015
Resource mobilization *E.g.,* McCarthy & Zald 1977, Kuran 1995, Tilly 1978	Collective action is more successful when participants command the appropriate kind and volume of resources, which can be financial, information, relational, or organizational. Information about both sides'	The mobilization of informational and socio-organizational resources is made significantly easier through communication technology. Social media in particular leverage information such as protest locations, logistics, and magnitudes to affect perceptions of success.
Repression-dissent nexus *E.g.,* Lichbach 1987, Moore 2000, Mason & Krane 1989	A circular relationship exists between repression and dissent. While dissent usually brings about some form of repression, the effects of repression on dissent are extremely heterogeneous and controversial. Repression of non-violent dissent often backfires.	Governments must decide whether to crack down on communication and when to do so; both choices can lead to collective action and other unexpected repercussions. Studies have not investigated the location of the tipping point. Real-life protest may be affected by digital repression, but studies haven't thoroughly explored these collective action responses. *E.g.,* Kedzie 1997, Gohdes 2015
Temporality and collective action *E.g.,* Rasler 1996, Francisco 1995	Repression may reduce dissent in the short run but encourage it in the long run, particularly when it is indiscriminate or extreme.	Connected movements may atrophy over time when the underlying organizational structures are weak, but the short- and long-term effects of repression (digital or traditional) on such movements are poorly understood. *E.g.,* Tufekci 2017
Strategy and collective action *E.g.,* Chenoweth & Stephan 2011, Carey 2010, Lichbach 1987, Moore 1998, Sullivan 2016	The intensity of physical repression against non-violent protest is lower than against violent protest. Sequencing matters: an increase in repression of non-violence may encourage a switch to violent tactics and vice-versa, though this is not fully supported empirically. Choice of strategy beyond the violence binary is still poorly understood.	Findings on the mixed use of technology and protest strategies on the ground are not consistent. Technology has not yet been strongly linked to either violence or non-violence. *E.g.,* Tufekci & Wilson 2012, Bohdanova 2014, Metzger & Tucker 2017
Structure and collective action *E.g.,* Pearlman 2012, Sutton et al. 2014	Organizational capacity matters. Highly organized collective is more likely to succeed and more impervious to repression. Different categories of actors have different tipping points for engagement in collective action. Collective endeavors of different kinds are facilitated by high engagement in independent organizations (e.g., civil society organizations), as these provide a sandbox for enhancing organizational experience.	Digitally enabled movements may possess a considerable degree of structure and organization, especially in the long run, but this does not always involve formal collectives. The contribution of individual social groups to connective action and the comparative role of technology in protests led by different groups have not been thoroughly examined. *E.g.,* González-Bailón et al. 2013

From Collective to Connective Action

Theoretical Roots of the Connective Action Paradigm

How does communication technology affect the emergence and nature of collective action? Has the proliferation of mobile phones in the 2000s and social media in the 2010s led to higher or lower levels of engagement in collective endeavors? In the scholarly community, these questions emerged in the late 2000s primarily in the form of theoretical frameworks, followed by a considerable number of empirical studies in subsequent years. Explicitly or not, many of these approaches ultimately draw from Olson (1965)'s *The Logic of Collective Action*. *Logic* transcended several fields of study with the observation that collective welfare is not simply the sum or average of the welfare of individuals that make up a group. Olson notes that "rational, self-interested individuals will not act to achieve their common or group interests" unless compelled to do so, whether via policy instruments or coercive mechanisms, or unless the number of individuals in a group is "quite small" (Olson 1965). Many individual endeavors require the engagement of more than one agent to achieve success; conversely, the interests of the group are not always identical to those of the individual. Prospective participants' predictions of group success with and without their input also influence their likelihood of participation, tying into the free-rider problem in the case of movements with high chances of success. The disconnect between individual and group pursuits encapsulates the collective action problem. The enduring impact of Olson's framework results from a broad formulation that opens itself up to challenges, exceptions, and new applications in such areas as conservation and environmental protection, addressing terrorist threats, nuclear disarmament, voting in parliaments and international assemblies, stemming the spread of disease, and declarations of war (Sandler 2015, Schelling 1960). The lexicon of collective action thus intersected with myriad topics of study in international relations, comparative politics, political economy, and public policy.

Olson's focus on the interdependence of individual and collective goals, on group size as a determinant of effective action, and on the mobilization of diverse groups made the collective

action paradigm a strong starting point for studies of mass protest and social movements. The themes raised by Olson reappear in modern studies, from participant-level surveys (Tufekci & Wilson 2012) to complex network-level analyses (see González-Bailón 2017).

Participation in demonstrations and protest movements is relational. Large-scale protest is a dynamic process that is often seen to flow from the build-up of 'information cascades' in which the identities of actors who begin the process affect subsequent actors' likelihood of engagement (Lohmann 1994, Klandermans et al. 2002, Karklins & Petersen 1993). Information propagation alone, however, is generally not considered sufficient to spur behavioral contagion or collective action. In line with these models, before the emergence of more recent perspectives, scholars often found that the formation of a collective identity had to precede collective action, or that collective identities played an important part in protest behavior (Klandermans et al. 2002, Polletta & Jasper 2001, Goodwin et al. 2000). By extension, movements that rapidly gain adherents with little prior identity-building may meet an early demise. Psychological models of collective action such as those drawing on social identity theory emphasize group identification especially strongly (Tajfel & Turner 1979). Prospective protesters hold multiple identities rooted in factors such as race, gender, employment, or ideology. In order for these latent identities to trigger participation in collective action, it may be necessary to make them more salient; participation in collective action may in turn further increase the salience of an identity.[1] In brief, while several psychological motivators are discussed in the literature and the importance attributed to each of them varies, "collective action is more likely when people have shared interests, feel relatively deprived, are angry, believe they can make a difference, and strongly identify with relevant social groups" (McGarty et al. 2013).

Although the relational nature of collective action is rarely challenged, the formation of a common identity as a necessary condition for protest was questioned even before the advent of commonly accessible technology. This was due in part to the elusive nature of the concept of *identity*, underdeveloped theory, ambiguous operationalization, and the possibility of reciprocal effects in which protest builds collective identities as much as the reverse (Opp 2012). Although

[1] See Jost et al. 2018 for a comprehensive literature review on this subject.

scholars continue to believe that common identities play a key role in collective action, the strong assumption that these identities must exist for such action to occur has been weakened in recent times.

New strands of research that identify communication technology as an organizational platform and conduit for expressing popular opinion challenge more of the core tenets of the collective action paradigm. The advent of mass communication platforms is increasingly being set against Olson's stipulations regarding group size (e.g., whether technologically driven collective action is weakened by large groups; see Lupia & Sin 2003), group composition (e.g., whether diverse or influential players affect the outcome; see González-Bailón 2011), and selective incentives (e.g., whether the calculus of private vs. public goods is different when an individual chooses to engage in protest in the information age). The group size proposition is perhaps most frequently queried. Olson's skepticism toward large groups' ability to sustain collective action stems from two factors: organizational costs and noticeability (Olson 1965, Lupia & Sin 2003). On the one hand, massive protest movements face the obvious challenge of effective coordination, with leaders struggling to reach each sector of adherents, the relative share of benefits to each adherent decreasing, and agreement becoming more difficult to achieve. On the other, individuals tend to disappear in large groups, as do their contributions; the failure of participants to notice each other's inputs increases the likelihood of free riding. Communication technologies offer improvements to organizational costs when any member (or all of them) can be reached almost instantaneously. The same quality may allow them to render the actions and inactions of individual members noticeable, provided the information is shared widely enough and despite the anonymity often associated with online networks.

The prominence of technology has also cast doubt on the traditional sequence from collective identity formation to collective action, as described above. This dynamic has been questioned on both theoretical and empirical grounds using movements such as *Indignados* in Spain as illustrations. Research and observational commentary both generally understand the latter as a collective effort whose focus on decrying structural inequality and austerity united numerous groups without a clearly defined collective identity. The diverse participant base of

the *indignados* and their reliance on technology helped them achieve continued relevance and eventually transform into a major, organized political party with considerable electoral success – Podemos (Anduiza et al. 2014, Margetts et al. 2015). In many similar cases, collective action preceded collective identity-building.

Mass Protest as Expression of Grievance and Resource Mobilization

Many frameworks of collective action emphasize a combination of grievances, strategic use of resources and structures, and taking advantage of political opportunities. Pure grievance-based models have generally been supplanted by variations on the latter two (McCarthy & Zald 1977, Morris & Staggenborg 2008). In light of the popular claim that modern, technologically enabled expressions of collective action (including social movements) are often decentralized or leaderless (Bennett & Segerberg 2013, Tufekci 2017), it is useful to delve deeper into established approaches to collective action beyond the basic premises of Olson's framework. Recent work that considers the impact of technology draws heavily on the resource mobilization tradition in particular; this dissertation follows a similar line of thought.

Theories and empirical studies of collective action supported by technology revolve largely around information cascades traveling in networks of contention. The metaphors of the network and contagion of information are well-suited for a research agenda whose core component is the study of information flows at a level previously inaccessible to social science (González-Bailón 2017). Classic works in the literature on social movements generally agree with the broad implication stemming from Tilly (1984)'s *repertoires of contention* – that outbreaks of unrest never occur in a vacuum, but rather are coordinated by small groups of highly engaged organizers (entrepreneurs) who consciously adopt a set of strategies to pursue their goals. These leaders must correctly identify the ideal place and time to mobilize. That is, they take advantage of political opportunity structures and build upon existing repertoires of contention while tailoring the movement at the margins to the necessities of the situation

(Tarrow 1994).[2] If these conditions are fulfilled, the likelihood of transforming potentially disorderly collective action into a highly organized movement increases.

Grievance-based theories of collective action view mobilization as the result of accumulated socioeconomic injustices: inequalities in wealth or access to power, prolonged periods of poverty, ethnoreligious marginalization and disenfranchisement, and other kinds of relative deprivation (Gurr 1970). Rapid socioeconomic change and/or deterioration generate discontent that sometimes culminates in a local, regional, or global movement. Similarly, discrimination and ethnic marginalization may be the seed of conflict, particularly when a dominant elite keeps other ethnic groups at bay (Cederman et al. 2011). These approaches have received limited support in the modern era because grievances and deprivation are commonly perceived as necessary, but not sufficient predictors of mobilization, especially in the long run (Dalton et al. 2010). Grievance theory also skims over the question of what *kind* of movement (e.g., violent or nonviolent) arises from deprivation and what determines this trajectory (Chenoweth & Ulfelder 2017, Chenoweth & Stephan 2011). Finally, it fails to account for access to material resources, structural strengths and weaknesses, and partnerships – all of which may be critical in setting off, controlling, and sustaining a movement.

Resource mobilization theory bridges this gap. This theoretical framework posits that protest movements mobilize and survive when participants succeed in commanding the appropriate kind and volume of resources (McCarthy & Zald 1977, Lichbach 1995, McAdam 1999). These resources can be financial, relational, informational, or organizational, and can manifest themselves in organizational capacity, skills, support networks, capital, and availability of large numbers of aggrieved individuals. The focus on structure is characteristic of the resource mobilization current, advancing that participants of new movements operate as rational actors who devise structures and methods of coordination based on strategy and allocation of resources. The existence of these structures implies specialization and internal

[2] Political opportunity approaches have faced some difficulties in adapting to changing contexts; the concept of political opportunities itself has been viewed as a catch-all for conditions that prompt collective action (Meyer 2004). Nevertheless, it remains a popular and highly adaptable approach.

coordination. States and their repressive apparatuses are not monolithic; neither are movements (Hendrix & Salehyan 2017, Chenoweth & Ulfelder 2017). Maintaining formation amid state repression and targeting of leaders may prevent the movement from both unraveling completely and disintegrating into chaos and riots (Pearlman 2012, Bob & Nepstad 2007).

While movements may manage many resources strategically, the one that most directly speaks to the topic of this dissertation is information. Information-oriented theories view both states' decision to repress and people's decision to mobilize as calculated actions based on the information each side possesses about their own strength, determination, and resources, as well as those of the other side (Kuran 1995, Lorentzen 2013). In Kuran's formulation, the strength and abrupt escalation of protests may stem from the element of surprise. Its foundations lie in the concept of *preference falsification* – a psychological phenomenon whereby individuals hold a certain view, but either fail to express it in public or publicly oppose it for fear of reprisal or of violating a social norm (Kuran 1995). The falsification of preferences can be responsible for individuals' failure to act when faced with government atrocities and other potentially harmful policies. Network-based theories of mobilization, which partially stem from the resource mobilization tradition, suggest that digital networks play an instrumental role in revealing these preferences, often using the Arab Spring as an example (Tufekci & Wilson 2012). Social media in particular provide insight into the situation on the ground that traditional channels – television, radio, newspapers, and word of mouth – cannot replicate in real time.[3] Digital channels can be a venue of social diplomacy for organized groups in particular, as they may benefit from creating an alternate narrative unfettered by state censorship (Jones & Mattiacci 2017). Information is thus seen as a structural resource that, if mobilized, has an impact on both the onset and outcome of collective action, in part by revealing hidden preferences.[4]

[3] Traditional sources are often more reliable due to the fact-checking mechanisms they employ, but do not offer immediate, multilateral estimates of protest size, protest diffusion, or strength of security forces. Perceptions of strength are an important factor in the calculus of the would-be protester.

[4] It is important to note that information as a resource and grievances or other psychological motivators are not mutually exclusive. Van Zomeren et al. (2012) (cited in Jost et al. 2018) see protesters as "passionate economists" combining emotional drives with instrumental considerations, including

Information travels through networks, and networks rely on information cascades – the recruitment of individuals to join the collective, regardless of their own information signals (Bikhchandani et al. 1992). At the level of broad sociopolitical groups, this is captured in Karklins & Petersen (1993)'s interpretation of *assurance games*, which employs game theory to deepen informational and structural theories of collective action by distinguishing among types of actors. Assurance games involve potential protesters continuously reevaluating the option of joining a protest based on the actions of others as well as their own predictions of the actions others will take. The 'tipping point' varies across groups: it is highest among party supporters and lowest among dissidents, with workers and students in between. Individual assurance games may culminate in a social movement and affect the movement's ability to effectively command relational and human resources. This strengthens the notion that the overall structural characteristics of a communication network translate to the structural characteristics of political engagement.

On a micro level, the stream of research on protest as the result of network dynamics has established a connection between *strong ties* – kinship networks, friendship networks, and joint membership in associations, among others – and the decision to join a protest. Lohmann (1994) and McAdam (1986) famously explored this trend using examples from Leipzig (1989) and the Freedom Summer project (1964), respectively. Both cases represented high-risk activism driven largely by close-knit, pre-existing social groupings. These collectives are built on trust, encouraging prospective participants to join when a link already exists between the recruiter and the recruited (Granovetter 1973**,** Diani & McAdam 2003). Weak ties, in turn, are traditionally viewed as enablers on the labor market, but their effectiveness in collective action has been deeply contested. However, the exact *mix* of weak and strong ties that enable protest in the information age remains elusive, and the two varieties of ties themselves are often mistakenly viewed as mutually exclusive.

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perceived group efficacy and resources available to both sides. Distinguishing between the two may not be a simple task. Relational, network-related motivations can be viewed as a realization of this dual effect.

The ubiquitous nature of social media in highly connected countries has reinvigorated the debate over the existence of *leaderless movements*, which defy the traditional emphasis on strong leadership (Della Porta & Diani 2015). These movements catalyze dissent and draw attention to their respective causes through uncoordinated mass activity (Steinert-Threlkeld 2017) or consciously choose horizontal, non-hierarchical decision-making as their primary strategy. In theory, the scarcity or complete lack of formal structures allows such movements to remain free from the confines and consequences of traditional hierarchies, ruling out divisive power struggles (Tufekci 2017, Abrutyn et al. 2016).

However, even in the digital age, skepticism surrounds both the existence of truly leaderless protest campaigns and the outcomes of those that strive to be leaderless. There is little empirical support for the notion that leaderless or unstructured protest resolves the collective action problem. Although some reviews in the resource mobilization stream have noted that "disruptions can be mobilized without formal organization" (Jenkins 1983), they have overwhelmingly evolved toward recognizing the role of strategic decision-makers in generating and sustaining a movement. Two main arguments against loose structures have been advanced. First, although many decentralized movements have enjoyed short-term success in achieving individual policy goals, their long-term survival is often crippled by fragmentation, defection, and lack of clear direction (Polletta 2002, Tufekci 2017). Second, although horizontalism and commitment to equality in such participatory movements produce abundant face-to-face interaction, strong and dense ties, and a structure built around personal relationships, these same effects may preclude movements from scaling (Bennett 2004). Thus, 'networked protest,' with few structures and a strong tailwind from social media, is sometimes regarded as most effective in rapid mobilization and momentum-building but fragile in sustained action (Tufekci 2017).

Access to Information and Diffusion of Dissent

The ability of media outlets to kindle and expand public dissent is often noted circumstantially, but rarely explored empirically. Transnational linkages with media –

particularly Western media – are a key component of frameworks that seek to explain either democracy or movement outcomes by arguing that cross-national connections magnify the visibility of and support for a domestic cause (Levitsky & Way 2010, Keck & Sikkink 1998).[5] Scholars have reached a partial consensus that traditional media encourage traditional forms of political participation – voting, donations, calls to politicians (if applicable), public debates, and other forms of working within the system that do not entail mass public demonstrations of disapproval (McLeod *et al.* 1996). The influence of the media on collective action and engagement in protest is not as clear-cut. One-to-many media platforms such as television are generally not considered conducive to street protest, and any potential relationship is difficult to pursue causally (Crabtree et al. 2015, Tufekci & Wilson 2012). If traditional media have an effect on an individual's protest proclivity, he or she is likely to already display high levels of prior engagement as well as previous use of a mix of traditional and digital media (Boyle & Schmierbach 2009).

Many studies of information flows and collective action are affected by low generalizability. The impacts of information access are contextual: they depend on not only the penetration of a channel of communication, but also on patterns of use, trust in the media, and unquantifiable cultural meanings attached to the medium in question. In locations that have not yet been thoroughly penetrated by new media – or in periods where the latter did not exist – traditional media have occasionally stoked or perpetuated violent collective action. For instance, incendiary broadcasts by Radio Mille Collines in Rwanda are commonly seen as having motivated both Hutu extremists and regular people to commit atrocities in the Rwandan Genocide (Thompson 2007). Radio has further been seen as a facilitator of 'vertical linkages' whose messaging flows along lines of social segregation instead of across them (Warren 2015). In young media systems, such forms of relaying information may increase support for incumbents and pacify large segments of society by retaining control over the flow and framing of news – a more difficult task in the chaotic web of online discourse. However, these effects are

[5] The Zapatista movement in Chiapas, Mexico, exemplifies movements fueled by socioeconomic and ethnic grievance whose ability to mobilize resources is bolstered by global networks of contention. It is widely considered to be among the first 'connected movements.'

difficult to disentangle, have not received extensive empirical support, and stand in contrast to modern methods of communication, which allow for a much more fine-tuned and targeted approach (Gohdes 2018). Even instances of collective violence fomented by media outlets such as Radio Mille Collines are anecdotal and not fully transferable to studies of protest, as the latter is a distinct form of collective action.

Authoritarian regimes are difficult environments in which to study information diffusion and public dissent due to scarce opportunities for controlled experimentation and the danger of preference falsification yielding biased results (Kuran 1995). Nevertheless, there have been attempts to investigate the possible mediating effect of Western media in such regimes. For instance, spatial variation in the availability of West German television stations has been explored as a factor stoking anti-government protest in East Germany in the lead-up to the fall of the Berlin Wall (Crabtree *et al.* 2015). These few studies have not shown any clear connection between demonstrations or riots and the availability of 20th-century technologies, which is often highly correlated with income levels.

The key limitation of such studies is that information diffusion is a complex process – one with multiple stages and multiple sources performing multiple, distinct tasks. In East Berlin, the mobilization along the Wall was prompted by a bungled Politburo press conference, which generated rumors that traveled from one individual to another irrespective of static indicators such as access to television. In Leipzig, information on the protests likely flowed between friends and family rather than from Western media (Lohmann 1994). It is not necessary for an entire population to have access to a medium for messages produced by that medium to be passed on in the next stage of the information-sharing process (Lohmann 1994, McAdam 1986, Metternisch et al. 2013). Furthermore, the mere availability of television signal or other mass media is not an event that is fixed in time; neither is its absence. In other words, long-term (lack of) access to an information source is difficult to assess as a motivating factor for mobilization because it does not create a controlled environment that would link the occurrence of protest with a destabilizing event. The strength of using network shutdowns as an intervention in empirical research lies in the creation of a quasi-experimental environment in which two

otherwise similar geographical areas or days differ only in the disappearance of a channel of communication. In this way, the importance of key informational resources often associated with modern collective action can be evaluated empirically. To pursue this point, at least two actions must be investigated jointly: individuals' engagement in protest and governments' engagement in suppressing them, whether by traditional means. The mutual dependency of these two processes is discussed below.

The Repression-Dissent Nexus and Reciprocal Effects

Although scholars from several subdisciplines have tackled the dynamics of collective action, many of them examine it on its own merits without exploring the other side of the equation – the choices and actions of the government. While collective action can be prompted by a number of societal grievances, it is often a response to new or existing measures of control by the government. In turn, episodes of government-orchestrated repression – from state violence and mass arrests to restrictions on freedom of expression – often follow demonstrations, strikes, riots, and smaller instances of dissent. In the comparative politics literature (and, later, that on social movements and international relations), this dependency is known as the repression-dissent nexus (Lichbach 1987, Moore 2000).

How important is this relationship to the narrative presented here? Identifying known links between repression and dissent is vital in understanding whether similar reciprocal effects apply to the information age, with its unique forms of dissent and control. Network shutdowns provide one viable pathway for this research: they function as ancillary crackdowns on communication that affect large groups of people in a specific area, their repercussions are visible, they often target both traditional and digital dissent, and their authorship is at least partially traceable. They can thus be compared to their non-digital counterparts more readily than fuzzier methods of control such as surveillance and selective censorship. Integrating network shutdowns into the literature on the repression-dissent nexus follows the recent trend of disaggregating repressive techniques in order to cover understudied or unusual modes of repression "whereby the processes and mechanisms leading to such actions may differ from

traditional means of repression" (Chenoweth et al. 2017). These considerations make the repression-dissent nexus the stream of research to which my concept of *disconnective action* most directly contributes.

Repression and protest pursue similar goals – to raise the costs of the other side's operations. Protesters march not only to raise awareness to their plight, but also to impose costs on the policies or actions of the government, sometimes physically paralyzing an area in the process. Governments exercise use of force and stifle free expression to impose costs on dissent they deem undesirable. However, existing studies suggest that the changes in tactics of mobilization and state behavior as a result of the other side's actions are not linear or mechanical. Most studies find that dissent usually stimulates some form of repression (e.g., Cingranelli & Richards 1999, Poe & Tate 1994, Regan & Henderson 2002).[6] Governments' intrinsic monopoly on violence makes this a less costly choice than alternatives such as negotiations or concessions (DeMerritt 2016). When the arrow is pointed the other way, however, scholars are split over the effects. Thus, repression has been found to increase dissent, decrease it, and have no identifiable relationship with it – an inconsistency that Davenport (2007) calls the 'punishment puzzle.'

Rather than discourage further work on the subject, the punishment puzzle has compelled researchers to explore non-linear dynamics and delve deeper into subsets of cases. Recent studies have focused on two dimensions in particular: one temporal, the other strategic. This dissertation speaks to both: Chapter 3 discusses the relationship between network shutdowns and protest in the short and long term (temporality) while Chapter 4 uses India as a setting for an investigation of violent and non-violent responses (strategy) as well as structural changes among protesters responding to network shutdowns.

Studies with a temporal focus draw attention to the wide variation in short- and long-term effects brought on by both repression and dissent, acknowledging that the momentum of protest changes over time. The first use of a repressive tactic may generate different reactions

[6] Davenport (2007) calls this the 'law of coercive responsiveness' and contrasts it with the erratic results of studies that tackle repression's effects on dissent.

among the general population than an uninterrupted crackdown, which may either mobilize those more familiar with the tactic or dishearten prospective dissidents. Severe or indiscriminate repression in particular dissuades potential protesters from taking to the streets in the short run, but may cause a surge in both violent and non-violent protest in the long run as more groups reach their 'tipping point' and witness others doing the same (Mason & Krane 1989, Francisco 1995, Karklins & Petersen 1994, Sullivan et al. 2012). The suggested mechanism consists of the rapid expansion of social anger – initially concentrated in a vocal minority of dissidents and opposition – to larger swathes of society in light of the cruelty of the government's repressive tactics. The distinction between short-term and long-term effects is known in the civil resistance literature as the backfire effect (Chenoweth et al. 2017, DeMeritt 2016). Several scholars have documented it deductively in individual cases – for instance, in the Iranian Revolution, where the demonstrations spread spatially in the long run (Rasler 1996). In brief, even if government leaders are rational actors and calculate the costs and benefits of repression, their calculation might make more sense in the short term than in the long term. Each may be ruled by a separate process; the enabling factors of one may not transfer to the other. Similarly, an ephemeral network shutdown may produce a different level of disruption than one that is prolonged into what I call a *digital siege*.

Scholars focusing on strategy build their narrative primarily around the distinction between violence and non-violence, and on how organized campaigns employing these two strategies react to repression (Chenoweth et al. 2017). A commonly reported finding in this strand of research is that the intensity of repression is lower when dissenters use non-violent tactics to further their goals (e.g., Carey 2010, Chenoweth & Perkoski 2017, Chenoweth & Stephan 2011).[7] However, very rarely is the impact of repression on dissident tactics materially engaged, and the broad puzzle of how participants in collective action react when abruptly faced with a

[7] Violence and non-violence are, quite obviously, not the only strategic options available to protesters, as evidenced by the rich terminology of protest that exists in India (see Chapter 4). Early theorists such as Sharp (1973) distinguished dozens of types of non-violent action in particular; these distinctions have largely survived. However, in the interest of parsimony, my approach to protest strategy is limited to the binary of violence and non-violence.

ramping-up of particular forms of repression remains unanswered (Sullivan 2016).[8] Strategy is also a factor in the decision calculus of governments, which face the choice between repressing dissent and accommodating protesters' demands. The two strategies are generally regarded as alternatives to each other (DeMerritt 2016, Pierskalla 2010), but yielding to protesters' demands is more costly and can pave the way to further concessions (Tilly 1978, Francisco 1995). Governments are found to alternate between the two strategies, turning to one when the other is met with dissent (Moore 2000). When protesters opt for non-violence, however, physical force is less justifiable on the part of governments, and security forces are more reluctant to use it. This is critical in the context of this dissertation because governments may employ alternate repressive tactics to replace physical means of crowd control. The distinction between violent and non-violent collective action becomes especially important in Chapter 4.

The existing findings on strategy are inextricably linked to another point of consensus – that repression is less effective against highly organized collective action. That is, spontaneous or weakly structured collective action can be controlled with relative ease while cohesive social movements are more impervious to government intervention. This conclusion emerges directly from empirical findings in studies of general organizational capacity (Pearlman 2012, Sutton et al. 2014) and the 'decapitation' of movements via assassination of leadership (Bob & Nepstad 2007). Most of these findings pertain to non-violent collective action in particular. This means that strategy and structure are intimately connected when the organizers and participants of collective action are forced to confront state repression. Scholarship on spontaneity, organization (or structure), and their coexistence is currently largely limited to a small number of theoretical contributions and broad ethnographic approaches (Snow & Moss 2014, Tufekci 2017). The last empirical chapter of this dissertation engages both strategy and structure in response to network shutdowns. This is a reasonable approach given that loose structures are seen as both an advantage and a weakness of technologically driven protest (Tufekci 2017), and

[8] Chenoweth et al. (2017) believe that there are ethical reasons for which some scholars prefer to leave this puzzle unaddressed, as the resulting studies could be used as road maps to repression. Similar concerns apply to this dissertation, although its results suggest that governments that shut down communication channels are likely to be affected by collective chaos and economic damage.

early studies on the subject have yielded conclusions that somewhat contradict the traditional findings on highly organized collective action (Hasanpour 2017).

The complexity and inconsistent findings that characterize the repression-dissent nexus open a space for studies of alternative means of repression and protest, and of how they interact with their traditional equivalents. On the collective action side, network shutdowns suspend a means of information transmission, weakening prospective participants' ability to credibly assess the utility of protesting. Will a volatile information environment compel protesters to "act without choosing" – i.e., improvise a change in strategy once information is limited and certain channels of coordination are locked down (Seymour 2014, cited in Chenoweth et al. 2017)? Addressing collective action, this dissertation contributes to a nascent literature on political behavior in low-information environments, which has largely thus far been largely focused on voting (Rozenas & Sadanandan 2018). On the government's side, recent studies have gone beyond the repression-accommodation binary in governments' choice of tactics to encompass a variety of repressive strategies (Fariss & Schnakenberg 2014). In identifying network shutdowns as a new, digital form of repression, examining how they overlap with traditional repressive methods, and analyzing their interactions with real-world protest, this dissertation positions itself in this new space.

The Elusive Relationship of Technology and Collective Action

Recent work lends credence to the idea that social influence from strong ties that coexist online and offline can directly lead to changes in political behavior in the real world, including voting and political protest (Bond et al. 2012, Steinert-Threlkeld et al. 2015). Other instances of collective action such as signing petitions have been replicated online with high degrees of success and unique, 'bursty' temporal dynamics characteristic of online information-sharing (Margetts et al. 2015, Böttcher et al. 2017). Dense networks of modern communication technology have been found to enable diverse forms of collective action, with a number of repercussions. Higher risks of exposure and collective outrage toward government wrongdoings may, in turn, alter governments' behavior (Joseph & Poznansky 2018).

The question of technology's influence on collective action is not new to the scholarly community. The contradictions of digital networks as catalysts for collective action were identified before the turn of the century and prior to the emergence of social media. Ayres (1999) pointed out that while the Internet had brought with it the ability for disparate groups to pool resources and elevate protest beyond borders, it "also [held] the power to turn unreliable and unverifiable information into a global electronic riot." Lupia & Sin (2003) observed that technology could benefit some forms of collective action (especially those otherwise weakened by large size) while undermining others by allowing individuals to mask their activities and decreasing the value of previously costly endeavors such as contacting congressional representatives. Nearly two decades after these early studies, empirical studies have only begun to explore the ways in which the abundance of electronic communication mobilizes or fuels mass dissent on the ground, and have hardly examined how the interactions between dissent and repression change when communication is cut off.

Although the relationship between communication technology and collective violence has been a growing focus area in the context of civil conflict (e.g., Pierskalla & Hollenbach 2013, Shapiro & Weidmann 2015, Warren 2015, Bergren & Bailard 2017, Zeitzoff 2017), little published work tackles the nexus between digital networks and lower-level dissent outside of civil war – including protest. Broadly speaking, existing studies have focused on either the reduced costs of coordination that stem from digital media or the contagious spread of information critical of the government. Some evidence for the former has linked the number of groups on certain social media platforms to protest, but this thread of research is in its incipient stage (Enikolopov *et al.* 2015). Studies of network effects in this current have found that protest movements tend to have a fragmented online presence (González-Bailón & Wang 2016) and that peripheral users – sporadic in communication, but strong in numbers – can both drive information diffusion and translate it to action (Barberá et al. 2015, Steinert-Threlkeld et al. 2015). However, proof of a clear causal link between technology and collective action remains elusive.

The falling costs of mobile connectivity in the first years of the 21st century drive greater penetration and enhance access to communication technology. This allows one of two effects (or

both) to take root: enhanced *information-sharing* and enhanced *coordination*, either of which can fuel collective action irrespective of whether it is violent or peaceful (Manacorda & Tesei 2016). A number of studies identify a positive link between the spatial distribution of cell phone connectivity and domestic unrest (Pierskalla & Hollenbach 2013, Manacorda & Tesei 2016, Warren 2015). Digital networks are not only platforms for resource mobilization and the spread of more accurate information on the forces commanded by both sides; they are also tools that augment citizens' awareness of socioeconomic grievances. This effect can be especially pronounced in highly unequal societies or areas where penetration of digital information networks rivals that of centrally controlled mass media, which are traditionally seen to keep citizens quiescent due to their vertical structure (Warren 2015). The affordances of cell phones and other communication technologies lie in reducing information asymmetries and costs among the adherents to the movement, thus potentially improving coordination.[9]

Classifying digitally enabled collective action carries the assumption that it is distinct from other forms of mobilization. Bennett & Segerberg (2013)'s *logic of connective action* is one of the first attempts at formalizing the role of digital networks in the construction of protest. Building on Olson (1965)'s approach to solving the collective action problem, the authors propose that individual, personalized action can replace top-down coordination. 'Connective action' does not require formal organizational control with strong ties between upper and lower tiers; highly personalized digital communication processes render collective identity framing less necessary. The free-riders of Olson's framework can become participants in connective action without the need to demonstrate strong commitment to the cause. Technology platforms help to scale such initiatives, as the sharing of personally expressive content makes participation dynamic and

[9] Nevertheless, case studies of individual states have thus far found the opposite effect to what is reported in the large-N literature. Bergren & Bailard (2017) documented a weak but existing pacifying effect of cell phone coverage on ethnic violence in Myanmar while Shapiro & Weidmann (2015) produced evidence that collective violence in Iraq decreased in areas of greater cell phone connectivity. Both states illustrate the rapid expansion of connectivity in areas where the penetration of communication technology has historically been low. However, the focus of both pairs of scholars is trained on the violence in the context of civil conflict, excluding mobilization in low-level (or no-level) conflict scenarios entirely.

self-motivating (Benkler 2006).[10] Bennett and Segerberg further outline a spectrum of connective action ranging from *self-organizing networks* – which discourage or shun the inclusion of formal organizations – to full-fledged collective action, where organizations appear in the foreground as prominent coalition members and technology is used as an additional mechanism of support. These structural considerations are likely to leave a mark on protest outcomes.

In the Arab Spring, the excitement generated by the rapid rise of networked social movements was tempered by their subsequent collapse, the return of authoritarian tendencies, and internal conflict across the Middle East and North Africa. The flexible structure that allows self-organizing networks to emerge and expand may turn into their greatest weakness in the long run, when organizing structures are needed most. But what if a 'connected protest' is thrust into an information vacuum? Would the structural characteristics of the underlying mobilization alter its trajectory? The behavior and evolution of connective action are impossible to separate from the repressive actions that prompt protest or follow it. Shifting between *methods of dispersion* such as strikes and stay-away protests and *methods of concentration* such as the mass occupation of town squares is often considered a boon to collective action (Schock 2005). Although the diffusion of outrage online is a method of dispersion, its inherent weakness in repressive states is that it can be shut down instantly and completely, as long as the government is willing to resort to extreme measures. In light of the emergence and democratization of communication technology, governments are directly confronted with the *dictator's dilemma* – a conundrum in which both stifling and stimulating the progress of technology may result in mass mobilization and existential threats to power (Kedzie 1997).[11] While the dictator's dilemma links the body of work on technology and collective action with the repression-dissent nexus, we do not know its tipping point, i.e. the circumstances under

[10] Actor-Network Theory (ANT) assigns even greater importance to digital networks, whose components are elevated to the status of agents alongside humans and organizations (Latour 2005).

[11] The dictator's dilemma is reminiscent of a Hobson's choice, where an actor (the government, in this case) can either accept what is offered to them – irrespective of side effects or defects – or reject it completely. It differs from this in two respects. First, both choices may lead to the same outcome – one that may accelerate the downfall of the government. Second, there is a strong element of ambiguity inherent to both choices, as mobilization is merely a possible consequence of both rather than a certainty (see Ellsberg 2017).

which it manifests itself most clearly. We also lack insight on the mechanisms of collective action that the repressive side of this tipping process engenders. Network shutdowns allow us to begin addressing this puzzle.

A Brief History of Information Blackouts

The objectives underlying network shutdowns are not new. Historically, information blackouts have often been used as a strategy of war in both domestic and international conflict. Throughout history, government actors in a number of states have confiscated pamphlets on a large scale, shuttered information outlets and printing presses, revoked publishing and broadcasting rights, and forcibly taken over channels of communication. These activities are all distinct from the more subtle strategy of selective censorship: they are often unanticipated (but coordinated), very large in both scale and impact, and eliminate sources of information rather than the information itself. The French Revolution, whose ranks included numerous prominent journalists and pamphleteers, transformed the very premise of information distribution in Europe – that of absolute state control over information flows (Darnton & Roche 1989). Reactive information blackouts were not necessary in pre-Revolutionary France, as only one newspaper – the *Gazette de France* – was allowed wide circulation. In the centuries that followed, the greater diversity of viewpoints in the media triggered widespread information blockades during moments of tension that did not necessarily escalate into internal conflict. Newspaper circulation was completely blocked during the February Revolution of 1917 in Russia (Hasegawa 2018) and partially during the Iranian Revolution in 1979, in which dozens of outlets opposed to theocratic Islamic rule were shut down (Moin 2015).[12] While the effects of these measures on subsequent levels of mobilization are impossible to measure, all three cases produced a vigorous black market for information procured and transmitted through illegal channels (Hassanpour 2017).

[12] Ayatollah Khomeini said of the press at the time: "After each revolution, several thousand of these corrupt elements are executed in public and burnt and the story is over. They are not allowed to publish newspapers. (…) We are dealing with wild animals. We will not tolerate them anymore." (Moin 2015).

Modern information blackouts follow precedents set in past coups, other forcible transfers of power, and security crises. Full state control of news agencies is the most basic and preemptive form of blackout, and is often the key determinant of press freedom indices (RSF 2018). Turkmenistan, for instance, has single news agency, forbids criticism of the president, conducts regular purges of the media environment, and ensures that newspapers remain in line with official state positions. In many cases, however, repressive governments take advantage of real or exaggerated threats to public safety and regime stability to decimate media outlets reactively. Examples of this strategy abound and disproportionately affect television and radio, which enjoy mass appeal in developing countries (La Ferrara 2016). The government of Hugo Chávez, for instance, shuttered 34 radio stations that expressed opposition to state economic policies in 2009. Kenya briefly disconnected the country's top independent television stations during a contested presidential election in 2018, a decision atypical for one of Africa's most stable democracies. Finally, Turkish President Recep Tayyip Erdoğan ordered the closure of more than 100 publishers, newspapers, television stations, radio outlets, and news agencies in a sweeping media purge following the 2016 coup attempt, pairing it with an escalation in Internet censorship (Yesil et al. 2016). Using the example of Argentinian military junta, Calveiro (1998) argues that states where brutality by security forces occurs in parallel with wide-ranging media blockades employ a strategy of "centrally adopted technologies of repression."

How do these extreme forms of information control translate to modern communication technologies over which states cannot establish full, centralized authority? To resolve the dilemma of decentralized and largely unvetted communication, governments across the spectrum of democracy have resorted to network shutdowns. A network shutdown is the intentional, significant disruption of electronic communication within a given area and/or affecting a predetermined group of citizens (Gohdes 2015, Dada & Micek 2017, Hassanpour 2017, Rydzak 2018). Extreme manifestations of network disruptions involve the large-scale or complete disconnection of digital communication, with the impact radius covering a local area, an administrative region, several regions, or an entire country. These extreme disruptions are often called network shutdowns, Internet shutdowns, or blackouts. Unlike technical failures,

premeditated disruptions are typically mandated by governments, which carry them out as a reactive or preventive measure against real and potential threats. The most common objective of this kind of interference is to restrict the flow of information through digital channels, particularly social media, mobile communication, and dedicated digital communication tools such as Facebook, Twitter, WhatsApp, Signal, or Telegram. This is especially prevalent when public dissent and protest are deemed to be fueled by digital communication networks.

Approximately 109 shutdowns or disruptions were reported in 2017, topping the number of cases reported in 2016 (about 75; Rydzak 2018). Both years stand in radical contrast to 2015, when between 15 and 33 major disruption episodes were registered (see **Figure 3.1**). Although degrees of confidence, volumes of evidence, and criteria of selection vary, it is possible that as many as 184 network shutdowns or disruptions of particular platforms took place in 2016-17, not counting smaller-scale disruptions undetected by researchers and analysts. Disruptions have been used in response to protests, riots, ethnic tension, and mass events, but also during professional and secondary-school exams in Algeria, Ethiopia, Gujarat (India), Iraq, Syria, and Uzbekistan. Technical, socioeconomic, and political analyses of such incidents are complicated by the challenges of establishing intent, absent a clear declaration from the government. For instance, while legal challenges by civil society in India have resulted in the exposure of official government shutdown orders, the government of Bashar al-Assad in Syria has repeatedly attributed disruptions to cable cuts, while Gabonese President Ali Bongo pointed to a "jammed-up" cell phone network as the cause of Gabon's month-long sundown-to-sunup Internet blackout.[13] As Chapter 4 contends, democracies are not immune to network shutdowns, with decentralized decision-making and limited institutional constraints leading India to execute more than 70 shutdowns in 2017, comprising approximately 70 percent of all such incidents on a global level. Interestingly, such blackouts do not appear to be consistently correlated with government requests for content removal; the states that carry out the largest number of

[13] The lack of a global database of power outages, which are sometimes associated with communication blackouts, creates a major challenge for studies of causal relationships between shutdowns and collective action. This limitation applies to the studies in this manuscript as well, but can be remedied if new data become available.

shutdowns annually either file numerous requests of this kind to entities like Google and Facebook (India, Turkey) or barely file any (Iraq, Syria).

The majority of known shutdown events have revolved around issues of security. Governments are particularly prone to disconnecting communication networks during or in anticipation of mass protest, whether violent or non-violent. Shutting down communication in such circumstances aims to disorient the protesters and disrupt coordination among the protest or movement leaders. Shutdowns can also be used as a security measure in the period of uncertainty or cooling following violent clashes or terrorist attacks.[14] Contentious elections and the unrest that sometimes accompanies them have been a routine justification in numerous African countries. Similar arguments have been made with regard to spreading rumors and multimedia that may lead to violent collective action. Though studies of the spread of false information beyond the Western world are few in number, some evidence suggests that rapidly advancing communication is a breeding ground for disinformation, particularly in areas where penetration of technology was previously low (see Boxell et al. 2017). The absence of fact-checking mechanisms in the Internet can inhibit a critical approach to information in such environments. In India and Sri Lanka, a number of violent events have been attributed to false stories and rallying on social media, and these services have been criticized for inaction against individuals who instigate ethnic or religious tension (Taub & Fisher 2018). Finally, network disruptions occur around mass public events such as religious processions, which are a common target for technologically enabled terrorism (e.g., IEDs triggered by cell phones and other devices). Events recorded in this last category include visits by public figures and mass entertainment events, primarily in India and the Philippines.[15]

Several studies have estimated the economic costs of network shutdowns using a variety of methodologies (West 2016, Deloitte 2016, CIPESA 2017, Kathuria et al. 2018). Regional estimates

[14] An early example that precedes the smartphone era is the July 2005 suicide bombings in London, which were followed by a brief cell phone signal blackout in the area surrounding the affected Tube station. This measure was roundly condemned in the UK (BBC 2006).

[15] More background information on recent trends in network shutdowns can be found in Chapters 3 and 4, as well as Appendices D and E.

place lost revenue in Sub-Saharan Africa at $237 million between 2015 and 2017 (CIPESA 2017) and in India at $3.03 billion between 2012 and 2017 (Kathuria et al. 2018). While it is unknown whether these damages scale linearly or exponentially, longer disruptions exacerbate their magnitude. Thus, even if shutdowns are found to aid governments in achieving their goals, leaders will continue to face a difficult choice between means of control.

While a body of literature on modern technologies and collective action is emerging rapidly, the socioeconomic and political effects of disruptions to communication have not commanded the same attention. Circumstantially, the effects of information chaos are reported to be profound. Hurricane Maria in Puerto Rico (2017) damaged or disabled nearly all of the island's communication infrastructure, seriously undermining the search for survivors and circulation of information on vital medical services (Pullen 2018). A small number of studies have confronted deliberate disruptions as drivers of collective violence in Syria as well as mobilization for protest in Egypt and Syria (Gohdes 2015, Hassanpour 2017). However, the limited number of cases and varying quality of data has, to date, precluded detailed cross-national analyses and examination of other country cases. In this dissertation, my aim is to begin filling this gap, open the door to approaches that are still more methodologically precise, and call attention of the scholarly community to an understudied aspect of repression and collective action.

Research Puzzle Overview and Dissertation Structure

Two primary puzzles drive my inquiries in this dissertation. First, if the implementation of new, digital methods of repression is a threshold process, where is this threshold located and what factors underlie it? Second, how do new methods of repression interact with established methods of collective action? This last question in particular is missing from studies of the repression-dissent nexus, which customarily examine only physical repression and collective violence or street protest. It is also missing from studies of technology and collective action, which either relate static indicators of connectivity with protest or tackle online forms of mobilization while leaving out repression entirely. In this way, I aim to demonstrate that digital

forms of repression have consequences for traditional forms of collective action, and to account for the temporal, strategic, and structural dynamics of this process. The scope of the analysis is global in Chapters 2 and 3 and subnational in Chapter 4, which focuses on India.

The dissertation is structured into three empirical chapters, bookended by an introduction and conclusion, and supplemented by an appendix that presents a detailed chronology of network disruptions. **Chapter 1**, the present chapter, offered an introduction to scholarship on collective action (including information dynamics and collective action outcomes), the relationships between technology and collective action that have been identified in the literature, and the application of network shutdowns as a form of information control between 2011 and 2018.

In **Chapter 2**, I conduct an empirical exploration of the relationship between connectivity and network interference, which I frame as a form of digital repression. Through a statistical model covering the years 1995-2011, I find that the pace of expansion of Internet access – but not cell phone penetration – is a strong predictor of the frequency of government-initiated interference in telecommunications. However, these dynamics are not linear: at an annual pace of expansion of approximately 7 percent, interventions into digital content peak and begin to decline. I describe the tipping point in this uneven trajectory as a *digital threshold*. At this apex point, the government faces a conundrum known in the literature as *dictator's dilemma*, where further restrictions on technology may be as detrimental to the leaders' survival as allowing its continued expansion (Kedzie 1997). The study also reveals that restrictions to digital communication in the period leading up to the Arab Spring do not seem to be related to government propensity to repress the population physically, but are positively related to other limitations to free expression. The implications of this finding are significant: either rapidly developing digital networks may outpace governments' ability to maintain the momentum of censorship, or governments may devise newer, more covert and innovative methods of information control. While identifying the prevailing dynamic between the two is not addressed in the study, it establishes a backdrop for the other empirical chapters by outlining how

governments reacted to the evolution of new communication technologies that would eventually come to be regarded as enablers of collective action.

In **Chapter 3**, I advance the narrative of digital repression into the period between the Arab Spring and 2016 through a detailed, daily-level study of network shutdowns and collective action, which transforms into what I call *disconnective action* when access to digital communication channels is revoked en masse. The study focuses on the temporal dynamics of disconnected protest, acknowledging that new, blanket forms of high-impact repression may produce different dynamics of collective action in the short and long term. The 2011-16 period witnessed not only some of the most vigorous rates of expansion of Internet access, but also a surge of digitally enabled social movements in both upper- and lower-income countries (Earl & Kimport 2011). At the same time, governments have made unprecedented advances in surveillance technology, filtering systems that prevent the discussion of sensitive topics, use of digital platforms in the interest of influencing elections, and large-scale disconnection of digital communication to curb protest. Using a global sample, I demonstrate that network shutdowns trigger a surge of protest in the short run, as existing grievances are bolstered by the indignation of those who have been disconnected from friends, family, and livelihoods. This escalation of collective action represents the opposite of what governments typically aim to achieve through network shutdowns. The analysis suggests that such blackouts do not pacify protest in the short run, but rather lead to an escalation of collective action. This casts doubt on governments' public narrative in support of shutdowns, which revolve around their ability to stifle mobilization, curb rumors, and ensure public safety. However, maintaining the blackout beyond the first week leads to a *digital siege*, which is associated with lower rates of protest. This implies that protest fatigue is exacerbated when communication and coordination via digital means are disrupted for extended lengths of time. This dual finding contrasts with established scholarship on the 'repression-dissent nexus,' which generally agrees that continued repression brings bout a temporary decline in protests followed by a re-emergence in the long run (Rasler 1996, Francisco 1995). Additionally, higher Internet penetration and recent protest experience seem to work somewhat against the escalation of protest when a shutdown is in place,

suggesting that 'disconnected protest' is governed by a separate set of dynamics. The results imply that new repressive tactics and forms of mobilization may feature interactions that do not conform to their previous iterations, and that traditional forms of collective action tangibly respond to digital repression – a new nexus to explore.

In **Chapter 4**, I pursue the dynamics identified in Chapter 3 further by conducting a subnational, quantitative study of a country that registers extreme values in both the incidence of public protest and network shutdowns – India. Where Chapter 3 focused on temporality, in Chapter 4 I turn my attention to the strategy and structure of disconnective action. I leverage the unique structural aspects of protest in India to both provide a robustness check for the previous chapter and probe for new dynamics. I use daily event data, disaggregated by state, to demonstrate that violent mobilization increases in frequency during a blackout and that protesters execute a tactical shift to non-violent methods only when blackouts are paired with state violence. The spatial, structural, and qualitative heterogeneity of collective action in India allows for a further analysis of protests according to their main participants. However, when collective action is broken down according to its primary organizing actors, shutdowns do not seem to have a consistent effect on collective action organized by structured actors or on more loosely organized 'leaderless' protest. At the same time, I do not find significant institutional effects stemming from the absence of coalition governments, the dominance of a single party in state legislatures, or fragmentation of the opposition. The chapter highlights the institutional discrepancies between the central government and state governments in India, encapsulated in the ruling Bhanatiya Janata Party (BJP)'s digitization campaign being conducted in parallel with individual states' use of network shutdowns to curb protest. In India, a relatively consolidated democratic system and the exorbitant economic costs of network shutdowns are insufficient safeguards against such measures; this creates a concerning precedent for other developing countries. The study supplements the previous chapter and prior research by adopting a more geographically precise focus, thus avoiding the weaknesses inherent to national studies that do not examine the coexistence of different phenomena in the same geographical space.

Chapter 5 closes the dissertation, returning to the overarching research puzzles that motivate the dissertation. It also outlines the joint limitations of the three studies and delineates potential future avenues of research. An **Appendix** supplements the dissertation by providing a detailed list of network shutdowns from 2011 to April 2018 (A) as well as an instruction sheet for an event categorization exercise in Chapter 4 involving student volunteers (B).

Chapter 2

The Digital Dilemma in War and Peace:

Connectivity Growth and Network Interference

Abstract

States are increasingly recognizing the empowering potential of information and communication technologies (ICT) for collective action and civil society. Many of these regimes work to control the information flow and curb any possibility of mass dissent encouraged by digital communication networks. In certain regimes, such disruptions may amount to 'digital repression.' How does the pace of expansion of Internet and cell phone connectivity affect the dynamics of interferences in these networks? Do other forms of repression alter these dynamics? I examine the indicators affecting interferences in digital networks worldwide between 1995 and 2011. Observations range from micro-level actions such as website blocking to large-scale shutdowns of communication networks (blackouts). I find that the pace at which Internet penetration (but not cell phone possession) expands consistently renders government-initiated telecommunication disruptions more likely and frequent. Second, I demonstrate the existence of a 'digital threshold' in the pace of change beyond which interferences taper off. This peak is located at an annual pace of expansion of about 7 percent. Third, I demonstrate that interferences are likely to happen in full-fledged authoritarian states rather than hybrid regimes. Finally, I determine that the evidence is weak for the connection between network interferences and traditional physical repression; however, the former coincide with other restrictions on free expression. These findings trace pathways for future research into the forms of information control used by threatened leadership in increasingly connected societies.

Introduction

"Dear subscriber: you may be sentenced to 20 years in prison for false or slanderous declarations via social media." This Orwellian text message from the Ministry of Posts and Telecommunications of Cameroon was received by thousands of citizens during the secessionist protests that rocked the country in January 2017. Several months earlier, the Speaker of the National Assembly called for stricter control over social media, calling them a "social malaise" and a "new form of terrorism." January's mass-distributed message was followed by a total Internet shutdown (blackout) in the Anglophone regions of Cameroon, applied irrespective of

individuals' actual participation in the demonstrations. This attempt to exercise absolute control over a communication network is an example of government-led 'digital repression' – a major trend in efforts to control the flow of information in the 21st century.

How do the development of technology and the expansion of networks affect the likelihood of disruptions in the network? Are national and regional governments more likely to implement website blocking or bans on telecommunications services in times of unrest, or perhaps in tandem with violation of their citizens' physical integrity rights? While much has been written on the implications of the 'digital revolution' for social movements, research on the regime's side of the coin is scant. Traditional modes of repression – arbitrary arrests, torture, beatings, and restrictions on the civil and political rights – may carry over perfectly to digital networks. However, they may also resurface modified or not resurface at all. Little attention has been given to identifying cross-national variations in controlling the information flow in the digital landscape.

This study aims to take a step toward filling the gap by analyzing the determinants of the decision to restrict access to digital networks or their subcomponents. I argue that the dynamic expansion of communication technology will be the most important determinant of the trend, cutting across levels of democracy, physical repression and violence, development indicators, and national demographics. The more vigorous the pace of expansion of connectivity, the more likely it is that governments will scramble to control the information flow using crude digital tactics. In non-democratic regimes especially, these tactics may constitute *digital repression* – actions aimed at stemming collective action and expression via technology, mimicking traditional repressive measures. However, I do not expect this relationship to be linear: leaders facing a rapidly developing technology must update their approach to it continuously, including their calculus of whether or not to restrict access. Thus, I expect that connectivity's pace of expansion will reach an inflexion point – or 'digital threshold' – at which governments will begin to turn away from crude repressive tactics and/or devise alternative strategies of control. The results confirm these expectations for Internet expansion, which exhibits a strong curvilinear relationship with network interference in most specifications. Furthermore, physical

repression does not seem to be a consistent predictor of network disruptions, while a stronger and more consistent link seems to exist between interferences and respect for freedom of speech. These findings should help establish a focus on the decision process of state leaders who find themselves in an increasingly 'wired' society – one where they can respond by acceding to demands, cracking down, or implementing new and innovative forms of control.

The article is organized in the following fashion. First, I review the literature on the link between information and communication technologies (ICTs) and repression, including a discussion of the somewhat limited empirical work on digital repression, interference, and network shutdowns (blackouts) in the social science literature. Next, I present the 'digital threshold' theory, outlining my argument and expectations. A presentation of the data and methodology follows. I then describe my results, ending with a discussion of the limitations and contributions of the study to our understanding of digital regimes.

Digital Technologies and the Toolkit of Repression

State-led repression manifests itself in many shapes and degrees of intensity. Yet restrictions on freedom of speech in the digital realm have not received as much attention within this body of work as more traditional indicators. This may be because narrowing access to information is less immediately threatening to an individual's physical integrity and fundamental protection from harm than violence and bloodshed (*cf.* Poe & Tate 1994, Cingranelli & Richards 1999). However, digital communication channels can be hotbeds of dissent, rendered more dangerous by rapid adoption, optional anonymity, lack of centralized control, and governments' slow pace of adjustment to digital technologies. Furthermore, governments may associate the emergence of public dissent with rapid increases in technology use, even if the link is spurious.

The *repression-dissent nexus*, which characterizes the relationship between state repression and protest as cyclical, has produced a fruitful literature, but empirical social science research has not yet extended this idea to digital means of control and resistance. Much published work that utilizes the repression-dissent nexus revolves around whether different tactics of repression

and mobilization escalate conflict or successfully deter the opposing side (Moore 2000, Lichbach 1987, Davenport 2010). Dictatorships in particular perceive increasingly violent forms of protest as harbingers of a violent exit and harsh judgment in case of an opposition victory. Hence, violent opposition triggers harsher repressive reactions (Regan & Henderson 2002, Carey 2010).

Although their relationship with collective action has not yet been conclusively established, rising Internet and mobile penetration inherently constitute a challenge to the status quo of government primacy in information transmission (Ruijgrok 2017). These technologies complicate authoritarian governments' 'hypodermic needle' approach, in which the government directly injects information into the populace through a network of state-run media (Katz & Lazarsfeld 1955). Both technologies imply the transition from state-driven, unilateral control and distribution of the information flow to a citizen-driven model, compelling regimes with a history of violations and more 'traditional' forms of repression or control to react against modern-day trends in society (Leberknight *et al.* 2012).

Decades of research on repression have given us an array of factors possibly influencing regime propensity to repress. Regime type, civil conflict, modernization, population size, and institutional capacity are all recurring themes. Institutional constraints and the diffusion and emulation of repressive behavior across national borders have also gained traction (Danneman & Ritter 2013). These indicators may serve as gateways to investigating whether the mechanisms of traditional repression are different from digital means of control, including digital repression. How does the growth of digital networks affect their chances of being controlled – and of freedom of expression through them being limited? While a burgeoning literature investigates digital networks' relationship with the costs of collective action and violence (Pierskalla & Hollenbach 2013, Shapiro & Weidmann 2015, Warren 2015), the present study addresses the regime's side of the barricade, which has not seen extensive empirical work.

Even before the Arab Spring, researchers observed that ICTs can function as both 'liberation technologies' and as technologies of repression (Deibert *et al.* 2008, Diamond 2010). Kedzie (1997) posits that authoritarian regimes face a conundrum in their range of responses to the fast-paced expansion of communication technologies. On the one hand, the government may choose to

curb access to these technologies; on the other, it may allow them to flourish. Both decisions may trigger mass dissent: the former through the removal of previously accessible means of communication, the latter through the expansion of resistance in growing channels the regime cannot quite control. In other words, both strategies may lead down the same path. Kedzie calls this the *dictator's dilemma* (or *dictator's digital dilemma*, per Howard *et al.* 2011). Although technology can be a vehicle for both social mobilization and crackdown, an emerging argument from the moderate space between these two positions is that digital technologies provide a stimulus and a platform for collective action, but do not guarantee its durability. This is because they can be co-opted by repressive regimes, who take advantage of the organizational fragility of digital activism (Tufekci 2017).

The threat to the regime that the expansion of digital technology carries is the destabilizing (though not necessarily democratizing) effect of multilateral communication. Each successive technological innovation – cell phones, the Internet, social media – replaces the top-down nature of state-run media, comprising primarily radio, television, and newspapers (Greitens 2013). Highly connected societies, even without democracy, do not devolve or degenerate technologically, and depriving large swathes of the population of a tool just recently made available to them potentially elevates the threat of civil unrest or subversive counteraction (Mason & Krane 1989). These channels are harder to control than centralized media.[16] Censorship and information control are inherently simpler processes *ex ante* than *ex post*, and the transition from a single disseminator to countless nodes constantly producing information involves a more complex and more insidious regulation agenda.

[16] For instance, before the Rwandan Genocide, the Hutu government transmitted genocidal narratives through the Radio Mille Collines (Thompson 2007).

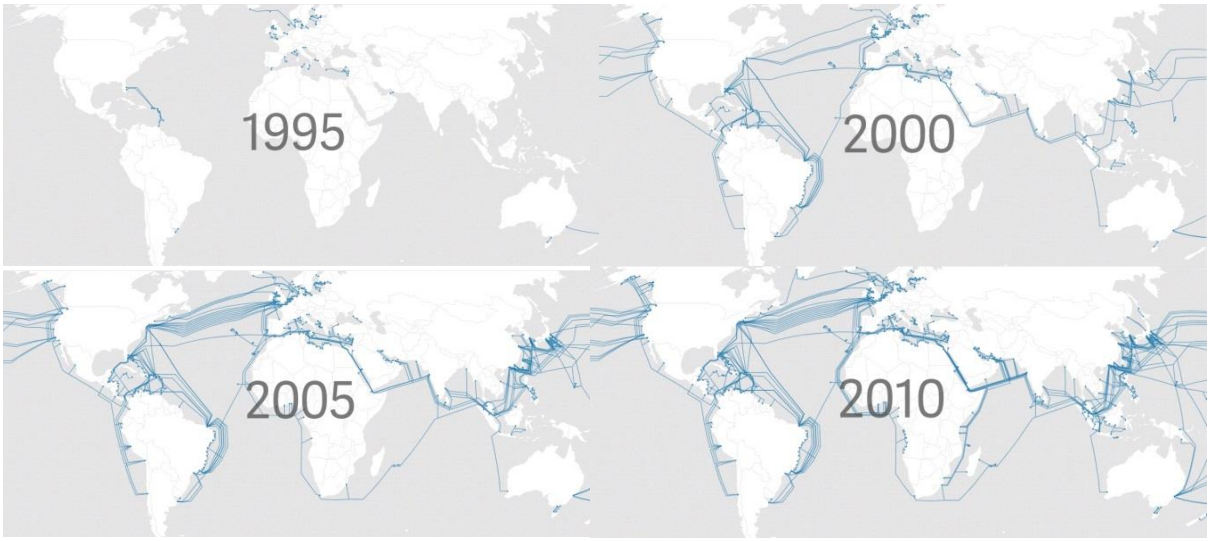


Figure 2.1 Schematic map of the expansion of submarine cables between 1995 and 2010. In the period covered by the study, the years 2000-2004 brought some of the largest growth in international connectivity as well as the largest cumulative lengths of newly-laid cable. The maps do not accurately reflect the geographic trajectory of the cables. Source: Telegeography (https://submarinecablemap.com/) via Groskopf (2016).

Much of the empirical literature revolves around the potential democratizing effects of ICTs, which can be seen as tools of expression – society's soapbox. Most studies have found that the diffusion of technology "[is not] a democratic panacea" (Groshek 2010) and that the apparent democratizing power of digital communication tends to vanish when examined globally (e.g., Rød & Weidmann 2015). The long-term outcomes of the Arab Spring provide some support for this. Nevertheless, there is a common, rather well-documented claim that exposure to the Internet in particular creates a culture of openness and favorable attitudes towards democracy (Nisbet *et al.* 2012, Stoycheff & Nisbet 2014).

The jump from expressing pro-democratic attitudes to taking action is a different matter. This link is critical because it can directly determine the government's choice of repressive strategy, most notably if vigorous technological growth coincides with public dissent. 'Smart mobs' – networks that are highly interlinked through technology and the rapid flow of information – are a new class of social movements that challenge governments in the modern era (Rheingold 2002), leading to 'networked protest,' powered by technology (Tufekci 2017).

Consequently, the use of mobile phones and the Internet has been linked to demonstrations, riots, and political violence (Miard 2012, Shapiro & Weidmann 2015). In turn, the escalation of turmoil can inform governments' *perception* of demands for democracy and regime change. The flurry of recent network interferences during or in the aftermath of elections – particularly large-scale blackouts in Africa – has provided ample evidence that non-democratic and ostensibly democratic governments do indeed fear 'smart mobs,' shielding themselves behind national security to justify blackouts. Governments' perception of risk in moments of crisis may be well-founded: Pierskalla & Hollenbach (2013) and Manacorda & Tesei (2016) both find a positive relationship between cell phone possession and unrest. While the conclusion receives mixed support in studies less reliant on news reporting (Dafoe & Lyall 2015), governments' wary approach to technology can be informed by their observation of protest and technological expansion taking place concurrently.

While reports of government overreach in the digital realm abound, the literature does not delve into cross-national dynamics in government responses to the growing organizational potential of communication. Between 2005 and 2015, non-democratic countries have reported some of the most dynamic rates of growth of both Internet and mobile connectivity (**Table 2.1**, **Table 2.2**). The availability of these networks varies greatly, with cell phones generally exhibiting high penetration regardless of other development indicators and Internet coverage remaining patchy or restricted to a narrow elite in many parts of the world (**Figure 2.2**). Governments are aware of these dynamics; their choice of response will reflect this. The degree to which they will be willing to embrace or constrain digital communication will depend, I argue, on the pace of the spread of enabling technology.

Table 2.1 Change in Internet penetration per 100 people, 2005-2015, states with largest change. Source: own work based on World Development Indicators (2016).

Country	*Internet penetration (2005), %*	*Internet penetration (2015), %*	*Δ*
Bahrain	21.3	93.5	72.2
Kazakhstan	3.0	70.8	69.9
Azerbaijan	8.0	77.0	69.0
Qatar	24.7	92.9	68.2
Oman	6.7	74.2	67.5
Lebanon	10.1	74.0	63.9
Russia	15.2	70.1	58.2
Albania	6.0	63.3	57.2
Saudi Arabia	12.7	69.6	56.9
Kuwait	25.9	82.1	56.2

Table 2.2 Change in cellular subscriptions per 100 people, 2005-2015, states with largest change. Source: own work based on World Development Indicators (2016).

Country	*Cellular subscriptions (2005), %*	*Cellular subscriptions (2015), %*	*Δ*
Macao SAR, China	113.8	324.4	210.6
Kuwait	60.2	231.8	171.6
Turkmenistan	2.2	145.9	143.7
Botswana	30.1	169	138.9
Maldives	68.4	206.7	138.3
Mali	6.4	139.6	133.2
Uruguay	34.7	160.2	125.5
Costa Rica	25.5	150.7	125.2
Cambodia	8	133	125
Panama	52	174.2	122.2

There is a dearth of case studies and large-N statistical approaches to regimes' use of ICTs. Where this topic does come into play, studies focus on *what content* is blocked in individual states (e.g., sensitive political, social, religious, or sexual content; *cf.* Deibert *et al.* 2008) or *how* it is blocked. Where researchers ask how governments censor online expression, they typically consider either one technique of limiting access (Clayton *et al.* 2006) or one country (Gohdes 2015, King *et al.* 2013).

Although case studies of censorship patterns (particularly in China and Russia) are numerous and useful, cross-national studies and those that refer specifically to network interference as a form of control can be counted on the fingers of one hand. Hassanpour (2017) and Gohdes (2015), for instance, offer detailed takes on Egypt during the Arab Spring and Syria in the ongoing civil war, respectively. Hassanpour demonstrates how the Mubarak regime's infamous 'digital kill-switch' in January 2011 backfired, leading protesters not to disperse, but to decentralize and spiral out of a single central location (Tahrir Square). This was one of the first countrywide, politically motivated disruptions of the Border Gateway Protocol – the protocol that controls the Internet's routing mechanism. Gohdes sheds light on the network disruptions of the Syrian Civil War and the effects of the Assad regime's expansion of its repressive repertoire into communication blackouts. Gohdes is able to show that network shutdowns are systematically associated with (and preceded by) higher degrees of state repression, and have repeatedly been used as a war tactic in Syria to choke the outflow of information after an attack. While excellent individually, these case studies are not generalizable.

Overall, researchers have unearthed some of the *what* and some of the *how* – but we do not have the *why*. A search for internal and external sociopolitical circumstances commonly accompanying episodes of interference should be undertaken. Such is the premise of the present paper, which attempts to fill the existing gap by investigating the determinants of network interferences.

Theory

My focus in this study is control of information access in the form of interferences with network access (Deibert *et al.* 2008). In democratic states, such control is often channeled through the judiciary and motivated by factors that are not always explicitly political: copyright claims, hate speech, trade in illicit substances or objects, and illegal digital content (e.g., child pornography) often warrant targeting. Large, deliberate blackouts targeting a certain area are

unpopular with the public and extremely rare, even when public safety is implicated.[17] In non-democratic regimes, on the other hand, such control often amounts to what may be termed *digital repression*. Digital repression can be defined as actions undertaken to suppress technology (particularly communication technology) with the aim of controlling dissent, collective action, or the flow of information. This can include politically motivated cyberattacks, removal of individual users, interference with Internet service providers (ISPs), blocking of websites for political reasons, and large-scale network shutdowns or disruptions.[18] This process is often supported by the absence or ambiguity of legal provisions on network interference, including laws defining the acceptable limits thereof.

Digital repression is seen by the elites in power as an instrument of regime survival in response to threats real or imagined, particularly in non-democratic regimes (Holtermann 2012). Greitens (2013) distinguishes between *regime control*, comprising the tools of online repression, and *regime activism*, in which regimes embrace new and social media to pursue their own agenda. Regimes see their own activism, in social media and the broader Internet alike, as a means of responding to or preempting social activism – an attempt to crowd out opposition and civil society. Regime control and regime activism complement each other to amplify the government's command of the digital realm. However, crude means of control like blackouts and website takedowns are an assertion of the regime's authority; activism is more difficult to master because the government's narrative is only one of many that compete for attention. Furthermore, the growth of technology outpaces the government's ability to connect with the

[17] For instance, a cell signal shutdown took place near the affected Tube stations after the 2005 terrorist attack in London, where cell phone-triggered bombs were suspected. The measure was roundly condemned as inducing further chaos. Numerous politically motivated disruptions were also recorded during the 2017 Catalan referendum.

[18] While the definition of digital repression in this study is broad, it reflects the wide spectrum of current and future restrictions on digital content. The definition adopted here mirrors the conceptual breadth of repression as a whole, which ranges from "actions that increase the costs of protest" (Tilly 1978 via Earl 2011) to conceptually detailed enumerations, including arrests, torture, mass killing, surveillance, bans, harassment, violations of bodily integrity, and curbing freedom of expression (e.g., Davenport 2010). Thus, if anything, digital repression constitutes a subset of traditional repression that may be governed by a separate set of rules. For more on the conceptual diversity of repression, see Earl (2011).

populace through new communication channels. Many of the latter were yet to be recognized as juggernauts of social mobilization in the period covered by the study.

My first expectation is that rapidly rising Internet penetration will be positively associated with network interference. In democratic countries, the greatest acceleration in the development of Internet infrastructure took place in the early 2000s.[19] The United States crossed the 50 percent penetration threshold with aplomb in 2002, adding 29 million users who accounted for a 9.7 percent leap in penetration in a single year. Other democratic countries registered even more dynamic growth. This early period was followed by a rise in network interference, as early profiteers of the digital age (e.g., Napster) were struck with the first wave of legislative and executive backlash. In democracies, the spike in Internet connectivity visibly preceded the onset of major interferences (**Figure 2.2**).

However, in non-democratic and hybrid regimes, the dynamics of disruption stem from a different set of factors. Governments may recognize the 'liberating' or 'democratizing' potential of the Internet and cellular communication through a fundamental change in the mechanisms governing the information flow. Although there are serious doubts about the effectiveness of digital technologies in the *sustainability* of collective action (Tufekci 2017), repressive governments around the world continue to make statements decrying the 'destabilizing' effects of technology and frequently view it as an existential threat. If such 'digital repression' follows the cues of traditional repression, the government will construe expanding communication networks as a threat to its existence and crack down. In line with classic theories of repression, the regime's reactions will be dictated by the will to maintain its hold on power when faced with a challenge to the status quo (see DeMeritt 2016).

Overt network interference often constitutes a crude digital repression tactic, used by regimes as a first response. In general, the growth in connectivity precedes the use of such tactics – and especially repressive innovation that enables more clandestine control. This is particularly true for countries whose digital infrastructure is developing at an accelerated pace,

[19] Another growth spurt occurred in the early 2010s, fueled by the rise of connected mobile devices.

but which still have sub-par capacity to stealthily control the digital information flow (Howard *et al.* 2011). While democracies developed this capacity earlier than non-democracies, the years that registered the most vigorous expansion of both Internet and cell phone networks coincided with the very public outpouring of overt attempts to control piracy and the flow of content. In turn, non-democracies were more interested in experimenting with digital repression than in copyright violations. These states, where both aggregate penetration of technology and the pace of change peaked several years after they did in democracies, had less time available in the specified period to develop sophisticated and less detectable methods of digital repression. In both cases – though for different reasons – the brisk pace of expansion of technology should thus render the respective states prone to methods that are rudimentary enough to be detectable.

However, I also expect a 'silver lining.' As the pace of Internet expansion reaches relatively high levels, it will eventually arrive at a *digital threshold* beyond which the incidence of network interference will begin to taper off. Thus, a curvilinear effect will be activated. There are several possible reasons why this might be the case. First, the regime might decide to give in to the impact of Internet expansion, especially if it perceives demand for democracy as an inevitable corollary of the growing market for communication technology (Nisbet *et al.* 2012). Digital networks are a 'socio-organizational' resource that can be mobilized to drive collective action (Spier 2017). This hypothesis entails a 'fearful regime' intimidated by civil society's rapidly expanding capacity to organize in a decentralized manner – and by the potential global and local consequences of disrupting communication networks. Second, the economic argument for limiting restrictions is equally potent: overt interference with a network that is expanding very rapidly may chill investments in infrastructure and the creation of a digital economy. These two arguments would entail the victory of citizens' digital capacity – their ability to use new technologies to their advantage – over that of the government.

However, there is also a third option: repression can go underground – that is, governments can switch to less detectable means of information control. The early years of the Internet saw governments with limited resources for information control in the online sphere, where traditional mechanisms of ownership and authority over mass media such as television and

radio were impractical. However, by the end of the 2000s, numerous authoritarian and hybrid regimes had reached high and continually rising penetration levels (**Table 2.1**) and began to recognize the value of more nuanced and insidious interference. Governments thus simultaneously recognized the economic bonanza promised by the expansion of the digital sphere and the need for control over unbridled expression. This period saw both a surge in Internet connectivity in non-democracies (**Figure 2.2**) and the implementation of the first sophisticated surveillance programs (e.g., the Great Firewall in China). Creative censorship, text and keyword filtering, legislation against content, and employment of private 'Internet armies' to remove posts and users are all tactics that remain uncodified by many databases. This represents a departure from the most overt methods of repression.[20] Given increasing interest on the part of world governments in the weaponization of digital networks, this may be a major driver of the digital threshold at high rates of expansion, even though the specified period largely precedes the known development of such sophisticated methods of control. To summarize, these two primary possibilities – (a) governments' surrender to the potential and implications of technology, and (b) the capacity for interferences in digital networks to become less detectable – lead me to expect a curvilinear relationship between Internet penetration and network interference. Two hypotheses stem from this:

> ***Hypothesis 1a:*** The pace of expansion of Internet penetration will be positively associated with network interference.
>
> ***Hypothesis 1b:*** The number of network interferences per year will increase until the pace of Internet expansion reaches the 'digital threshold' and the frequency of interference begins to decline.

A critical assumption underlying this theory is that the expansion of technology precedes the application of increasingly varied and sophisticated methods of control. In other words, the expected decline of the methods of interference described in this study would reflect a threshold

[20] Additionally, highly connected societies do not necessarily undergo a transformation toward self-expression values. Support for various forms of online censorship remains high in some parts of the world (Shen & Tsui 2016). Provided a compliant populace, continued surveillance may not generate any significant backlash.

process, not a process of learning. A learning process would entail governments acting as gatekeepers to further expansion, which they would only permit once they have diversified their repertoire of control and rendered it less visible. While governments are the ultimate decision-makers in the calculus of extending infrastructure, they typically react to trends brought on by communication technology rather than preempt them (a reverse-causality argument). **Figure 2.2** shows that the surge in connectivity in democratic countries preceded the onset of interferences and the pace of change subsequently stabilized. In hybrid and especially authoritarian regimes, disruptions partially mirror the pace of change, as their governments swiftly move to implement methods of control. However, absolute penetration rises steadily in the long run, and the pace of yearly change in penetration peaks before disruptions seemingly start to taper off. This suggests that governments adapt to changing conditions in connectivity rather than anticipate them.

Innovations in digital control do not advance as quickly as connectivity does, especially at early stages of development. For instance, new submarine cables open the floodgates of connectivity for millions of users in multiple countries at a time. Massive investments led to a surge in international cable expansion in the early 2000s and the simultaneous inauguration of submarine cables in multiple countries via multiple coastal landing stations.[21] This led to connectivity spikes in all of these countries (see **Figure 2.2**).[22] Few states have the capacity to fine-tune digital repression before the vigorous expansion of the network.[23] Similarly, data requests – a more clandestine form of attempted control – only surged after the pace of change reached its peak in many countries, and this occurred primarily in countries that were well on their way to greater connectivity. Finally, Freedom House's *Freedom on the Net* report has found that, even in countries where the independence of traditional media is targeted and undermined, restrictions on online discourse in are less severe. Although freedom of expression online is on a consistent, downward trajectory globally, this must be seen in light of the fact that

[21] Egypt registered a rise in penetration from 4 to 11 percent between 2003 and 2004, increasing absolute penetration from 2.9 million to 8.8 million.
[22] In 2012, for example, the West Africa Cable System was inaugurated along a stretch of 11 countries, providing Internet to several states that had previously been largely disconnected.
[23] The most notable exception is China.

connectivity in many countries has been rising for years (Freedom House 2016). I begin to address the reverse causality problem in my statistical models using lagged variables, though more detailed work is needed in the future to pursue this further and pinpoint causal relationships.

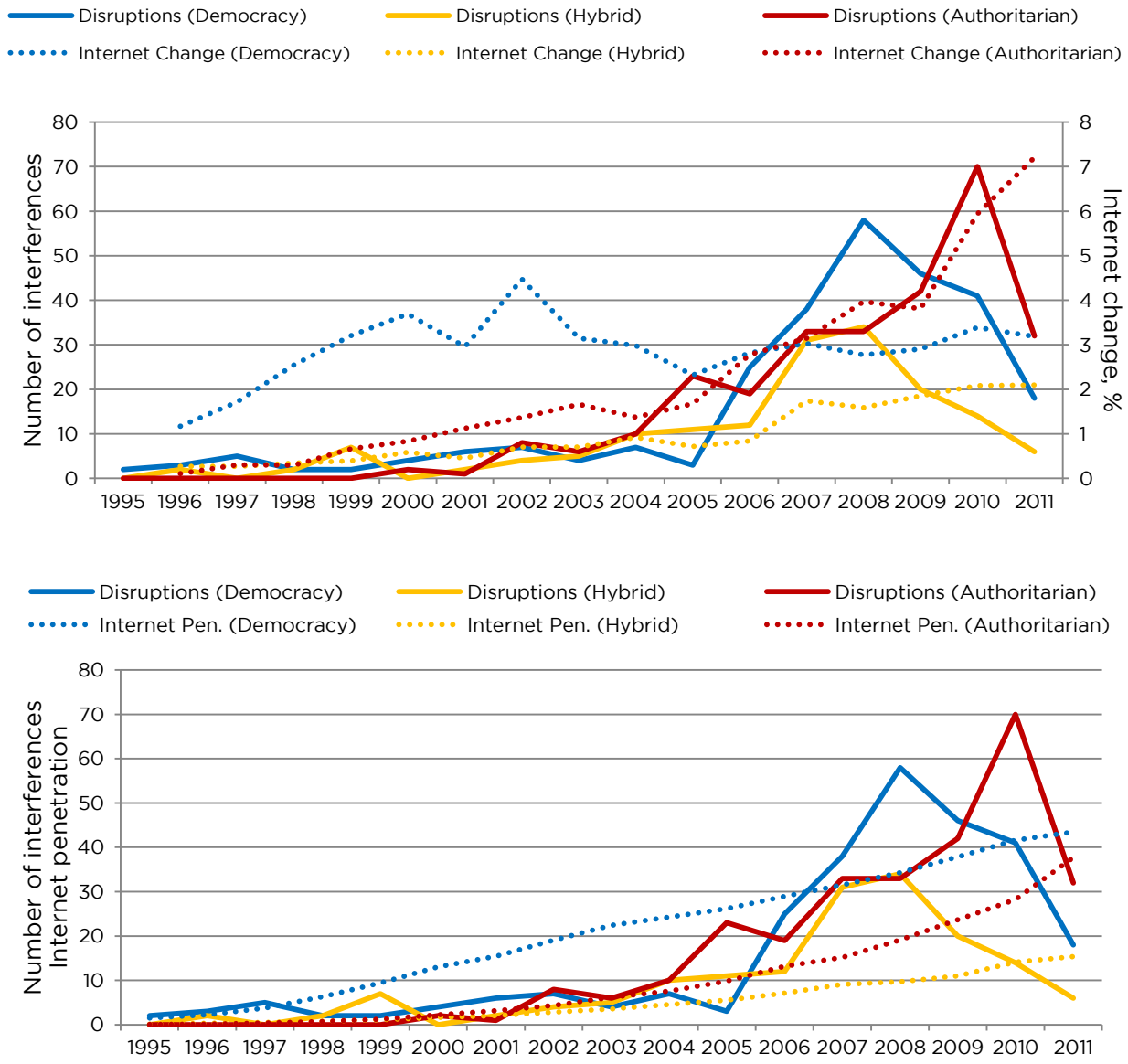


Figure 2.2 Trajectory of network interferences in democratic, hybrid, and authoritarian regimes, against Internet change (pace of Internet expansion; top) and Internet penetration (bottom).

The association between cell phone use and social mobilization has been explored rather extensively in recent literature. The 'liberation technology' argument, which views cell phones

as a tool of activism and amplification of protest, implies that governments will go to great lengths to limit the empowering potential of technology (Hussain & Howard 2013). Warren (2015) in particular underscores the difference between mass media (television, radio) and cell phones insofar as fueling collective action is concerned, arguing that the former promote appeals to national unity while the latter drive "divisive appeals" that may stimulate violence. This concern may compel governments to restrict network accessibility, particularly with cell phone ownership rising rapidly in non-democracies and hybrid systems (see **Figure 2.2**). Several high-profile, large-scale shutdowns have occurred in countries with high or swiftly expanding mobile connectivity – e.g., in Gabon (169 cell phone subscriptions per 100 people) in 2016 and the Gambia (131) in 2017. Anecdotal evidence from recent shutdowns in Africa, where the falling cost of handheld devices has triggered a massive spike in cell phone possession in recent years, suggests that high cell phone use is indeed considered a threat by many governments, at least post-Arab Spring and especially around elections (Manacorda & Tesei 2016, Pierskalla & Hollenbach 2013). Rising smartphone adoption, which enables greater use of social media on the move and allows rapid diffusion of images and video, is encouraging this trend. However, the period covered by this study does not include the rapid emergence of smartphones.

I expect the relationship between the pace of expansion of cell phone possession and network interference to be positive. The reasons behind this are broadly similar to those that apply to Internet penetration. However, the internal dynamics of cell phones as weapons of resistance are likely to be different from those of the Internet, and so are the dynamics of interference (Bergren & Bailard 2017). Before the smartphone boom, mobile phones were a less versatile form of digital communication than the Internet, especially in the developing world. While the Internet can be destabilized in a multitude of more or less visible ways on a gradient of precision and scope, disrupting mobile communications is often a zero-sum game. To suspend calls and SMS, the regime may have no choice but to completely block access because it may not be able to resort to subtler, softer forms of censorship. Indeed, none of the other forms of interference in the dataset used here pertain to cell phone networks. While governments can

attempt to hunt down individual numbers and call records, establishing the origin of a 'destabilizing' message or call is non-trivial. In many cases, the government can only shut down the network or leave it alone. I argue that, under amenable circumstances, most will not take the risk and will disconnect the network. The vigorous expansion of cell phone possession is thus expected to be a predictor of *large-scale* ('full') network shutdowns, or blackouts.

Recent incidents in India and Pakistan have supplied circumstantial evidence that both democracies and hybrid regimes are willing to repeatedly execute full blackouts when faced with growing cell phone possession, violence, social turmoil, or even largely apolitical mass gatherings (IHRB 2015). National and regional security are the most common lines of defense. Cell sites have also been disrupted on a regional level by terrorist groups (e.g., Al-Shabaab in southern Somalia in 2014). Moreover, governments benefit from the 'black box' of intelligence – the claim that explaining the reasons for a shutdown would compromise security. States can claim that shutting down a cell network is the least invasive digital approach given that surgical restrictions are difficult to execute (the 'zero-sum game' argument). Furthermore, telecoms and cell sites are often state-owned and always bound by national laws, some of which (e.g., in Myanmar and DRC) enforce compliance with government requests under threat of revoking licenses to operate (Industry Dialogue 2015). National security, difficulties moving interferences underground (i.e., rendering them less detectable), and governments' authority over telecom companies are expected to drive up the popularity of blackouts as a repressive measure.

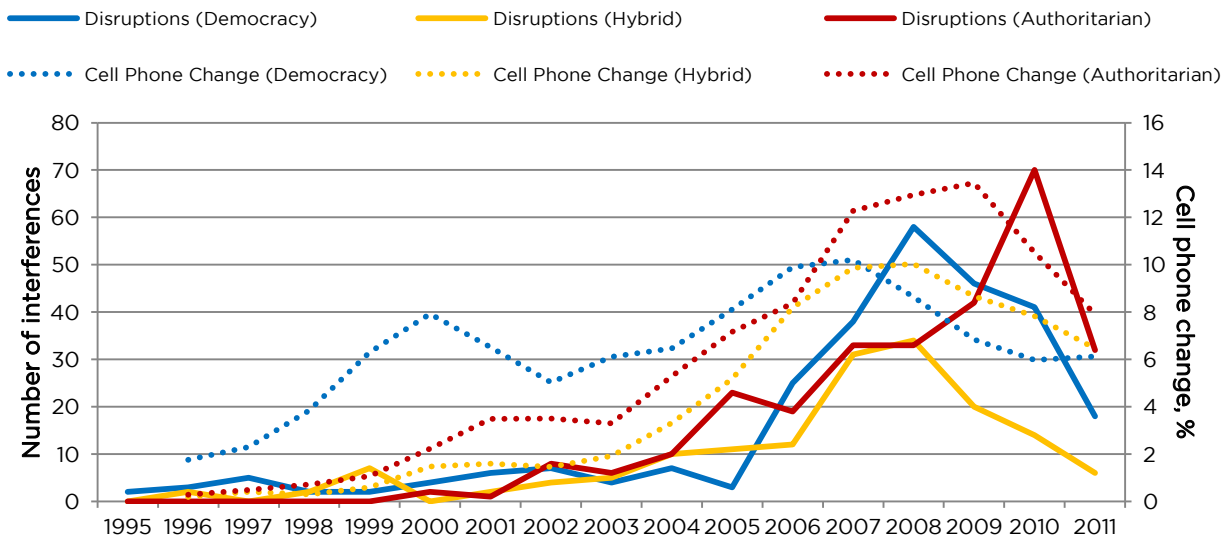
Once more, I expect a 'digital threshold' effect in the dynamics of large-scale blackouts when cell phone possession is taken into account. Governments might be less enthusiastic about executing full-network disconnections when the pace of expansion of mobile technology is high due to the collateral damage they cause. For instance, the Nigerian government's attempt to shut down GSM telephony in Borno State, motivated by an effort to disrupt Boko Haram's communication network and coinciding with exponential mobile growth, caused more havoc among the public than among insurgents (Jacob & Akpan 2015). The economic fallout of large-scale blackouts may also be highly problematic or undesirable for the government. Conservative estimates for Internet blackouts in 2015 reveal at least $2.4 billion in damages

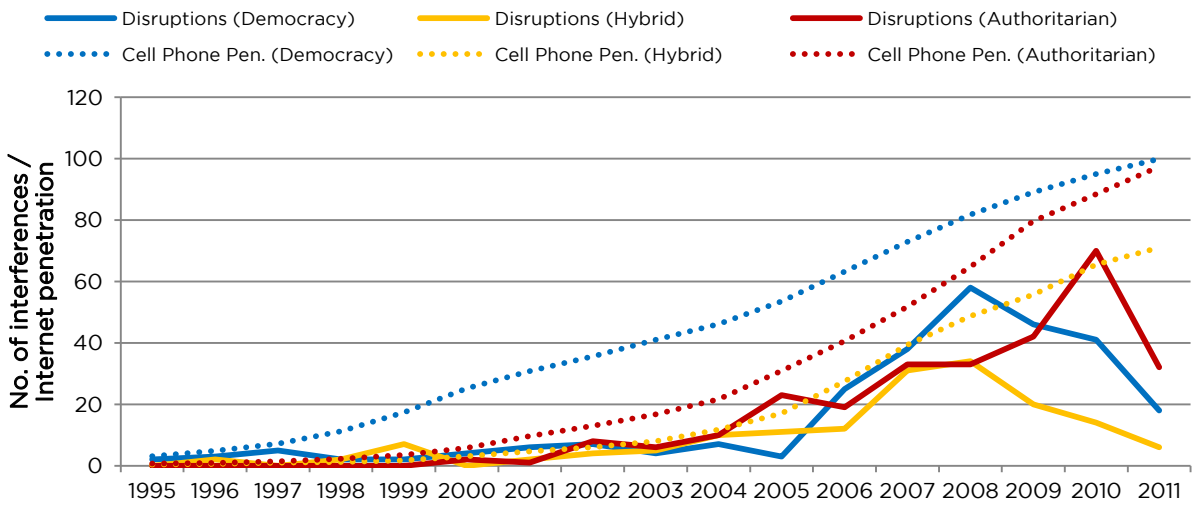
across the world (West 2016) or $10.2 million per 10 million people per day across all levels of connectivity (Deloitte 2016). For the government, such a drain on the economy is a clear disincentive because it throttles tax revenue from businesses that are increasingly reliant on communication technology. In sum, the increasing socioeconomic repercussions of large-scale shutdowns are expected to contribute to a 'digital threshold' effect that sees blackouts decline at high or rapidly growing rates of penetration – in this case, the extent of cell phone possession.

> ***Hypothesis 2a:*** A faster pace of change in cell phone possession will be positively associated with the tendency for governments to execute full network shutdowns.

> ***Hypothesis 2b:*** The likelihood of full network shutdowns will increase until cell phone possession reaches the 'digital threshold' and the likelihood of shutdowns begins to decline.

Figure 2.3 Trajectory of network interferences in democratic, hybrid, and authoritarian regimes, against change in cell phone possession (pace of cell phone expansion; top) and cell phone possession (bottom).





Data and Methodology

The study's panel data covers 176 countries between 1995 and 2011. I use Howard's Why Do States Disconnect Their Digital Networks (WSDDN) dataset (Howard *et al.* 2011), which comprises several hundred network interference episodes in 101 countries (democracies and non-democracies) spanning the years 1985-2011. The time span of this study omits the years 2011-2016, which witnessed the multiplication and most vigorous growth of Internet censorship, network shutdowns, and other government interferences. With the popularization of social media, this period also saw the emergence of *connective action*, or collective action supported by communication technology with organizational structures that are often looser than those of traditional collective action (Bennett & Segerberg 2013). Howard *et al.*'s data are not easily extendable to subsequent years given the data collection method, which relied on searching news sources using predetermined criteria and a team of coders. Enlarging the dataset would carry the risk of inserting the bias of another researcher. Furthermore, the dynamics of these two periods are likely to be different given the seminal role of the Arab Spring in both popular mobilization and repression; a separate examination of each allows us to avoid tortuous explanatory pathways.

In contrast to several popular measures of press and Internet freedom, the WSDDN dataset does not create an index and thus avoids pooling together all the individual components of a country's censorship apparatus. However, its event-analysis model does not provide insight on any potential determinants thereof. The dataset was chosen not for the data's precision – which exhibits selection problems characteristic of reported event data – but for their uniquely useful conceptual treatment. Every individual disruption event is a separate data point. The database identifies four different categories of interferences, as shown in the table below.

Table 2.3 Howard *et al.* (2011)'s typology of network disruptions. Summary statistics based on Freedom House measures of democracy in Polity 2 dataset (hybrids and authoritarian regimes coded as non-democracies).

	Democracy	*Non-democracy*	**Total**
Complete (full-network) shutdown	12	34	**46**
Specific site-oriented shutdown	134	224	**358**
Individual users (removal of nodes)	78	129	**207**
Shutdown by proxy (ISP shutdown)	47	52	**99**
Total	**271**	**439**	**710**

There are significant missing data in the WSDDN database for the first nine years – a self-explanatory problem given the embryonic state and penetration of the Internet at the time. Thus, I set the lower date at 1995. Mid-decade, the United States was relaxing restrictions on commercial traffic and transforming Internet governance away from the protected status the Internet enjoyed at its origins, when it existed at the intersection of government, military, and academia. Access to Internet and mobile technology in the developing world was extremely scant. Even in the United States, there were fewer than 10 Internet users per 100 people in 1995. This period also saw some of the first instances of governments meddling with access to digital content.

The primary dependent variable in this study is a count of all network interferences that took place in a country in a given year, aggregating all four categories. An isolated full network

shutdown binary variable is used as a dependent variable in some regressions. Using this allows us to circumvent the problem of only that category applying to mobile networks. I use negative binomial regression throughout the study, though select regressions use zero-inflated negative binomial regression.[24] The negative binomial model accounts for overdispersion in the dependent variable, which has a high coefficient of variation (ratio of standard deviation to mean), as confirmed by a significant dispersion parameter (alpha). A standard Poisson model would therefore be inappropriate for this analysis. Furthermore, the count variable contains a high number of zeroes, i.e. years in which a given non-democratic state was not known to implement restrictions on access. This encourages the use of a zero-inflated model to account for excess non-events, but requires a theoretical explanation for the variable used to explain these. I also attempt to address caveats on reverse causality by lagging all independent variables by one year, complementing the theoretical remarks on the topic in the previous section.[25] All regressions are run with robust standard errors.

Independent Variables

This study includes two primary independent variables: Internet penetration and cell phone possession (mobile density), as well as their squared terms.

The *pace of Internet expansion* is operationalized using the World Bank's Internet penetration variable from the World Development Indicators (World Bank 2017). This last variable represents individuals with Internet access per 100 people; I use year-by-year differences to account for the pace of technological development. Internet penetration is often a fast-moving variable (see **Table 2.1** and **Figure 2.2**), even though the temporal range of this study does not encompass the period of fastest adoption (2011-15). If a significant effect is detected, it will suggest that digital crackdowns either follow or coincide with surges in connectivity. Greater

[24] A Vuong test was executed to compare the relative usefulness of the zero-inflated model versus a regular negative binomial. It did not favor either model, thus encouraging the use of both. The small standard errors in the inflation equation imply that a zero-inflated negative binomial model is appropriate here.

[25] While lagging variables is standard procedure in panel regressions, it does not solve the causality problem, which deserves further consideration in future studies. The causal mechanisms behind the relationships identified here are only theorized in this chapter

availability of the Internet and the especially vigorous expansion thereof create the *potential* for collective action – as a facilitator and coordination tool more than a causal mechanism – which puts regimes on high alert. I therefore use the year-to-year change in Internet penetration as the first independent variable. Given that I expect a curvilinear relationship, I also include the *squared term* of change in Internet penetration in the study.

The pace of cell phone expansion is operationalized using the 'mobile density' variable from WDI, which represents the "percentage of subscriptions to a public mobile telephone service using cellular technology" (World Bank 2017). Once again, the static cell phone possession variable is replaced with one that accounts for rate of expansion of the technology. Even today, the technological convergence between Internet and mobile, though observed in parts of the developing world, is far from ubiquitous (see **Figure 2.4** for distributions[26]). In the period covered, the smartphone was not yet the dominant handheld device in the mobile world (GSMA 2015). The true rift between Internet and cell phone penetration exists in the poorest countries, where low-cost cellular devices are much more common than a connection to the Internet. While the absolute measures of Internet and cell phone penetration are correlated (at 0.51 for the bottom ten countries and 0.8 for the entire sample), there is no significant correlation between the pace of yearly change for the two measures. To test for the presence of a curvilinear relationship, I also include the *squared term* of the cell phone change variable.

[26] Note that the distribution peaks at a level higher than 100 mobile phones per 100 individuals – the result of users purchasing multiple SIM cards.

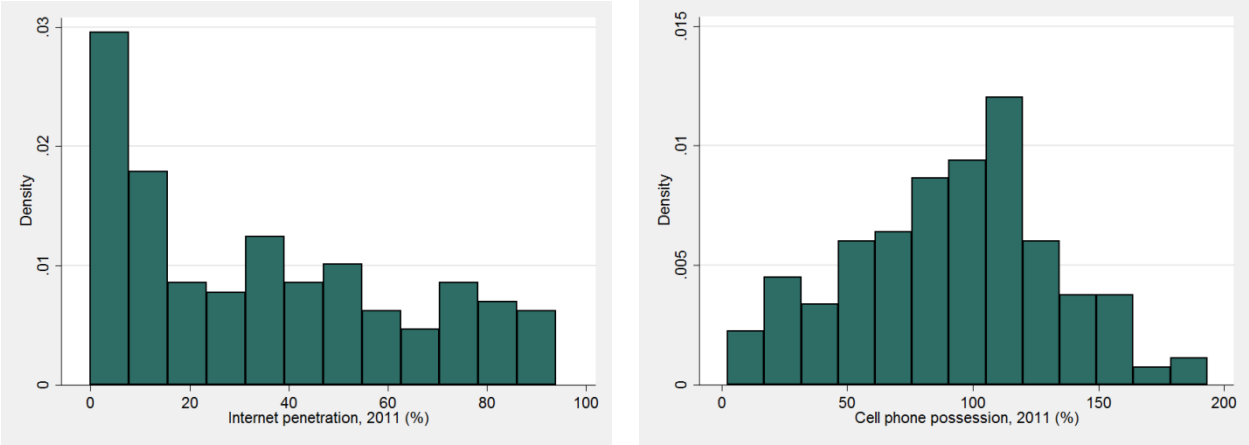


Figure 2.4 Cell phone possession in 2011 exhibits much greater normality in its distribution than Internet penetration.

Control Variables

A number of control variables were used, based on a combination of the repression and ICT literatures. *Regime type* is a fundamental consideration, nearly ubiquitous in studies of repression. It is vital to know whether similar processes are at play across all levels of democracy. In particular, hybrid regimes composed of an amalgam of democratic and non-democratic characteristics may use a different battery of tools than do pure, crystallized authoritarian regimes – or use the same tools with differing frequency (Regan & Henderson 2002, Kerr 2013). The variable is built using the 21-point Polity 2 scale. The scale itself suffers from a number of problems – notably, the same score can be rendered by very different subscores on the six factors that comprise it. This makes comparing the quality of governance and democracy difficult (Coppedge *et al.* 2011). As a result, the reported statistical tests in this study use binary indicators of anocractic (-5 to 5) and authoritarian (< -5) regimes based on the Polity 2 scale, with democracies as the excluded category. I also incorporate interactions between the main independent variables and regime type, as it stands to reason that technology's effect on technological repression would be contingent on the political system.

Economic growth, operationalized in this case as the annual percentage growth rate of GDP, has been seen to create at least two opposing tendencies in studies of repression. First, if

inequality is kept in check and other economic grievances are addressed, no major protest should take place and the regime should have no incentive to repress. Second, whether due to sharp increases in inequality that are likely to accompany dynamic growth or other grievances associated with modernization, the population could be driven to rebellion and the government to reaction. Though support for this assertion is scant (Poe *et al.* 1999), the outcome may be different for network interference, as economic growth could 'steal the thunder' of whatever effect the penetration of technology may have.

Logged GDP per capita and *logged population* estimates are classic control variables in studies of conflict. There is, at the very least, an association between GDP per capita and repression, though available research has not shown a direct link for lower levels of violence than large-scale civil war (Holtermann 2012, Besley & Persson 2011). Linking low GDP and civil war is straightforward and common in the literature, which associates the effect with poverty, grievance, the opportunity costs of rebellion, and state capacity (Holtermann 2012). Lower-level repression is less clear-cut; in this case, in choosing its repressive tactics, the government may take economic concerns into account when considering the option of interfering in digital networks. Similarly, a large population could influence a government's decision to disrupt a network if network interferences follow cues set by traditional forms of repression, where larger populations tend to be associated with a greater propensity for regimes to crack down (Koopmans 2005, Nordås & Davenport 2013).

But demographics require a closer look. The breadth of the population variable blurs the mechanisms behind its effects on the dependent variable. Research has shown a close association of *youth bulges* with both modern-day popular movements and governments' propensity to repress (Nordås & Davenport 2013). A large cohort of youth, in combination with socioeconomic grievances, is more prone to mass mobilization. Furthermore, youths aged 15 to 24 are the most active users of communication technology. Repressive states – aware of their own demographics – can adopt preemptive strategies of repression to prepare for any oncoming tide of indignation. While this trend was demonstrated in the Arab Spring – in which every state that experienced unrest was experiencing a youth bulge – its generalizability

remains an open question. Using the U.S. Census Bureau's comprehensive international demographic database, I pooled two age groups that commonly constitute the definition of youth (15-19 and 20-24) to determine the proportion of youth in a given population.

Tertiary education enrollment (World Bank 2017) is included due to the expectation that a highly educated population is liable to be both more tech-savvy and have the organizational capacity to wield new technologies more effectively as tools against the regime (Asal *et al.* 2016). Conversely, the regime will recognize the threat of technology-assisted mobilization and more willingly interfere with both large networks and popular 'opinion leaders' around whom activists and netizens concentrate. High or growing levels of education have been used to explain both nonviolent dissent and cyberattacks (Asal *et al.* 2016). Most governments are aware of these societal trends and could be expected to wield the tools of network interference as a preemptive measure, a reactive one, or both.

Violent repression is one of the most likely disruptors of the results. It also carries some of the deepest implications because the willingness of regimes to interfere with networks may exhibit patterns in line with various types of traditional repression, particularly the violation of physical integrity rights, freedom of association, and freedom of speech (Gohdes 2015). Discovering a nexus between digital and traditional strategies of violent repression may be of great importance in its own right, as it would empirically open the discussion on the complementarity of substitutability of repressive strategies. Mining this issue may help determine whether network interference typically takes place as part of a broader government strategy to stifle counter-regime mobilization – that is, whether it can constitute digital repression. In particular, network interference may follow the cues of other mechanisms of information control. Governments rarely consider digital networks equivalent to traditional media, and many countries with considerable media restrictions are less draconian with new communication technologies (Freedom House 2016). It is therefore important to juxtapose the throttling of online speech with broader restrictions on expression and bodily integrity.

The primary indicators of traditional repression in this study will be three indexed variables from the CIRI Human Rights Data Project (Cingranelli & Richards 1999). These are: respect for

physical integrity rights, freedom of association, and freedom of speech. The physical integrity rights index is an additive measure that combines forced disappearances, extrajudicial killings, political imprisonment, and torture. The freedom of association (and assembly) variable examines whether citizens were subject to restrictions on forming organized societies or groups and/or assembling peacefully. The freedom of speech variable encompasses restrictions on both the press and regular citizens, taking media ownership into account.[27] By including these three variables, I am accounting for a breadth of repressive activities. However, I also cross-validate them with measures from the Integrated Crisis Early Warning System (ICEWS; Boschee *et al.* 2015) that speak to both physical repression and violation of association and speech rights.

Dissent can also be an indicator of simmering conflict and has a known circular relationship with traditional forms of repression – the repression-dissent nexus (Lichbach 1987). For instance, governments have publicly pointed at demonstrations and riots as justification for methods of digital repression ranging from low-level monitoring to whole-country blackouts, and ascribed the power to mobilize large crowds to digital communication tools. I therefore account for collective action in the form of *non-violent protests* and *violent riots*, both of which are a direct incentive for a government to use traditional measures of repression. It is widely accepted that sustained, non-violent civil resistance is an effective strategy while unfettered violence only perpetuates the cycle of repression (Chenoweth & Stephan 2011). Will non-violent and violent resistance have the same effect on network interference or will governments switch to these 'softer' strategies of information control during non-violent protests, whose more composed nature limits the incentives for bloodshed? This question has not yet been explored empirically and thus provides a possible cornerstone for future research. Both variables are sourced from the ICEWS dataset for 1995-2011; both are logged count variables of the number of non-violent protests and riots, respectively, in each country-year.

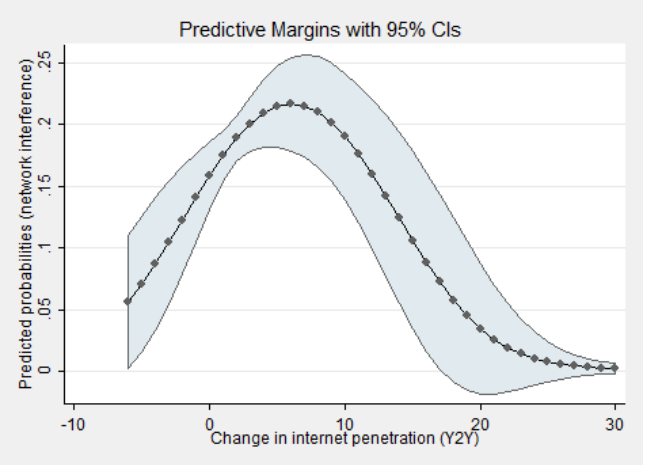
[27] In unreported regressions, this was cross-validated with Freedom House's Freedom of the Press Index and Reporters Sans Frontières's World Press Freedom Index. While the results were similar, both indices are highly correlated with a number of variables, which warranted their exclusion from the final models.

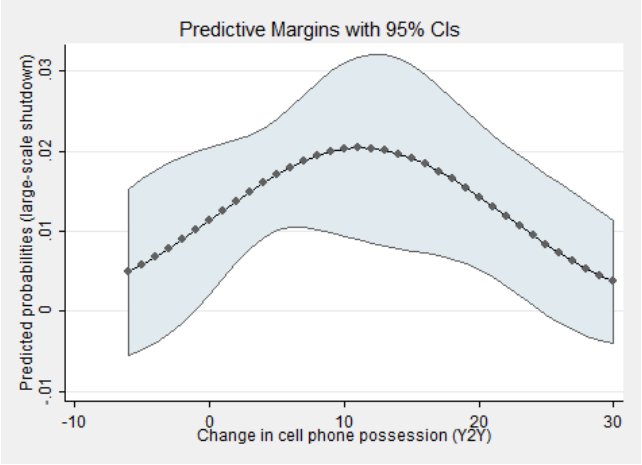
Results and Discussion

Across all statistical tests, CHANGE IN INTERNET PENETRATION was consistently significant as a predictor of network interference. The pace of expansion of Internet connectivity was found to be positively associated with network interferences, suggesting that a higher rate of growth is linked to higher rates of disruption, interference, or disconnection of digital networks. The squared term for Internet change is similarly significant and negative across most specifications. This demonstrates the predicted 'digital threshold.' For the 1995-2011 period, the number of overt interferences in communication networks begins to decline when countries enter a phase of feverish network growth. This may be due to governments' fear of technology and its mobilizational capacity, their embrace of the digital economy, their concern about the economic repercussions of interference, or increased 'repressive innovation,' which allows regimes to take their digital operations underground while maintaining a benign façade.

Figure 2.5 plots the predicted probabilities a representative regression. The dynamics for change in Internet penetration exhibit a sharp rise in the probability of interference when connectivity advances at a slower pace (approximately 0-7 percent), followed by a peak at around 7 percent and a subsequent sharp decline. The probability of any kind of interference bottoms out completely when the pace of development is exceptionally fast (annual change larger than 20 percent). Cell phone networks display a somewhat similar effect when regressed against complete blackouts. The latter graph exhibits a much more gradual rise and fall as well as lower predicted probabilities. More importantly, the confidence intervals for cell phones denote that the variable is not significant. If so, governments may perceive cell phone networks as tools of everyday communication rather than of mass mobilization. Based on these two graphs alone, we can draw the preliminary conclusion that an association between Internet expansion and network interferences seems to exist, but that cell phone connectivity may be unrelated even to large-scale shutdowns. We have seen empirical support for this in major shutdowns occurring in countries with very high cell phone penetration (e.g., the Gambia and Gabon) as well as those with relatively low penetration (e.g., Ethiopia).

Figure 2.5 Predicted probabilities for Internet penetration (left) and cell phone possession (right).





Model 1 is a negative binomial regression using number of interferences in a given year as the dependent variable. It reveals several patterns that resurface in other analyses. The effect for the two Internet variables is strong and congruent with H1. The pace of expansion of mobile networks, however, fails to predict the trajectory of network interferences. This points to a rift in the dynamics of the two technologies and how they relate to digital information controls. In addition, while ANOCRACIES display a fairly consistent, positive trend towards network interference, the association is practically never significant. This allows us to draw no conclusions on whether *digital* repression is more willingly applied in hybrid regimes or anocracies, where some measure of public dissent and expression of political opinion is permitted (Vargas-León 2016). The diversity of policy approaches in these regimes also translates to leadership pulling in different directions, without cross-country consistency. Authoritarian regimes, meanwhile, harbor clear enthusiasm for network restrictions in their quest for control – a finding supported by **Figure 2.2**. The interaction variables fail to confirm that the effect of the pace of Internet expansion depends on the political system in place (but see Model 8).

TERTIARY EDUCATION has a consistent, positive relationship with propensity for network interference. This lends credence to the 'fearful regime' scenario, in which restrictions to access stem from the existence of a highly educated population that knows how to wield digital tools

to drive collective action. This model also demonstrates a trend that cuts across all others: YOUTH BULGES do not seem to be strongly related to the frequency of network disruption. Thus, an effect prominently displayed in the Arab Spring does not seem to hold cross-nationally. Growing Internet penetration could itself dull the effect of large cohorts of youth precisely because young people are usually first to adopt new technologies, though cross-national statistics on this are lacking. A final effect that becomes ubiquitous with further statistical tests is that respect for FREEDOM OF ASSOCIATION rights is entirely unrelated to a government's penchant for disruptions while PHYSICAL INTEGRITY appears inconsistently associated with it. States that respect physical integrity rights tend to carry out fewer interferences, but the strength of the connection varies greatly by regression. Conversely, respect for FREEDOM OF SPEECH presents the expected negative association with interferences – a finding that becomes a trend across all regressions with the raw interference count as the dependent variable. It would therefore appear that governments use digital repression to supplement their campaigns against free expression of any kind to a larger extent than to support the physical brutalization of the populace. Of interest, too, is the positive link between GDP per capita and network interferences, which implies increased *capacity* to implement disruptions.

Table 2.4 Regression results (Models 1-4). "NB" denotes negative binomial regression. "ZINB" denotes zero-inflated negative binomial regression. All indicators lagged by one year.

	Model 1 (NB)	**Model 2 (NB)**	**Model 3 (ZINB)**	**Model 4 (ZINB)**
	Number of network interferences	**Number of large-scale disruptions**		**Number of network interferences**
Δ Internet penetration	0.166 (.061)**	0.307 (0.173)	0.308 (0.164)	0.161 (0.058)**
Δ Internet penetration^2	-0.012 (0.004)**	-0.0204 (0.015)	-0.023 (0.015)	-0.011 (0.004)**
Δ Cell phone possession	-0.012 (0.024)	0.091 (0.042)	0.093 (0.052)	-0.011 (0.024)
Δ Cell phone possession^2	0.000 (0.000)	-0.000 (0.042)	-0.000 (0.000)	0.000 (0.000)
Anocracy (dummy)	0.573 (0.383)	1.461 (0.000)	0.800 (1.028)	0.503 (0.383)
Authoritarian regime (dummy)	0.974 (0.372)**	2.396 (0.809)**	2.397 (0.925)**	0.873 (0.358)*
Δ Internet penetration * Anocracy	0.121 (0.124)	0.090 (0.838)	0.485 (0.426)	0.126 (0.132)
Δ Internet penetration * Authoritarian	-0.069 (0.054)	-0.108 (0.116)	-0.064 (0.169)	-0.057 (0.053)
Tertiary education	0.021 (0.005)***	0.0160 (0.185)	0.008 (0.013)	0.020 (0.005)***
Physical integrity	-0.141 (0.065)*	-0.613 (0.015)***	-0.516 (0.094)***	-0.120 (0.067)
Freedom of association	0.097 (0.174)	-0.090 (0.111)	0.055 (0.402)	0.131 (0.167)
Freedom of speech	-0.664 (0.177)***	0.525 (0.470)	0.373 (0.489)	-0.688 (0.172)***
GDP growth	-0.063 (0.016)***	0.042 (0.022)	0.030 (0.023)	0.056 (0.015)***
Population (log)	0.436 (0.071)***	0.206 (0.113)	-0.050 (0.149)	0.369 (0.077)***
GDP per cap (log)	0.374 (0.111)**	0.500 (0.263)	0.398 (0.243)	0.330 (0.111)**
Youth bulge	0.062 (0.039)	-0.008 (0.095)	-0.065 (0.075)	0.066 (0.039)
Lagged DV	0.203 (0.065)**	0.001 (0.0243)	0.131 (0.266)	0.157 (0.064)*
Inflate variable: Log political restrictions			-0.969 (0.289)**	-1.317 (0.371)***
(Intercept)	-13.633 (2.044)***	-12.289 (4.174)***	-4.546 (4.196)	-11.894 (2.253)***
N	**1,497**	**1,497**	**1,497**	**1,497**

*** p<0.05; ** p<0.01; *** p<0.001**

How do **Models 2** and **3** differ from the first? Both use LARGE-SCALE DISRUPTION (blackout or network shutdown) as the dependent variable in lieu of the aggregate. Still, neither the expansion cell phones nor its squared term is a significant predictor of major, deliberate blackouts – and indeed, neither is the expansion of the Internet. While the direction follows my expectation, the notion that governments who cannot or will not target individual users may rather resort to full telecommunication shutdowns is not supported. The 'digital threshold' is similarly unconfirmed. This finding is relevant to both analysts of digital cultures and the participants of technologically enabled social movements, as it points to possible differences between enabling, 'mobilizational' technologies. The limited number of cases of full shutdown in the specified period (40) is the primary caveat of this model. In recognition of this, I use a zero-inflated negative binomial regression in **Model 3**. I inflate on a log of episodes of political restrictions derived from ICEWS event data. These data largely consist of individual actions to subdue the press and reporting, and are considerably more detailed than CIRI's free speech variable. Such restrictions may chill or suppress local reports of interference events – thus inflating the proportion of zeroes. Interestingly, whenever this inflate variable is used, it is significant, but corresponds to a *lower* number of zeroes. In both models, respect for PHYSICAL INTEGRITY rights is negatively and significantly associated with full network blackouts, tying into Gohdes (2015)'s findings for Syria. This implies that blackouts tend to arise in countries where physical repression is commonplace. Nonetheless, in all, regressions on complete network shutdowns would be much more robust given a larger N and a stronger inflate variable. This may be possible in replication studies that adapt the present specification to 2011-17, which saw a surge in blackouts. **Model 4** uses the same zero-inflated model on the broader sample of interferences, as the frequency of *non*-interference in digital networks in any given year is high – 90.14 percent. This yields encouraging results that mirror Model 1.

Model 5 introduces fixed effects, which control for unobserved heterogeneity deriving from individual country characteristics and increase the precision of the prediction. Conditional-effects models have been deemed deficient because they do not properly model dispersion and are thus not true fixed-effects models (Allison & Waterman 2002). I therefore applied a method

suggested by Allison & Waterman (2002): an unconditional estimation of the fixed effects negative binomial model. Here, the model failed to converge when the lagged dependent variable was included; using the CIRI FREEDOM OF SPEECH variable and accounting for time through year dummies produced the same result. The final regression therefore does not include these variables, which is one potential weakness of the model. The freedom of speech variable is replaced with the ICEWS event count, cross-validated with Freedom House's Freedom of the Press index (unreported). With these caveats, the expected effects for change in Internet penetration remain strong. Notably, this is the only model on *all* interferences in which cell phones are found to have a distinct effect, although the direction of the effect runs against the prediction.

Model 6 presents a robustness check that replaces the CIRI human rights variables with logs of some of their subcomponents from the ICEWS dataset, aggregated by country-year. These are instances of: (1) USE OF VIOLENT REPRESSION, (2) ADMINISTRATIVE SANCTIONS, and (3) RESTRICTIONS ON POLITICAL FREEDOMS. The first of these encompasses a crucial aspect of respect for physical integrity and is typically associated with state-driven abuse; the latter two include restrictions on freedom of association and freedom of speech. Change in Internet penetration and its squared term remain strongly significant. I find no association between network interferences and violent repression, continuing the mercurial tendencies of the latter variable – but, curiously, also no association with political restrictions and a tenuous link with administrative sanctions. While this does not cement the findings on the interaction between traditional and digital repression, it does strengthen the continued relevance of the Internet variables, which remain significant while cell phone network development continues to have no statistically significant effect.[28]

[28] These outcomes were cross-validated using a number of other variables in unreported regressions that explore other formulations of repression, conflict, and regime type. These tests were performed using the UCDP/PRIO Armed Conflict Dataset (Gleditsch *et al.* 2002, Allansson *et al.* 2017), the UCDP/PRIO Battle-Related Deaths Dataset (Lacina & Gleditsch 2005), and the Major Episodes of Political Violence (MEPV) dataset (Marshall 2015). None of the conflict variables – interstate conflict, intrastate conflict, tallies of deaths in battle, or domestic and regional conflict magnitude – produced consistent and significant effects. Future research will have to probe this deeper.

Model 7 incorporates a core building block of the repression-dissent nexus – protest behavior. In several iterations, network interferences were not found to be linked to DEMONSTRATIONS (non-violent protests, logged) or violent RIOTS.[29] Fast-growing connectivity may lay the foundation for more vocal and more public peaceful protest, which – as it grows more noticeable – compels the government to begin taking repressive digital action. However, the types of interferences outlined here do not seem to consistently react to variations in mass dissent in the period under study. Neither demonstrations nor riots trace a trend in any direction, suggesting that governments tend to take other repressive measures when protest endures or turns violent. The results for Internet dynamics remain persuasive, but in future studies, it will be vital to examine whether these tendencies have changed in the post-Arab Spring reality, especially given the proliferation of network shutdowns motivated by mass protest. This extends beyond the scope of this study.

Lastly, **Model 8** includes INTERNET PENETRATION in addition to yearly change therein.[30] This measure, which is not correlated with the pace of expansion, allows me to further investigate whether static levels of connectivity affect network interferences independently from the change variable. The results suggest that they do. Higher Internet connectivity in the previous year increases the incidence of network interferences. Further tests incorporating interaction variables reported a statistically significant, positive conditioning effect between Internet connectivity and both non-democratic regime types, suggesting that the effects of Internet penetration on digital repression are conditioned by the political system. This opens a promising avenue for future research.

In addition to these tests, I ran regressions that included cross-national data on the proportion of households with the instruments of traditional mass media (televisions and radios), per the International Telecommunications Union (ITU) (ITU 2017). This is an important

[29] The finding for riots was derived from an unreported regression that was run separately (excluding demonstrations) due to the high correlation between the two variables (80.74).
[30] Internet penetration and its squared term were considered as independent variables and performed strongly in additional regressions. However, this would have rendered the theory and model less parsimonious.

consideration, as the interaction of new and old media creates a complex arena in which government-controlled, traditional channels are often at odds with digital platforms that base their existence on openness (Warren 2015). Indeed, the disconnect between traditional and new media was apparent during the Arab Spring, when state-owned networks failed to report on ongoing protests. However, both indicators have a low N (televisions: N = 990; radios: N = 487) stemming from the fact that some countries did not report these data for multiple years. Entering the independent and control variables into the equation further dampens this number, which sinks into the 200s in the case of radio. Since an accurate interpolation of missing data was not possible, these models are omitted from the final set.

Finally, I calculated the quadratic maximum of each regression to pinpoint the expected pace of Internet expansion (and cell phone expansion) at which the parabola peaks and begins to decline. The purpose is to offer a first attempt at estimating exactly how dynamic increasing connectivity must be for the government to desist from possibly repressive digital interferences and potentially transition to other, less overt forms of control. Repeating the regressions with centered predictors,

$$Y = \beta_1 \textit{INTERNET CHANGE} + \beta_2 \textit{INTERNET CH.}^2 + \beta_1 \textit{CELL CHANGE} + \beta_2 \textit{CELL CH.}^2 + L(X_2, X_3, X_4 \ldots) + \beta_0$$

where L is a linear function of the other predictors, I calculated the quadratic equation's maximum (X_M) using the derivative of the equation:

$$X_M = \frac{-\beta 1}{2\beta 2}$$

The results of this approach across all specifications indicate that the probability of network interference begins to decrease when the pace of yearly change in connectivity reaches 7.13 percent. A similar peak occurs at 11 percent for cell phone possession, but because the variable does not reach significance across the board and the number of cases is low, this effect cannot be statistically distinguished from random noise. Additional, unreported regressions on the raw Internet connectivity measure identified a similar trend in Internet penetration itself, with a peak at around 30 percent connectivity.

Table 2.5 Results of negative binomial regressions (Models 5-8). "FE" denotes country fixed effects. All indicators lagged by one year.

	Model 5 (FE)	Model 6	Model 7	Model 8
	Number of network interferences			
Δ Internet penetration	0.237 (0.062)***	0.206 (0.067)**	0.158 (0.061)**	0.172 (0.062)**
Δ Internet penetration^2	-0.016 (0.004)***	-0.014 (0.004)**	-0.011 (0.004)**	-0.012 (0.004)**
Δ Cell phone possession	-0.052 (0.020)**	-0.023 (0.024)	-0.013 (0.024)	0.005 (0.025)
Δ Cell phone possession^2	0.000 (0.000)*	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Anocracy (dummy)	0.687 (0.462)	0.958 (0.333)**	0.627 (0.371)	0.735 (0.366)
Authoritarian regime (dummy)	1.189 (0.530)*	1.534 (0.290)***	1.028 (0.364)	1.254 (0.358)***
Δ Internet penetration * Anocracy	-0.030 (0.070)	0.140 (0.165)	0.131 (0.131)	0.101 (0.135)
Δ Internet penetration * Authoritarian	-0.008 (0.046)	-0.059 (0.054)	-0.063 (0.053)	-0.091 (0.053)
Tertiary education	0.050 (0.016)**	0.018 (0.005)***	0.022 (0.005)***	0.017 (0.006)**
Physical integrity	-0.027 (0.095)		-0.112 (0.069)	-0.130 (0.073)
Log violent repression		0.124 (0.096)		
Freedom of association	0.452 (0.192)*		0.119 (0.178)	0.134 (0.179)
Freedom of speech			-0.685 (0.180)***	-0.713 (0.179)***
Political restrictions (log)	0.377 (0.117)**	0.240 (0.133)		
Administrative sanctions (log)		0.211 (0.100)*		
GDP growth	0.072 (0.020)***	0.047 (0.018)*	0.062 (0.017)***	0.065 (0.018)***
Population (log)	11.188 (1.859)***	0.227 (0.078)**	0.375 (0.080)***	0.352 (0.083)***
GDP per cap (log)	1.590 (0.314)***	0.246 (0.105)*	0.344 (0.114)**	0.180 (0.130)
Youth bulge	0.244 (0.118)*	0.103 (0.042)*	0.067 (0.039)	0.070 (0.041)
Number of protests (log)			0.098 (0.066)	0.112 (0.065)
Internet penetration				0.020 (0.006)**
Lagged DV		0.227 (0.066)**	0.207 (0.064)**	0.191 (0.062)**
(Intercept)	-177.118 (25.241)***	-11.679 (2.099)***	-12.979 (2.126)***	-11.705 (2.154)***
N	1,503	1,531	1,497	1,497

*** p<0.05; ** p<0.01; *** p<0.001**

Conclusion and Discussion

This study has been among the first to look at the indicators affecting interferences in digital infrastructure across time and on a global level. It is also one of the first to examine the socio-political underpinnings of these events in a wide range of countries, including those where they can be and have been equated to 'digital repression.' The results strongly suggest that the pace of expansion of Internet connectivity is consistently associated with a greater incidence of government-initiated interferences. In particular, change in Internet connectivity is found to predict interferences without distinguishing the latter by type. Second, the study exposes the existence of a 'digital threshold' beyond which network interferences – and within them, digital repression – tapers off. Conversely, the link between cell phone expansion and interferences – large-scale blackouts or otherwise – is not confirmed, indicating a divide between the dynamics of the two technologies. While both have been deemed 'liberation technologies,' their effects on digital information control appear to be distinct leading up to the Arab Spring. As the tools of individual communication blended with those of mass communication in the 2010s, this distinction is likely to lose significance.

The study yields several other interesting results. First, I fail to find proof for the relationship between Arab Spring-style youth bulges and network interference. Second, the models do not establish a link between network interferences and the frequency of non-violent protest and violent riots in the studied period. Mass dissent in 1995-2011 was more likely either tolerated, appeased, or dispersed using other repressive methods such as quid-pro-quo violence. Third, disruptions tend to arise in authoritarian rather than hybrid regimes. The interest in digital repression is strong in such states, and quickly follows the expansion of connectivity (**Figure 2.2**). Finally, the evidence is weak for a connection between network interferences and traditional physical repression – a finding that holds true when individual violations of physical integrity rights are used in the regression in place of an aggregated index. The implication is that 'softer' measures such as interferences in communication networks are not necessarily used in tandem with physical brutality. However, a somewhat stronger negative link exists between network interferences and freedom of expression rights, implying that micro-level events whose

goal is to limit certain content online tend to occur in states with lower interest in protecting free expression in other domains. Future work can expand on these findings by using them as a springboard for individual country and regional studies. In the chapters that follow, I take an alternate approach by focusing on the gaps in the current timeline that featured some of the most high-impact cases of digital repression, beginning with Egypt's 2011 shutdown.

Another important finding in the study is that the relationship of the pace of Internet expansion with propensity for network interference reaches a 'digital threshold.' Beyond this threshold, which denotes dynamic growth in communication technology, a curvilinear effect sets in and regimes begin to relax their stance on overt disruption. I calculate this turning point to hover at around 7 percent change in penetration per year. The existence of this effect argues against the (otherwise rational) claim that censorship and blocking only increase as Internet expansion quickens because we have better tools to immediately report it. If this were the case, increased awareness and reporting rates would make the number of reported disconnections climb ever higher, with no peak and no drop. Overt interference becomes less frequent when Internet penetration increases rapidly, although it is not yet possible to conclusively state whether a single mechanism is responsible for this. This finding offers us a potent argument in favor of encouraging the growth of information and communication technologies worldwide.

A significant limitation of this study is the reliance on reported data from a period that, in the timeline of technological development, is already somewhat distant. One of the largest jumps in global connectivity took place in and after 2011, and the Arab Spring altered the face of conflict, repression, collective action, and the political uses of technology in many ways. The distribution of digitally repressive strategies may be different for the 2010s. For instance, approximately 150 reported large-scale network shutdowns took place in 2016-17 alone – significantly more than in the entire period covered by this study. These smartphone-era strategies of repression are also distributed differently, occurring beyond known repressive regimes (most prominently in India, as per Chapter 4). The dataset does not avoid the pitfalls of data that use press reports as a source – most notably possible overreporting based on such factors as the international attention a country receives. Few, if any, comprehensive datasets

procure their data directly from corporate actors and network performance services for use in social science. Researchers will have to resort to press-based placeholders until a more objective database is established.

Despite these shortcomings, the implications of this study are far-reaching if proven true. It provides some of the first evidence that governments, as a rule, intensify the harassment of digital citizens as a nation's pace of digital connectedness quickens, but begin to refrain from it once technology expands feverishly. This tipping point is different in each society and appears for a variety of reasons. For technologists and researchers alike, this may provide motivation to continue strengthening national Internet backbones, bolstering countries' reliance on international traffic, and encouraging companies and governments to widen access to digital technology.

Chapter 3

Disconnective Action:

The Dynamics of Mass Protest in Network Shutdowns

Abstract

Between 2011 and 2017, approximately 40 countries carried out as many as 277 known, deliberate, large-scale disruptions to electronic communication. These incidents have ranged from politically motivated shutdowns of social media to complete blackouts of Internet and cell phone communication. Collectively, they comprise a new, rapidly emerging form of digital repression. In this study, I use a new, global dataset to examine the daily effects of large-scale network shutdowns on collective action in the form of protest between 2011 and 2016. I find that Internet shutdowns trigger a surge of protest in the short run, but maintaining the disruption beyond the first week – a 'digital siege' – is associated with lower rates of protest relative to the immediate public response. This contradicts the typical dynamics of repression and protest identified in the literature on the 'repression-dissent nexus.' These effects are conditioned by a country's recent history of protest and Internet connectivity, but not in the expected way: in both the short and long run, extensive experience of protest and higher Internet penetration are actually related to lower absolute protest numbers when a blackout is in place. The findings add a new dimension to the repression-dissent nexus and the dynamics of collective action in the information age.

打开窗户，新鲜空气和苍蝇就会一起进来。

If one opens the window for fresh air, one must expect some flies to blow in.

– Deng Xiaoping

Introduction

In the turbulent state of Jammu and Kashmir (India), access to the Internet or other digital communication networks was cut off in an effort to stifle or preempt protest up to 94 times between 2011 and mid-2018 (SFLC 2018). Similar measures of combatting protest coordination have been seen in the Arab Spring revolutions, ethnic protests in Ethiopia, electoral and other anti-government unrest across Sub-Saharan Africa, and mass events in approximately 40 other countries. However, violence continues to flare in Kashmir; streets continue to fill up in

Ethiopia's Oromia region; dissenters continue to gather to call for secession in Cameroon and the resignation of the authoritarian President Faure Gnassingbé in Togo. There is little cross-national evidence that disconnecting networks as a measure of tackling protest works; conversely, the evidence of its economic damage is mounting (West 2016, Deloitte 2016, CIPESA 2017). If Internet blackouts in unstable circumstances are indeed counterproductive to their primary goal, what justifies their use? The puzzle at the heart of this study is how the dynamics of protest develop when a large-scale network shutdown is in place. Although at least one previous study has empirically examined collective action amid an information vacuum (Hassanpour 2017), the evolution of disconnected protest over time remains unknown. The potential co-dependency of digital repression and collective mobilization on the ground is especially intriguing given that several studies on traditional repression and dissent identify a short-term decline and a long-term escalation of collective action when it faces continued, indiscriminate or extreme repression (Rasler 1996, Francisco 1995). This study aims to establish whether protesters react similarly to digital repression.

Between 2015 and 2017, the Internet or social media were disconnected for political reasons at least 194 times across the world. In 2017 alone, these networks have been rendered unavailable for nearly 3,000 cumulative days. This emerging trend in information control unlocks new varieties of collective action that progressively emerge as Internet connectivity becomes accessible to wider swathes of the world's population. How does the sudden, ephemeral disruption of coordination via digital communication affect a society's willingness to publicly express dissent, and how do sustained blackouts further alter these dynamics? Researchers have investigated the links between the expansion of connectivity, the (de)motivating nature of social media activism, and real-life collective behavior such as public protest (Steinert-Threlkeld et al. 2015, Tufekci & Wilson 2012, González-Bailón et al. 2011, Enikolopov et al. 2016, Hassanpour 2017). 'Networked protest' has been viewed as highly effective in mobilizing outrage and potentially even sending crowds into the streets, but weak at maintaining momentum and structure (Tufekci 2017). However, only recently has the proliferation of large-scale blackouts enabled scientific testing through statistical and quasi-

experimental methods investigating the other side of the coin – how societies and economies react when thrust into a digital information vacuum.

In this study, I investigate the relationship between large-scale network shutdowns[31] and collective action, represented by mass protest. I explore two aspects of this nexus that have not previously been scrutinized: the distinct dynamics of fleeting versus sustained 'digital sieges,' and the mediating impact of technological penetration as well as recent history of protest on collective action in a disrupted information environment. Additionally, the study explores new ground by looking beyond the two states whose shutdown dynamics have previously been examined in the literature, expanding the scope of analysis to all known shutdown incidents between 2011 and 2016.

New submarine and terrestrial cable connections, the falling costs and increased competition among mobile devices, and the expansion of the middle class in many countries have all contributed to a surge in global connectivity in recent years. Internet penetration continues to rise at an exponential rate, reaching 46 percent, or 3.4 billion people, in 2016 (World Bank 2017). Mobile devices, whose possession surpassed 100 devices per 100 individuals for the first time in 2016, are responsible for a large part of this growth. In academic research and the activist world alike, these dynamics have spurred the notion that digital networks can be used as 'liberation technologies' (Diamond 2010), bridging class divides, streamlining activism, increasing public accountability, and enhancing coordination and rapid mobilization in collective action. Scholars were quick to point out, however, that governments can easily usurp this process through censorship, disinformation, surveillance, and wholesale disconnection (see Gladwell 2010).

[31] The terms 'network shutdown,' 'Internet shutdown,' 'network disruption,' and 'blackout' are often used interchangeably, but distinctions of scale and focal area exist among them, even though no universal definitions exist for any of the terms (see Rydzak 2018). The broadest of these terms is 'network disruption.' In this dissertation, I predominantly use the term 'network shutdown' to refer to a disruption of social media, Internet connectivity, or cell phone service that affects a large number of people. The term 'blackout' is used infrequently here with the same meaning, as it too denotes widespread and severe disruption. Complete blackouts, in which no component of the communication infrastructure is functional, are extremely rare.

Network shutdowns (also known as Internet shutdowns or blackouts) are deliberate, significant disruptions of electronic communication within a given geographical area and/or affecting a predetermined group of citizens. Their extreme manifestations involve the disconnection of entire administrative regions or countries from the Internet, its constituent parts (particularly social media), or mobile phone service.[32] Network shutdowns differ from technical failures such as cable cuts in that they are mandated by governments, typically as a means of addressing a political issue (Dada & Micek 2017). A common objective of this tactic is to restrict the flow of information through digital channels, ostensibly for security reasons. Thus, shutdowns are especially prevalent when rising public dissent and street protest are deemed to be fueled by digital communication networks.

Large-scale disruptions of digital communication made headlines in 2011, when the government of embattled Egyptian strongman Hosni Mubarak implemented a nationwide, four-day blackout in response to crowds gathering in Tahrir Square to demand the President's resignation. Similar efforts in Libya and Syria soon followed. By 2017, these scattered attempts at undercutting communication among protesters and their sympathizers had become a regular occurrence across the spectrum of democracy. **Figure 3.1** visualizes the steady rise in the number of major disruptions worldwide between January 2011 and December 2017. While the first several years registered a number of events, the 2015-17 period recorded an unprecedented surge, with as many as 221 known network shutdowns worldwide across nearly 40 countries, and many smaller-scale events likely remaining under the radar. In tandem with the rapidly growing number of cases, the cumulative duration of disruptions has been rising with each year, reaching approximately 2,576 days of disconnection from the Internet or social media in 2017 (Rydzak 2018).

[32] Widespread disruptions to cell phone connectivity can be network shutdowns, but not Internet shutdowns, due to the fact that smartphones and mobile devices with access to the Internet are not yet ubiquitous across the world. Nevertheless, most mobile network operators (MNOs) are also Internet service providers (ISPs).

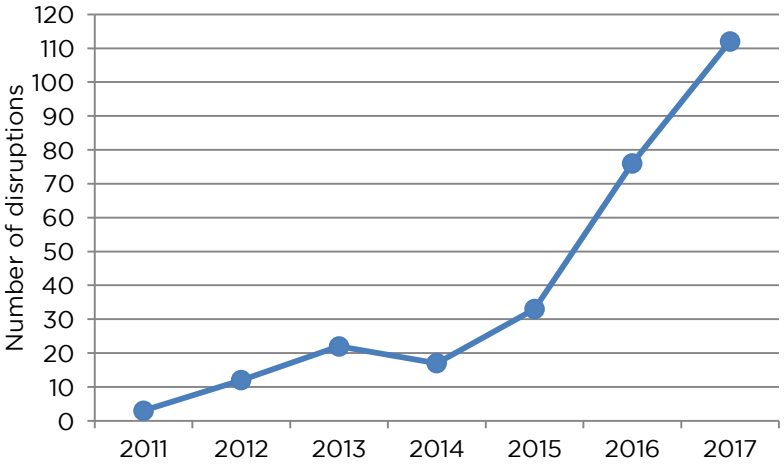


Figure 3.1 Estimated number of network shutdowns per year worldwide (2011-2017).

Authoritarian governments and hybrid regimes routinely employ shutdowns to interrupt coordination and communication in the course of protests, riots, and public events. For instance, the government of Cameroonian President Paul Biya severed access to the Internet in the country's two Anglophone regions amid secessionist protests in January 2017, in a 'digital siege' that lasted 93 days. Contentious elections are a leading pretext for disruptions in Sub-Saharan Africa, most prominently in countries with questionable track records in protecting human rights and the democratic process. In one such example, Gabon implemented an 'Internet curfew' for twelve hours each day for a month following its contested 2016 presidential election, which had prompted widespread street protests. Yet repressive non-democratic regimes are hardly alone in their political use of network shutdowns, with India accounting for approximately 70% of all shutdown events in 2017. Proposals to pass into law provisions that would allow governments to carry out large-scale shutdowns in security situations have proliferated in stable democracies; some have already entered the legal code.[33]

Most of the network shutdowns between 2011 and 2017 have accompanied or followed overt, widespread dissent, particularly street protests and riots such as those witnessed in Kashmir. Even in cases where protest does not occur, but disruptions are executed as a security

[33] In stable democracies, proposals to implement blackouts of communication technology sometimes surface in the wake of terrorist attacks and riots, such as the 2011 unrest in England. However, these proposals face stiff opposition from the media and civil society, and are consequently rarely implemented.

measure during a public event, such events have curtailed much more than the ability for crowds to coordinate. Blackouts have entailed severe restrictions on free expression, large and indiscriminate economic losses in increasingly connected industries, displacement of people, disruptions to the work of humanitarian agencies, and interruptions in reporting on human rights violations (West 2016, CIPESA 2017, Rydzak 2018). They have also been used as an instrument of war (Gohdes 2015). This variegated impact establishes network shutdowns as a new and versatile form of 'digital repression' whose collateral damage is both widespread and underreported. **Figure 3.2** displays the global geographic distribution of network shutdowns in 2016-17.

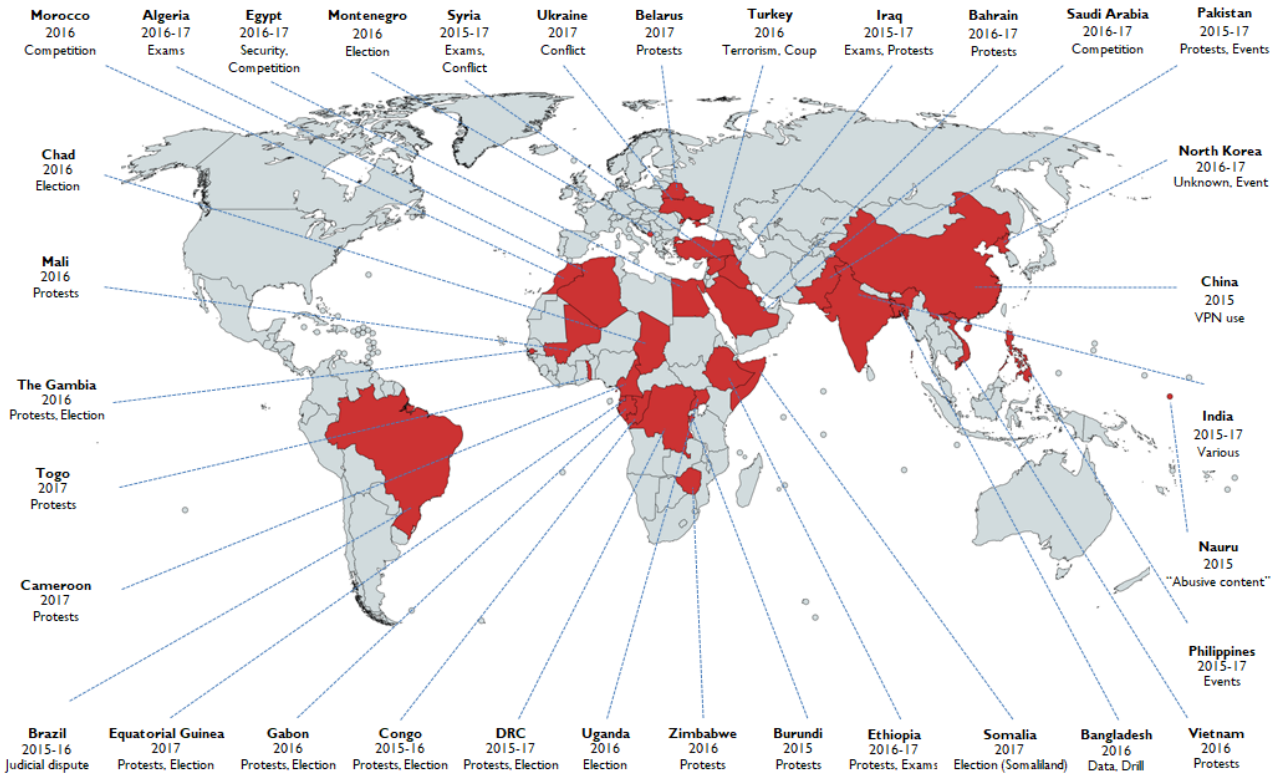


Figure 3.2 Global map of network shutdowns, 2016-17.

Despite the significance of shutdowns as an emerging topic in studies of political repression, their impact on both protest and other political phenomena has not been thoroughly studied. Two comprehensive case studies of individual blackouts have suggested that such outages may stimulate collective action or collective violence in their immediate aftermath (Hassanpour 2017, Gohdes 2015). Nonetheless, they have not examined (1) the potentially differing effect on protest dynamics that disconnection may generate in in their immediate aftermath and further down the line; (2) the impact of differing levels of Internet connectivity and previous history of organized collective action; or (3) the dynamics of disconnection and dissent in countries other than Egypt and Syria. This paper aims to reduce these gaps in our understanding of an emerging phenomenon and draw attention to the radiating effects of modern, technologically enabled repression.

Networked Grievance, Protest, and Backfire

Public protest is a time-honored mechanism for expressing mass discontent, and several theories have emerged to reflect this. Two have produced a particularly enduring body of work: grievance theory and resource mobilization. Grievance theory views mass mobilization as the result of accumulated socioeconomic injustices: inequalities in wealth or access to power, prolonged periods of poverty, ethnoreligious marginalization, and other kinds of relative deprivation (Gurr 1970, Cederman et al. 2011). But this body of work does not always account for access to material resources, structural strengths and weaknesses, and partnerships – all of which may be critical in setting off and sustaining collective action. Resource mobilization theory bridges this gap. This theoretical framework posits that protest movements mobilize and survive when participants succeed in commanding the appropriate kind and volume of resources (McCarthy & Zald 1977). These resources can be financial, relational, informational, or organizational, but theory stretches to a variety of other categories. In resource mobilization theory, the success of a social movement is commonly predicated on (a) the aggregation of resources (especially money and labor), (b) coordination and organization, (c) the involvement of outside individuals and organizations, and (d) a calculus of costs and rewards on both sides, which in turn is affected by "the structure of society and the activities of authorities" (McCarthy & Zald 1977). Network-

based theories of micromobilization are rooted in resource mobilization and emphasize the transmission of *information* as a resource via strong and weak ties (Lohmann 1994, McAdam 1986).

A growing group of scholars has advanced that the global information society has enabled new, technological expressions of the established concept of collective action (Earl & Kimport 2008, González-Bailón & Wang 2016, Tufekci & Wilson 2012, Castells 2015). Bennett & Segerberg (2013)'s *logic of connective action* formalizes the role of digital networks in the construction of protest. Connective action does not require formal organizational control with strong ties between upper and lower tiers; individual action can replace top-down coordination; and highly personalized digital communication processes render collective identity framing less necessary. The tools of digital communication thus facilitate coordination and ease the collective action problem. In the Arab Spring, however, the rapid rise of 'networked social movements' was tempered by their subsequent collapse, the return of authoritarian tendencies, and internal conflict across the Middle East and North Africa. This has prompted scholars to warn that the rapid *emergence* of digitally enabled collective action is distinct from its *survival*.

Beyond the internal dynamics that govern collective action, the circular relationship between repression and dissent has also long been a center of scholarly attention. The emergence of digital technology has not altered this trend; indeed, as a strategy of repression, network disruptions may interact dynamically with both real-world protest and online dissent. Large-scale shutdowns are often officially justified by the outbreak of mass protest and the need for national or regional security, but the escalation of protest amid an information blackout is not a given. The repression-dissent nexus is a useful lens through which to examine both technologically mediated protest and extreme forms of digital repression such as network shutdowns.

The repression-dissent nexus builds on the premise that governments respond to dissent with repression, in line with Davenport (2007)'s *law of coercive responsiveness*. However, it adds that the relationship is endogenous: under certain circumstances, repression may generate an escalation of dissent (Carey 2006, Rasler 1996, DeMeritt 2016). Thus, the two sides continually

attempt to anticipate each other's behavior. When information is harnessed effectively to spread outrage, even a single repressive incident can become a "transformative event" and turn small-scale mobilization into widespread revolt (Hess & Martin 2006).

Recent studies have added two dimensions to these dynamics: one strategic, the other temporal. Scholars focusing on strategy build their narrative primarily around the distinction between violence and non-violence, and particularly on how organized campaigns employing these two strategies react to repression (Chenoweth et al. 2017). A commonly reported finding in this strand is that the intensity of repression is lower when dissenters resist non-violently (e.g., Carey 2010, Chenoweth & Perkoski 2017). More relevant to the present chapter is the body of work on dissent and temporality. Studies with a temporal focus draw attention to the wide variation in short- and long-term effects brought on by both repression and dissent. Severe or indiscriminate repression in particular dissuades potential protesters from taking to the streets in the short run, but may cause a surge in both violent and nonviolent protest in the long run as more groups reach their 'tipping point' and witness others doing the same (Mason & Krane 1989, Francisco 1995, Karklins & Petersen 1994). The suggested mechanism consists of the rapid expansion of social anger – initially concentrated in a vocal minority of dissidents and opposition – to larger swathes of society in light of the cruelty of the government's repressive tactics. The distinction between short-term and long-term effects is known in the civil resistance literature as the backfire effect (Chenoweth et al. 2017, DeMeritt 2016). Several scholars have empirically confirmed its existence in individual cases – for instance, in the Iranian Revolution (Rasler 1996). Even if government leaders are rational actors and calculate the costs and benefits of repression, their calculation might make more sense in the short term than in the long term. This points to a crucial difference between the immediate escalation of grievance and the survival of protest: each may be ruled by a separate process and the enabling factors of one may not transfer to the other. I map this idea onto the dynamics of 'disconnected protest.'

Network Shutdowns and Collective Action

Blackouts constitute a disruptive change in a material resource (low-cost communication and revenues from businesses reliant on the digital sphere) as well as a social resource – communication itself (Spier 2017, Deloitte 2016). While the social entrepreneurs (leaders) embedded in social movement organizations are disproportionately affected by the former, regular citizens are affected by both. Social media platforms on mobile phones have common organizational uses: to coordinate groups of protesters, arrange to attend a protest with close friends, or send announcements to all protest participants (Obar et al. 2012, González-Bailón et al. 2011, Lee et al. 2015). Various other services – from Google Maps to ride-sharing applications – are used as navigational and logistical instruments. Within movements, mobile phones and the Internet enable strong coordination on both the horizontal and the vertical dimensions.[34] On the horizontal level, these technologies provide "the means for aggregating grievance" and connecting disparate communities of protest, which allows leadership to rapidly forge and maintain closer ties with other groups (Breuer et al. 2015). On the vertical level, communication technologies enable the commanders of violent action and the coordinators of nonviolent action to convey directives and instructions, while activists on the ground feed information from the grassroots back to their leadership if the latter is remote. This implies that access to digital communication is a hybrid, *socio-organizational* resource – a resource in itself, but also one that draws its strength from enabling access to other resources and tools (Spier 2017).

By lowering the coordination costs of collective action and providing a platform to share grievances, digital technologies are said to lower what Shirky (2008) calls the *Coasean floor* – the point at which the costs of collective action outweigh the benefits (Bailard 2015, Bergren & Bailard 2017). Both the backfire and the network effects literatures deal with this cost-benefit analysis on the part of civilians who face the dilemma of collective action and regimes who face the dilemma of physical repression (Carey 2009, Moore 2000). However, in most cases that

[34] These two technologies are becoming increasingly indistinct, with mobile data growth remaining especially strong in lower- and middle-income countries. A major surge in mobile data usage occurred in the period covered by this study, leading to a larger proportion of individuals accessing the Internet via mobile phone than desktop by 2016 (GSMA 2017).

feature the dynamics of disconnected protest, unrest is already underway and merely provides an excuse for a crackdown. Therefore, for some individuals, the Coasean floor will have already been lowered. Disconnecting access to a network is expected to generate a cascade that lowers this barrier for the general population. Hassanpour (2017) adopts a similar premise to argue that shutdowns turn peripheral participants into localized leaders, escalating in "globally dispersed, but locally concentrated networks of contention." He calls this the *dispersion hypothesis*.

As a form of digital repression, network shutdowns are often indiscriminate with respect to the demographics of the targeted areas, though they are often geographically targeted.[35] While disruptions may be national in scope or limited to a single city, they affect all residents, regardless of ethnicity, religion, gender, or political inclinations.[36] Truly indiscriminate shutdowns that blanket entire countries are less common than those that strike a lower administrative unit, but still occur regularly (e.g., in Togo, DRC, Congo, Gabon, and Iraq). Within each unit, the limitations of communication technology render it challenging to sever a connection for a given community or identity group while retaining it in others. Furthermore, spillover effects are nearly unavoidable. For instance, in Damascus, multiple outages traced to the government occurred in both districts supportive of the Assad regime and those where opposition was more visible (Hassanpour 2017). In Cameroon and India, regional shutdowns have affected peaceful populations for months at a time, despite targeting a minority responsible for the unrest. In the Philippines, pre-announced, multiple shutdowns in Cebu City extended beyond the city limits due to differences in terrain that enable cell phone users to acquire a signal from cell towers located outside of the city.

[35] In some cases, such geographical targeting does narrow the focus of repression on selected social or ethnic groups, such as in the protests in the region of Oromia (Ethiopia) in 2016-17. At least four disruptions – both targeted (March 2016, August 2016) and nationwide (October-December 2016, December 2017) have been linked to violent unrest in Oromia.

[36] At the same time, certain professions and social groups are disproportionately affected. For instance, owners of small and medium enterprises (SMEs) and international trade (import/export businesses and supply chain) incur heavy losses and lose communication with clients when during blackouts (Deloitte 2016, West 2016, CIPESA 2017).

Thus, blackouts often cut across demographics and social divisions even if they are aimed at a subset of society or geographical area. Still, fragmented reports from conflict zones and related scholarly accounts suggest that the dynamics of public responses to a shutdown may differ along demographic lines, particularly when the circumstances involve the active involvement of youth or an educated populace (Nordås & Davenport 2013, Asal et al. 2015). I take these concerns into account in the research design.

Educated, younger, more affluent individuals who do not belong to a marginalized ethnic group are commonly viewed as more likely to use the Internet as both consumers and producers (Pew Research Center 2015). More arguably, the same subsets of society have a greater propensity to leverage it to find alternate channels of political participation that may include protest (Karatzogianni 2013, Schlozman et al. 2010). Network shutdowns are a 'great equalizer' – they remove the perceived resource advantages of these groups in rapidly mobilizing and coordinating protest. The risk of executing this kind of action is that these very groups will lead the backfire. In the volatile information environment of a blackout, apolitical individuals who would not otherwise spontaneously join a movement are deprived of a means of understanding the distribution of forces between the two sides. Consequently, they do not know whether inaction will be costlier than collective action (Mason & Krane 1989, Kuran 1995, Karklins & Petersen 1993).

While blackouts can be used as a method of disrupting coordination and/or concealing information on repressive regime activities (Gohdes 2015), their impact on collective action remains largely unexplored. The proposed mechanism of grievance that is activated as a result of a blackout and its temporal dynamics are discussed in the next section.

Theorizing the 'Disconnexus'

This study investigates the nexus between large-scale network disruptions (network shutdowns, Internet shutdowns, blackouts) and mass mobilization in the form of public protest. I approach network shutdowns as a form of digital repression – a suppressant of collective action thought to be driven by the spread of rumors or coordination using digital

communication platforms. The study links to the existing body of research on the repression-dissent nexus, but also connects two lines of scholarly thinking about collective action: grievance theory and resource mobilization theory. The rapidly growing number of massive disruptions to digital communication provides an opportunity to build on these theories, test them, and apply them to *connective action* – mobilization that uses the modern tools of digital communication (Bennett & Segerberg 2013, Earl & Kimport 2011, Howard & Hussain 2013, Hassanpour 2017).[37] While previous works have broken down the impact of technology on political activity irrespective of disruptions to access, this chapter fills this gap by considering the effects of digital repression on the dynamics of mobilization on a global scale, given differences in technological penetration and previous experience of protest. I also argue that network shutdowns have distinct effects on collective action depending on whether they are ephemeral or sustained, despite their shared goal of disorienting, disrupting, and scattering those who engage in it.

The core theoretical claim of this chapter is that, under certain conditions, large-scale network disruptions increase the incidence of collective action (represented by protest) by means of generalizing the grievances of a subset of society and removing an avenue through which dissent is commonly expressed. However, the effect is expected to be short-lived: while a surge of protest will be observed in the immediate aftermath of a disruption, the removal of a critical communication channel will weaken the long-term organizational capacity of the protesting crowds, all else remaining equal. The organizational fragility of 'networked protest' has been noted in the past, with an emphasis on the capacity of social media to stimulate immediate rather than persistent action (Tufekci 2017). My theory conveys a variation of this argument in which existing grievances are bolstered by a surge of new protesters who have lost a key channel of communication, but the groundswell subsides when a regime shows that it will not back down on the blackout. If this effect is shown to be true, it will have direct implications for governments' digitally repressive tactics, which are meant to cripple, rather than reinforce, the material resources of participants in collective action.

[37] Hassanpour (2017)'s *network collective action* presents a similar concept to Bennett and Segerberg's formulation.

The effect is expected to be conditioned primarily by two factors: widespread access to communication technologies and recent history of grievance and protest in the area. Accordingly, I deliver a theoretical approach that accounts for both the onset and the short-term survival of collective action in the wake of a total digital communication breakdown, based on whether protesters face sustained pressure via prolonged shutdown, or *digital siege*. Previous research has often argued that information and communication technologies (ICTs) do not directly trigger or sustain collective action, but rather facilitate the process of information diffusion once grievance or organizational capacity reach a critical point (Steinert-Threlkeld et al. 2015, Valenzuela et al. 2014). I expect that the dynamics of protest will be transformed when citizens are confronted with a large-scale communications blackout, which may rapidly escalate protest, but subsequently de-escalate it. These are the building blocks of the *theory of disconnective action*.[38]

Hypothesis 1: *Network shutdowns increase the incidence of protest in their immediate aftermath.*

The conditioning effects require closer attention. Greater Internet connectivity is expected to contribute additional grievances once access is disconnected. During a disruption, more connected populations are deprived not only of a convenient avenue for the expression of discontent, but also of the flow of revenue that connectivity often provides. With the mobile economy firmly established as the primary channel of connectivity in the developing world and the growing reliance of businesses on the Internet, the economic costs of blackouts are just one additional, but critical source of grievance. Recent estimates have placed the cost of Internet disruptions in Sub-Saharan Africa in 2015-17 in a range between about $160,000 (the Gambia, 3 days) and $126 million (Ethiopia, 36 days), totaling more than $218 million for the entire region

[38] The name of the theory is inspired by Bennett & Segerberg (2013)'s aforementioned *logic of connective action*, which itself is a play on Olson (1965)'s famous *logic of collective action*. The theory also runs askew of several models of micromobilization, according to which it is "most difficult to initiate a protest movement, but less costly to sustain it once the rebels have overcome the dilemma of collective action" (Carey 2009).

(CIPESA 2017).[39] Stores, banks, online businesses, and private companies that conduct part of their activities through the Internet or communication technology are severely affected in each instance. This compounds existing grievance and leaves fewer channels of dissent open, driving up the chances of participation in alternate methods of political expression. In brief, in areas that feature higher Internet penetration, the cost of engaging in collective action relative to that of abstaining will fall once a disruption occurs, as more livelihoods will be affected.[40]

A history of protest, too, indicates experience with collective action amid previous challenges to its continuity. Extensive, recent protest experience has been identified as a factor in the evolution of mobilization. A rich history of domestic protest may offer an auspicious opportunity structure for collective action to coalesce into a cohesive movement, with organizational structures and leadership that has had enough time to channel political knowledge and tactics down to the street-level participants (McCarthy & Zald 1977). Domestic nonviolent resistance in particular has been shown to remain strong when the country in question has experienced sustained protest in the recent past, reducing the need for protest organizers to seek inspiration from abroad via emulation (Braithwaite et al. 2015). This factor may be of even greater relevance when a blackout is in place: if the socio-organizational resources (here: communication platforms) with which participants exchange information are disrupted, those willing to protest must fall back on mechanisms and tactics accumulated prior to the disruption.[41] If communities that witness vigorous and frequent expression of grievance on the streets are used to seeking information through a number of avenues when communication channels are open, the demand for information should manifest itself with even

[39] Additional estimates from signal a daily GDP impact across the world in a range between $600,000 (low connectivity) and $23.6 million (high connectivity) per 10 million inhabitants (Deloitte 2016), or $2.7 billion in 2015 (West 2016).

[40] A similar, testable hypothesis can be advanced with regard to areas where the *pace* of expansion of connectivity is high. This is applied in the data analysis.

[41] While the research design used for this study makes it challenging to account for the level of structure and organization in collective action, a case-study approach, as presented in Chapter 4, will enable us to make these distinctions. Of particular importance is the existence of social movement organizations, which often build the bridge between amorphous collective action and disciplined social movements (Murdie & Bhasin 2011).

greater intensity in a scrambled information environment (Murdie & Bhasin 2011, Norris et al. 2005).

Hypothesis 2: *Higher Internet penetration and extensive recent experience with protest increase the incidence of protest during a network shutdown in the short run.*

But protests are not isolated in time; their dynamics change as the situation unfolds. A surge of protest in the wake of a blackout does not tell us how the face-off between aggrieved citizens and intransigent government actors will end. While the largely ephemeral nature of early shutdowns gave researchers little opportunity to study the regrouping strategies of both sides as the disruption continued, more recent events have included an abundance of prolonged shutdowns, which can be designated *digital sieges*. To illustrate, of the 2,952 shutdown days in my dataset, 2,550 belong to disruptions that have lasted for seven days or longer. While this says nothing about their *frequency* – a small number of blackouts lasted for 365 days or more – it still motivates the distinction, as well as a more careful exploration of longer-term dynamics, which would be lost at progressively higher levels of analysis. Furthermore, a closer look at event data reveals that even the first large-scale shutdown to receive widespread coverage – Egypt's three-day experiment on January 28, 2011 – was accompanied by an immediate escalation and decentralization of protest, followed by re-centralization and a decrease in the number of demonstrations on the second and third days (Hassanpour 2017, Boschee et al. 2015). The next increase in the absolute number of protests was only seen on the day the shutdown ended.[42]

Prolonged disruptions convey the message that the government will not relinquish pressure in spite of continued protests. While few studies assess the results of resource deprivation as a

[42] ICEWS records 79 protests (49 nonviolent and 30 violent) on the day before the blackout was implemented (January 27); 116 on the first day of the blackout, with a clear surge in violent dissent; and 95, 46, and 66 on the second, third, and fourth day, respectively. A final surge to 82 occurs on the final full day of the disruption, indicating continued vigor in crowds around the country. Subsequent days generally saw lower (if fluctuating) protest incidence until Mubarak resigned on February 11 (Boschee et al. 2015). While this does not exemplify *H3*, it is consistent with *H1*. The claim that the shutdown did not deter protest receives additional backing.

strategy in conflict (internal or external), its use in counterinsurgency offers two advantages: crippling morale among the defending side and giving the executing side the upper hand in intelligence and information management (Beehner et al. 2017). This, coupled with growing exhaustion with the blackout and economic damage, may lead individuals to desist from dissent until the blackout is lifted. Perhaps paradoxically, some of the same mechanisms that were expected to escalate grievance and protest in the short run are predicted to work against further upward spirals as a disruption continues unabated. Higher Internet penetration increases the costs incurred by society during the event; as these enter the frame and the initial protests prove ineffective in forcing the regime to yield, mobilization should diminish. Similarly, the relative rarity of blackouts as a mechanism of repression may strip a population well-versed in the art of protest of the advantages this experience proffers, as a prolonged information disruption introduces a new component in the toolkit of repression that traditional coordinators of collective action may not be prepared to address.

Hypothesis 3: *Prolonged network disruptions reduce the incidence of protest.*

Hypothesis 4: *Higher Internet penetration and extensive recent experience with protest decrease the incidence of protest during a network shutdown in the long run.*

Several assumptions underlie the theory. First, the actors of importance in the calculus of protest participation are: (1) the government, (2) one or several social movement organizations (SMOs), (3) movement entrepreneurs, and (4) regular citizens. While I follow Karklins & Petersen (1993)'s logic of multiple assurance games and tipping points that vary by social group, I do not separately account for the role of students, workers, and dissidents in the composition of social movements, as the framework focuses on general socio-organizational resources within the protest and not within any given group.[43] Second, the behavior of each of these groups will

[43] Limitations of data in terms of both the number of countries considered here and the level of temporal precision – daily event data – also contribute to the difficulty of creating a more complex, actor-based model.

steer individuals' decision to mobilize – particularly in the case of regular citizens, who take their cues from the other, more organized actors. The breadth of the data makes it difficult to account for the internal structure of protests; thus, we must assume that the grievance will expand from first movers who are committed to the cause to previously unaffected individuals who find themselves stripped of an information channel. Finally, communication technology does play some role in collective action, and that role varies by the degree to which organization and coordination are prioritized, in line with Bennett & Segerberg (2013)'s spectrum of *connective action*. Pursuing these assumptions empirically is a task for future studies.

In brief, the theory of disconnective action argues that the deficit in a socio-organizational and material resource – digital communication – will be balanced by additional human resources as more people join the ranks of the aggrieved, having lost an alternate, low-cost means of channeling their grievance. Relatively high or rapidly expanding Internet penetration and a recent history of public dissent will condition this process. However, sustained blackouts, or *digital sieges*, will bring protest rates back down as the costs of the blackout become prohibitive and the government refuses to back down.

Research Design

Introducing the Disconnective Action Dataset

My theoretical approach stipulates that network shutdowns will provoke a surge of protest in the short run via expansion of grievance to a larger subset of society. However, this effect is unlikely to hold when the government maintains a 'clenched-fist' approach to the disruption – that is, sustains the shutdown for a number of consecutive days. While it is theoretically challenging to predict a precise turning point, I aim to demonstrate that shutdowns introduce an element of chaos that changes the dynamics of protest described in the literature to date. In this section, I will outline the data for the study; present the statistical methodology and sampling methods used to analyze them; and identify the variables that will help to pursue my hypotheses.

The primary dataset (N = 434,016) consists of country-day observations whose dates range from January 1, 2011 to December 31, 2016. This amounts to 2,192 observations per country for 198 countries. Event data for protest, arrests, instances of physical repression, unconventional violence, use of military force, and accommodation (yielding) are all collated using pre-defined categories from the Integrated Crisis Early Warning System (ICEWS) – or aggregated subcategories of each variable from the same source (Boschee et al. 2015). Further event data – riots, strikes, arrests, and restrictions on political rights – were also sourced from this database to use as control variables or robustness checks.

Lockheed Martin's ICEWS combines human and machine coding to monitor and collect data on all significant world events throughout a given year. Each event is classified using the CAMEO (Conflict Mediation Event Observations) event coding scheme, and each identifies the actor(s) involved. I converted these data into country-day format to facilitate analysis using multiple variables; an unfortunate side effect of this process was the loss of certain information, such as the precise geographical location of each event.[44] For the relevant variables (e.g., accommodation or unconventional violence), I also used ICEWS' embedded actor data to generate separate variables that summarize instances where *government* actors triggered the event in question. This allowed me to retain some information on responsibility and helped to avoid reaching spurious conclusions via misattribution.

I use network disruption (shutdown) as a treatment variable throughout the analysis. I collected highly precise shutdown data for all countries in the world by triangulating sources from four categories: news reports, Google's Traffic Disruptions tool (part of the company's Transparency Report), information gathered by civil society (Access Now, the Software Freedom Law Centre in India, and Bytes4All in Pakistan), and periodic status updates from Internet monitoring services such as Oracle's Internet Intelligence[45] and Akamai. The diversity of sources allowed me to adopt the stringent rule that a shutdown would not be recognized if it was not confirmed by at least two of the four types of sources. In addition, I derived a measure

[44] A much more spatially sensitive approach will be used in Chapter 4 to illuminate the case study of India, which has seen considerable geographical variation in both protests and blackouts.
[45] Formerly Dyn Research.

of approximate duration for each shutdown event in this dataset. Uncertainty of duration was also dealt with. Out of the 264 identified disruptions between 2011 and 2016, several short episodes had unknown or disputed end dates; in such cases, I used the conservative estimate of one day, even if the disruption was likely to have lasted longer. Shutdowns that were no more than several hours in length, which feature prominently in Syria, India, and several others states, were also assigned a duration of one day. The result is a dataset that specifies whether a shutdown was occurring in any given country on any given day.[46]

Dependent Variables

I use two complementary measures of protest that stem from the research design. The first is a raw, daily count of protests for each country-day, calculated using restructured ICEWS data. For the purposes of this study, I do not distinguish between nonviolent protest (125,599 occurrences) and violent riots (23,852 occurrences) as expressions of collective action, though I separate them to test the robustness of the results.[47] Summary statistics for the dependent variable are presented in **Table 3.2**, along with those of the other variables used in the study. Protests occurred on just above 10 percent of the days covered by the study period; consequently, they can be classified as rare events on a daily level.[48] Half of the country-day observations where protests did take place involve a single occurrence. The largest single concentration of protests on a single day – 116 – was observed on the first day of Egypt's 2011 network shutdown, with the second day of the same shutdown, the first two days of the 2014

[46] While it is rare to witness multiple shutdowns in the same country on a given day, this does occur in India, where regional governments can resolve to shut down the Internet simultaneously, though not necessarily in consultation with each other. The maximum number of parallel shutdowns on any given day in India was three.

[47] The combined variable will be referred to as "protests" for the remainder of this study. Note that, while the count of events in each category is reported above, the total number of *observations* (country-days) that witnessed at least one event of either kind is 44,610. I examine the two strategies of collective action separately in a case study in Chapter 5.

[48] This increases to 31 percent when events are aggregated to the weekly level.

Ukrainian Revolution, and a June 2013 escalation of Turkey's Gezi Park protests following close behind.[49]

Country-level event data present a particular challenge to researchers: ecological inference fallacy, or aggregation bias (Rokkan 1970). The country level of analysis erases a sizable amount of internal variation in the dynamics of protest. This is important because taking stock of the locations of demonstrations and riots is the first step to group- or even individual-level modeling of collective action. King (2013) recommends the use of variables whose default level of analysis is identical, but this proves unfeasible given that protests and blackouts tend to be geographically concentrated (and not always nationwide in scope) while a number of covariates are impossible to measure at a more minute level of analysis. Thus, in this study, I aim primarily to detect a broad trend while leaving a spatially disaggregated approach for a case study in Chapter 4.

Treatment and Independent Variables

The treatment variable for the quasi-experimental design is a *network disruption* (shutdown or blackout), coded 1 for a day on which it is observed and 0 otherwise.[50] Across the dataset, shutdowns were observed on 2,952 days. A shutdown is defined as any instance of deliberate, significant disruption of electronic communication within a given area and/or affecting a predetermined group of citizens.[51] The blackout can pertain to Internet connectivity itself,

[49] France registered the highest number of nonviolent protests (91) on January 11, 2015, as millions rallied against terrorism in the aftermath of the Charlie Hebdo attack two days prior. In Egypt, President Mubarak's resignation also coincided with a large number of largely peaceful protests. The largest number of riots on a single day (68) was recorded on the first day of the Euromaidan, where violent dissent predominated.

[50] While two simultaneous shutdowns were observed in a country on 53 days and three were observed on eight occasions, this was not enough to justify a non-binary approach.

[51] This definition excludes permanent bans on certain communication tools as a matter of long-term policy, which often spans several years, as well as website blocking that does not significantly impede communication. These are qualitatively different from large-scale shutdowns in purpose (disrupting coordination vs. contributing to long-term communication frameworks or targeting sensitive content for removal). Omitting policy-based bans helps to avoid a scenario in which a single observation (China) introduces a large amount of noise in the analysis. Omitting website blocking ensures that blackouts are

certain components thereof (e.g., broadband or mobile data), other mobile services (e.g., SMS, calls), or communication and social media platforms. However, this raw, binary variable is of limited use when attempting to trace the temporal dynamics of shutdowns and collective action beyond a static point. Thus, for most regressions, I substitute the binary variable with a factor variable with three values: 1 for days when a shutdown is not in place, 2 for when a shutdown is in its first week, and 3 for when it has been in place for longer than a week. The aim of this is to establish whether a 'digital siege' wears down or encourages further protest (*H3*).[52] **Table 3.1** shows the number of days during which a shutdown was in progress across the dataset, disaggregated by country.

not conflated with censorship. There is a lack of consensus regarding the definition of a shutdown – a consideration that should be made in future research.

[52] The choice of temporal cutoffs is not arbitrary. **Figure 3.3** displays the average number of protests for every blackout day across all cases. It suggests a clear drop-off on day six – a trend that continues in the second week.

Table 3.1 Cumulative number of shutdown days by country (2011-16). See Appendix for bar graph and notes on each case. Six additional countries conducted shutdowns in 2017: Belarus, Cameroon, Equatorial Guinea, Togo, and Ukraine, with complex disruptions in Iran. It is uncertain whether the shutdown in southern Somalia's (2014) continued into subsequent years. Other cases with significant uncertainty marked in cursive.

Country	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*Total*
Algeria	0	0	0	0	0	1	**1**
Bahrain	0	0	0	0	0	192	**192**
Bangladesh	0	0	0	0	0	1	**1**
Brazil	0	0	0	0	1	4	**5**
Burundi	0	0	0	0	17	0	**17**
Chad	0	0	0	0	0	2	**2**
China	0	0	0	0	*1*	0	**1**
DRC	25	0	0	0	18	30	**73**
Egypt	5	0	0	0	0	3	**8**
Ethiopia	0	0	0	0	0	*117*	**117**
Gabon	0	0	0	0	7	29	**36**
Gambia	0	0	0	0	0	3	**3**
India	0	3	15	22	*39*	*185*	**264**
Iraq	0	0	0	19	24	*18*	**61**
Mali	0	0	0	0	0	3	**3**
Montenegro	0	0	0	0	0	1	**1**
Morocco	0	0	0	0	0	241	**241**
Myanmar	0	0	1	0	0	0	**1**
Nauru	0	0	0	0	243	*183*	**426**
Nigeria	0	0	191	2	0	0	**193**
North Korea	0	0	0	0	0	275	**275**
Pakistan	0	7	5	5	10	206	**233**
Philippines	0	0	0	4	0	0	**4**
Republic of Congo	0	0	0	0	10	4	**14**
Saudi Arabia	0	0	0	0	0	*234*	**234**
Somalia	0	0	0	*331*	*0*	*0*	**331**
Sudan	0	0	2	0	0	0	**2**
Syria	2	4	4	1	*165*	10	**186**
Thailand	0	0	1	0	0	0	**1**
Turkey	0	0	0	0	0	8	**8**
Uganda	0	0	0	0	0	5	**5**
Venezuela	0	0	0	3	0	0	**3**
Vietnam	0	0	0	0	0	7	**7**
Yemen	0	0	0	2	0	0	**2**
Zimbabwe	0	0	0	0	0	*1*	**1**
TOTAL	**32**	**14**	**219**	**389**	**535**	**1,763**	**2,952**

The theory expects two macro-level factors to affect participation in protest during a blackout – one human and one technological. The human variable is the *history of protest* that an area has experienced in recent times, drawing from Braithwaite, Braithwaite, & Kucik (2015) and ICEWS. Neither lags nor aggregate protest counts for the entirety of the previous year are appropriate here, as the former only accounts for an isolated point in time without examining

larger trends and the latter aggregates to the yearly level while shedding variation. Thus, I use a novel approach that summarizes the number of protests in the 365 days preceding every observation. This allows me to account for the dynamics of contention that emerge in the longer term.[53]

The technological variable is Internet penetration, as reported by the World Bank. While the association of Internet connectivity with protest is somewhat facile (as noted by Wolfsfeld et al. 2013 and Howard & Hussein 2013), network shutdowns introduce a singular circumstance in which to test it. If divergent responses are found to occur in high-, medium-, and low-penetration countries in conjunction with a blackout, we will have acquired knowledge about the new grievances of the information age and variations in how vigorously they are expressed. Given the growing importance of cell phones as the primary hubs of Internet use in the world, cell phone possession is used in some specifications as a robustness check.

Control Variables

Several demographic and socioeconomic variables are considered: proportion of youth (youth bulge), regime type, GDP per capita, fluctuations in commodity prices, and unemployment rates. Student and youth protests are an established phenomenon in modern times, from Quebec's massive tuition protests in 2012 to Hong Kong's Umbrella Movement in 2014. The disenfranchisement of youth, driven partly by the scarcity of gainful employment and economic prospects, was the vehicle of grievance in protracted unrest in countries like Egypt and Yemen, where between 60 and 75 percent of the population was under 30 in the 2010s. Governments facing youth bulges may be more repressive, fueling the repression-dissent nexus (Nordås & Davenport 2013). Youth are also more likely to use communication technology – and the Internet in general – than are older cohorts, and may leverage those resources more effectively for public expression of political attitudes (Schlozman et al. 2010). The data are derived from the U.S.

[53] The variable's maximum – 8,776 protests in the preceding 365 days – was achieved by India on September 17, 2016.

Census Bureau and cover an age range of 15-24 – a bracket by which youth is commonly defined.[54]

Many associations have been drawn between regime type and contentious activity, with most observing that democracies create more openings for the airing of both localized dissent and ideological grievances than do hybrid and authoritarian regimes (e.g., Hendrix & Haggard 2015). Since I do not propose to make fine-grained distinctions on the subtypes of authoritarianism and the dynamics of protest, I use the Polity scale to classify states as authoritarian, hybrid, or democratic (Marshall et al. 2017). Additionally, several markers of human development exist and no macro-level indicators perfectly reflect processes that unfold on the micro level. However, poverty and the economic condition of the country may generate grievance. In particular, high levels of unemployment and large shocks to commodity prices signal a nationwide economic downturn, whose repercussions are commonly linked to expressions of grievance at the individual level (Grasso & Giugni 2016).[55] These variables are supplemented by a *weekend* indicator to account for days of the week (Friday to Sunday) when people enjoy more latitude for protest (Hassanpour 2017).[56]

Finally, one of the more contentious aspects derived from research to date has been the effect of the state's strategy of choice when faced with collective action. This is especially relevant for the

[54] Gross enrollment in higher education was also considered. We can expect similar dynamics here because the cultural resources gained in higher education may yield an improved ability to organize and coordinate groups in both nonviolent and violent contention (Machado, Scartascini, & Tommasi 2011), and because educated individuals are, on average, more proficient in the use of technology (Asal et al. 2016). However, missing data on enrollment in higher education considerably decreased the N, even after interpolating missing values between two years for which data existed. In these specifications, the primary findings continue to hold strongly.

[55] These indicators are derived from the World Bank (GDP per capita), the International Labor Organization (unemployment), and the UN Food and Agriculture Organization (commodity prices). Monthly commodity price fluctuations are measured using the general Consumer Price Index, supplemented by the CPI for food where missing data were recorded (167 country-months). The CPI measures changes in the price of a basket of goods and services. Robustness tests using each index separately did not significantly affect the results. A number of countries still contain numerous months of missing CPI data, though most of those are not shutdown-prone.

[56] I acknowledge the limitations of this definition, particularly for Muslim countries. However, most of these states adopted a Friday-Saturday weekend in the 2000s and 2010s, and Friday prayers are included in this conventional calculation.

repression-dissent nexus, in which the cyclical nature of the processes of repression and dissent may be disrupted by appeasement from the government (Rasler 1996, Moore 2000, Pierskalla 2010). Governments may shuffle between repression and accommodation based on perceived effectiveness (Moore 2000), but concessions may also catalyze more protest due to the political opportunities they create (Rasler 1996, Carey 2009).

It is also possible that inconsistent strategies yield more collective action, for many of the same reasons that drive people to rally against indiscriminate repression (Lichbach 1987). While the cost of participation does not necessarily change, prospective protest participants may either perceive a universal threat in the regime's unbalanced response or see it as a window of opportunity. This is a compelling argument here; inconsistent strategies may be intentionally wielded to supplement the disorder caused by the communication blackout. But given that, in most known cases, disruptions are themselves a form of repression, it is possible that adopting strategies of accommodation alongside them will send inconsistent or conflicting signals to the public and further escalate protest. However, given the radical nature of a blackout as a form of digital repression, I do not expect accommodation to typically follow in its wake. Likewise, consistent application of several forms of repression may deter further escalation of dissent, interacting with the blackout.

The above considerations lead me to incorporate event data on *arrests*, *violent repression* events, and *restrictions to political rights* as complementary indicators of grievance-generating repression. All three are extracted from ICEWS (Boschee et al. 2015) and parsed to ensure the analysis retains only events executed by government actors. I also include a *yield* variable to account for government accommodation strategies, comprising a battery of concessions to political demands as well as the release of prisoners. A quick examination of the summary statistics also reveals that *declarations* of concession are much more common than actual instances of concession; therefore, a *yield declaration* variable is used in some specifications to test the strength of the model. Both indicators are derived from ICEWS.

Table 3.2 Summary statistics for the estimation sample.

Variable	*Obs*	*Mean*	*Std. dev.*	*Min*	*Max*
Protest	434016	0.344344	2.092543	0	116
Shutdown	434016	0.006802	0.082191	0	1
Protest history	361746	125.6095	450.0216	0	8776
Internet penetration	423420	42.90937	28.77794	0	98.24001
Cell phone possession	426344	101.7012	40.22904	2.38	235.61
Violent repression	434016	0.049851	0.454958	0	34
Political rights restriction	434016	0.028319	0.251457	0	19
Arrest	434016	0.627659	3.208248	0	100
Yield (gov't)	434016	0.065198	0.463509	0	47
Yield declaration (gov't)	434016	0.66628	2.896534	0	178
Regime	366,064	1.54391	.7068028	1	3
Log GDP per capita	405149	9.137583	1.193397	6.393047	11.77028
Unemployment	394,560	8.935679	6.48054	0.1	31.4
Δ Commodity prices	390,994	0.004165	0.015912	-0.17939	0.830634
Youth bulge	434,016	17.02163	3.621017	9	25.4
Weekend	434016	0.428832	0.49491	0	1

Estimation Strategy

Two primary estimation strategies will be used: linear modeling using negative binomial regression and matching methods. The panel data fulfill two basic conditions for a negative binomial model: follow-up time is identical for all countries (2,192 days) and overdispersion of the dependent variable. With a clear rightward skew and a variance nearly 13 times higher than the mean, the protest variable is overdispersed (see Appendix). Additional goodness-of-fit tests confirm this. Negative binomial models are thus superior to both OLS and Poisson modeling in the context of this study.

The study is set up as a quasi-experiment where the 'treatment' is a network shutdown. Evaluating the effects of such a treatment is ideally done through a randomized controlled trial, which randomly assigns individuals to treatment and control groups. The difficulties of ensuring this in the social sciences are well-known. Treatment assignment is usually non-random; this is only exacerbated when the subjects are administrative units rather than individuals in clinical settings (Persson & Tabellini 2002). Thus, several methods have been proposed to attempt to compensate for the lack of a controlled environment. Chief among them are matching methods, which rely on identifying individuals in the treated and non-treated

groups who are similar on a large set of observable characteristics (Stuart 2010). This approach seeks to guarantee that the primary (and ideally only) factor distinguishing the treatment and control groups is the treatment itself – that is, to minimize the differences between pairs of observations. This approximates a counterfactual situation in which the treatment was *not* applied to a subject with similar observable characteristics and compares the results for the outcome variable in the two scenarios. In other words, matching pairs each treated observation with its untreated "statistical twin."[57]

There are several advantages to using matching methods over regular regression. They require fewer modeling assumptions – most importantly that of a linear relationship between covariates and outcomes (Stuart 2010). Although the requirement of achieving 'balance' between treatment and control groups reduces the sample size, it arguably improves efficiency and may reduce estimation error. While matching does not always fully address endogeneity problems in studies such as the present one, it does so to an extent when it is possible to measure the variables that influence treatment assignment – in this case, the incidence of blackouts.[58]

Matching methods have become increasingly common in political science; some of the resulting studies also recognize the temporal dynamics of the process in question. In social science, matching has been used to study topics such as social media and protest, civil society and political support, the effectiveness of antipoverty programs, and the effects of insurance schemes in developing countries, among others (Valenzuela et al. 2014, Boulding & Núñez 2014, Mensah et al. 2010). As a policy decision in their own right, shutdowns also emerge in non-random circumstances, as countries possess certain (often unknown) characteristics that predispose them to execute disruptions. The day or days on which the shutdown is implemented are, likewise, non-random.

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[57] Ben Jann, "Kernel matching with automatic bandwidth selection." 2017 London Stata Users Group Meeting, London, September 2017.

[58] Matching does carry the assumption that the unobserved characteristics of the control and treatment observations are similar. This is not always true, but a set of other matched characteristics make it more likely that this expectation will hold (Artés & Jurado 2015).

I rely on several matching methods and algorithms to verify my findings. Recent work by King & Nielsen (2016) cautions against overreliance on propensity score matching (PSM), the preponderant matching method in quasi-experimental social science research. Under certain circumstances, this method of reducing imbalance in the covariates may actually increase imbalance. Multivariate distance matching (MDM) using several sets of matching algorithms is thus prioritized throughout the estimation process.

Results

Figure 3.3 shows the average number of protests and episodes of violent repression per consecutive shutdown-day, set against the average number of protests per consecutive protest-day across the whole dataset. These trajectories suggest that the repression-dissent nexus in its most basic form – that is, a clear relationship between collective dissent and violent repression – surfaces during communication shutdowns as well, even without considering differences in regime type. This matches the relatively strong correlation (.54) between the two variables (see **Table 3.3** for correlation matrix). Both protests and repression experience an abrupt decline on day six of the shutdown, on average, with the protest count falling to 45 percent of its original value. This downward trend continues as the blackout persists, dropping to fewer than one protest per day by day 14. These dynamics are at odds with the trajectory of each consecutive day of *protest* (dotted line), where collective dissent only accelerates and spreads to different locations as it continues. This provides an empirical foundation to further explore these dynamics statistically.

Table 3.3 Correlation matrix of variables used in regressions in Chapter 3. Correlations above 0.65 are shown in bold.

	Protests (non-violent + violent)	Shutdown	Shutdown week	Protest history	Internet penetration	Repression	Arrest	Political rights restriction	Yield (gov't)	Yield declaration (gov't)	Regime type	Log GDP per capita	Δ Commodity prices	Unemployment	Youth bulge	Weekend
Protests (non-violent + violent)	1															
Shutdown dummy	0.1308	1														
Shutdown week	0.1139	**0.9346**	1													
Protest history	0.6053	0.2	0.1862	1												
Internet penetration	-0.0223	-0.0219	-0.0181	-0.0252	1											
Repression	0.3762	0.0509	0.0386	0.2487	-0.0123	1										
Arrest	0.5539	0.168	0.1564	**0.7746**	-0.0293	0.194	1									
Political rights restriction	0.2176	0.0635	0.0585	0.2423	-0.0009	0.1403	0.2072	1								
Yield (gov't)	0.3218	0.0939	0.0856	0.4443	-0.0156	0.1591	0.4366	0.1441	1							
Yield declaration (gov't)	0.1683	0.0298	0.026	0.2502	0.1231	0.1013	0.2263	0.1031	0.1592	1						
Regime type	-0.0236	0.0351	0.0378	-0.0183	-0.171	0.0385	-0.0517	-0.0006	-0.0218	0.024	1					
Log GDP per capita	0.0033	-0.0172	-0.014	0.0141	**0.8937**	0.0077	0.0008	0.0148	0.0048	0.1296	-0.0789	1				
Δ Commodity prices	0.0218	-0.0031	-0.0058	0.0414	-0.1473	0.0222	0.025	0.0179	0.0188	0.0107	0.0923	-0.1323	1			
Unemployment	-0.0345	-0.0212	-0.0205	-0.0491	0.0157	-0.02	-0.0702	-0.0242	-0.038	-0.0619	-0.1517	0.0026	-0.0242	1		
Youth bulge	0.0004	0.0435	0.0422	-0.0029	**-0.7945**	0.0059	-0.001	-0.0114	0.0021	-0.1534	0.2699	**-0.7114**	0.125	-0.0351	1	
Weekend	-0.0107	-0.0008	-0.0004	0	0.0001	-0.0026	-0.029	-0.0009	0.0033	-0.0133	-0.0001	0	-0.0011	-0.0002	-0.0001	1

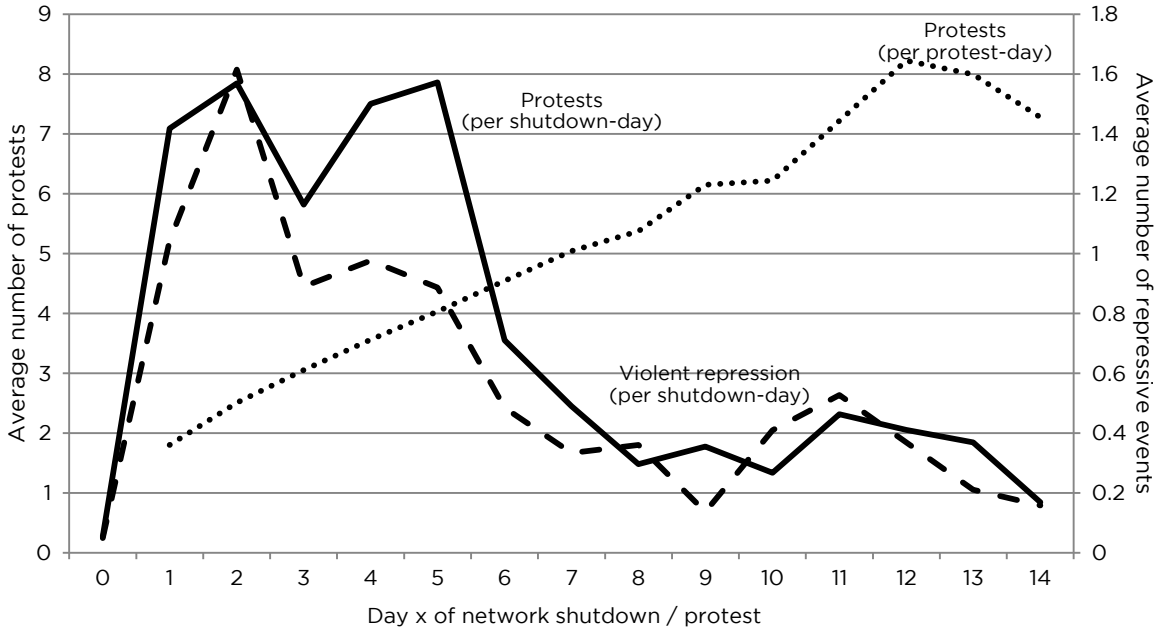

Figure 3.3 Average number of protests per consecutive shutdown day (1st, 2nd etc.; solid line) set against average number of instances of violent repression per shutdown day (dashed line) and average number of protests per protest day irrespective of shutdowns (dotted line). Repressive events plotted on secondary axis.

Statistical tests of the hypotheses provide strong support for the predicted effects. Three recurring findings stand out. First, network shutdowns are associated with a clear increase in the number of protests occurring in their immediate aftermath, i.e. the following day. The effect holds regardless of whether the scope of consideration for prior protest is narrow (in models where protests on the previous day are considered) or broad (in models where the preceding year of protest history is considered). *H1* is therefore confirmed across the specifications that distinguish between the short- and long-term effects of blackouts. Second, although the effect is still positive, prolonged shutdowns are accompanied by a significant drop-off in protest incidence. Pursuant to *H3* and *H4*, this clarifies that the effect of Internet blackouts is dynamic: temporal distinctions should be made between ephemeral, short-term disconnections and 'digital sieges.' Third, there is a relationship between the temporal dynamics of shutdowns and protest history, as well as another between the temporal dynamics of shutdowns and Internet penetration, which speaks to both *H2* and *H4*. These links are detailed below. **Table 3.4**

summarizes the baseline results from the four estimated random-effects negative binomial models. The table reports incidence rate ratios instead of coefficients, as the latter are difficult to interpret in negative binomial models (Hilbe 2011).

Model 1 uses a binary shutdown measure, a one-day lag to account for protest on the previous day, and other variables that vary by day (event data), without higher-level controls. In this basic specification, the relationship between shutdowns and protest is significant and negative, suggesting that, without accounting for changes in shutdown dynamics across time, blackouts are associated with a decrease in the raw number of protests. The emergence of a shutdown on a given day decreases the incidence rate (number of events per unit of time) by a factor of .91, all else held equal. On the surface, this runs counter to *H1*, which predicts that blackouts will immediately trigger new grievances and send greater crowds into the streets. However, by omitting the exact point in a blackout's trajectory at which the observer is located, this specification does not recognize the potentially uneven dynamics that blackouts produce. Simply put, the model does not distinguish between day one of a shutdown and day 100. Further in this model, yesterday's number of protests strongly affects today's, as do violations of both political rights and physical integrity – two indicators of repression. Another finding that proves consistent in subsequent models is that of increased protest incidence associated with declarations of concession by the government. While the coefficients of all the variables are small as a result of the variation in protest being considered on a daily level, this contributes to the conversation about government strategies of dealing with repression. Further examination of this aspect is largely outside the purview of this study.

Model 2 expands the same specification to include variables that vary by year and month. This decreases the number of observations to approximately 336,000. The binary shutdown variable remains negatively associated with protest. Raw Internet penetration does not seem to translate to more protest on a day-to-day level; the association between these variables requires deeper probing. Monthly fluctuations in a basket of commodities exert the most powerful effect on collective action, reflecting deeply ingrained and commonly observed grievance dynamics.

The primary disadvantage of these models is that they do not account for the broader dynamics of either protest or shutdowns. The usefulness of a one-day lag in protest is limited when we fail to investigate a country's deeper, sustained relationship with collective action (Braithwaite et al. 2015). It stands to reason that populations with more protest experience will react differently to attempts to curb the information flow than those to whom protest is relatively unfamiliar. Likewise, the theoretical setup calls for a distinction between short-term blackouts and *digital sieges*. Model 3 corrects this inadequacy by substituting the lagged protest variable with a protest history variable that tallies the number of protests in the previous 365 days for each observation, and swapping the binary shutdown variable for a categorical variable that distinguishes between the first week of a blackout and subsequent weeks. The results are revealing. The first week of a disruption drives up the incidence of protest by a factor of 3.62. Subsequent weeks seem to witness *lower* rates of protest compared to both the first week and non-shutdown scenarios (IRR = .89), but this is only significant at the .1 level. Accumulated protest is also a very strong predictor of the number of protests on a given day, though the incidence rate associated with this relationship is small.

The fullest specification is presented in Model 4, which adds interactions of the time-sensitive shutdown variable with protest history and Internet penetration. A network disruption in its first week continues to have a strong and positive association with protest; in subsequent weeks, the effect is positive this time, but with a much lower incidence rate. Relative to baseline, digital sieges appear to be more likely to witness flare-ups, but their levels are not comparable to the impetus of the first week. The incidence rate for the first week is 5.4 – more than three times higher than the corresponding rate for subsequent weeks. This reinforces *H1* and partially confirms *H3*: while collective action in a digital siege is higher than the baseline, it diminishes with respect to the first week. More interesting effects take hold in the interactions. While the incidence rates are minuscule, the effect of extensive protest history (high cumulative protest count across the last 365 days) is *negative* when a country faces an Internet shutdown – both in the first and subsequent weeks. This brings forward an intriguing possibility – that a rich history of protest actually *decreases* the incidence of collective action during a blackout. By

extension, if we assume that areas that are historically steeped in protest have had plentiful opportunities to muster organizational resources for coordinated collective action, it follows that collective action that occurs in the aftermath of blackouts tends to be spontaneous. Shutdowns are, by design, disruptions to socio-organizational resources; if so, the notion that imposing them encourages spontaneous protest, which relies less on accumulated structures and experience, is certainly plausible.

A second finding from these interactions is that higher Internet connectivity is also negatively associated with protest when a shutdown is in place, both in the short run and in digital sieges. This runs askew of *H2* but reinforces *H4*. Higher Internet penetration does not automatically translate to higher levels of public outrage when a blackout is implemented. In prolonged disconnection, one possible explanation is 'blackout fatigue' as individuals in a more highly connected area begin to understand that the shutdown is not a 'flash in the pan.' It is also worth noting that the protest interactions run in the opposite direction to at least one of their parent variables; protest history (and, in some specifications, Internet connectivity) is positively associated with protest when not interacted with a shutdown. This points to dynamics that are indeed altered in the presence of a blackout. Factors that might bolster protest under normal circumstances appear to turn into handicaps during shutdowns.

Table 3.4 The dynamics of disconnective action. Dependent variable: number of protests on day *t*.

	Model 1	*Model 2*	*Model 3*	*Model 4*
Shutdown $_{t-1}$	.776**	.750**	-	-
	(.027)	(.027)		
Shutdown $_{Week\ 1}$	-	-	3.621**	5.358**
			(.301)	(.731)
Shutdown $_{Week\ 2+}$	-	-	.891	1.683**
			(.057)	(.192)
Protest $_{t-1}$	1.058**	1.057**	-	-
	(.001)	(.001)		
Protest history	-	-	1.000**	1.000**
			(.000)	(.000)
Shutdown * Protest history				
Week 1	-	-	-	.999**
				(.000)
Week 2+				.999**
				(.000)
Violent repression $_{t-1}$	1.044**	1.044**	1.118**	1.119**
	(.002)	(.002)	(.003)	(.003)
Arrest $_{t-1}$	1.021**	1.022**	1.014**	1.015**
	(.001)	(.001)	(.003)	(.001)
Political rights restriction $_{t-1}$	1.070**	1.069**	1.093**	1.010**
	(.007)	(.007)	(.008)	(.008)
Yield $_{t-1}$	.999	1.000	1.012**	1.014**
	(.004)	(.004)	(.005)	(.005)
Yield declaration $_{t-1}$	1.012**	1.012**	1.010**	1.010**
	(.001)	(.001)	(.001)	(.001)
Internet connectivity	-	1.002**	.989**	.989**
		(.000)	(.000)	(.001)
Shutdown * Internet connectivity				
Week 1	-	-	-	.981**
				(.006)
Week 2+				.984**
				(.004)
Regime				
Hybrid	-	1.006	.958†	.962*
		(.017)	(.018)	(.018)
Authoritarian		1.147**	1.010†	1.010*
		(.032)	(.042)	(.043)
Log GDP per capita		1.767**	1.681**	1.654**
		(.027)	(.030)	(.029)
Δ Commodity prices	-	4.084**	11.290**	11.489**
		(1.538)	(.000)	(6.404)
Unemployment	-	1.006**	1.001	1.002
		(.001)	(.002)	(.002)
Youth bulge	-	1.029**	1.056**	1.054**
		(.004)	(.004)	(.004)
Weekend	.898**	.891**	.881**	.881**
	(.008)	(.009)	(.010)	(.010)
No. of observations	433,818	336,069	274,071	274.071
No. of groups	198	158	156	156

Random-effects negative binomial regression results. Significance levels (two-tailed): †90%, *95%, **99%. Incidence rate ratios (IRR) reported with standard errors in parentheses.

Finally, I examined the effect of the shutdown 'treatment' using multivariate (Mahalanobis) distance matching (MDM). This aids in causal inference by accounting for confounding – a situation in which the covariates affects both the treatment and the outcome. Indeed, many of the covariates – e.g., other forms of repression or Internet penetration – may predetermine the initiation of a shutdown. I use nearest-neighbor matching with regression adjustment bias correction and estimate separate treatment effects for the first week and subsequent weeks of a blackout.[59] I use the same covariates that were used in fullest specification of the regression model, minus interactions. The average treatment effect on the treated (ATT) for the first week of a shutdown is 1.75. In other words, the first week of a blackout brings about an average increase of nearly two protests per day. An identical test for the second and subsequent weeks of a blackout finds that the treatment yields a number of protest events that is *lower* relative to the matched control group by about one protest (.78, to be precise). This provides still more evidence that the effects of network disruptions on collective action are non-linear. Both results hold strongly in models with bootstrapped standard errors, where the effects are an additional 2.41 protests for week one ($p < .001$) and .57 fewer for the second and subsequent weeks ($p < .05$).

Conclusions and Discussion

The goal of this chapter was to establish how network shutdowns affect protest dynamics. This topic can benefit greatly from scholarly attention given the proliferation of these deliberate communication blackouts that has been observed since Egypt captured the world's headlines with its use of the "kill switch" in 2011. The spread of shutdowns as a new method of repression has enabled us, for the first time, to examine these interactions at a broader scale, beyond influential yet isolated national cases. The primary finding is that shutdowns are associated with a spike in protest incidence in their immediate aftermath – but this surge subsides as a blackout is maintained for more than one week, thus becoming a *digital siege*. This outcome helps us to resolve a puzzle in the dynamics of information flows: does disrupting the

[59] The choice of methodology is based on caveats regarding bias in using propensity score matching alone in King & Nielsen (2016) as well as recent work by Ben Jann. The regression adjustment is an additional way of accounting for the likelihood of the treatment being assigned to individual observations. Using other methods does not significantly change the results.

information flow generate enough grievance to send crowds into the street or strip them of coordination platforms, undermining the eventual cause of protest? I argue that it does both.

The results also highlight other dynamics that bear closer investigation. The more seasoned a country is in the experience of recent protest, the *less* protest it experiences when thrust into an information blackout. While the effect is small, it is also strong and consistent. The implication is that collective action that occurs in the wake of a shutdown is, by and large, spontaneous – or at least more spontaneous than in cases where connectivity remains untouched. A similar effect is observed for Internet connectivity, whose higher rates contribute to decreased incidence of protest when placed in conjunction with a blackout. When combined, these relationships suggest that the "power and fragility of networked protest" (Tufekci 2017) carries over to circumstances where the information landscape is compromised. If shutdowns occur in environments with a more limited recent history of public dissent, the response is more likely to be spontaneous; if the response is spontaneous, it is more likely to reveal its fragility and succumb to the chaos-inducing purpose with which the shutdown is implemented. Higher Internet connectivity means that more people have more to lose when a blackout chokes the area's digital economy; these individuals may refrain from overt protest as a strategy of coaxing the government into lifting the digital siege.

Taken at face value, these results may lead an observer – or, worse, a government – to conclude that extended network shutdowns are a viable way to stifle modern protest. This is far from the truth. Shutdowns carry a crippling cost not only at the micro level, but on a macroeconomic scale as well (West 2016, Deloitte 2016, CIPESA 2017). One week of disconnection already deals significant economic damage, particularly in developing countries. Maintaining the grip on information channels can devastate economies in ways that are not always fully clear even to the governments pulling the plug. In short, disconnecting digital networks does little to prevent the escalation of protest in the short run and remains prohibitively expensive in the long run. This study therefore determines that shutdowns are not a viable form of repression.

This study yields new information on communication and coordination in the midst of an information crisis. It expands our knowledge about such vacuums by tracing the rise and fall of 'disconnected protest' in a wide array of countries, arguing that the surge of collective action may be temporary (Hassanpour 2017). It also touches on the phenomenon of spontaneous collective action and its repercussions using the unique circumstance of a blackout to approach the problem from an unconventional side (Snow & Moss 2014). But how do these dynamics play out on a subnational level in a situation where shutdowns become a government's preferred method of disrupting dissent? Does information chaos lead to strategic changes among the participants of collective action and a rebalancing of violent and non-violent protest? How do blackouts affect organized and loose-knit groups expressing outrage in the street? These questions have been left unaddressed here; I will pursue them through a quantitative study of India in the next chapter.

Chapter 4

Of Blackouts and Bandhs:
The Strategy and Structure of Disconnected Protest in India

Abstract

State governments in India have executed approximately half of the world's known network shutdowns – large-scale, deliberate disruptions of Internet connectivity, cell phone service, or social media. India is also a hotbed of collective action with widely varying degrees of organization and coordination, which are partially determined by the identities of the primary participants. However, no independent assessment of the effects of such information vacuums on the strategy and structure of collective action exists, for India or any other state. In this study, I expand on the previously formulated theory of disconnective action by examining how structural characteristics affect collective action responses during a network shutdown in an extreme case via statistical analysis. Shutdowns are found to be much more strongly associated with violent collective action than with non-violent mobilization. However, a breakdown of the structure of individual protest events reveals weak effects for both organized and 'leaderless' collective action during a shutdown. On the other hand, the co-occurrence of state violence with a shutdown is found to encourage non-violent action. The findings imply that information blackouts primarily disrupt highly structured and non-violent protest, compelling participants in collective action in India to substitute non-violent tactics for violent ones that are less reliant on effective communication and coordination. The analysis creates a precedent for other subnational studies of digital repression and adds to the discussion on extreme means of controlling (dis)information flows online.

"It is tempting to look at the Internet as a standalone technology,
but it is in fact a mirror of human behavior."
– Interview with Gary Fowlie (ITU), July 2016

Introduction

On July 8, 2016, a young Kashmiri militant commander named Burhan Wani was gunned down by Indian Army and police units in the Anantnag district of the Indian state of Jammu and Kashmir. Wani, a 22-year-old man from an educated family, had been one of the leading figures of the Hizbul Mujahideen, a separatist group designated as a terrorist organization by India, the European Union, and the United States. What distinguished Wani from thousands of

other fighters was his prolific use of social media as a tool of recruitment and communication with civilians, particularly Kashmiri youth. The militant's funeral was attended by 200,000 mourners and precipitated years of violent unrest in what is popularly called the *Burhan aftermath*. With news of Wani's death spreading rapidly on social media, riots erupted across the state in the first twelve hours following the incident. In an effort to restore public safety and prevent "rumor-mongering," the state government of Jammu and Kashmir then suspended mobile and landline telephone service across the state. Through parallel bans on newspaper distribution and cable television, the Vale of Kashmir entered a state of complete information blackout. Although Internet and mobile services were intermittently available in the aftermath, the network shutdown only was only lifted completely after 203 days, with dozens of additional flare-ups thereafter (Rao 2016).[60] State authorities invariably claim that these deliberate blackouts, which occur more frequently in India than in any other country in the world, are useful in pacifying or preventing protest. However, empirical evidence is never presented.

This study applies the *theory of disconnective action*, as described in Chapter 3, to the subnational level, narrowing the scope of analysis to the 36 states and union territories of India. India is unique in the scale, number, and diversity of both protest and network shutdowns, which I frame as a method for quelling public dissent that amounts to state repression. In Chapter 3, I argued that communication blackouts escalate collective action in the short run, but undermine it when they are maintained as a *digital siege*. This implies that the temporality of disconnected protest matters. The first goal of this chapter is to supplement this finding with a closer examination of strategy in disconnective action while maintaining a temporal component in the analysis. This approach, applied subnationally, both enriches the cross-national study with new, country-specific information and allows me to obtain new findings on aspects left untouched in the previous chapter.

[60] A year after Wani's death, his successor, Sabzar Ahmad Bhat, was also killed in a gunfight with the Indian Army. Internet services were shut down almost immediately following the encounter amid reports of youth coordinating stone-pelting mobs via WhatsApp. While the resulting protests were violent and widespread, they did not reach the momentum of the Burhan aftermath, which had left 94 protesters dead in the first several months.

Newly released data enable us to examine the subnational availability of digital platforms that facilitate collective action, which form part of the broader study's theoretical framework. While cross-national data on the daily level are valuable even without examining subnational administrative units, they carry a considerable risk of ecological bias, i.e., the application of macro-level conclusions to the micro level (Rokkan et al. 1970, Snyder 2001). Several social movements in India have generated or inspired nationwide demonstrations; however, blackouts are invariably executed on a district or state level. Hence, in this case, the assumption that the phenomena under investigation (collective action and network shutdowns) are occurring in the same physical space is possibly erroneous, and resolving this weakness is only achievable through a closer look at state- or district-level dynamics.

Second, I take advantage of newly available data as well as the idiosyncratic nature and composition of collective action in India to pose a research question that deepens the analysis presented in the previous chapter: does structure matter in disconnected protest? Highly structured unrest benefits from the affordances of digital technology, which offers platforms for organization and coordination. On the other hand, the momentum of rumors and false information traveling in social media may provoke spontaneous, unstructured outrage (Tucker et al. 2018, Snow & Moss 2014). Breaking down the type and participants of collective action events can help to address structural questions about both collective and disconnective action, enabling us to better distinguish between those two scenarios. Finally, this article provides a brief discussion of an alternate, institutional explanation that speaks to aspects of the Indian case that are difficult to quantify. The study thus creates a foundation for future case studies on new forms of repression and resistance.

Why is India worth a closer subnational examination? The overarching conclusion of Chapter 2 – that developing countries which experience the most vigorous growth of Internet connectivity also tend to interfere less overtly with content – is cast into doubt in India, which executed more than 100 network shutdowns between 2016 and 2017. At the same time, the government's national digitization campaign has enabled rapid advances in the penetration of digital information channels, embodying the contradiction of facilitating information flows

while attempting to control them. This study complements Chapter 2 by examining a country that defied its findings after 2011. Chapter 3, in turn, established the dynamics of disconnective action in broad strokes. Absent from that analysis is any consideration of strategy in disconnected protest. How do strategies of protest change amid an information and communication vacuum? A rich body of work in the social movements literature and an emerging strand in research on the repression-dissent nexus discuss the distinct dynamics of violent and non-violent collective action (Chenoweth & Stephan 2011, Carey 2010, Lichbach 1987, Moore 1998, Sullivan 2016). Conversely, neither technology nor its absence have been empirically linked to either violence or non-violence, and findings on the mixed use of technology and protest strategies on the ground are sometimes at odds with one another (Bohdanova 2014, Metzger & Tucker 2017). The abundance of non-violent demonstrations and violent riots in India as well as the diversity of government responses thereto underlies the choice of India as a focus for a quantitative subnational study of strategy in disconnective action.

In Chapter 3, I also do not account for the uneven spatial distribution of network shutdowns and collective action. A cursory look at the trajectory of shutdowns in India shows that the northern border states have acted as 'innovators' and shutdown contagion has advanced south with time. In India, shutdowns are not concentrated in a single state and are never executed on the national level. This variance allows us to draw broader conclusions on the spread of shutdowns rather than attempting to explain a highly localized phenomenon, of which shutdowns are an example in many other countries. Previous research has also shown that collective action among the majority of India's population is largely associational (through alliances with political parties and NGOs) and primarily targets state governments, though the intensity of grievance and incidence of protest vary (Ren 2017). Thus, shutdowns in India are localized responses to largely localized grievances. It is thus a suitable case with which to explore localized dynamics that cannot be pinpointed cross-nationally.

Similarly, few conclusions can be drawn from Chapter 3 about the decision process or institutional characteristics of government actors addressing localized expressions of dissent, whether via shutdowns or violent crackdowns. India's democracy prominently relies on

allocating authority to state (subnational) actors. Since responses to local protest tend to be spatially targeted and rarely orchestrated as a countrywide, centrally coordinated campaign, the ultimate responsibility for implementing them belongs to state- and district-level actors whose authority is rarely overridden by central actors. This strengthens the credibility of any relationships that are uncovered. India therefore offers a strong starting point for probing dynamics that could not be captured at the cross-national level in Chapter 3.

Patterns of Digital Expansion and Information Control in India

Technology and politics are increasingly intertwined in India. The Bharatiya Janata Party (BJP), a Hindu nationalist party with a near-absolute majority in India's lower house as of 2018, has consistently supported efforts to expand digital literacy through urban and rural connectivity programs, including a countrywide initiative to provide high-speed Internet to rural areas through the Digital India program. It has also linked digitization to otherwise unrelated policies such as the demonetization scheme of 2016, which abruptly removed most of the country's currency from circulation and produced a surge in the use of digital payments (Gupta & Auersald 2017). The controversial Aadhar program is advancing in its goal of creating digital identity documents for every citizen of India, including biometric information and bank account data. This has generated heated debates on privacy and potential theft of personal data. BJP's endorsement and adoption of digital tools for political purposes have extended into the party's own campaigns, ensuring high visibility for BJP on social media through a combination of active engagement and the employment of ostensibly independent users as political agents (Bradshaw & Howard 2017, Narayan & Narayanan 2016).

But India's accelerated entry into the ranks of connected countries has been accompanied by widespread misinformation and disinformation whose spread is enabled by the increased availability of connected mobile devices and digital communication tools. The dissemination of such content has been circumstantially linked to escalations of communal tension[61], protests, and riots. WhatsApp and Facebook, the dominant social media platforms in India, are also the

[61] In the Indian context, the term *communal* is usually typically used to describe Hindu-Muslim relations (Dhattiwala & Biggs 2012).

primary digital conduits of false information (Kaur et al. 2018).[62] Users of these services have both created new rumors and magnified the reach of existing ones. Allegations shared widely on WhatsApp contributed to the lynching of several individuals falsely suspected of kidnapping in the state of Jharkhand in 2017, while rumors of cattle slaughter disseminated through similar channels emboldened a mob of 'cow vigilantes' to murder a Muslim villager in Uttar Pradesh two years earlier (Abraham 2017). In West Bengal, decades of communal peace between Hindus and Muslims were broken by violent riots sparked by a student's sharing of a cartoon of Muhammad, the news of which spread from village to village (Daniyal 2017). In brief, the expansion of access to digital communication has both widened the space for free expression and accelerated the proliferation of false information in India, mirroring trends in other countries. However, the ways in which variation in the availability of new communication technologies has affected displays of public anger remain understudied.

India's drive toward a digital economy is paired with an incongruous approach to information control. Network shutdowns are the most overt strategy of controlling information flows to be sanctioned by government actors on all levels, from the central government to local authorities. Widespread institutional support makes India the most shutdown-prone sovereign state in the world by several orders of magnitude. Between 2016 and 2017, regional executive governments and judiciary entities ordered approximately one hundred blackouts and disruptions of specific communication networks – more than all other countries combined (Mawii et al. 2018, SFLC 2018, Rydzak 2018). Recent estimates have placed the total duration of shutdowns in India between 2012 and 2017 at 16,315 hours (680 days), generating an economic loss of approximately $3.04 billion (Kathuria et al. 2018). The resulting expansion of economic grievances is theorized in Chapter 4 as a catalyst for more collective action even in the absence of digital networks. While the absolute number and cumulative duration of shutdowns are growing in India, it appears that their average duration is decreasing, indicating a more targeted but consistent approach that may stem from awareness of the extent of the economic damage they create.

[62] India is WhatsApp's largest market, its 200 million users constituting a fifth of the total number of users in the world as of 2017.

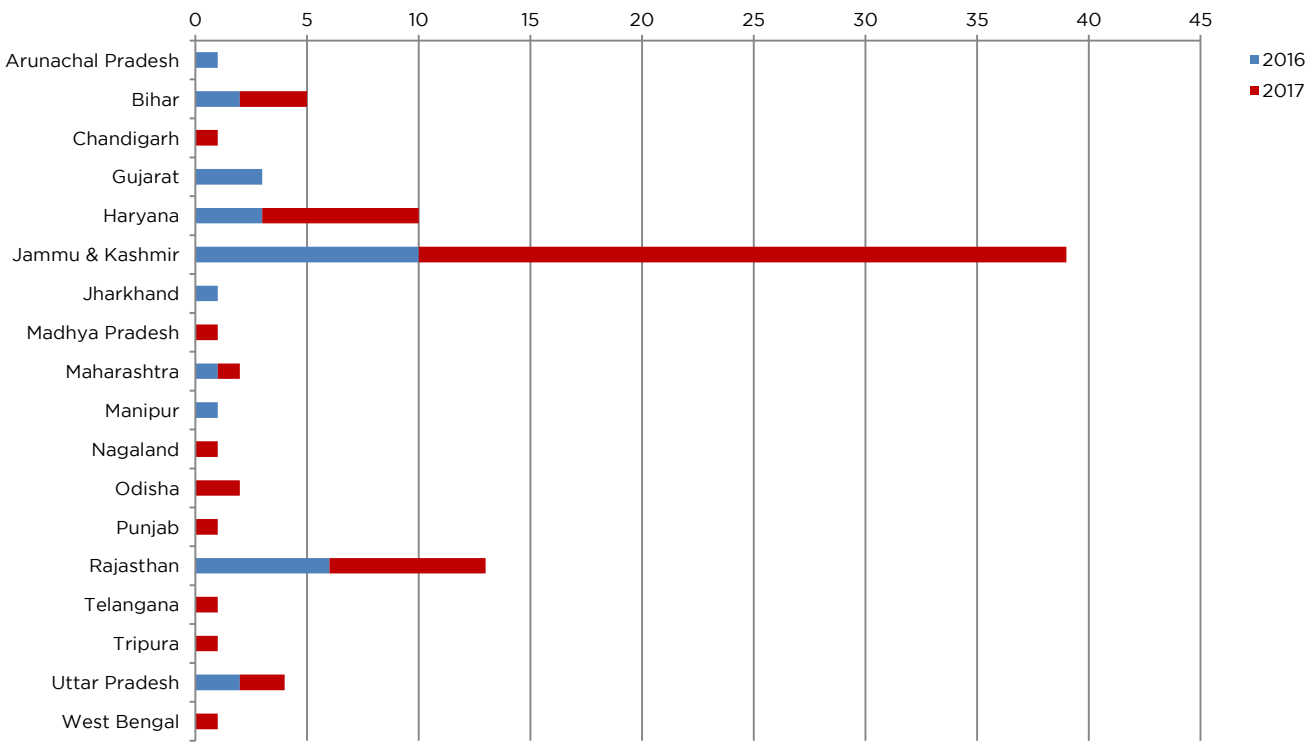

Figure 4.1 Number of network shutdowns across India in 2016-17, by state. States that did not experience any shutdowns in this period are not shown. Sources: Own work based on SFLC (2018), Kathuria et al. (2018), and Mawii et al. (2018).

Despite the prolific use of network shutdowns across the country, neither India nor any other national government has conducted publicly acknowledged studies on the effectiveness of shutdowns as a means of suppressing unrest. India's case is particularly noteworthy for a number of reasons. First, it has a rich and diverse history of social movements, of which some are rooted in the Gandhian ideals of peaceful resistance and inter-caste unity while others coalesce around one caste or religion (Varshney 2001, Behar & Prakash 2004). Second, it hosts an immense variety of ethnic and caste-based configurations as well as extreme inter-state disparities in levels of human development. Nineteen out of 36 states and union territories have implemented shutdowns as of April 2018, with no clear common socioeconomic thread aside from political unrest connecting them (SFLC 2018). The heterogeneity of India's economy and society thus lends itself to the analysis of factors that support and impair 'disconnected protest.' Daily event data and the use of socioeconomic variables that vary subnationally enable us to

capture a degree of variance that increases the generalizability of the findings (Snyder 2001). Third, India's status as an extreme case on both the dependent and independent variables creates an opening for exploratory studies that identify new variables to be considered (see Case Selection section below). In India, the causal link from protests to blackouts is sometimes confirmed by the official shutdown orders published by government actors; this chapter pursues the opposite pathway to question the effectiveness of this measure while exploring local effects that are particular to India. The results will have practical policy implications for political settings similar to India, including developing countries with rapid rates of growth in connectivity.

In India, the majority of shutdown events occur in the relatively volatile western or northwestern states of Gujarat, Rajasthan, Haryana, and particularly the contested territory of Jammu and Kashmir (J&K). Out of 36 states and union territories, these four regions account for more than 75 percent of all recorded shutdown events in India, while Jammu and Kashmir alone comprises about 47 percent. While shutdowns are occasionally spurred by security concerns during peaceful mass events such as festivals and processions, a large proportion of known cases are implemented with the explicit goal of ensuring or restoring public order. In most cases, this has been tantamount to preventing or quashing protests, riots, or collective violence (e.g., military maneuvers by Islamist militants and Kashmiri separatists in the north). Preemptive shutdowns are used to combat rumors, which the central and state governments link to the escalation of protest.[63]

Institutional variables play a significant role in the expansion of network shutdowns as a form of information control in India. A permissive legal environment has enabled both the proliferation of blackouts as a means of maintaining public order and the decentralization of responsibility for restrictions to access. Before August 2017, shutdowns were executed primarily under Section 144 of the Code of Criminal Procedure – a legal provision with roots in the British Raj which grants states broad powers to prevent or disperse unlawful assemblies during

[63] According to a senior BJP official, suspending access to the Internet is acceptable "where rumour-mongering or motivated misinformation could lead to the incitement of violence" (Bhatia 2017).

curfews. Blackouts are thus perceived as "a logical extension of curfews" and measures whose purpose is to inhibit public gatherings (Narrain 2018).[64] Colonial-era laws such as the Telegraph Act of 1885 have also been used to justify blackouts such as the disconnection of 22 social media services in Jammu and Kashmir in April 2017 (Human Rights Watch 2017).[65] In August 2017, India's Ministry of Communication announced new regulations governing the suspension of telecommunication services, amending the Telegraph Act (DoT 2017). These amendments introduce a degree of checks and balances, such as vesting the authority to implement shutdowns exclusively in senior civil servants. However, numerous terms and clauses remain open to interpretation.[66] Empirically, these regulations have done little to dampen shutdown occurrence or usher in more prudence in executing them; 29 incidents were recorded in the final five months of the year and a further 45 in the first four months of 2018.

Shutdowns in India arise in a variety of environments and conditions. The socioeconomic diversity of these environments has also produced different combinations of protest actors whose importance may rise or fall when they are forced to coordinate disconnective rather than collective action.

Literature Review

Structural Resources and Collective Action in India

Historically, major waves of collective action in India are preceded by new strategies of mobilization that benefit from the specific structural affordances of the actors who produce them (McAdam et al. 2001). Many formulations of resource mobilization theory emphasize the structural role of entrepreneurs, or first movers, who serve as catalysts and coordinators of collective action; nearly all formulations highlight the general importance of the structural

[64] India is not unique in equating shutdowns with curfews conceptually or operationally. In 2016, Gabon implemented 12-hour 'Internet curfews' for 25 days following a controversial election. Nightly curfews were also in place in the town of Duraz (Bahrain) for at least a year (2016-17).

[65] The government's authority to enforce shutdown orders is also codified in many of the license agreements that allow companies to operate (Narrain 2018).

[66] This includes "threats to public safety" and "public emergency," the two causes underlying the amendment.

characteristics of protest networks (Gurr 1970). The focus on structure sets resource mobilization theory apart from grievance-based approaches. This perspective rejects the claim that assembled crowds succumb to mob mentality or the act as an irrational, aggrieved collective. Instead, it advances that participants of movements operate as rational actors who devise structures and methods of coordination based on strategy and allocation of resources (Canel 1997). Maintaining formation amid state repression may prevent the movement from both unraveling completely and disintegrating into chaos and riots (Pearlman 2012, Chenoweth & Ulfelder 2017). This link between the structural, organizational aspect of collective action and differing levels of violence manifests itself vividly in India, where spontaneous mobs usually do not riot under the banner of a specific organized entity. It also justifies a joint examination of structure and violence in both connected and disconnected protest.

Social movements vary structurally in the composition and diversity of their participant base. An individual's calculus of whether to join a protest is strongly affected by his or her profile and social group. This is captured in Karklins & Petersen (1993)'s interpretation of *assurance games*, which employs game theory to deepen informational and structural theories of collective action by distinguishing among types of actors. Assurance games involve potential protesters continuously reevaluating the option of joining a protest based on the actions of others as well as their own predictions of the actions others will take (Schelling 1985). The decision to join a movement is one outcome of assurance games among groups in the general population, comprising students, workers, dissidents, and party supporters. The 'tipping point' for dissent varies across groups: it is highest among party supporters and lowest among dissidents, with workers and students in between. Individual assurance games may culminate in a social movement and affect the movement's ability to effectively command relational and human resources. This strengthens the notion that the overall structural characteristics of a communication network translate to the propensity for a group to mobilize against the state. Assurance games, however, are not easily transferrable from their original region of application (Eastern Europe) to South Asia or to national contexts like India, where multiple collectives with varying degrees of formal organization protest against a range of localized issues and do

not necessarily respond sequentially in communicating their dissent (Seymour et al. 2016). Thus, it is imperative to formulate new approaches that more accurately reflect the structural features of dissent in individual countries. Disconnective action, where coordination and socio-organizational resources come into play, creates an opening for this.

The articulation of popular discontent is deeply ingrained in civic life in India. The use of synchronized strategies is regarded as particularly effective, with movements characterized by extensive social networks and commanding organizational support successfully paralyzing commercial activities and transit on numerous occasions (Mitra 2002). Protests in India, commonly called *agitations*, vary significantly by type and tactics, emerging on a spectrum between radical and often disorganized riots to highly institutionalized demonstrations. The vernacular reflects this: unique forms of dissent in India include *bandh* (a general stay-away strike), *dharna* (a sit-in protest that typically involves groups congregating at their target's door until the target yields to their demands), *gherao* (similar to a *dharna*, but with workers demanding concession from employers), *jail bharo* (voluntary mass arrests), and *roko* (obstruction of a road or railroad), among others (McHenry 2015). These categories, according to the Armed Conflict Location and Event Data (ACLED) project, collectively make up about a quarter of all protests in India between 2016 and April 2018, with the other 75 percent falling into the traditional categories of demonstrations, riots, and strikes (Raleigh et al. 2010).[67]

Resource mobilization and the nature and magnitude of societal grievances both influence the trajectories of collective action in India. Structural resources and dependencies are at the heart of several studies on the Indian subcontinent (Brass 1997, Varshney 2001, Wilkinson 2004, Dhattiwala & Biggs 2012). Scholars like Wilkinson (2004) and Brass (1997) have described political brokerage systems that incite interethnic violence in India. While Wilkinson tackles the motivations of political instigators, Brass establishes concept of the 'institutionalized riot system' – an informal network of "riot professionals" instigating and maintaining ethnic and religious

[67] Government responses also vary significantly. Use of force against riotous groups constitutes a minority of cases, primarily in Northern India, while arrests are common during large or destructive protests across the country.

strife.[68] Brass argues that ostensibly spontaneous, violent protests are typically sparked by a group of insiders with institutional ties to political parties, and that the resulting unrest both leverages and alters the political opportunity structure for the participants. Critical components of an IRS include effectively targeted dissemination of rumors meant to stir unrest as well as a precipitating event that can generate violent expressions of outrage.[69] Political opportunity structures therefore lay the foundation for riots, but the continuation and expansion of riots relies on the resources that can be mobilized. This nexus between violence and resource mobilization via tacit political support was exemplified in the Gujarat riots of 2002, where the greatest devastation occurred in areas with greater electoral competition (Dhattiwala & Biggs 2012). In the elections that followed, these were also the areas where the nationalist BJP's vote increased the most.

While Brass holds informal, politically connected organizational structures responsible for violent dissent, some evidence suggests that the impetus toward interethnic violence in India is tempered by countervailing forces in areas where a rich network of organizations creates a basis for associational life (Varshney 2001).[70] Such structures – comprising professional associations, trade unions, networks of craftspeople, civil society, and political parties that refrain from calls for violence – contribute to an 'institutionalized peace system' that is based on stronger interethnic ties and synergy among its participants. Strong underlying identities – often revolving around caste, religion, and ethnicity – create common fronts that are at once clusters of grievance, as described in much of the social movement literature (Tilly 1978). While these considerations are useful in the case of violent unrest, collective action is naturally diverse, and few equivalent structural approaches have been made to address the broader range of protest types in India, let alone in a disrupted information environment (McHenry 2015). Information blackouts allow us to test whether these India-specific concepts hold years after they were

[68] Wilkinson (2004)'s focus on ethnic riots is more analytical and cross-sectional than either Brass (1997) or Varshney (2001). His key argument is that both Hindu and Muslim and politicians seek to polarize their constituencies to obtain an electoral advantage, and this determines their reaction to violence.

[69] A fluctuating balance of power between two or more rivals, a background of contentious events such as mass mobilizations or elections, prominent political supporters, and institutional weakness all aid in the development of coordinated riots.

[70] This perspective draws from Putnam (1993)'s idea of social capital.

originally described, with the emergence of communication technology as an intervening development.

Research on structured protest has shown that organizational density promotes the diffusion of protest (Minkoff 1997). The concentration of associational life into organized entities has been linked to the proliferation of protest in India. For instance, the Bureau of Police Research and Development (BPRD) estimates that around 45 percent of all agitations (protests) in 2016 were organized by political parties, labor unions, or student bodies, while communal dissent and uncategorized incidents accounted for about six and 29 percent, respectively (BPRD 2017).[71] At the same time, civil society in India is energetic and growing rapidly, mirroring trends in the "associational revolution" in other developing countries (Salamon 1993). Estimates from 2008 place the number of NGOs in the country at approximately 18,000; publicly available data suggest that this number has grown to 38,323 in 2018 (CSRIdentity 2018). Environmental organizations, women's rights groups, poverty alleviation collectives, and associations working for the social advancement of children and youth are among the most active emerging civil society actors.

Beyond sheer numbers, the relationships among civil society actors and between them and other types of actors can contribute to or detract from the organizational capacity of protest organizers (Minkoff 1997). Transnational advocacy networks (TANs) – diverse networks of advocates working on multiple geographical levels – are particularly relevant to network shutdowns. Local organizations embedded within TANs rely heavily on communication with national and international actors to carry out their activities and expand the reach of their messaging (see Keck & Sikkink 1998, Cogburn 2017). However, collective action in India revolves primarily around domestic issues, and organizations such as professional societies, unions, youth groups, or local wings of political parties often take primacy in protest.[72]

[71] BPRD does not explain the methodology used in assigning these labels to individual protests or provide more detailed definitions of these designations.

[72] While civil society organizations in India do organize collective action, other organized actors are much more prominent. The Indian government's legislative provisions restrain domestic organizations that focus on 'high politics' issues such as marginalized minorities or religious rights by limiting the

Structured networks of domestic organizations operating on a local, state, or national level play an important role in coordinating demonstrations. Leadership in such cases is often spread across a variety of groups, particularly as protest contagion wins a protest movement additional support from actors in other states. For instance, a *Bharat bandh* (nationwide shutdown protest) in April 2018, one of the larger lower-caste protest movements of the 2010s, began with a call from a small Punjab-based organization and ultimately attracted more than 200 unions, associations, castes, and tribes, most of which led marches in support of Dalit interests in their respective states (Mitra & Tomar 2018).[73] In disrupted digital environments, organized calls to action of this kind may not travel as far, constraining the size and spread of collective action.

The distinction between violent and non-violent resistance has also been at the center of recent research, and its relevance to India stems from the abundance of one or both forms of dissent across the country, with non-violent mobilization remaining the more centrally organized of the two.[74] Non-violent and violent methods of contention emerge in different structural environments: non-violent collective action involves a broader coalition of actors, a greater likelihood of attracting new participants, and a larger set of organizational resources that these actors are prepared to engage (Chenoweth & Lewis 2013, Chenoweth & Stephan 2011, Chenoweth & Ulfelder 2017). Non-violent and violent collective action are often viewed as substitutes; protesters' relative reliance on them is dynamic, fluctuating in line with government strategies of accommodation and repression (Lichbach 1987, Moore 2000). Indian Army and

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registration privileges of these organizations and cracking down on transnational funding directed toward them (Jalali 2008). This contributes to an "uneasy partnership" between NGOs on the one hand and state governments on the other – one that depends as much on organizational capacity as it does on state institutions' approaches to alleviating poverty (Kudva 2005). Additionally, the deep links between civil society actors and state governments have sown seeds of distrust toward NGOs in Indian society, where they are occasionally perceived as beholden to the state, dominated by middle-class interests, and less representative of social grievances than mass social movements driven by a variety of actors (Brown 2014, Kudva 2005, Ray & Katzenstein 2005).

[73] Despite initial suspicions that the protests were spontaneous and leaderless, police later claimed that banners, posters, and simple stick weapons were provided to participants and funded by unknown parties.

[74] Chenoweth & Ulfelder (2017) point out that non-violent demonstrations and violent riots are only individual expressions of two broader categories of resistance, but I treat them as representative of those two approaches here.

police forces regularly alternate between peaceful crowd control methods and physical intimidation or outright attacks using tear gas, water cannons, rubber bullets, and occasionally live fire, as well as coordinated baton charges (*lathi charges*) (Swartzendruber 2018). It is reasonable to expect that the pendulum of tactics swings both ways for both sides, which respond to each other's actions.

Digital Technology and Connective Action in India

The previous chapter summarized existing research on the potential of communication technologies for collective action (Earl & Kimport 2008, González-Bailón & Wang 2016, Tufekci & Wilson 2012, Castells 2015). In particular, I used Bennett & Segerberg (2013)'s *logic of connective action* to create a parallel theory of disconnective action. Connective action takes advantage of digital technology to reduce the need for formal organizational control, common identity frames, and central coordination. In India, connective action is expressed in the growing use of social media to catalyze or bolster both organized social movements and less coordinated collective action. While Internet connectivity remains relatively low at 34.9 percent, it is rising rapidly, bringing with it novel political functions. 'Networked protest' and highly connected social movements in India are young and evolving. Consequently, they have been the subject of very little empirical work, and much of the scholarly work in existence is descriptive.

Prior to the emergence of social media, digital technologies were of limited use in political mobilization in India. Jeffrey and Doron (2013) trace the origins of technologically enabled grassroots movements to the electoral campaign of the Bahujan Samaj Party (BSP) in Uttar Pradesh in 2007. Uttar Pradesh is India's most populous state as well as one of its poorest; marginalized castes (Scheduled Castes) comprise a fifth of its population.[75] The BSP, who scored an upset victory in the election, took advantage of the falling cost of cell phones to reach wider audiences among the marginalized castes. Social media also played a role in offline protest

[75] Only five countries have populations higher than that of Uttar Pradesh.

following the terrorist attack in Mumbai in 2008, and in voter registration and transparency campaigns during 2009's general election (Meti et al. 2015).

The turning point in the history of India's 'connective action' came two years later, in the form of the India Against Corruption (IAC) campaign (Narayanan & Pradhan 2016, Kumar 2015). Activist and organizer Anna Hazare, who had previously led grassroots movements in the state of Maharashtra, inspired widespread protest that called for the application of new anti-corruption measures to members of the Indian government.[76] The combined online and offline drive to release Hazare from prison comprised direct calls to the government, high visibility on all major social media platforms, abundant text messaging, and active television coverage.[77] This was mirrored in 2012 in the Delhi gang rape case, where a young woman was brutally beaten and raped while returning to her home in Delhi; the woman, who became known as Nirbhaya ("fearless" in Hindi) in the media, later died of her injuries (Narayanan & Pradhan 2016). A wave of protests across India followed, decrying a culture of impunity and victim-blaming. Facebook, Twitter, and WhatsApp were instrumental in both spreading information and organizing the movement, with high-profile celebrity support and a range of NGOs assisting in scheduling marches.

The use of mobilizing structures in the Nirbhaya movement (in the form of logistical posts that served to coordinate protest) was of some importance. However, studies have noted that the key strength of social media in the movement was the opening of new opportunity structures by recruiting prominent adopters remotely (Ray & Tarafdar 2017). Twitter in particular, despite its low penetration in India, emerged as an *ad hoc* connector of civilian participants and journalists in ways that would resurface in protests around the world (Barnard 2017, Poell & Rajagopalan 2015). Further network analysis revealed that the key figures of online mobilization during the unrest were at once some of the primary organizers of the street

[76] Hazare was a prominent and experienced organizer who had previously scaled a local Rajasthan movement in support of an Indian Right to Information Act (RTI) to the national level. The act was passed by the central government in 2005.

[77] While the relative contributions of new and traditional communication technologies to the recruitment of IAC supporters are uncertain, Facebook had 46 million Monthly Active Users (MAUs) in India (3.7 percent of the population) at the end of 2011 while television penetration stood at 47.2 percent (ITU 2018).

protests (Ahmed & Jaidka 2013).[78] The distrust toward traditional media, which reluctantly broadcast images of police using tear gas and batons against the crowds, contributed to the rise of alternate sources of information, which rivaled mainstream outlets in popularity (Ahmed & Jaidka 2013). Similar dynamics have since been replayed in large, national movements such as 2017's student protests against a ban on a traditional Tamil bull taming sport and numerous more localized mobilizations.

Widely shared content has prompted both mass protest and blackouts, with at least four videos filmed in four different states allegedly mobilizing crowds and triggering shutdowns between 2015 and 2017.[79] State governments and security forces, aware of the mobilizing effect of content diffusion for collective action in numerous cases since the IAC and Nirbhaya movements, have increasingly relied on network shutdowns to stem information flows before or in the course of unrest. These events did not occur in a vacuum; tracing the evolution of connective action in India is critical to capturing the motivations and consequences of disconnective action across the country.

Theory and Hypotheses

The *theory of disconnective action*, outlined in Chapter 3, predicts that incidence of protest will increase immediately following a blackout and begin to decline once the blackout turns into a *digital siege*, or sustained shutdown. The precise point at which a digital siege begins is context-dependent. In the broader theory, I also suggest that such an outcome is a Pyrrhic victory for the government, as the economic costs of the shutdown are typically very high. Thus, I argue

[78] Additional studies have suggested changing dynamics in the flow of information and conversation throughout the Nirbhaya movement, both online and offline. The primary emotions conveyed in the early phase of the protests were anger, anxiety, and individualism; as the movement progressed, they shifted towards achievement and collectivism (Ahmed et al. 2017). This emphasis on sociopolitical change in this discourse distinguished it from previous collective action around the topic, arguably ensuring its continued presence in Indian politics.

[79] Officials in Nagaland (2015), Bihar (2016), and Rajasthan (2017) have referred to viral videos, which depicted violent incidents and vandalism, to justify network shutdowns. A 2017 shutdown in Jammu and Kashmir officially aimed to curtail rumors during a by-election; however, once connectivity returned, a video of Indian Army forces using a protester as a human shield was spread widely on social media, provoking further anger in the streets.

that shutdowns are ineffective in the short run and economically devastating in the long run. Most shutdowns in India are short, rarely exceeding five days in duration, but their financial impact is considerable (Kathuria et al. 2018). The structural diversity of collective action in India and the considerable variance in participants' choice of strategy are matched by similarly varied responses by security forces. Thus, in this chapter, I move away from the focus on short- and long-term impact and adjust the theoretical expectations to examine more specific local responses in the midst of blackouts in India.

The distinction between non-violent and violent forms of protest is critical in India. Abundant riots in Kashmir, the hypothesized 'institutionalized riot system,' and the organizational sponsorship that underpins many non-violent movements underscore this distinction (Brass 1997, Varshney 2001, Chenoweth & Lewis 2013). Some evidence suggests that the diffusion of non-violent social movements is more likely to be supported by social media and digital communication channels than that of violent movements (Rane & Salem 2012). Since the former are structurally more robust than the latter and shutdowns target that organizational capacity, shutting off communication is expected to reduce levels of non-violent protest.

Structurally, riots are less inclusive, less diverse, less likely to achieve success, and less coordinated than non-violent mobilization (Chenoweth et al. 2017, Chenoweth & Stephan 2011). If blackouts truly disrupt the spread of rumors and the coordinated collective action that stems from it, a disproportionate increase in riots, which are more disorderly and more loosely coordinated than peaceful resistance, should follow. The codependency between repression and dissent also provides arguments in favor of investigating this connection. Many researchers believe that violent and non-violent mobilization are substitutable for one another once a change of tactics occurs on the government's side. A new strategy of repression, for instance, may induce previously peaceful protest to turn violent in the face of an unconventional threat (Moore 2000, Shellman et al. 2013). The 'punishment puzzle,' conceptualized by Davenport (2007) as the contradictory and imbalanced set of findings in the literature to date on the effects of repression on dissent, also argues in favor of teasing out separate effects for different types of collective action, as shutdowns may not be uniformly (in)effective (see Sullivan 2016). In brief, it

is as important to consider whether particular patterns of repression are effective as it is to determine whether they produce uniform patterns of dissent. Considering differences in levels of coordination, I expect that the incidence of riots will increase and that of non-violent demonstrations will decline when a blackout is in place. Hypothesis 1 addresses the differing expectations in relation to non-violent protest and its riotous counterpart:

Hypothesis 1a: *Network shutdowns decrease the incidence of non-violent collective action.*

Hypothesis 1b: *Network shutdowns increase the incidence of violent collective action.*

Beyond the protest-riot binary, the structural aspects of collective action can be magnified further to encompass the socio-organizational resources behind each event – specifically, the principal participating or organizing actors. This perspective allows us to directly tackle the question of whether disconnective action is more or less dependent on formal organizational structures than collective action as it typically unfolds, and where digital networks play at least some role. Does the *composition* of protest change when protesters face a blackout? The information age has raised questions about the value of careful planning, organization, leadership, structure, and cohesion. One emerging view is that digitally enabled social movements are highly effective at rapid mobilization and momentum-building but fragile in sustained action (Tufekci 2017). This is sometimes ascribed to the weakness of organizational structures, especially in 'leaderless' movements. The impromptu, weak-tie-heavy nature of the networks that make up the Internet has led both scholars and media outlets to frame these networks as originators of spontaneous collective action (Steinert-Threlkeld 2017, Dolata & Schrape 2018, Howard & Hussein 2013).[80] In contrast, I argue that organizations, civil society, and other formalized collectives use the affordances of the Internet to organize collective action in times when connectivity is not disrupted, to complement their standard procedures of

[80] Recently, most of these framings have acknowledged the limitations of such forms of collective action. This ties into a more skeptical view of the Internet's role in perpetuating democracy, which is increasingly pervasive in the academic community (Persily 2017).

recruitment and identity-building (Dolata & Schrape 2018). In India, where even small NGOs and social movement organizations (SMOs) usually have dedicated Facebook pages, this is especially plausible.

Previous research has found that the removal of leaders and organizing structures may precipitate either chaos or backfire, depending on opportunity and ideology, but also the movement's pre-existing unity and institutional formalization of its structures (Bob & Nepstad 2007, Davenport 2014). When lines of communication are severed, individuals and organizations are detached from various platforms that improve coordination, communication, and diffusion of information. With no access to these resources, actors that rely on these and other structural resources to communicate and disseminate the call for protest may find their role diminished. The protests that result in the chaos of the information blackout are therefore likely to be less structured and more informally assembled than those where the underlying organizational capacity is upheld (see Sutton et al. 2014). This question is critical because organizational cohesion has been viewed as a key factor underlying the resilience of (non-violent) movements and, ultimately, explaining their success (Pearlman 2011, Sutton et al. 2014). The role of formal organizations is expected to diminish in the midst of a network shutdown as the organizational capacity that enables highly structured protest is weakened, affecting or removing focal points for collective action. As a corollary, engagement in less structured protest is expected to increase. This leads to a second hypothesis:

Hypothesis 2: *Network shutdowns diminish the role of formal organizations in collective action.*

Finally, broader patterns of policing and state violence may yield changes in protest dynamics when a shutdown is imposed. This follows from studies that focus on whether strategies of collective action and state repression complement or substitute each other (Rasler 1996, Chenoweth et al. 2017, Moore 2000). Is it possible that the intensity of violent crackdowns changes participants' reasoning when such actions by security forces are conducted in tandem with a disruption to the information flow? An abundant literature indicates that violent coercion is typically used in response to increasing levels of threat and violent dissent (Regan &

Henderson 2002, Davenport 2000; see also DeMerritt 2016). If shutdowns are meant to quash organized collective action (which tends to be non-violent), repressive policing and domestic military operations carried out jointly with a shutdown may indicate to protesters that a shift to non-violent mobilization is still the more desirable option. The final hypothesis reflects this.

Hypothesis 3: *The co-occurrence of state violence with a network shutdown leads to an increase in non-violent protest.*

Research Design

Case Selection

India is notable for the proliferation of both collective action and the use of network shutdowns as a means of repressing it. In the context of this study, it is therefore an extreme case. Extreme cases contain values that are very far from the mean on either a dependent (Y) or independent (X) variable (Gerring 2008). Why pursue India as an extreme case on protests (Y) and shutdowns (X)? Extreme case analysis is an emerging approach to research in comparative politics. Its most consequential advantage is the high chance of discovering omitted variables when deviant values are registered on the dependent and especially independent variables (Seawright 2016). India embodies both of these scenarios. Cross-sectional (especially cross-national) models and typical case selection both risk omitting confounders – the former due to overgeneralization and the latter due to the close relationship of typical cases with the population average, which may inhibit the discovery of new causal effects and mask sources of measurement error (King et al. 1994). The exploratory potential of this approach is amplified by the emerging nature of shutdowns as a modern strategy of repression; today's extreme case may become tomorrow's typical case, or be surpassed by a more repressive regime intent on testing the effectiveness of information blackouts.

India qualifies as an extreme case in several respects. First, it accounts for 132 of the 277 shutdown episodes (48 percent) in the data underlying this manuscript, which span the years 2011-17. While blackouts escalated in 2017 (63 percent of the total), India's contribution to their

total count has never been smaller than 23 percent, with a clear increasing trend. The raw number of shutdowns also belies India's consistent record of democratic rule; indeed, it is one of the few democracies to have exercised the power to shut down communication networks, let alone as assiduously as it has.

Extreme values are also present in the dependent variable. A cursory analysis of protest data reveals that the average number of protests of any kind on any given day in 2011 hovered around six. While this starting point already exceeds the daily averages of most other countries in the same year, public dissent in India has also been on a steady upward trajectory, with every previous year surpassing the number of events in the previous. On an average day in 2016, for instance, ICEWS records nearly 22 individual protests across India, as well as the single largest flare-up on any day of the last decade.[81] The climb towards higher protest incidence between 2011 and 2016 is visible in **Figure 4.2.**

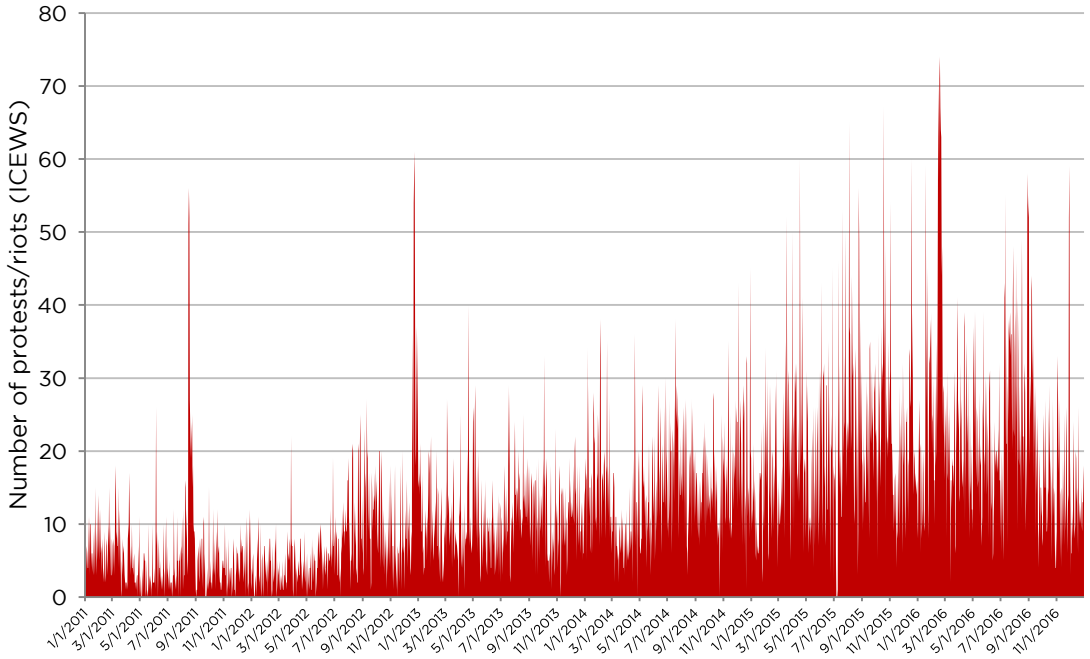


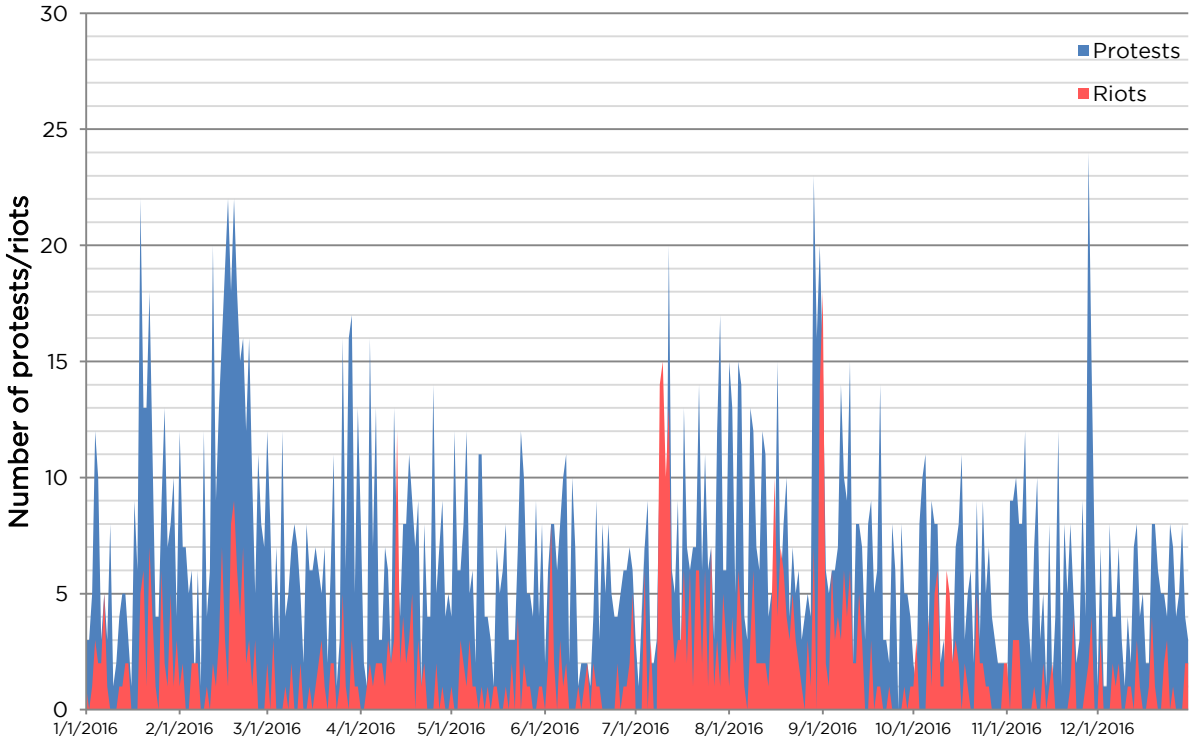
Figure 4.2 Combined incidence of protests and riots in India, 2011-16, based on ICEWS (Boschee et al. 2015).

[81] Seventy-four protests were registered on February 19, 2016. A considerable proportion of these protests occurred in Haryana, where the Jat community paralyzed movement and business in the state. The Jat demanded inclusion in the Other Backward Classes (OBC) category in order to gain access to social, educational, and employment benefits reserved for members of OBCs. Both this and subsequent Jat 'agitations' (June 2016, March 2017, November 2017) triggered network shutdowns.

But collective action in India is not only more commonly observed than in many other countries; it is also qualitatively different. Rooted in and inspired by three far-reaching movements in the colonial period – the Non-Cooperation Movement (1920-22), the Civil Disobedience Movement (1930-34), and the Quit India Movement (1942) – collective dissent was also at the heart of the democracy-building process in India (Swain 2013). Following independence, colonial struggles were quickly channeled into nation-building and grassroots caste emancipation movements that built on one another, emulating examples from both neighboring and remote states. Strategic shifts to broad-based, inclusive, organized social movements gained particular prominence in the 1960s, when the death of Jawaharlal Nehru created opportunities for collective mobilization among marginalized groups (Ray & Katzenstein 2005). This led to the rise and persistent presence of pro-poor movements in the politics of states like Kerala and Tripura, where platforms focused on underserved groups brought the Communist Party of India to power multiple times (Heller 2005). Some of the most active social movements stemmed from joint campaigns by civil society organizations and left-leaning political parties.

By the 1990s, organized public protest had become a mainstay of the democratic process across India. The diversity of causes and tactics espoused by the resulting movements is considerable, ranging from lower-caste dissent in Bihar, through mobilization against inequalities between landowners and informal laborers, to modern nationalist and feminist movements as well as less organized stone-pelting mobs in areas of communal tension (Nielsen & Nilsen 2016). Social media have magnified the visibility of many of these movements, doubling as a method of recruitment (Kumar 2015). In short, protest in India is significantly more common than the global average; it is also qualitatively different in that manifestations of dissent have played an enduring role in its process of democratization. **Figure 4.3** expands the previous figure into one distinguishing parameter – non-violent protests and violent riots.

Figure 4.3 Aggregate number of daily protests (non-violent) and riots (violent) in India, 2016. *Source*: ICEWS (Boschee et al. 2015).



An additional distinction should be made between extreme and *deviant* cases. Though the two are very closely related, the deviance of deviant cases is defined relative to a pre-defined set of expectations. The values they register are surprising and different from the general relationship that has already been identified; the (typically statistical) model that has pinpointed this relationship cannot satisfyingly explain the deviant case (Gerring 2008). Extreme cases, on the other hand, are identified relative to the distribution of a single variable (or both DV and IV). While India was included as a dummy variable in Chapter 3 without producing a significant change in the results, I make no assumptions here about its role in those models and select it due to its deviance relative to the respective variables' means, in addition to the other reasons outlined above.

In this study, the analysis is bolstered by a quantitative approach that disaggregates the states and union territories of India. The primary benefits of such an approach are greatly

increased variance on quantifiable variables, a method of addressing the ecological inference problem, and accounting for factors that are idiosyncratic to India, such as varying caste proportions or elections to State Assemblies occurring at different times. Subnational studies, supported by data that track precise event trajectories, are an effective way to resolve 'whole-nation bias' – an ecological inference issue where causal pathways are blurred by extrapolating a single national-level observation to its constituent units (Rokkan et al. 1970, Snyder 2001). Such analyses are particularly useful when a country's subnational units exhibit considerable variation on multiple variables, as is the case in India.

Pairing this approach with extreme case selection helps to identify the factors that make the case extreme, and trace them back to other national contexts for greater generalizability. India is an extreme case on the national level, but neither public dissent nor shutdowns are equally distributed. For instance, the neighboring and chronically underdeveloped states of Jharkhand and Bihar register some of the lowest tallies of protest in official police records, while Tamil Nadu, a significantly more prosperous state, recorded nearly 110,000 protests between 2009 and 2014 – 577 times higher than Jharkhand (BPRD 2017).[82] Thus, some of India's subnational units are more representative of cross-national tendencies, and are more readily comparable to cases beyond India. Applying quantitative methods to a single country that is highly heterogeneous internally can strengthen the precision of the findings (Gerring 2008, Coppedge 1999, Fearon 1991, Flyvbjerg 2006).

Dependent Variables

The study uses two broad measures of collective action – daily counts of peaceful demonstrations and riots – as dependent variables, deriving them from the Integrated Conflict Early Warning System (ICEWS) dataset (Boschee et al. 2015), similar to the approach taken in Chapter 3. The initial analysis covers daily protest events across India in 2016 – the most recent

[82] According to police records, Tamil Nadu is the state most prone to public expression of dissent. Several states and union territories (e.g., Jharkhand, Meghalaya, and Nagaland) see little to no protest, while others occupy a space between the extremes (e.g., Odisha, Karnataka, and Assam). This ranking is not borne out in the ICEWS or the ACLED data.

full year for which ICEWS event data is available. **Figure 4.4** shows the distribution of protests and riots across India.[83] It is immediately noticeable that the National Capital Territory of Delhi leads the country in peaceful collective action as the territory closest to the national structures of governance, followed by Uttar Pradesh, India's most populous state. Conversely, 40% of all riots occurred in Jammu and Kashmir as part of the increasingly volatile communal conflict.

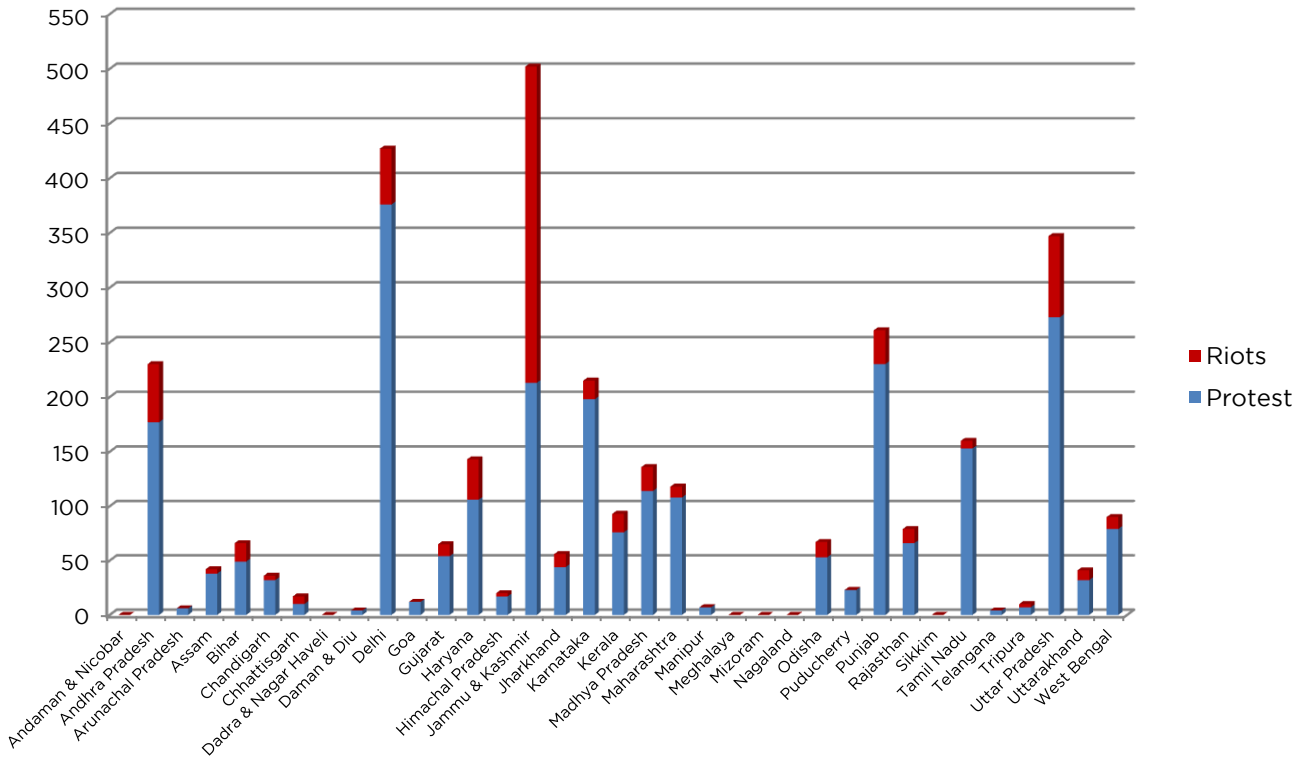


Figure 4.4 Number of protests and riots by state in India, 2016. *Source*: ICEWS (Boschee et al. 2015).

To capture the structural aspects of collective action events in India, I use a second set of dependent variables based on newly released data from the ACLED (Armed Conflict & Event Location Data) project (Raleigh et al. 2010).[84] ACLED's data on India, released in April 2018,

[83] Due to the small *N* (63), I folded strikes and hunger strikes into peaceful protest. I also do not distinguish between the idiosyncratic forms of collective action in India described earlier in the study, leaving such distinctions for future research.

[84] The ICEWS data do not enable me to break down collective action by type as well as the ACLED data do. For the purpose of future studies, I have submitted a Right to Information Act request (roughly

covers demonstrations, riots, battles, and violence against civilians that occurred between 2016 and early 2018, totaling 22,891 events. Each event contains a marker denoting its primary participants, ranging from specific organizations or political parties (e.g., All Migrant Employees Association of Kashmir, Communist Party of India, All India Trinamool Student Congress) to less formally defined professional collectives (e.g., teachers, lawyers) and general categories (e.g., mob, people, women, men), which reflect lesser degrees of formalization. I classified each of the named groups into one of seven categories, based in part on ACLED's informal typology (Swartzendruber 2018). [85] These, categories, described in **Table 4.1**, correspond to political parties (1), labor unions (2), students and youth (3), ethnic, religious, and caste groups (4), farmers and farmers' associations (5), other professions, professional organizations, and civil society organizations (6), and unidentified, unclassified, or vaguely described participants (7). The availability of this information allows us to examine the structural side of disconnected protest, represented by both the balance of protests and riots and degree of formal organization that disconnected protest tends to assume in light of the disappearance of certain means of digital communication. In this way, we will be able to infer the effect of network shutdowns on protest coordination – and hypothesize further on the role of digital communication networks as hubs of organized collective action when connectivity is not impaired.

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equivalent to a Freedom of Information Act request in the U.S.) to India's Bureau of Police Research and Development, which also breaks down protest by type.

[85] To improve the clarity of the analysis in the context of this study and increase the number of data points in each category, I aggregated several of the groups identified by ACLED as corresponding to a profession (Teacher, Health Worker, and Journalist Groups) into a separate category that encompasses organizations and associations, particularly formal vocational groups and NGOs. This enhances the study given the structural focus of my framework, which places more emphasis on levels of organization than on the exact identity of the participants.

Actor	Description
Political parties/actors	A specific political party/parties, politician(s), or supporters of a political entity (including youth wings) are named as primary participants or organizers
Labor unions	One or more unions are explicitly named as organizers. Does not include non-unionized professional associations or student unions.
Student/youth groups	Student unions and other organized collectives of youth.
Ethnic, communal, caste	A specific caste, tribe, or religious group is named as a primary participant or organizer. This includes organized entities that revolve around religious doctrine (e.g., Hindutva groups not affiliated with any political party). Includes organized separatist protest.
Farmers' groups	Farmers' organizations with varying degrees of coordination.
Organizations and professions	Civil society organizations (but not labor unions) or organized representatives of a specific profession (e.g., jewelers, teachers, doctors) are named as primary participants or organizers.
Unidentified or vague	No specific actor is defined, actors are described vaguely or ambiguously, or a loosely defined group of people is named as primary participants or organizers (e.g., residents, villagers, women, men).

Table 4.1 Typology of protest and riot events by primary participant.

Of the 22,891 events recorded by ACLED in 2016-17, 7,379 (32.2%) do not have a primary participant explicitly specified in the corresponding variable. In most instances, however, the description of each case offers a clear indication of the groups involved. To parse this sizable subset of the full dataset, I recruited 395 students from a large upper-division political science course, each of whom received identical coding instructions, based on previous scholarship on micro-task crowdsourcing (Difallah et al. 2015, Hauser & Schwarz 2016).[86] The students, all of whom had voluntarily signed up for the study, were divided into 66 groups of six and individually tasked with classifying 100 observations.[87] A total of 325 coders (82.3%) submitted

[86] The instruction sheet is included in the Appendix.

[87] While college subject pools suffer from certain weaknesses, upper-division courses offer a more focused sample of coders than the average population of students, especially with a built-in incentive structure (Hauser & Schwarz 2016). In human-coded event data with a low expected response rate, it is important to establish a balance between the number of observations and the number of coders assigned, as well as between validity and reliability (accuracy vs. consistency; King et al. 1994, Eckstein 2000). Despite the simplicity of the task and the advanced level of the class, I expected a relatively high attrition rate as well

complete responses; the most frequent coding was generally adopted for the final dataset. A simple percentage agreement calculation was made for each observation (count of most frequent designation divided by number of coders for each set) to obtain a basic measure of inter-coder reliability. The average joint probability of agreement across the subsample was 62.8% – a relatively strong result given the availability of seven options and coder idiosyncrasies.[88] I performed additional validity tests by selecting five random samples of observations and self-coding them, then comparing the outcome with the category generated for each observation using the crowdsourcing exercise. Scoring agreement ranged from 71% to 91%, increasing the overall confidence in the coding mechanism.

Independent Variables

The primary independent variable used in this study is a factor variable corresponding to the consecutive day of a network shutdown in a given state or union territory of India on any given day. Shutdowns in India are generally short, but frequent. Few exceed two weeks in length, but several may occur in the same area for several days at a time. Digital sieges of the kind seen in Cameroon are rare; however, in the Kashmir region, communication is often inaccessible several times a month. The data for India were collected in a similar fashion to Chapter 4 – by cross-referencing sources, including reports from civil society (particularly the Delhi-based Software Freedom Law Centre, SFLC 2018) and news publications based in India. While countrywide shutdowns (as seen in Togo in 2017 or Egypt during the Arab Spring) are often relatively easy for specialized network analytics services to detect, subnational incidents of the kind seen across India are much more challenging, preventing such services from being used as a source for triangulation. However, most of the incidents reported by civil society were

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as bias generated by lack of extensive training, and therefore assigned six students to every hundred observations while coding the remainder of the observations myself. As a result, 6,600 observations were assigned to the students. Students were assigned into coding groups randomly and were not informed of the composition of their group. I account for the distinction between coders (students vs. author) in the source dataset using a separate binary variable. Two sets reported identical results and were discarded.

[88] A large number of categories bolsters this statement, as this decreases the likelihood that two or more coders will select a given category by chance (Gwet 2014).

also separately described in news outlets, increasing confidence in their veracity, even though intent is not always easy to establish.

To respond to H3, I use a measure of *state violence* from the ICEWS dataset, which includes violent suppression of gatherings by police and army units, demonstrations of military or police power, and torture.[89] This will help to pinpoint the tactical shifts (if any) that occur under shutdowns, particularly when methods of control are applied simultaneously.

Control Variables

India's case requires a particular set of control variables to account for country-specific dynamics.[90] Demographic variables – *youth population, Scheduled Castes, Scheduled Tribes, Muslim population*, *literacy*, and *rural population* (all percentages) – are drawn from the 2011 Census.[91] All four figure into the everyday trajectories of protest in India. Large youth cohorts have occasionally been linked to mobilization (Nordås & Davenport 2013), and circumstantial evidence suggests that use of social media to mobilize is relatively widespread among young people (see Ahmed et al. 2017). Proportions of youth vary across India from 16 (Kerala) to 33 percent (Andhra Pradesh) of the population. Youth and students assembled into collectives with varying degrees of coordination have participated in 'stone-pelting' riots in Jammu and Kashmir, organized student strikes on numerous occasions, and played critical roles in national initiatives such as the Nirbhaya movement (2012) and the leaderless Jallikattu protests (2017).[92] Scheduled Castes (SCs) and Scheduled Tribes (STs), historically disadvantaged and entitled to reservations (allocations) of certain resources and privileges, have called for or led *bandhs* and other forms of protest to secure them. Communal tensions between Muslims and Hindus are a

[89] These data were tested against the "Violence against Civilians" measure from ACLED, with somewhat weaker but broadly similar results.

[90] Missing data for most of the control variables exists for the state of Telangana, which was created in 2014 as a result of the Andhra Pradesh Reorganisation Act. Data for Andhra Pradesh generally include Telangana in the calculation for 2016.

[91] While more up-to-date data would have been useful, the only state-level variable for which the Office of the Registrar General and Census Commissioner has a projection for 2016 and 2017 is the raw population count. Inferring dynamics of change within this space or calculating percentages based on data from two different years would have significantly biased the results.

[92] This movement revolved around preserving a traditional Tamil bull-taming sport.

thread of daily life in Kashmir and several other northern states where a more even population balance between the two polarized communities has led to frequent outbreaks of protest. Literacy rates are linked to political outcomes in India via differences between the flow of information in highly literate communities and those with low literacy rates (Rozenas & Sadanandan 2018). A similar argument can be made with respect to proclivity toward protest in a low-information environment. Finally, grievances over land evictions and other sources of discontent have led to farmers' protests across India. Rural mobilization is relatively common, bolstered by the sizable rural population in certain states. In Assam, Bihar, and Himachal Pradesh, for instance, more than 80 percent of all citizens live in rural areas. These variables are supplemented with monthly data on *Gross State Domestic Product per capita*, combining information from the Reserve Bank of India with sources from India's Open Government Data platform.

Another set of control variables accounts for other events that have been deemed potentially important in the mechanics of protest. Several of them mirror Chapter 4 and are also derived from ICEWS data, though they reappear here with slight variations. The India data were parsed thoroughly to ensure that only domestic events were covered. *Arrests* form a separate variable, reflecting the global study on shutdowns. *Restrictions on political rights* include limitations on freedom of expression (e.g., shutting down media outlets), administrative sanctions, and curfews under Section 144, which play an important role in state governments' strategies of protest control (Narrain 2018). I also once more account for the strategy of government concessions to domestic actors via a composite *Yield* variable, which may either placate or invigorate protesters. India's separatist and communal movements periodically turn to violence or militancy that doesn't fall under the definition of protest (Dhattiwala & Biggs 2012). To represent such cases (e.g., militant attacks against domestic targets), I add a *Collective violence* variable to the analysis. Additionally, some of India's most notable social movements have revolved around the country's rape epidemic. Reported rapes surged by 60 percent between 2012 and 2016, reaching 39,000 cases according to India's National Crime Records Bureau (NCRB 2016, Dhillon 2018). Unfortunately, NCRB only provides state-by-state aggregates of

rape reports, rendering the data less useful for a dynamic analysis. I therefore settle for the much more limited event data on rapes provided by ICEWS. Finally, the *Election* variable comprises data on State Assembly elections from the Trivedi Centre for Political Data (Jensenius & Verniers 2017).[93] The binary variable is coded as 1 for the month leading up to an election, the election itself, and the month following the announcement of the results.[94]

Variations in connectivity are intimately linked to the debate on connective action, with numerous studies using Internet or mobile penetration as a proxy for networked political engagement (Barnard 2017, Zeitzoff 2017, Pierskalla & Hollenbach 2013). By extension, they are a key consideration in the debate on disconnective action, providing a foundation upon which to contrast the two. Wireless connectivity in particular is growing rapidly in India and other developing countries, spurred by greater competition and falling costs in the smartphone market, which has displaced fixed-line Internet as the primary conduit of connectivity. Unfortunately, the monthly data available from the Telecom Regulatory Authority of India (TRAI) clusters states in a way that precludes state-by-state analysis.[95] To remedy this with a measure closer to the study's argument, I gathered data on Facebook availability ("reach") through Facebook's advertising platform.[96] This approach has recently been employed to estimate demographic data such as the size of migrant populations (Zagheni et al. 2017). Facebook, YouTube, and WhatsApp have comparably large user bases in India, and all three have been the target of allegations of rumor-mongering (Bhakto 2018).[97] Facebook's advertising platform gauges user behaviors, demographics, and location to provide micro-level data on the reach of the social network, which can be used as an imperfect proxy for the total number of

[93] Five states and UTs – Assam, Kerala, Puducherry, Tamil Nadu, and West Bengal – held legislative elections in 2016.

[94] An additional variable accounting for a change in ruling party is included in the dataset.

[95] For instance, the "North East" region includes Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura, while six other states include aggregate numbers for six other states and UTs. This would render penetration estimates unreliable.

[96] To my knowledge, this is the first use of data from the Facebook advertising platform in the context of protest. The availability of subnational data is a particularly notable strength of the platform.

[97] Business intelligence firms WeAreSocial and GlobalWebIndex estimate that all three platforms have an estimated penetration of 30 percent (approximately 400 million accounts), though the proportion of the population that is regularly active stands at about 19 percent (255 million).

Facebook users in a given area.[98] For this study, I obtained data for each state that reflects the upper bound of the user base estimate and divided it by the Indian government's projection of the population of each state for 2016.

Discussion of Results

Quantitative Analysis of Disconnected Protest

The correlation matrix (**Table 4.1**) reveals that few of the variables are strongly correlated. The exceptions are Facebook reach and percentage rural population (0.79), Facebook reach and Gross State Domestic Product per capita (0.81), and percentage of rural population and Gross State Domestic Product per capita (0.76). All of the final regressions were also run with two of the problematic variables excluded; none of these resulted in significant differences in the strength or direction of the effects presented below. Following the previous chapter, I use negative binomial regression across all quantitative estimations. Count data typically follow the Poisson distribution. While events occur at different rates in different periods, restricting the analysis to shorter periods allows me to take into account deviations in levels of mobilization (King 1989).

[98] Twitter's reach is more limited in India, and the corresponding advertising platform does not provide information about several key states where shutdowns occur. As a result, these data are less useful and cause convergence issues in the statistical analysis.

Table 4.2 Correlation matrix of variables used in regressions in Chapter 4. Correlations above 0.65 are shown in bold.

	Non-violent protests	Riots	Shutdown *consecutive days*	Protests *consecutive days*	Riots *consecutive days*	State violence	Collective violence	Political rights restriction	Arrest	Rape	Yield (gov't)	Facebook reach	Election	Rural (%)	Scheduled Tribes	Scheduled Tribes	Muslim (%)	Literacy (%)	GSDP per capita
Non-violent protests	1																		
Riots	0.3042	1																	
Shutdown *consecutive days*	0.0929	0.3287	1																
Protests *consecutive days*	**0.6693**	0.2547	0.1307	1															
Riots *consecutive days*	0.2417	0.6218	0.3471	0.3624	1														
State violence	0.1712	0.3455	0.3386	0.241	0.3675	1													
Collective violence	0.1533	0.1796	0.205	0.169	0.1692	0.4471	1												
Political rights restriction	0.0799	0.0994	0.1222	0.086	0.1472	0.2027	0.0811	1											
Arrest	0.1761	0.0467	-0.0324	0.1904	0.0403	0.184	0.2371	0.0946	1										
Rape	0.0418	0.0243	-0.0103	0.0624	0.0155	0.0774	0.0933	0.0209	0.1592	1									
Yield (gov't)	0.0846	0.03	0.0043	0.082	0.015	0.0609	0.0912	0.0392	0.188	0.0488	1								
Facebook reach	0.0667	-0.006	-0.0268	0.0539	-0.0062	0.0245	0.0107	0.0248	0.0264	0.0061	0.0486	1							
Election	0.0014	-0.0155	-0.0251	-0.0026	-0.0155	-0.0078	-0.0005	0.014	0.0258	-0.0054	0.004	-0.0532	1						
Rural pop. (%)	-0.0986	0.0133	0.0604	-0.0847	0.0137	-0.04	-0.0365	-0.0397	-0.1701	-0.0247	-0.0779	**-0.7941**	-0.0394	1					
Scheduled Castes	0.1733	0.0394	-0.0727	0.2103	0.0547	0.1254	0.2403	0.0246	0.4199	0.1552	0.1161	-0.305	0.0676	0.1998	1				
Scheduled Tribes	0.003	-0.0162	-0.0551	0.0001	-0.0151	0.0349	-0.0044	0.0314	0.1789	0.0548	0.055	-0.3596	-0.041	0.262	0.2432	1			
Muslim (%)	0.1117	0.2419	0.5431	0.1408	0.2465	0.3235	0.2508	0.1252	0.0569	0.0249	0.0177	-0.1375	0.1223	0.109	0.1361	-0.0343	1		
Literacy (%)	-0.0588	-0.0942	-0.1589	-0.0795	-0.0992	-0.1158	-0.1252	-0.018	-0.0254	-0.0441	-0.0127	0.4832	0.0807	-0.6031	-0.4253	-0.4275	-0.2196	1	
GSDP per capita	0.0664	-0.0349	-0.1095	0.0443	-0.0372	-0.0128	-0.0213	0.02	0.116	0.0073	0.0518	**0.8164**	-0.0016	**-0.7622**	-0.3112	-0.3604	-0.2218	0.5707	1

	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
Dependent variable	**Non-violent protest**	**Non-violent protest**	**Non-violent protest**	**Riots**	**Organized collective action**	**Leaderless collective action**
Shutdown *t-1*	1.673** (.265)					
Shutdown *consecutive days*						
1		1.275 (.311)	1.171 (.302)	3.888** (1.174)	.853 (.273)	1.068 (.518)
2		2.711** (.523)	2.382** (.504)	4.673** (1.543)	1.974** (.502)	1.161 (.576)
3		1.513 (.448)	1.574 (.460)	5.362** (1.783)	1.589 (.526)	1.153 (.660)
4		.596 (.339)	.626 (.359)	3.519* (1.921)	.755 (.428)	.654 (.662)
5		.661 (.471)	.689 (.491)	1.511 (1.528)	1.040 (.688)	.000 (.000)
Lagged DV	1.152** (.016)					
DV *consecutive days*						
1		1.268** (.050)	1.310** (.053)	1.460** (.170)	1.337** (.055)	1.286** (.100)
2		1.305** (.081)	1.353** (.090)	1.395 (.300)	1.319** (.087)	1.177 (.154)
3		1.392** (.132)	1.501** (.150)	1.663† (.472)	1.458** (.145)	.992 (.216)
4		1.570** (.199)	1.664** (.219)	2.743** (.902)	1.531** (.210)	1.556† (.386)
5		.842 (.174)	.910 (.199)	1.557 (.612)	1.011 (.203)	.297* (.173)
State violence *t-1*	1.020 (.015)	.999 (.010)	1.000 (.011)	1.043** (.017)	1.008 (.011)	1.018 (.285)
Arrests *t-1*	1.003 (.011)	1.002 (.007)	.997 (.007)	.998 (.015)	1.007 (.007)	1.000 (.986)
Political rights restriction *t-1*	1.069 (.076)	1.022 (.046)	1.033 (.048)	.917 (.070)	.987 (.050)	.900 (.235)
Yield (gov't) *t-1*	1.061 (.044)†	.976 (.030)	.992 (.792)	.989 (.066)	.965 (.032)	1.003 (.966)
Collective violence *t-1*	1.012 (.014)	1.008 (.008)	1.013 (.136)	.978 (.014)	1.008 (.009)	.976 (.156)
Rape *t-1*	.947 (.052)	1.085* (.035)	1.081* (.038)	1.015 (.074)	1.054 (.038)	1.058 (.404)
Election (recent, occurring, upcoming)	1.103 (.180)	.974 (.098)	.820* (.079)	2.851** (.441)	1.430** (.135)	1.284 (.177)
Facebook reach	1.005* (.010)	1.082** (.012)		1.019 (.018)	1.089** (.012)	1.006 (.794)
Scheduled Castes (%)	1.000 (.000)**	1.000 (.000)		1.000 (.000)	1.000 (.000)	1.000 (.259)
Scheduled Tribes (%)	1.000 (.000)	.999** (.000)		1.000 (.000)	1.000** (.000)	1.000† (.071)
Muslim (%)	1.453 (.674)	.784 (.261)		.422† (.198)	.685 (.224)	.409 (.168)
Literacy (%)	.967 (.015)†	.984 (.012)		.991 (.015)	.968** (.010)	.973 (.268)
Rural (%)	.671 (.764)	.922 (.646)		.010** (.013)	1.528 (1.097)	1.915 (.725)
GSDP per capita	1.000 (.000)	.999** (.000)		1.000** (.000)	1.000** (.000)	1.000 (.437)
Constant	1.656 (3.494)	.221 (.314)		.633 (1.477)	.320 (.440)	.003 (.010)
Fixed effects (Time = Weeks)	NO	NO	YES	NO	NO	NO
No. of observations	11,680	11,680	12,775	11,680	11,680	11,680
No. of groups	32	32	35	32	32	32

Table 4.3 Random-effects negative binomial regression results. Significance levels (two-tailed): †90%, *95%, **99%. Incidence rate ratios (IRR) reported with standard errors in parentheses.

Visual analysis of the histograms for all the collective action variables clearly indicates a rightward skew with a large number of 0s and isolated events. The variance-to-mean ratio of the dependent variables used for the statistical analysis ranges from 2.59 to 4.34 (variance significantly higher than mean), justifying a negative binomial regression approach, with incidence rate ratios reported for greater ease of interpretation.[99] Values higher than 1 correspond to a positive effect, with larger values generally indicating higher incidence of the outcome variable. The negative binomial regression also registered better results in goodness-of-fit tests across the board, including lower values for the Akaike Information Criterion (AIC), lower mean differences in observed vs. predicted values, and stronger fit for individual counts of protest events.[100] **Figure 4.5** compares the residuals of the Poisson and negative binomial models to account for my selection of the latter.

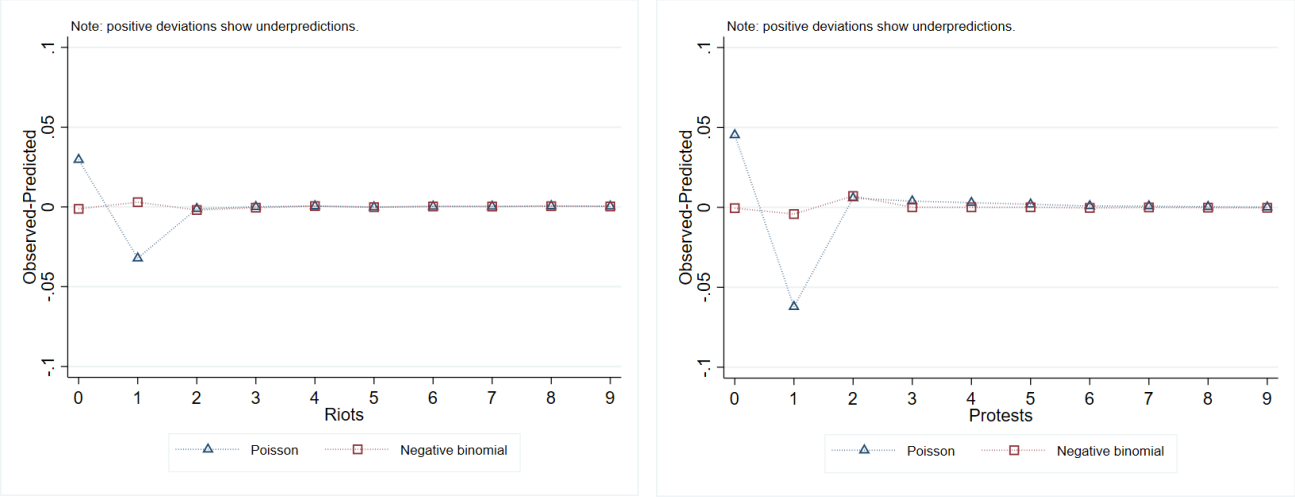


Figure 4.5 Residuals plot for Poisson and negative binomial regressions using non-violent protests (left) and violent riots (right) as dependent variables. Plots closer to 0 across the board are indicative of better-fitting models. Poisson underpredicts at 0 and overpredicts at 1 in both cases while negative binomial is relatively consistent. Poisson performs especially poorly when estimating the probability of the first event. This suggests that the negative binomial model performs better. The finding is corroborated in additional goodness-of-fit tests. Generated using **countfit** command in Stata 15.1.

[99] This is lower than the equivalent ratio in the global study, likely due to the prevalence of protest across India, which entails lower variance.

[100] A sample graph comparing the residuals of both models is available in the Appendix. The standard Poisson model performs especially poorly when estimating the probability of the first protest or riot event.

In **Table 4.3,** Models 1-3 focus on the distinction between violent and non-violent collective action in periods of disconnection.[101] Model 1 opens the analysis by examining non-violent protest (based on ICEWS data) as the dependent variable and a binary indicator denoting whether a network shutdown was in place on the previous day. When their exact dynamics are not probed, network shutdowns are positively and significantly associated with non-violent protest, providing some support for *H1a*. Model 2 takes into account the progression of consecutive shutdown days, replacing the binary variable with a more dynamic factor variable. The lagged dependent variable is also switched out for a factor variable that accounts for consecutive *protest* days in order to facilitate comparisons between the two. Here a clear difference emerges between the regular dynamics of peaceful protest and those that occur in an information vacuum. While the overall trend is positive for the first three days, the escalation of non-violent protest is only significant for the second consecutive day of disconnection. In contrast, consecutive days of protest, without singling out blackout days, tend to see a gradual, statistically significant increase until the fourth day, after which the relationship loses significance. Although the effect is inconsistent, this finding does suggest that the usual dynamics of non-violent mobilization are affected by information and communication blackouts. A secondary trend that reappears in other models (including most not shown here) is the correlation between Facebook reach and non-violent demonstrations. This is one of several clues that imply a link between communication technology, organizational capacity, and non-violence.

These dynamics are replicated in Model 3, which adds fixed effects for 52 weeks of 2016. In mixed time-varying and time-invariant panel data, the use of fixed effects typically requires the removal of time-invariant variables, as fixed effects estimators rely on variation within individuals (Bohlken & Sergenti 2010, Gunasekara et al. 2014). Removing these variables does not change the estimate of the parameter associated with the shutdown variable, which continues to point toward a situation distinct from the broader dynamics of each consecutive

[101] This generates greater confidence in the results. In additional, unreported regressions, these findings are verified using data from ACLED, yielding similar results.

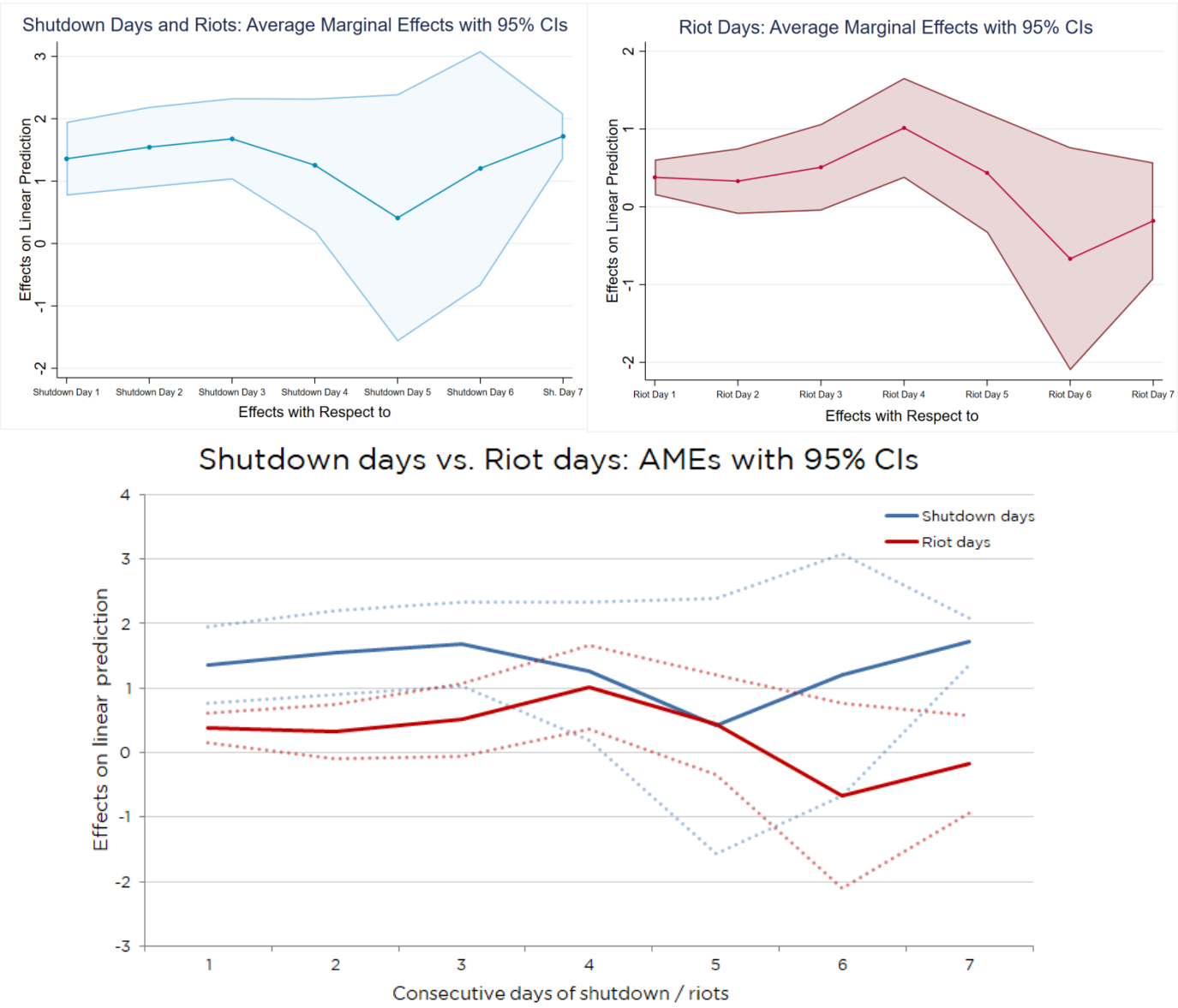
day of collective action. While fixed effects capture additional variance, the loss of time-invariant variables is too significant to use them in subsequent analyses.[102]

Model 4 examines a more violent form of collective action: riots. The results are a near-mirror image of the findings for non-violent mobilization. Riots continually increase in intensity for the three first days of disconnection. Although the factor variable for consecutive days of riots also registers a positive tendency, it is weaker in both intensity and significance levels, illustrating the chaotic dynamics of violent protest. This result provides support for *H1b*. Despite the chaos and impulsiveness that characterize many riots, maintaining a blackout seems to strengthen and entrench unrest instead of quelling it. A more conservative interpretation is that shutdowns do not compel rioters to prematurely cease rioting. In combination with the previous models, this signals that violence and non-violence are substitutes rather than complementary actions in the course of disconnective action, with shutdowns leading to violent outcomes that are more difficult for security forces to harness peacefully and more damaging to both property and the local economy. If shutdowns in India are at once costly, ineffectual, and destabilizing, a solid argument against the practice itself emerges. Additionally, none of the specifications in which riots are the dependent variable point to variations in the availability of Facebook as a driver of violent collective action. Although Facebook penetration is only a proxy for online activity involving mass coordination, this finding adds to the skepticism surrounding the effects of shutdowns, as the measures adopted seem to encourage collective action that does not rely on the Internet to expand.

Figure 4.6 illustrates the primary finding regarding violent collective action. For the first four consecutive days, average marginal effects for each shutdown day are considerably higher than for each day of rioting without considering shutdowns. They also display higher significance levels before both lose significance on the fifth day.

[102] However, regressions that included them produced patterns similar to the results specified in this section.

Figure 4.6 Average marginal effects of each consecutive shutdown day (top left; blue line in combined graph below) and each consecutive day of riots (top right; red line in combined graph below) on the linear prediction of the number of riots per day. This allows us to trace the temporal dynamics of violent collective action in two scenarios. Combined graph (below) included to facilitate comparison.



Models 4 and 5 tackle the structural aspects of collective action in India directly. The dependent variable in Model 4 is organized collective action, operationalized as the combination of all protest and riot events on any given day with clearly identifiable participants. The exact operationalization used in this regression comprises events where organized

collectives (e.g., civil society or groups representing a profession) were the primary participants.[103] Intriguingly, the dynamics of disconnected protest here resemble those of non-violent mobilization in general. The correlation between the two (.62) exemplifies the link between organization and non-violence while remaining sufficiently low to conduct a separate analysis. The effect is weak and uneven, alternating between a (non-significant) decline in collective action and ephemeral surges. This supports *H2*, suggesting that blackouts do disrupt the socio-organizational resources of the organizing entities, possibly destabilizing participation in organized protest. Amid the strategic shock that shutting down communication channels entails, structured actors and their followers may fall back on more extreme tactics. While technology is not critical for organized collective action, a rapidly escalating situation would call for immediate tactical decisions. A further piece of supporting evidence is the significant and positive connection between larger Facebook user bases and organized protest, which can again be interpreted as a larger-than-average proclivity to use digitally enabled means of coordination in organized collective action.

Model 5 shifts the focus to collective action that does not have an organized coordinating party or clearly defined groups as participants. While such protests cannot be called leaderless in the purest sense, they are less reliant on formally constituted entities and often consist of loosely assembled women and men who do not walk under any organizational banner. With this form of protest as the dependent variable, I encounter a challenge to *H2*. Across several similar specifications, there does not seem to be a significant relationship between blackouts and 'leaderless' or loosely coordinated collective action. This calls into question one expected effect – a surge of organizationally loose protest occurring without central coordination. The consistency of this result also suggests that the dynamics of "locally clustered, but globally diffused protest" led by local vanguard, as demonstrated by Hassanpour (2017) in Egypt and Syria, are not fully realized in India. Pairing this finding with the others, it appears that loosely

[103] This operationalization omits political parties (or individual political actors), unions, youth groups, and farmers' organizations, as including them increases the correlation between this variable and the broader non-violent protest variable to .89. The risk of conflating structure and non-violence would weaken the analysis. Communal, religious, and caste protests were not included in any version of this set given difficulties in establishing a consistent degree of coordination among such events.

coordinated disconnective action neither flares up nor cedes to resurgent, formally organized protest as a result of a shutdown. Instead, it gives way to violent expressions of dissent. Coordination and leaderlessness are complementary, not substitutable.

Finally, I construct a model that accounts for the co-occurrence of network shutdowns with violent methods of crowd dispersal, including *lathi* charges and gunfire. In May 2018, for instance, the affluent southern state of Tamil Nadu conducted its first shutdown immediately following a violent anti-pollution protest in which security forces killed more than a dozen demonstrators. How does this simultaneity of repressive strategies affect disconnected protest? The substantive results of an interaction model where consecutive days of blackout are interacted with levels of state violence are the following. Before losing significance on the third day, the joint effect of a blackout and higher levels of state violence on non-violent protest is positive, albeit weak ($p < .007$ for the first day, $p < .056$ for the second). One possible interpretation is that this pincer maneuver involving the simultaneous use of two government strategies brings protesters back into the fold of non-violence, as another strategic shift away from violent action occurs.

The direction and significance of the incidence rate ratio for a number of additional models for five consecutive days of blackout is displayed in **Table 4.4**.

Dependent variable	Day 1	Day 2	Day 3	Day 4	Day 5
Non-violent protests	+	+	+	-	-
Riots	+	+	+	+	+
Organized protests	-	+	+	-	+
Leaderless protests	+	+	+	-	-
Political protests	-	+	+	+	-
Student/youth protests	-	-	+	-	+
Ethnic/communal protests	+	+	+	+	-

Table 4.4 Direction of effect and significance level for the relationship between network shutdown and different outcome variables. Specification of control variables identical to Model 2. Union and farmers' protests not included due to small number of coinciding cases. Shading denotes non-significance ($p \geq .05$).

The results of these analyses do not take into account negative reporting bias that stems from disrupting communication networks (Earl et al. 2004). Blackouts introduce confusion into the information environment, potentially silencing *reports* of unrest rather than unrest itself. Accounting for this is methodologically challenging. Such bias could be expected to reduce reported incidence of protest rather than inflate it, thus weakening the significance of any escalatory effects. Correcting for this is beyond the scope of the present study, but is likely to introduce more doubt regarding the utility of exercises in digital repression such as network shutdowns.

Alternate Institutional Explanations

In the above, I have explored some of the structural dynamics of disconnected protest, providing evidence that shutdowns may turn non-violent protest (which tends to be organized) into violent riots. The average duration of these outbreaks of violence in periods of disconnection is at least as great as that of riots as a whole, and their concentration in a given area is greater. On the government's side, the structural-institutional dynamics that may encourage collective action and responses to it are more nuanced and difficult to capture. Elections to both the Lok Sabha (the lower house of India's parliament) and to individual Vidhan Sabhas (lower houses of state legislative assemblies) have indicated a trend toward fewer coalition governments, with the nationalist BJP gaining ground in most constituencies. By 2016, many rural areas, which had decisively backed BJP in the 2014 elections, were the scene of large protests against continued economic hardship. BJP's rise to power also coincided with increasing preference toward shutdowns as a means of quelling collective action. Studies have demonstrated that India hosts an array of polarized, Duvergerian two-party systems subnationally (Gowda & Sridharan 2010) and that the dynamics of information flows are linked to this polarization (Rozenas & Sadanandan 2018). An extension of veto player theory suggests that risky or ideology-driven policy solutions are more attractive when the number of veto players is small (Tsebelis 1995). Power-sharing, which forms the bedrock of India's democratic system, could discourage government actors from executing shutdowns, which remain largely unpopular in India. Perhaps, then, the dominance of BJP in state parliaments is the omitted

variable that explains both protest and shutdowns, creating a favorable institutional environment for both the former (as protesters can attribute economic woes to a specific political actor) and the latter (as even controversial policies may be easier to implement when partisan preferences are strong and political challengers are weak).

However, this appears to be only partially true for shutdowns. While BJP was in power in four of the five states that most actively pursued shutdowns in 2016 (Jammu and Kashmir, Rajasthan, Haryana, and Bihar), it ruled in coalition with left-leaning or regionalist parties in two of those states, including Jammu and Kashmir.[104] In 2016, only three (33.3%) of the ten states that executed shutdowns had coalition governments, but six (27.3%) of the 22 states that refrained from shutdowns also featured coalition rule. A similar split exists between high- and low-protest states with respect to coalition governments.[105] The proximity of the results in these two cases does not allow us to infer a correlation between coalition governments and shutdowns. Nonetheless, the mere existence of a coalition does not imply equality in power-sharing. I therefore examined the fragmentation of coalition and opposition parties using Laakso and Taagepera (1979)'s widely accepted effective number of parties measure, which in this case assigns less weight to small coalition partners.[106] Neither the fragmentation of the coalition nor that of the opposition was consistently related to shutdown proclivity or protest.[107]

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[104] At the same time, states that did not implement shutdowns in 2016 had a stronger presence of center-left (primarily Congress) and regionalist governments. Only four out of 14 were BJP-dominated. BJP dominance also does not seem to covary with propensity toward state violence (e.g., police crackdowns on protesters, military operations against militants), which casts doubt on its connection with state repression in general.

[105] Using the ACLED protest data, I calculated that 43% of the states where the number of protests was above the mean of $\bar{x} = 296.5$ had coalition governments while 37.5% of those below the mean had such power-sharing arrangements.

[106] The formula for this measure is $ENP = \frac{1}{\sum_{i=1}^{N} p_i^2}$, where N is the total number of coalition partners (with a minimum of $i = 1$) and p_i corresponds to each partner i's number of seats.

[107] The fragmentation of the opposition, following a common approach, is operationalized as the proportion of seats held by the dominant opposition party out of all opposition seats. All of the results reported in this paragraph remained strong in a robustness check using data on shutdowns, protest, and party fragmentation for 2017, a year in which the number of shutdowns in India spiked further. It should further be noted that parties in India, well over a thousand in number, are not easily placed on the conventional left-right spectrum. For a more nuanced discussion of this point and parties' interactions with local socioeconomic dynamics, see Rozenas & Sadanandan (2018) and Gowda & Sridharan (2010).

This lack of association can potentially itself be explained by institutional factors. In practice, the proximate actor invoking Section 144 to suspend communication services is the District Magistrate rather than the state-level legislature or executive power, neither of which is required to provide consent. Future work on the institutional drivers of information control amid mobilization for collective action should therefore examine political affiliations among these actors.[108]

[108] District Magistrates have publicly stated that implementing shutdowns under Section 144 is less cumbersome than other forms of addressing protest, including police engagement. No credible data exist on the names and party affiliations of these actors as of 2018.

Table 4.5 Network shutdowns and coalition dynamics in the Vidhan Sabha (lower house) of state legislative assemblies in India (2016-17). States with no shutdowns in this period not shown.

	2016					*2017*				
State	**Shutdowns**	**Coalition gov't?**	**Dominant party**	**Effective # of parties**	**Opposition fragmentation**	**Shutdowns**	**Coalition gov't?**	**Dominant party**	**Effective # of parties**	**Opposition fragmentation**
Arunachal Pradesh	**1**	NO	nationalist	1	0.8998	**0**	NO	nationalist	1	0.8998
Bihar	**2**	YES	mixed	2.0899	0.7208	**3**	YES	mixed	2.0899	0.7208
Gujarat	**3**	NO	nationalist	1	0.9242	**0**	NO	nationalist	1	0.9629
Haryana	**3**	NO	nationalist	1.0425	0.5135	**7**	NO	nationalist	1.0425	0.5135
Jammu & Kashmir	**10**	YES	mixed	1.9936	0.5	**29**	YES	mixed	1.9936	0.5
Jharkhand	**1**	YES	nationalist	1.6113	0.6133	**0**	YES	nationalist	1.6113	0.6133
Madhya Pradesh	**0**	NO	nationalist	1	0.9355	**1**	NO	nationalist	1	0.9355
Maharashtra	**1**	NO	nationalist	1	0.9345	**1**	NO	nationalist	1	0.9345
Manipur	**1**	NO	center-left	1	0.3889	**0**	YES	nationalist	1.61	1
Nagaland	**0**	NO	regionalist	1	0.5711	**1**	NO	regionalist	1	0.5711
Odisha	**0**	NO	regionalist	1	0.5714	**2**	NO	regionalist	1	0.5714
Punjab	**0**	YES	ethnoreligious	1	0.5128	**1**	NO	center-left	1.4099	1
Rajasthan	**6**	NO	nationalist	1	0.8333	**7**	NO	nationalist	1	0.8333
Telangana	**0**	NO	regionalist	1	0.4483	**1**	NO	regionalist	1	0.4483
Tripura	**0**	NO	left	1	0.9089	**1**	NO	left	1	0.9089
Uttar Pradesh	**2**	NO	left	1	0.4733	**2**	YES	nationalist	1.0843	0.6352
West Bengal	**0**	NO	regionalist	1	0.5249	**1**	NO	regionalist	1	0.5249

Conclusion

This chapter has explored the dynamics of disconnective action further by quantitatively and qualitatively analyzing India as an extreme case study. This subnational approach has revealed that while some of the general dynamics identified in Chapter 4 continue to hold, India exhibits traits that make it unique in how collective action is driven when access to information and communication channels is limited. The findings suggest that social media and digital platforms are not critical to collective action, as mass mobilization can occur even in their absence. However, these channels are readily employed as methods of coordination, and removing them can turn a predictable situation into one that is highly volatile and violent. Another policy implication is that network shutdowns in India are not uniformly effective while remaining prohibitively costly when maintained. Extrapolating from Kathuria et al. (2018)'s calculation of the costs of shutdowns in India, a three-day blackout equates to a revenue loss of at least $559,000, without counting less palpable economic damage and the aftermath of violent collective action, to which blackouts appear to lead. This is a high price to pay for a tactic that appears to be ineffective as a weapon against collective action.

While I provide limited support for the unanticipated enabling effect of shutdowns on non-violent protest (except possibly when a blackout is paired with state violence), violent mobilization seems to grow in intensity during blackouts. The deterrent might therefore amount to an encouragement to substitute non-violent tactics for violent ones. At the same time, the tests conducted above indicate a strong connection between the reach of Facebook and non-violent protest as well as a non-existent link between Facebook and riots. While the non-significant result suggests the effect of shutdown on non-violence is at least ambiguous, continued targeting of the communication infrastructure is entirely misguided once a tactical shift to violence occurs, as rioters do not typically use Facebook to mobilize. Much like in Chapter 3, however, much work remains to be done to determine the causal pathways behind these effects. We cannot say with confidence *why* violent collective action rises in the wake of a shutdown while surges in non-violent action lose their momentum, and the structural factors analyzed here do not seem to explain it well. We can say, however, that the relationship exists.

These findings cast considerable doubt on whether shutdowns are a useful device in the quelling of unrest. Rumors and disinformation continue to spread with or without access to digital communication networks, whose primary role is that of accelerators of information diffusion. Indeed, mobilization may not be primarily driven by these networks themselves or even formal organizations that use them to bolster their showing in the streets, but rather by micro-level information cascades among people with strong private ties, as a number of scholars of social movements have previously argued (Lohmann 1994, McAdam 1986, Passy & Monsch 2014).

Future research can improve upon the approaches taken here in at least three ways: by adding more temporal variation (as both 2017 and 2018 have seen a surge of shutdowns in India that greatly exceeds the numbers for 2016), increasing the level of spatial precision to the district level (as studies of India traditionally assume the district as the level of analysis, per Dhattiwala & Biggs 2012), and attempting to capture the size rather than simply the incidence of protests. Probing subnational dynamics deeper still may be especially useful, as circumstantial evidence suggests that uniquely outlying cases such as Jammu and Kashmir can harbor additional effects (see **Figure 4.7**). Exploration of the spatiality of collective action, shutdowns, and violence further should also incorporate more minute-level election data, including *panchayat* (village council) elections, which sometimes spur violent incidents. Finally, scholars must gather better data on the role of social media in non-violent collective action versus its violent equivalent, expanding on a tangential finding in this study.

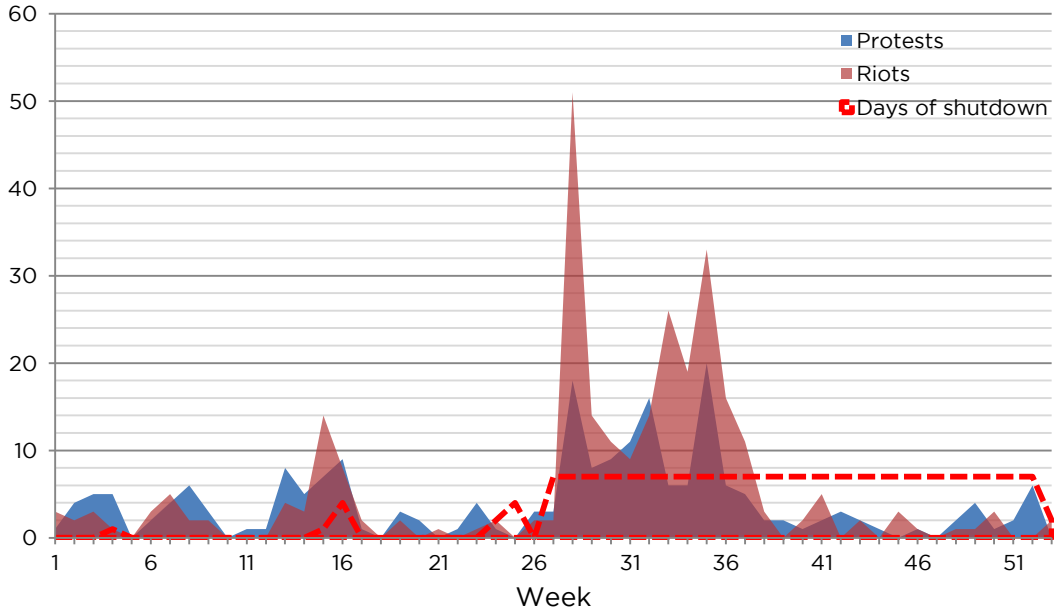

Figure 4.7 Number of protests and riots in Jammu and Kashmir in 2016, by week, based on ICEWS. Dotted line represents number of days in a given week that a network shutdown was in place. This visualization of dissent trajectories in Jammu & Kashmir suggests that, in some cases, network shutdowns may be followed by a surge in both violent and non-violent mobilization.

In many ways, India is a Petri dish of information control in the developing world.[109] As a democratic state and an emerging economic power, it sets examples for similar countries to follow. However, the rapid growth of the Internet user base in India has had contradictory impacts on both society and democratic governance. A 2015 survey, for instance, found that more half of all Facebook users in India equated the latter to the broader Internet (Mirani 2015). The level of trust that new users vest in platforms awash in hearsay and disinformation make India, in many ways, a supercharged mirror of trends in high-income countries where individuals find it increasingly challenging to distinguish fact from fiction on social media (Tucker et al. 2018). But in India and states with similar socioeconomic trajectories and internal tensions, the consequences of conflating the two can be even more dire. It is therefore necessary to hold at least two parallel discussions: one on how information control can turn into digital repression and another on the repercussions of information diffusion in diverse communication environments.

[109] Thanks to Rocío Campos for this metaphor.

Chapter 5

Conclusion:
The New Panopticon?

Two overarching puzzles motivated this dissertation. First, the dictator's dilemma (Kedzie 1997) has long been theorized, but the threshold at which this dilemma manifests itself most vividly has not been empirically pursued. Indeed, scholars have rarely questioned the nature of this threshold; is it one of economic development, regime type, institutional strength, Internet connectivity, or still another factor? Second, although we have some empirical knowledge about both repression and dissent in both their traditional and digital varieties, the relationship between digital repression and traditional collective action still eludes us – especially the questions of temporality, strategy, and structure.

In the preceding three chapters, I have outlined a number of conditions under which network shutdowns and other interferences arise, and described several of the sociopolitical responses that they provoke. I have shown that there is a strong and empirically measurable link between the pace of expansion of Internet connectivity and broadly conceptualized interferences in digital networks, but this link eschews the positive, linear relationship at a certain rate of expansion. That is, the dictator's dilemma seems to occur most prominently at a certain rapid rate of expansion (calculated as 7.13 percent) – the point at which Internet penetration appears to outpace governments' capacity or willingness to interfere. This finding provides a partial answer to the first research puzzle, adding an empirical element to the theorized dictator's dilemma that diverges from its standard interpretation. To address the second puzzle, I show that network shutdowns as a form of digital repression are linked to a surge in collective action in the short run on a cross-national level, but sustaining the pressure is linked to decreased levels of protest as the initial surge wanes. Although the exact time horizons are different for each country, India provides evidence that collective action strategies and structures are also affected when shutdowns occur, with violent protests escalating while non-

violent protests and those that involve more formal collectives finding their typical dynamics destabilized. The temporal, strategic, and structural dimensions all intertwine. Although questions of causality and simultaneous effects remain, I have identified several new dynamics that provide the foundation for future causal studies.

In framing digital information and communication tools whose absence may alter the course of modern collective action, I build on accumulated scholarship on resource mobilization. In demonstrating the relationships between digital repression and subsequent non-digital dissent, I add new considerations to the repression-dissent nexus, particularly the temporality, strategy, and structure of collective responses to new repressive tactics. How does this relate to what we know from previous studies? First, the temporal dynamics that characterize the backfire effect of digital repression are the inverse of what has been identified in much of the literature on the nexus, which suggests that continued repression temporarily dampens but eventually reignites collective action (Rasler 1996, Francisco 1995). Digital repression and its aftermath are different: the disappearance of a channel of expression encourages people to take to the streets, but the effect is short-lived, declining from the second shutdown week onward.

Second, although the literature overwhelmingly supports non-violence as a more successful tactic than its violent counterpart (see Chenoweth et al. 2017), the impact of different forms of repression on tactical switches in collective action remains a puzzle, with only a limited number of studies suggesting that repressing non-violence pushes participants to switch to violent dissent and vice-versa (Lichbach 1987, Moore 1998, McAdam 1983). The example of India, where most states have reported localized shutdowns and where the available empirical data are richest, provides partial, though indirect support for this in the digital realm. Shutdowns are associated with a subsequent surge in riots while non-violent mobilization loses its momentum as the organizational costs of planning such protests increase. However, shutdowns also seem to be as disruptive for collective action organized by formal actors as they are for loose-knit groupings. This does not necessarily equate to lower chances of eventual success and is thus tangential to the common finding that strong organizational structures are a boon to collective action (Pearlman 2012, Sutton et al. 2014). It does, however, suggest that digital communication

networks are increasingly becoming facilitators or conduits for organized dissent in the streets, and that forms of repression that specifically target these affordances may affect them. Any such effect is offset by the collective chaos it induces and the economic burden it places on local structures, both social and institutional.

Prior to 2011, interferences were predominantly small in scale, amounting to censorship of individual users, services, and components of the telecommunications infrastructure. In this period, dozens of countries made enormous advances in connectivity. This expanded the information landscape significantly, opening new channels of communication in states and communities that had previously relied on top-down, one-to-many, and local-level circulation of news and ideas (Warren 2015). At the same time, repressive regimes quickly identified these new routes as a challenge to their preponderance and control of the information cycle. Along the spectrum of democracy, governments that faced security challenges have been compelled to balance the expansion of the digital economy with the temptation to exercise authority over potentially damaging flows of information. Centralized control over such flows is inherently more difficult than monitoring and directing the narrative in the press, radio, and television; even individual, peripheral voices can generate a rapid cascade of reactions beyond the local level when they reach sufficient numbers (Barberá et al. 2015, Steinert-Threlkeld et al. 2015). Before 2011, however, states that registered very rapid rates of expansion preferred to take a hands-off approach to interference, as the growth of technology outpaced their ability to effectively block information and social media networks were only circumstantially associated with collective action.

Egypt's disappearance from the global Internet in January 2011 altered these dynamics. Despite the ultimate failure of the government's attempt to disrupt coordination and collective action, the use of network shutdowns as a means of controlling information and weakening the organizational capacity of protest spread to numerous other countries. This process of diffusion was initially dominated by autocratic governments who perceived an existential threat in the rapid circulation of information and rumors. However, the strategy quickly became a mainstay of hybrid regimes, followed by several democratic countries, led prominently by India. Today,

they are rarely a response to challenges to central rule, but increasingly a default tactic that either supplements or substitutes for traditional forms of repression. Their more localized impact diminishes the media coverage that surrounds them, but their effect on collective action endures as the annual number of shutdowns grows.

Despite growing interest in the repercussions of shutdowns among researchers and civil society actors, the number of deliberate disruptions is increasing exponentially each year, and little is known about how collective action changes and adapts when its participants are suddenly placed in a low-information environment. The dynamics of *disconnective action*, as presented here, suggest that blackouts lead to a short-term surge in protest, followed by a premature decline. Both effects must be viewed in the context of the empirically proven economic damage they cause in the affected areas. In India, where a large proportion of shutdowns is concentrated, turmoil in the north accounts for a considerable share of the total. But blackouts have occurred in all parts of the country, from the Vale of Kashmir to the otherwise prosperous southern shores of Tamil Nadu, spreading southward. While shutdowns may disrupt or scramble organized, non-violent collective action, this comes at the cost of escalations in the occurrence of violent dissent. If state governments assume a two-pronged tactic consisting of violent crackdown and information blackout, non-violent mobilization may increase, renewing the cycle. In the midst of this strategic back-and-forth, the disruption may impair both critical services and the government's own command of the security situation.

The results reported here are not meant as a qualitative judgment on the legitimacy of using network shutdowns in security situations, but rather an indication of their effectiveness. The term *digital repression* covers not only deliberate curtailment of rights, but also collateral harm dealt to society in the course of suppressing dissent. The existence of these unintended effects implies that undermining communication may be more repressive and less effective than it appears on the surface. The primary policy implication gleaned from the data analysis is that few winners emerge from the removal of communication channels. Governments do not achieve their goals faster than they would without the use of shutdowns, and may indeed

induce more chaos as information flows are stalled, collective action becomes more extreme, and dissent becomes harder to control.

Collective mobilization did not emerge as a phenomenon in the information age. While much has been written on modern communication networks' potential to enable 'leaderless' movements, most protest activity remains, to some extent, structured. The mere existence of social media or cheap mobile devices does not imply that they will be used effectively – if at all – to support collective action. At the same time, protest organizers in India do seem to be affected by severed lines of communication, at least to an extent that casts doubt on their ability to sustain structured or non-violent protest. Taken as a whole, the analyses conducted here indicate that technology is helpful, though not necessary or sufficient for collective action. That is, although it contributes to the expansion of dissent beyond a local community, its absence may simply lead individuals to choose other avenues to channel their disaffection. The use of technology in mobilization does not invalidate established theories of collective action or of the interplay between dissent and repression. On the ground, relying excessively on the potential of digital networks to effectuate change is as misguided as the notion that blocking them completely will derail a movement. These networks are, after all, channels for underlying grievances and enablers of organizational decision-making rather than essential ingredients for building democratic institutions.

Numerous challenges remain in the analysis of disconnected protest. One concern is theoretical. A small number of studies incorporate the scarcity of information as a consideration; more can be done to better theorize access to information as, essentially, access to a resource. Depending on the national context, this work may focus on customary forms of sharing information, which itself may vary with socioeconomic variables (Rozenas & Sadanandan 2018). Likewise, the unique conundrum that governments face with the digital dilemma inevitably includes economic costs, which can be embedded into more complex game-theoretic models. The case of India also shows that, while the institutional link between disconnected protest and the composition of legislatures is relatively weak, there are clear institutional components that

affect an area's proclivity toward blackouts, such as delegation of executive authority and possibly length of tenure of the officials ordering the disconnection.

Another concern pertains to levels of analysis. Information flows, including the well-known concept of information cascades, occur on a micro level. Although studying disconnective action as a real-life counterfactual to the free flow of digital communication allows us to better understanding the role of technology in collective action, the effects discussed will remain partially correlational unless the motivations and network characteristics of individual protesters are explored further. The limited survey work that speaks to this in countries that employ overt methods of information control is a promising lead (Tufekci & Wilson 2012, Hassanpour 2017). Network shutdowns can also be a useful instrument in determining the mix of strong and weak ties that motivate people to mobilize. Communication technology is not composed exclusively of weak or strong ties; scholars often mistakenly see them as conflicting forces while failing to note that the information-sharing dynamics of the Internet may be distinct from the motivational dynamics of the decision to protest in the streets (see also Jost et al. 2018). Learning about a protest on Facebook or Twitter does not guarantee participation; it is also entirely compatible with choosing to participate through one or more strong ties. This dissertation does not directly tackle network effects and strength of ties in disconnected protest. In future research, by comparing the sources of information for the same subjects in connective and disconnective action and analyzing the decision to protest or remain passive with and without connectivity, scholars will learn much more about the mobilizing potential of communication technology.

A third concern relates to the amount, nature, and quality of available data. Although two of the preceding three analyses have relatively high temporal (and, in Chapter 4, spatial) variation thanks to the use of minute daily data, it is still possible that shutdowns and collective action do not take place in the same physical space. Pinpointing these effects would yield more robust findings, and more accurate data would help to cement or reject the current ones. Finally, within the scope of the third concern, questions about causality and intent are critical and, in this case, interrelated. Specifically, researchers do not always have strong indications of

deliberate action to disrupt communication, and governments routinely use infrastructural damage to explain an outage. If the government does not itself confirm the shutdown, attribution can only be inferred. Relatedly, the relationship between shutdowns and collective action is likely endogenous, in that the causal effect probably travels both ways. Future studies could mitigate this concern by identifying an instrumental variable that is strongly related to shutdowns, but weakly to protest. A comprehensive dataset on power outages, for instance, would alleviate some of these problems. However, as of mid-2018, no international reporting mechanism exists for this indicator, and very few countries report such outages to the public. In summary, stronger theories must be explored, micro-level motivators of mobilization must be examined, and higher-quality data must be used to question these findings and generate new ones. The use of mixed research methods will be especially important in future work on these topics.

In July 2016, the UN Human Rights Council voted to incorporate an addition to Article 19 of the Universal Declaration of Human Rights. The new language expanded the Article's provisions for freedom of expression to the Internet. The measure, unsuccessfully opposed by a number of countries, included clauses that condemned government attempts to shut down access to the Internet, deeming them a violation of human rights. Although this step denotes a change in the international human rights landscape, the enforcement of the new provisions remains very limited. Preventing full-scale shutdowns may benefit both society and governments, as argued here. Nevertheless, the development of technology creates new fields of control that are less palpable than blackouts while often impinging on human rights. Countless examples from the corporate world can be enumerated here, revolving predominantly around privacy and the use of behavioral data to predict and influence political preferences. On the governments' side, the potential diffusion of mass surveillance tools among and beyond non-democratic regimes underscores the weakness of international agreements on privacy, as exemplified in China's emerging social credit system and its testing of new surveillance tools on the marginalized Uyghur minority (Cook 2018). Network shutdowns, while not free of significant measurement challenges, are generally observable; the risk of

spurious conclusions stems largely from misattributing technical outages to malicious government actors. By contrast, topics such as surveillance in repressive states will be difficult to analyze quantitatively, as the underlying data are often either proprietary or locked away from researchers inquiring about governments' strategies of information control.

Several countries – most prominently China, Iran, and Russia – are pursuing models of Internet governance whose goal is to replicate national borders and notions of sovereignty in the sphere of digital information flows. Governments have emphasized the need for deeper insight into personal data as a security measure or marker of 'social credit.' This creates a new iteration of the Panopticon, Jeremy Bentham's famous model of surveillance based on the concept of a prison that relies on detainees' uncertainty regarding whether they are being observed. The use of new technologies in the interest of security and information control often pursues the same goals as the Panopticon – self-censorship and self-policing derived from uncertainty and lack of information. While systems of domestic surveillance are likely to continue evolving, network shutdowns add an element of coercion to this dynamic. Paradoxically, when applied heavily and for extended periods, these restrictions to communication can also inhibit the government's own ability to surveil.

This dissertation is a story of two ambiguous choices. One belongs to the government – the question of whether to crack down on digital communication, when to do so, and how to do so, without foreknowledge of the consequences. The other belongs to protesters thrust into uncertainty by the disappearance of an important channel of information, communication, and organization. In both cases, the risk of taking action is difficult to calculate, as the method of repression is new. While individuals commonly prefer known risks over unknown risks (Ellsberg 2017), these two decisions are complex and context-dependent, and both sides often make the more ambiguous choice. Although shutdowns are only vignettes of governments' approaches to domestic crises and other ostensibly precarious circumstances, they embody the contradictions of a time when states must balance the impulse to limit access to information with mitigating the damage that digital repression causes on its margins.

Appendix A

List of Known Network Shutdowns

This non-exhaustive list of network shutdowns between January 2011 and April 2018 served as the basis for the data used in the statistical tests conducted in Chapters 3 and 4. It includes shutdowns reported as deliberate by at least two of the following categories of sources: news media, civil society, network measurements, industry reports, or government actors. For most incidents, I report duration, location, and the circumstances surrounding the shutdown, in addition to at least one source (note that Access Now, a common source, is abbreviated to AN). Not all incidents in India are paired with a source due to their abundance, but most are well documented and simple to find. It is important to note that, despite these precautions, attribution of network shutdowns to government actors remains a difficult task.

January 2011

Egypt: Mubarak regime cuts of most Internet and cell phone service across Egypt

- **5 days** (Jan 28–Feb 1)
- **Location:** Nationwide
- First recorded nationwide network shutdown, executed by the Mubarak regime to discourage or disband mass anti-government protest.
- Shutdown began late at night on January 27 and ended in the early hours of February 2; duration does not include these dates.
- See Hassanpour (2017) for in-depth exploration of the dynamics of protest during the shutdown.
- https://www.nytimes.com/2011/01/29/technology/internet/29cutoff.html

June 2011

Syria: Much of the country blacked out amid Arab Spring protests

- **2 days** (June 2-3)
- **Location:** Nationwide
- 3G, DSL, and dial-up shut down as Syria disconnects communication for the first time.

- Large protests in numerous locations around Syria in the context of the Arab Spring; reignited by photographs of the body of Hamza Ali al-Khatib, a young boy tortured and killed by government security forces, circulating on YouTube.
- https://www.washingtonpost.com/blogs/blogpost/post/syria-internet-services-shut-down-as-protesters-fill-streets/2011/06/03/AGtLwxHH_blog.html
- https://dyn.com/blog/syrian-internet-shutdown/

December 2011

Democratic Republic of Congo: SMS shutdown in wake of general elections

- **25 days** (~Dec 19 – ~Jan 12)
- **Location:** Nationwide?
- Maintained after elections in the wake of protests. Some reports indicate the shutdown began before the official results were announced.
- Election saw yet another victory by incumbent Joseph Kabila.
- Similar disruptions occurred in 2015, 2016, and 2018.
- https://cipesa.org/2017/03/the-evolution-of-internet-shutdowns-in-dr-congo/
- https://www.theverge.com/2011/12/19/2646721/sms-social-media-banned-congo

January 2012

India: Jammu & Kashmir shuts down mobile Internet as part of larger telephony ban

- **1 day?** (Jan 26)
- **Location:** Jammu & Kashmir (Kashmir Valley)
- Precautionary measure for Republic Day; in place 9-12 am.
- http://www.rediff.com/news/slide-show/slide-show-1-kashmiris-celebrate-republic-day-but-without-mobiles-internet/20120126.htm

March 2012

Pakistan: Capital of Balochistan province blacked out for Pakistan Day due to security concerns

- **1 day** (Mar 23)
- **Location:** Balochistan (Quetta)
- Several paramilitary personnel were killed during the shutdown in an attack orchestrated by Taliban militants (probably Tehree-e-Taliban Pakistan).
- https://tribune.com.pk/story/354388/security-concerns-on-pakistan-day-balochistan-blacked-out/

July 2012

Syria: Internet cut across Syria for 40 minutes

- **1 day** (Jul 19)
- **Location:** Nationwide
- NSA whistleblower Edward Snowden claimed this was an accidental shutdown caused by NSA attempts to infiltrate a Syrian internet service provider (ISP).
- https://www.theguardian.com/world/2014/aug/13/snowden-nsa-syria-internet-outage-civil-war

August 2012

Pakistan: Balochistan blocks mobile services on Independence Day

- **1 day** (Aug 14)
- **Location:** Quetta (Balochistan) + surrounding area
- https://tribune.com.pk/story/421966/cell-phone-services-blocked-in-quetta-on-independence-day-report/

Pakistan: Mobile services suspended in parts of the country amid terror fears during Eid-al-Fitr

- **1 day** (Aug 19)
- **Location:** Karachi, Lahore, Quetta, Multan
- http://www.dawn.com/news/743395

September 2012

India: Jammu & Kashmir suspends mobile services due to protests over *Innocence of Muslims*

- **1 day** (Sep 21)
- **Location:** Jammu & Kashmir (Kashmir Valley)
- https://india.blogs.nytimes.com/2012/09/21/telecom-services-blocked-to-curb-protests-in-kashmir/

Pakistan: Mobile services suspended in several major cities for Ishq-e-Rasool

- **1 day** (Sep 21)
- **Location:** Islamabad, Rawalpindi, Lahore, Karachi, Quetta, Peshawar, Faisalabad, Jhang, Multan, Khanewal, Chakwal, Kot Moman, Attock, Murree, and Chakri
- Most locations in Punjab.
- Government officially confirmed this shutdown as a precautionary step to prevent terrorist attacks on Ishq-e-Rasool (Day of Love for the Prophet). "Terrorists usually use mobile phones to detonate explosive devices, therefore we took this step."

- Major protests and riots across the country over anti-Muslim film (*Innocence of Muslims*).
- https://www.samaa.tv/pakistan/2012/09/mobile-phone-services-suspended-in-main-cities-of-pakistan/

November 2012

Syria: Three days with no Internet

- **3 days** (Nov 29-Dec 1)
- **Location:** Nationwide
- Possible alternate start date: November 30.
- Full shutdown; widespread landline and cell service outages.
- Government blamed terror attacks, but two very short shutdown drills had been held in the preceding days.
- https://arstechnica.com/information-technology/2012/12/paint-it-black-how-syria-methodically-erased-itself-from-the-net/

Pakistan:

- **1 day** (Nov 16)
- **Location:** Karachi, Quetta

Pakistan: Mobile services blocked for several hours in multiple locations for Day of Ashura

- **1 day** (Nov 23)
- **Location:** Karachi, Quetta, Islamabad (G-9)
- Possibly extended into November 24 and may have begun on November 22 in parts of the country. Some sources claim more than 50 cities were affected.
- Government continues to claim that bombs have previously been detonated using cell phones.
- https://tribune.com.pk/story/470131/no-mobile-service-in-karachi-quetta-from-1pm-till-evening/

December 2012

Pakistan:

- **1 day** (Dec 28)
- **Location**: Karachi
- Terrorist threat
- https://tribune.com.pk/story/485826/terrorism-threat-cellular-services-suspended-in-karachi/

January 2013

Syria: Internet cut in parts of Damascus ahead of defiant speech by Assad

- **1 day** (Jan 6)
- **Location:** Damascus (parts)
- Another slowdown on January 20 in Google data
- https://www.washingtonpost.com/world/syrias-assad-is-defiant-in-rare-speech/2013/01/06/00f4f67a-5803-11e2-b8b2-0d18a64c8dfa_story.html

India: Jammu & Kashmir suspends mobile and Internet for Republic Day security drill

- **1 day** (Jan 26)
- **Location:** Jammu & Kashmir (Kashmir Valley)
- https://www.thehindubusinessline.com/news/Mobile-internet-services-snapped-in-Kashmir/article20575925.ece

Pakistan: Mobile services suspended for Shi'a religious observance

- **1 day** (Jan 3)
- **Location:** Balochistan, Khyber Pakhtunkhwa, Punjab, Sindh, Azad Kashmir [many individual districts in each]
- Precautionary measure to avert acts of terror during Shi'a procession for Hazrat Imam Hussain's Chehlum (40th day after Day of Ashura)
- Police filed a request with the Punjab government
- https://tribune.com.pk/story/493420/long-march-in-the-name-of-security-mobile-services-suspended/

Pakistan: Mobile services suspended following security threat (Tehreek-e-Taliban and others)

- **1 day** (Jan 13)
- **Location:** Karachi, Islamabad (blue area), Faizabad, Shahdara, Rawat, Lahore
- Reports of attacks on Tahirul Qadri and procession participants
- https://tribune.com.pk/story/487909/lahore-police-request-blocking-mobile-services-on-imam-hussain-ra-chehlum/
- https://tribune.com.pk/story/493420/long-march-in-the-name-of-security-mobile-services-suspended/

Pakistan: Further precautionary measures

- **1 day** (Jan 15)
- **Location:** Islamabad, Rawalpindi, Gujranwala
- https://tribune.com.pk/story/493420/long-march-in-the-name-of-security-mobile-services-suspended/

February 2013

India: Jammu & Kashmir suspends mobile Internet and TV news after Afzal Guru's execution

- **7 days** (Feb 9-15)
- **Location:** Jammu & Kashmir (statewide)
- Afzal Guru was a Kashmiri separatist convicted for helping to orchestrate the 2001 Indian Parliament terror attack
- https://economictimes.indiatimes.com/news/politics-and-nation/anonymous-joins-protests-against-internet-shutdown-in-kashmir/articleshow/18468270.cms

Pakistan: Security threat during Friday prayers

- **1 day** (Feb 1)
- **Location:** Karachi
- https://www.pakistantoday.com.pk/2013/02/01/mobile-services-to-be-suspended-during-friday-prayers-in-karachi/

March 2013

Pakistan: Some services apparently suspended for Pakistan Day

- **1 day** (Mar 23)
- **Location:** Lahore, Punjab
- Source: KillSwitch.pk

May 2013

Nigeria: Prolonged cell phone shutdown in parts of 3 states during military offensive vs. Boko Haram

- **191 days** (May 27 – ~December 3), restored in Y & A after about 60
- **Location:** Borno, Yobe, Adamawa (first shut down in Maiduguri on May 17)
- 3 states in the NE affected (Borno, Yobe, Adamawa)
- Emergency rule had been declared in all 3 states
- Restored in Yobe and Adamawa after 2 months; in Borno until December
- Affected local economy and jacked up prices
- Soldiers communicating via radio or Thuraya satellite phones
- Goal: disrupt BH communications and prevent them from using rewired cell phones as detonators for homemade bombs
- May have led directly to deaths ('Internet refugees'): "Umar Babale, a commercial cab driver, told PREMIUM TIMES that a majority of those killed in the Benisheik attack of

September 17 were people who had travelled 135km just to make phone calls in the neighbouring town of Damaturu, Yobe state capital." (3)

- (1) http://www.irinnews.org/news/2013/06/11/military%E2%80%99s-shutdown-ne-nigeria-telecoms-disrupts-trade
- (2) http://www.aljazeera.com/blogs/africa/2013/05/72246.html
- (3) http://www.premiumtimesng.com/news/145640-borno-residents-want-phone-network-restored-boko-haram-gets-deadlier.html
- (4) https://freedomhouse.org/report/freedom-net/2015/nigeria
- (5) http://www.ictafrica.info/FullNews.php?id=12684
- https://www.premiumtimesng.com/news/134766-nigerian-military-shut-gsm-telecommunications-in-maiduguri-in-hunt-for-boko-haram.html
- Academic study: http://www.stabilityjournal.org/articles/10.5334/sta.ey/print/

Syria: First May blackout across the country

- **2 days** (May 7-8)
- **Location:** Nationwide
- Google and Akamai reporting 19-hour disruption; no confirmation of intent from Assad regime
- https://www.newyorker.com/news/daily-comment/why-did-syria-shut-down-the-internet

Syria: Second May blackout

- **1 day** (May 15)
- **Location:** Nationwide
- Reason still unknown
- https://mashable.com/2013/05/15/syria-internet-outage/
- https://www.theatlantic.com/international/archive/2013/05/syrias-internet-offline-again/315249/

Pakistan: Gilgit-Baltistan suffers mobile shutdown justified by conflict between sects

- **1 day** (May 7)
- **Location:** Gilgit-Baltistan
- https://tribune.com.pk/story/545221/security-cellphone-services-to-be-suspended-for-a-day-in-gilgit-baltistan/

Pakistan: Mobile services suspended in Islamabad/Rawalpindi for Chinese PM Li Keqiang's visit

- **1 day** (May 23)
- **Location:** Rawalpindi, Islamabad

- Possibly two days (May 22-23)
- https://www.geo.tv/latest/87014-cellular-services-to-remain-suspended-in-twin-cities-today
- https://www.firstpost.com/world/mobile-phone-services-shut-for-second-day-in-pakistan-for-lis-visit-809625.html

July 2013

India: Jammu & Kashmir suspends mobile and dongle service after 4 people killed in clashes w/ Border Security Forces

- **1 day?** (Jul 18)
- **Location:** Kashmir Valley
- Ramdan district clashes
- https://rsf.org/en/news/journalists-attacked-police-kashmir-internet-and-3g-suspended

Pakistan: *No details available*

- **1 day** (Jul 31)
- **Location:** Karachi, Rawalpindi, Lahore, Gujranwala, Sardogha

August 2013

Myanmar: Very brief disruption (1 hour)

- **1 day** (August 5), though traffic suggests slowdowns July 23 – August 6
- **Location:** Nationwide
- All routed networks withdrawn from global routing table for one hour
- https://dyn.com/blog/myanmar-internet/

India: Jammu & Kashmir suspends mobile Internet for 5 days after/during communal riots

- **5 days** (Aug 10-14)
- **Location:** Jammu & Kashmir (statewide)
- Communal riots in Kishtwar district
- https://thewire.in/government/jammu-kashmir-has-lost-18-days-of-mobile-internet-access-over-last-four-years
- https://www.hindustantimes.com/india-news/broadband-internet-services-suspended-till-aug-15-in-kashmir/story-nHbqJqqTBQdQyWXHtxW2eJ.html

India: Jammu & Kashmir suspends mobile Internet and telephony for Independence Day

- **1 day** (Aug 15)
- **Location:** Jammu & Kashmir (statewide)

- http://withkashmir.org/2017/05/25/a-detailed-list-internet-shutdowns-in-kashmir/

September 2013

Sudan: Protests against government lead to total Internet shutdown in Khartoum

- **2 days** (Sep 25-26), though traffic to YouTube was slowed through Oct 5 (11 days)
- **Location:** Khartoum
- Gov't started censoring journalists the week before
- https://www.accessnow.org/mass-internet-shutdown-in-sudan-follows-days-of-protest/

November 2013

Pakistan: Mobile services suspended in several locations for Day of Ashura

- **1 day** (Nov 14)
- **Location:** Karachi, Hyderabad, Khairpur, Sehwan, Nawabshah, Larkana
- http://www.killswitch.pk/?q=node/22

December 2013

Thailand: Protesters shut off part of Internet service in raid on state telecom office

- **1 day** (Dec 1)
- **Location:** Unknown how many affected; telecom office is in Bangkok
- 32% of internet paths down as protestors storm Communications Authority of Thailand (CAT Telecom) offices
- But most businesses immediately switched to alternative providers (and some businesses, like banks, had backup connectivity through another telecom
- http://research.dyn.com/2013/12/protests-lead-outage-thailand/

Pakistan: Chelum Day shutdown of mobile services in various parts of Pakistan

- **1 day** (Dec 24)
- **Location:** Rawalpindi, Peshawar, Skardu, Sargodha, Gilgit, Kohat, Bannu, Jhelum, Jalalpur, Gujarnwala, Hafizabad, Tank, Muridke, Dera Ismail Khan, Pindi Bhattian, Bhakkar, Faisalabad, Lahore, Quetta, Sukkur, Karachi, Matiari, Sanghar, Jamshoro, Hyderabad, Mirpur Khas, Thatta, Badin
- http://www.killswitch.pk/?q=node/20

January 2014

India: Jammu & Kashmir suspends mobile Internet and telecom services for Republic Day

- **1 day** (Jan 26)
- **Location:** Kashmir Valley
- Precautionary
- https://thekashmirwalla.com/2013/01/shutdown-restrictions-cellphone-jam-mark-republic-day/

Pakistan: Tahir-ul-Qadri's protest march against corruption, cell service blocked along route

- **1 day** (Jan 14)
- **Location:** Karachi, Hyderabad, Sukkur, Mirpur Khas, Punjab, Rawalpindi, Islamabad, Balochistan, Khyberpakhtun Khawa
- http://www.killswitch.pk/?q=node/27

February 2014

Venezuela: Twitter blocked

- **1 day**? (Feb 18)
- **Location**: Nationwide
- https://www.slashgear.com/venezuelan-government-shuts-down-internet-in-wake-of-protests-22317781/

Venezuela: Internet blocked through state-run ISP

- **2 days** (Feb 20-22), conservative estimate
- **Location:** Táchira
- Separate from Twitter ban, but related
- Several different ISPs, including the state-run provider, lost connectivity
- Not everywhere (article mentions "areas such as San Cristóbal") – Táchira
- Also content delivery network Edgecast and IP address belonging to Twitter's image hosting service
- CONATEL still suggested this was not directly due to protests and that "online attacks were waged" against them
- Comes in tandem with forced closure of news network NTN24
- 1 week after Twitter block
- Google data shows additional sudden fall to near-zero at beginning of February, but only for a couple of hours

- https://www.slashgear.com/venezuelan-government-shuts-down-internet-in-wake-of-protests-22317781/
- https://www.digitalrightslac.net/en/documentando-los-bloqueos-a-internet-en-venezuela/

Somalia: Al-Shabaab forces mobile Internet shutdown in Central and Southern Somalia

- **331 days** (Feb 4 – Dec 31), uncertain thereafter
- **Location:** Central and Southern Somalia
- Affected work of humanitarian agencies
- https://www.devex.com/news/some-aid-groups-affected-by-mobile-internet-shutdown-in-somalia-82875

India: Jammu & Kashmir mobile Internet and Internet through plug-in on 1st ann. of Afzal Guru death

- **2 days** (Feb 9-10)
- **Location:** (Kashmir Valley, most parts)
- https://internetshutdowns.in/

Syria: Internet down for a brief period

- **1 day** (Feb 20)
- **Location:** Nationwide?
- Only Dyn Research (→ Google) reported on this

March 2014

Nigeria: Mobile phone lines shut down in Borno state

- **2 days** (20 hours; March 23-24)
- **Location:** Borno State (Maiduguri)
- Around Maiduguri (state capital); raid on terrorist camps in Sambisa forests.
- http://www.premiumtimesng.com/regional/nnorth-east/157338-mobile-networks-restored-borno.html

Syria: Near-total blackout for 7 hours

- **1 day** (March 20)
- **Location:** Nationwide
- Gov't claimed it was a cable cut, which is technically possible given the few connections Syria has w/ outside world
- Google data shows a brief outage at the beginning of February and a report at the end of February (Feb 20), as per Dyn Research.

- https://www.newsdeeply.com/syria/articles/2014/03/21/why-did-95-percent-of-syria-lose-internet-this-week
- https://www.huffingtonpost.com/2014/03/20/syria-internet-down_n_5001664.html

India: Jammu & Kashmir suspends mobile Internet in selected "hot spots"

- **1 day?** (Mar 11)
- **Location:** Parts of Jammu & Kashmir

India: Jammu & Kashmir suspends Internet to stop political leaders from addressing UNHRC event

- **1 day?** (Mar 17)
- **Location:** Kashmir Valley (parts)
- Video link with Geneva

April 2014

Yemen: Local tribesmen sabotage Shabwa internet cable

- **2 days** (Apr 8-9)
- **Location:** Shabwa Governorate, Ma'rib Governorate
- Public Telecommunication Corporation is Yemen's only ISP
- Major fiber optic cable (new ones announced not long before)
- Tribesmen wanted gov't to continue paying salary of dead sheikh
- Resulted in decrease in Internet speeds, complete stoppage in some areas
- http://www.yementimes.com/en/1776/news/3780/Tribesmen-sabotage-Internet-cable-in-Shabwa.htm
- http://www.fiberopticmania.com/news/details/914/tribesmen-damage-fiber-optic-cable-in-yemen
- https://jaziranewswire.qa/interruption-of-communication-in-marib-and-shabwa-in-yemen-as-a-result-sabotage-acts-2/

June 2014

Iraq: Three short shutdowns in 3 weeks

- **~19 days** (Jun 13-30)
- **Location:** Ninawa, Anbar, Saleh El Din, Kirkuk, Diyalah *[according to the order]*.
- **Location (2):** "All access to Internet" also ordered blocked in: Al-Adel (Baghdad), Al-Ghazlieh (Ghazaliya, Baghdad), Abu Greib (Abu Ghraib), Al-Radwanieh (Radwaniyah, Baghdad), Al-Mahmoudieh (Mahmoudiyah), Al-Luteifiah (Al-Latifiah, Baghdad),

Fallujah, Jarf Sakher (Jurf al-Sakhar / Jurf al-Nasr), Al Taji (Taji), Al Youssfieh (Youssefieh, Baghdad?), Al Missyeb (Mussayib?)
- Possibly first case of exam shutdowns
- Order also involved VPN blocks (4 pm – 7 am daily), shutdown of almost all social media (Facebook, Twitter, YouTube, Viber, Skype + Tango, Wechat, Instagram, Didi)
- Order uses security incidents as justification
- https://twitter.com/DynResearch/status/479999294838439937
- http://www.independent.co.uk/news/world/middle-east/iraq-government-orders-total-internet-shutdown-in-25-of-country-rest-left-with-limited-access-9542778.html
- Another request for shutdown in June 2014, but uncertain if acted on: https://smex.org/iraq-telecom-ministry-orders-isps-kill-the-internet-in-five-provinces/

July 2014

Pakistan: Youm-e-Ali mobile shutdown invoked in wake of terror threat

- **1 day** (Jul 20)
- **Location:** Karachi, Hyderabad, Muzaffargarh, Sardogha, Narowal, Chakwal, Jehlum, Rawalpindi, Attock
- http://www.killswitch.pk/2014

August 2014

India: Jammu & Kashmir suspends mobile Internet for a few hours on Independence Day

- **1 day** (Aug 15)
- **Location:** Kashmir Valley

Pakistan: Cellular services suspended during anti-Sharif Inqilaab March

- **6 days** (Aug 8-13)
- **Location:** Lahore Model Town
- http://www.killswitch.pk/?q=node/7

September 2014

India: Nagaland blocks mobile Internet in Vadodara after riots over offensive picture of Muslim shrine and stabbing

- **3 days** (Sep 27-29)
- **Location:** Gujarat (Vadodara)
- https://timesofindia.indiatimes.com/india/Communal-clashes-in-Vadodara-after-stabbing/articleshow/43771015.cms

November 2014

Pakistan: Day of Ashura preventive shutdown

- **2 days** (Nov 3-4)
- **Location:** Punjab, Sindh, Khyber Pakhtunkhawa, Balochistan; Gilgit-Baltistan, Muzaffarabad
- http://www.killswitch.pk/?q=node/3

January 2015

Philippines: Cell phone service throttled in Manila during Pope Francis visit

- **4 days** (Jan 16-19), like visit
- **Location:** Manila metropolitan area
- Implemented by PLDT (owner of networks Talk 'N Text, Sun Cellular, and Smart) and requested by National Telecommunications Commission (NTC)
- http://www.rappler.com/specials/pope-francis-ph/80989-telcos-disrupt-signal-pope-visit

DRC: SMS and Internet blocked during and following protests

- **18 days** (Jan 20 – Feb 6)
- **Location:** Nationwide
- Protests were about an electoral bill
- Banks and government agencies granted access after 4 days, but general public had to wait 3 weeks
- http://www.radiookapi.net/actualite/2015/02/06/rdc-lambert-mende-annonce-le-retablissement-dinternet-dans-les-heures-qui-suivent
- https://cipesa.org/2017/03/the-evolution-of-internet-shutdowns-in-dr-congo/

February 2015

Gabon: Internet shutdown coinciding with union strike

- **3 days** (Feb 24-26)
- **Location:** Nationwide?
- SYNATEL, telecom union, called month-long strike
- Discovered through Google disruption data combined w/ search
- Follow-up: int'l calls couldn't go through March 9 – Gabon Telecom blames sabotage
- Gabon had not previously had a shutdown, but traffic levels dipped visibly in March 2011, in time for the start of the Arab Spring
- http://www.biztechafrica.com/article/gabon-hit-internet-disruptions/9964/

- https://transparencyreport.google.com/traffic/overview?fraction_traffic=product:21;region:GA;start:1422748800000;end:1425167999999&lu=fraction_traffic

March 2015

Gabon: Short shutdown + no international calls possible

- **1 day** (March 8/9)
- **Location:** Nationwide?
- Article above claims only international calls, but Google traffic took a major dip as well
- http://www.biztechafrica.com/article/gabon-hit-internet-disruptions/9964/

India: Nagaland shuts down mobile and broadband Internet after lynching video goes viral

- **2 days** (Mar 7-8)
- **Location:** Nagaland (statewide)
- Lynching of man accused of rape
- https://www.huffingtonpost.in/2015/03/09/nagaland-lynching_n_6828442.html
- https://timesofindia.indiatimes.com/india/Nagaland-blocks-internet-services-imposes-curfew-in-tense-Dimapur/articleshow/46497164.cms

Pakistan: Mobile and wireless Internet suspended for Pakistan Day parade

- **1 day** (Mar 23)
- **Location:** Islamabad, Rawalpindi (adjacent to parade ground)
- http://www.killswitch.pk/?q=node/36

April 2015

Burundi: Mobile communication apps (Twitter, Facebook, WhatsApp, Viber) blocked amid citizen clashes with police

- **17 days** (April 27 – ~May 13)
- **Location:** Nationwide?
- Background: major protests and coup attempt against President Nkuruzinza after his decision to seek a third term
- Clashes left 20 people dead and fueled refugee crisis of 50,000 people fleeing to neighboring countries
- Three radio stations also banned (they had carried announcement of coup and were torched)
- Cara Jones: "unique characteristic of coups d'état in the 21st century: It's very hard to take over a government if you don't control social media, not just traditional media."
- WhatsApp back on May 13; no other information

- No visible traffic dip in Google data
- https://www.accessnow.org/access-urges-un-and-african-union-experts-to-take-action-on-burundi-interne/
- http://www.itwebafrica.com/ict-and-governance/363-burundi/234560-burundi-shuts-down-internet-access
- https://qz.com/404051/how-we-may-know-theres-a-coup-in-burundi-whatsapp-is-working/
- https://www.theguardian.com/world/2015/may/14/burundi-protest-twitter-social-media

Gabon: Second three-day Internet shutdown

- **3 days** (Apr 3-5)
- **Location:** Nationwide?
- Not explained in any way by Gabon Telecom
- Speculation is again sabotage
- Gabon Telecom owned by Maroc Telecom
- http://www.biztechafrica.com/article/gabon-hit-internet-disruptions/9964/

Togo: Apparent slowdown or restriction of access before elections

- **7 days** (Apr 16-22)
- Elections on April 25
- Possibly a test before elections, but this is speculation
- Protests had taken place the previous month (unrelated to the elections), with injuries reported (beating + live bullets)
- https://www.amnesty.org/en/latest/news/2015/04/togo-authorities-must-guarantee-the-right-to-demonstrate-before-the-elections/
- Corroborated by Google disruption data

May 2015

India: Militants force cell tower shutdown in Jammu & Kashmir

- **1 day?** (May 28 – ?)
- **Location:** Kashmir (Sopore district)
- Duration unknown; conservative estimate used
- 50+ cell towers shut down in northern Kashmir (Sopore)
- Article doesn't specify how this was carried out
- Lashkar-e-Islam (previously unknown militant group) earlier warned people working with telcos to stop or face attacks

- Affected companies: Aircel [Malaysia], Airtel, Vodafone, Reliance, Idea
- http://in.reuters.com/article/india-kashmir-telecoms-idINKBN0OD20W20150528

Nauru: Facebook ban due to social media's "power to create instability" and "indecency"

- **426 days** (May 3 – after July 1, 2016)
- **Location:** Nationwide
- Opposition says it's designed to affect asylum seekers and suppress information flows on abuses in detention camp (refugees are usually headed for Australia).
- At least one article claimed ban was requested by Australia
- Government denies this was the reason – says they are fighting child pornography and other indecency
- Shutdown meant to be indefinite. Current status unknown, but maintained at least until mid-2016
- Refugees on other islands also have very limited communication capabilities
- Nauru's Internet penetration is not officially reported
- http://www.abc.net.au/news/2015-05-29/nauru-president-baron-waqa-defends-facebook-ban/6507240
- http://www.abc.net.au/news/2015-05-05/refugee-advocates-claim-nauru-facebook-ban-requested-australia/6444506
- http://www.cnet.com/uk/news/how-australia-keeps-refugees-disconnected-refugee-crisis/
- http://www.abc.net.au/news/2015-11-13/asylum-seeker-children-on-nauru-use-social-media-to-reach-out/6938256

June 2015

India: Jammu suspends mobile and broadband Internet; clashes between Sikh and state police

- **2 days** (Jun 5-6) *broadband*, restoration of mobile unknown
- **Location:** Jammu
- https://www.firstpost.com/india/cop-stabbed-in-sikh-protests-in-jammu-mobile-and-internet-services-suspended-as-tension-ensues-2281964.html

India: Militant attacks disable as many as 2,500 cell towers, affecting Internet connectivity

- **~3 days** (Jun 3-5)
- **Location:** Jammu & Kashmir (statewide)
- Previously unknown group is Lashkar-e-Islam
- Not reported by SFLC
- http://www.livemint.com/Industry/B9VHTsAJowOrjRtqcylYJJ/Jammu--Kashmir-battles-to-restore-mobile-services-after-mil.html

Iraq: Possibly first Iraqi exam shutdown (6th grade)

- **2 days** (Jun 27, 29)
- **Location:** Nationwide
- https://arstechnica.com/tech-policy/2015/06/iraqi-government-shut-down-internet-to-prevent-exam-cheating/

July 2015

Syria: ISIS bans private Internet access in Raqqa

- **165 days** (Jul 20 – Dec 31), ~**727 days** total including 2016-17
- **Location:** Raqqa
- http://www.thearabweekly.com/Opinion/1523/ISIS-bans-home-internet-in-Raqqa
- http://www.aljazeera.com/news/2015/07/isil-bans-private-internet-access-syria-raqqa-150720094428577.html

Iraq: Three-week everyday shutdown for exams (2nd year in a row)

- **~22 days** (Jul 1-22)
- **Location:** Nationwide
- Very rough estimate
- https://www.accessnow.org/despite-everything-iraq-still-shutting-internet-school-exams-2017/
- https://financialtribune.com/articles/people/20274/iraqi-internet-shutdown-to-prevent-exam-cheating

August 2015

India: J&K suspends mobile Internet during Independence Day celebrations

- **1 day** (Aug 15)
- **Location:** Kashmir
- http://withkashmir.org/2017/05/25/a-detailed-list-internet-shutdowns-in-kashmir/

Pakistan: Mobile shutdown for Independence Day

- **3 days** (Aug 13-15)
- **Location:** Islamabad, Rawalpindi, Karachi, Islamabad, Quetta, Rawalpindi (and the others from a previous entry) [*alternative source*: Punjab, Singh, Balochistan]

September 2015

India: Gujarat shuts down mobile Internet after large rally seeking OBC status for Patel community

- **8 days** (Aug 25 – Sep 2)
- **Location:** Gujarat (statewide), rumors that it continued in Ahmedabad and Surat (but other articles say it was restored the same day)
- This and subsequent incidents led to a decision in India's Supreme Court that upheld states' rights to implement network shutdowns and suspend mobile services (February 2016). If police invokes Section 144 of Criminal Procedure Code, state executives will be able to apply unlawful assembly provisions to the Internet and disconnect Internet services for short periods.
- https://timesofindia.indiatimes.com/india/Mobile-internet-services-banned-across-Gujarat-after-Hardik-Patels-detention/articleshow/49024649.cms
- https://www.thehindu.com/news/national/other-states/internet-ban-in-gujarat-upsets-people-business/article7603530.ece

India: Ghodra bans Internet for 24 hours

- **1 day** (Sep 28)
- **Location:** Gujarat (Ghodra / Godhara)
- Occasion: Ganesh Visarjans, derogatory messages against Islam making rounds on Whatsapp
- "Precautionary/pre-emptive measure" citing anti-Muslim messages on WhatsApp
- http://indianexpress.com/article/india/gujarat/gujarat-internet-services-in-godhra-suspended-for-24-hours/

India: Jammu & Kashmir shuts down mobile, wireless, and Internet during Eid amid beef ban

- **4 days** (Sep 25-28)
- **Location:** Jammu & Kashmir (statewide)
- Beef ban and prohibition of cow slaughter expected to bring protest
- https://indianexpress.com/article/india/india-others/to-avoid-tension-during-eid-ul-zuha-govt-ban-internet-in-jk-for-two-days-from-tomorrow/

India: Manipur blocks nearly all Internet access (mobile, broadband) following riots

- **~7 days** (Sep 2-8)
- **Location:** Manipur (statewide)

- Seemingly wider blanket ban than in Gujarat – all broadband connections except some BSNL lines (despite earlier suggestions that only FB and WA). First time in Manipur
- Seems like they happen where there's a military operation
- Protests erupted after 3 laws passed restricting residency and land ownership rights of non-Manipuris.
- Ethnic/tribal communities dominate in hilly areas. Hindus in valley. Tribal landowners worried they might be dispossessed
- http://scroll.in/article/753108/why-a-blanket-ban-on-the-internet-in-troubled-manipur-is-not-a-good-idea

India: Gujarat forces another mobile shutdown in Navsari district

- **2 days** (Sep 12-13)
- **Location:** Gujarat (Navsari district)
- March of Hardik Patel and his organization

India: Gujarat forces another mobile shutdown in Surat

- **1 day** (Sep 19)
- **Location:** Gujarat (Surat)
- Hardik Patel detained by police for violating protest ban
- https://timesofindia.indiatimes.com/india/Hardik-Patel-arrested-in-Surat-mobile-internet-banned/articleshow/49028314.cms

October 2015

Congo Brazzaville: Large shutdown purportedly to quash protests

- **10 days** (Oct 20-29)
- **Location:** Nationwide
- https://motherboard.vice.com/en_us/article/kb7ew9/congo-government-allegedly-shuts-off-internet-service-to-squash-protests

India: J&K mobile Internet suspended in Jammu when carcasses of cows found

- **1 day** (Oct 8)
- **Location:** J&K (Jammu)

India: Meghalaya blocks Internet in Garo Hills to prevent spread of inflammatory messages

- **1 day** (Oct 11)
- **Location:** Meghalaya (Garo Hills)

- Voting period of Garo Autonomous District Council (GHADC)
- https://www.northeasttoday.in/internet-blocked-in-garo-hills/

India: Gujarat suspends in Rajkot amid Hardik Patel threats to conduct protest in stadium

- **2 days** (Oct 17-18)
- **Location:** Gujarat (Rajkot)

India: Gujarat forces another internet shutdown in Bhilwara

- **1 day** (Oct 24)
- **Location:** Gujarat (Bhilwara)
- Communal tension over killing of a Muslim youth
-

November 2015

India: Mobile services suspended in Kashmir ahead of Modi's visit

- **1 day** (Nov 7)
- **Location:** Kashmir
- Until end of rally
- http://www.bgr.in/news/mobile-internet-services-suspended-in-kashmir/

China: Mobile services cut in Xinjiang for residents evading Great Firewall

- **1 day?** (Nov 24)
- **Location:** Xinjiang
- Duration unknown, not a classic shutdown
- Use of VPNs and other circumventing software as official cause; citizens had to go to local police station to have service restored (cyberpolice)
- Restoration on case-by-case basis; duration is a conservative estimate, difficult to classify as a traditional shutdown
- http://www.nytimes.com/2015/11/24/business/international/china-cuts-mobile-service-of-xinjiang-residents-evading-internet-filters.html?_r=3

December 2015

India: Rajasthan blocks mobile Internet services indefinitely in some districts

- **1 day?** (Dec 21), but certainly longer

- **Location:** Rajasthan (Nagaur, Dungarpur, Udaipur, Bhilwara, others – locations of protests. Shutdown might have been statewide)
- Followed communal clashes in several districts
- "Social networking apps and websites should not be allowed to disturb the communal harmony in the state."
- http://www.medianama.com/2015/12/223-rajasthan-internet-block/

Brazil: First WhatsApp block

- **1 day** (Dec 16)
- **Location:** Nationwide
- https://www.theguardian.com/technology/2015/dec/17/whatsapp-blocked-brazil-48-hours-facebook

Pakistan: Mobile Internet suspended after intelligence reports about security threats

- **1 day** (Dec 11)
- **Location:** Islamabad
- http://www.dawn.com/news/1225699

January 2016

DRC: Internet and SMS banned for 20 days

- **20 days** (Jan 19 – Feb 7)
- **Location:** Nationwide?
- Protests against Kabila turn ugly in Kinshasa
- Social media blocked, others as well judging by Google Search stats
- 4% of DRC citizens have Internet (March 2017), but digital tools are frequently used for political purposes (e.g., opposition parties and groups use WhatsApp to organize rallies)
- Google network traffic also recorded slowdowns for several days before and after elections (November 27, 2015) – specifically Nov 24 – Dec 3. These incidents are not reported anywhere else.
- http://www.wsj.com/articles/congo-blocks-internet-access-amid-protests-against-president-kabila-1421938042
- https://cipesa.org/2017/03/the-evolution-of-internet-shutdowns-in-dr-congo/
- https://www.google.com/transparencyreport/traffic/explorer/?r=CD&l=WEBSEARCH&csd=1433341101510&ced=1463961346156

India: Kashmir blocks mobile Internet for several hours for Republic Day

- **1 day** (Jan 26)
- **Location:** J&K (Kashmir)

February 2016

Uganda: Social media and mobile money services blocked across Uganda for Election Day

- **3 days?** (Feb 18-21)
- **Location:** Nationwide
- Twitter and WhatAapp at least, but Google does not report dip in total traffic
- MTN Uganda announced on Twitter: "The UCC has directed MTN to disable all Social Media & Mobile Money services due to a threat to Public Order & Safety"
- Museveni later said the block was supposed to stop users from "telling lies."
- http://globalnetworkinitiative.org/news/gni-condemns-election-day-shutdowns-social-media-uganda

India: Haryana blocks mobile Internet and SMS in some districts

- **4 days** (Feb 19-22) [AN]
- **Location:** Haryana (Jhajjar, Panipat, Sonipat, Hisar, Rohtak, Jind, Bhiwani)
- Jat community protests demanding reservations turned violent
- http://www.medianama.com/2016/02/223-haryana-blocks-mobile-internet/

India: Rajasthan (one district) shuts down Internet amid Jat community agitations

- **1 day** (Feb 22-23)
- **Location:** Rajasthan (Bharatpur district)
- https://www.hindustantimes.com/jaipur/rajasthan-bharatpur-burns-in-jat-quota-fire/story-6E1TGDJKYmpy2LxrGILLfJ.html

India: Gujarat bans mobile Internet to prevent cheating in an exam

- **1 day** (Feb. 28)
- **Location:** Gujarat (Bharatpur)
- Revenue Accountants Recruitment Exam, block implemented to prevent cheating
- 3rd time blocked since September 2015
- http://timesofindia.indiatimes.com/city/ahmedabad/Banks-suffer-Rs-1500-cr-loss-as-internet-shut-down-due-to-Patidar-agitation/articleshow/51888620.cms
- http://www.medianama.com/2016/02/223-gujarat-bans-mobile-internet-to-prevent-cheating-in-an-exam/

India: Gujarat (one district) blocks mobile Internet services for 12 hours during Patidar women's conference

- **1 day** (Feb. 28)
- **Location:** Gujarat (Mehsana)
- Patidar Anamat Andolan Samiti (PAAS) women's conference took place despite being refused permission by district government.

March 2016

Morocco: VoIP ban (Skype, WhatsApp, Viber)

- **241 days** (March 9 – Nov 4)
- **Location:** Nationwide
- Motive: only public telecom networks should be used; communication apps eat into revenues
- http://www.wamda.com/2016/01/impact-voip-ban-morocco-on-the-economy-and-entrepreneurship

Republic of Congo: Total communications blackout (election)

- **3 days** (March 20-23)
- **Location:** Nationwide
- Mobile phone + SMS + Internet service, at least 48 hours, to prevent "illegal" reporting of election results
- President Denis Sassou Nguesso (who "won" the election) has been in power for most of the last 32 years
- More possible slowdowns in April, recorded in only one source (Google Transparency Report)
- http://www.aljazeera.com/news/2016/03/congo-media-blackout-presidential-elections-160320044041238.html
- Same in January (DRC): http://www.wsj.com/articles/congo-blocks-internet-access-amid-protests-against-president-kabila-1421938042

Pakistan: Mobile services suspended in Islamabad and Rawalpindi

- **3 days** (March 21-23)
- **Location:** Islamabad, Rawalpindi
- Mobile *phone* service, although Internet was also unstable in some areas

- Claimed reason: to foil attempts by terrorists to sabotage dress rehearsal for Pakistan Day
- http://propakistani.pk/2016/03/21/mobile-phone-services-suspended-in-isbrwp-for-pakistan-day-rehearsals/

Pakistan: Mobile services (SMS, telephony, partial Internet) blocked in Islamabad for sit-in

- **4 days** (Mar 28-31)
- **Location:** Islamabad ("within 10 km radius of sensitive locations")
- Cause: Pro-Mumtaz Qadri sit-in. Qadri was an Elite Police commando hanged in February for the 2011 assassination of Governor of Punjab Salmaan Taseer, who had spoken in support of a Christian woman sentenced to death for blasphemy (Asia Bibi).
- https://propakistani.pk/2016/03/31/telcos-customers-lost-millions-due-to-cellular-network-shutdown-in-islamabad/

Ethiopia: Twitter and WhatsApp down after unrest

- **~30 days** (Mar 12? – Apr 12?)
- **Location:** Oromia region + others
- Exact number of days unknown, but in place for at least one month.
- Didn't work for more than a month on state-owned Ethio Telecom
- Protests began in November over marginalization of largest ethnic group in Ethiopia
- Security forces shot dead 266 demonstrators, according to Ethiopia Human Rights Project
- Government spokesperson says it may be "erratic" connection, and it's not a policy
- https://www.addistar.com/2016/04/12/twitter-whatsapp-down-in-ethiopia-oromia-area-after-unrest/

April 2016

India: Mobile Internet shutdown in Jammu & Kashmir (5 districts)

- **5 days** (Apr 14-18)
- **Location:** North Kashmir, Srinagar, Pulwama (South Kashmir)
- Protests over deaths of 4 people in clashes with security forces
- Jammu and Kashmir had suspended Internet for 2 days following beef ban
- http://www.medianama.com/2016/04/223-mobile-internet-suspended-kashmir/

India: Mobile Internet shutdown in Gujarat after Patidar reservation agitation (Gujarat)

- **3 days** (Apr 17-19)
- **Location:** Gujarat (Ahmedabad, Mehsana, Surat, Rajkot)

- The shutdown came on April 18 amid the "Jail Bharo Andolan," demanding the release of several Patidar activists.
- Gujarat = 13% of India's net and mobile transactions
- 10% of all transactions in Gujarat take place through Internet and mobile banking.
- First Mehsana, then Ahmedabad, Surat, and Rajkot
- Affected areas have a combined population of 9.48 million people
- http://timesofindia.indiatimes.com/city/ahmedabad/Banks-suffer-Rs-1500-cr-loss-as-internet-shut-down-due-to-Patidar-agitation/articleshow/51888620.cms
- http://www.bgr.in/news/internet-services-blocked-in-gujarat-after-patidars-clash-with-police/

India: Jharkhand blocks Internet services in city of Bokaro during celebrations after communal clashes

- **3 days** (Apr 16-18)
- **Location:** Jharkhand (Bokaro City)
- Communal clashes during celebrations of Ram Navami shortly before. Block to prevent spreading of fear and hatred through social media.
- https://timesofindia.indiatimes.com/city/ranchi/Internet-services-blocked-in-Bokaro-after-communal-tension/articleshow/51856786.cms

Chad: Internet cut after tense elections

- **2 days** (April 9-11)
- **Location:** Nationwide
- Mobile first, then all
- Reminiscent of Congo shutdown
- http://www.thecitizen.co.tz/News/Internet-remains-cut-in-Chad-after-tense-elections/-/1840340/3156880/-/1331m1f/-/index.html

North Korea: Twitter, Facebook, YouTube, and others blocked "temporarily"

- **275** days (Apr 1-Dec 31) in 2016
- **Location:** Nationwide
- "For a certain period of time." Services previously available in select locations to foreigners. Visiting foreigners now might be scared to use VPN
- South Korea also blocked North Korea Tech, which actually reports on digital abuses in NK
- Unconventional ban given nearly non-existent access to Internet for general population
- http://www.northkoreatech.org/2016/04/02/north-korea-blocking-twitter-south-korea-blocking/

May 2016

Brazil: WhatsApp blocked for 72 hours amid corruption case

- **3 days** (May 2-4)
- **Location:** Nationwide
- Judge was seeking data for case (under seal) involving organized crime and drug trafficking
- Same judge that ordered the arrest of WhatsApp executive Diego Dzodan
- Concern that Congress may pass laws weakening digital privacy: one measure calls for Internet companies to remove content deemed critical of politicians within 48 hours, another for the arrest of users that violate a site's terms of use
- December: Judge in São Paulo ordered telecom carriers to block WhatsApp for 48 hours for non-compliance w/ police eavesdropping requests in a separate criminal drug case. That ban was overturned the same day.
- https://theintercept.com/2016/05/02/100-milhoes-de-brasileiros-estao-sem-whatsapp-gracas-a-um-juiz-estadual/
- http://www1.folha.uol.com.br/mercado/2016/05/1766869-justica-determina-bloqueio-do-whatsapp-em-todo-o-brasil-por-72-horas.shtml

Uganda: Social media blocked ahead of Museveni's inauguration

- **1 day** (May 12)
- **Location:** Nationwide
- Ugandan Communications Commission (UCC) ordered ISPs to block social media ahead of inauguration
- Facebook, Twitter, WhatsApp, and Viber affected
- OONI HTTP request tests showed shutdown was inconsistent (Smile Telecom blocked both secured and unsecured HTTP, Orange blocked only unsecured Facebook and Twitter)
- https://globalvoices.org/2016/05/11/social-media-access-blocked-in-uganda-ahead-of-president-musevenis-inauguration/
- https://ooni.torproject.org/post/uganda-social-media-blocked/

Iraq: Internet blocked for several hours to prevent 6th-graders from cheating

- **10 days** (May 14, 15, 16, 26, 28, 30; Jun 2, 4, 6, 8)
- **Location:** Nationwide
- Second year in a row gov't has ordered telecoms to shut down Internet to prevent cheating

- Iraq shutdowns in 2016 do not take into account very intermittent service for the rest of the year, which could have been the result of intentional disruptions
- "Madory explains that ITPC, which is run by the communications ministry, sells bandwidth to ISPs who use the country's "backbone" to "communicate to the outside world and within the country". This, he says, is a "single point of failure" that the government can use to turn the internet off with impunity."
- Kurdish ISPs typically unaffected by Iraq's shutdowns given extensive sovereignty
- http://www.wired.co.uk/article/iraq-internet-blackout-censorship
- http://www.theatlantic.com/technology/archive/2016/05/iraq-shut-down-its-internet-to-prevent-sixth-graders-from-cheating

India: Internet shutdown in Uttar Pradesh as preventive measure against expected riots

- **3 days** (May 16-18)
- **Location:** Uttar Pradesh (Azamgarh district)
- First time broadband and mobile were both shut down
- Social media "used actively to spread misleading reports" (Azamgarh district magistrate)
- http://timesofindia.indiatimes.com/city/lucknow/Internet-blocked-in-riot-hit-Azamgarh/articleshow/52300964.cms
- http://www.medianama.com/2016/05/223-internet-shut-down-azamgarh/

Vietnam: Facebook blocked amid protests in reaction to massive water pollution

- **~7 days** (May 16-22)
- **Location:** Hanoi, Saigon?
- Millions of dead fish have washed up on the oceanic shores of Vietnam
- Probable perpetrator: Formosa Plastics (Taiwan)
- Hundreds of people protesting
- Reports of blocking during Obama's visit (May) appear to be false; some sources (AN) claim one localized and one nationwide shutdown
- http://sflc.in/internet-shutdown-tracker-india-2013-2016/
- https://www.privateinternetaccess.com/blog/2016/06/vietnams-temporary-facebook-ban-forced-vietnamese-use-options/

Saudi Arabia: Facebook Messenger calling service blocked, much like many others

- **234 days** (May 12-Dec 31) in 2016, **497 days** (May 12, 2016 – Sep 20, 2017) total
- **Location:** Nationwide
- Duration is a rough estimate. Multiple VoIP apps have been blocked or throttled since 2013, starting with Viber. Ban lifted in Sep 2017 on most or all apps, but technically blocking began much earlier than May 2016

- https://advox.globalvoices.org/2016/09/07/angered-by-mobile-app-censorship-saudis-ask-whats-the-point-of-having-internet/

Ethiopia: Nationwide blackout for exams

- **9 days** (May 30-Jun 8)
- **Location:** Nationwide
- Ongoing Oromo protests as well, but official reasoning was exams
- https://globalvoices.org/2017/06/01/ethiopia-imposes-nationwide-internet-blackout/

June 2016

India: Haryana (Sonipat district) mobile Internet and bulk SMS shutdown

- **1 day?** (Jun 4)
- **Location:** Haryana (Sonipat)
- Follows call for reservations from Jat community + preceded violence that occurred the next day
- http://www.medianama.com/2016/06/223-mobile-internet-ban-sonipat/

India: Haryana (Rohtak district) blocks mobile and SMS services; Jat agitation

- **1 day?** (Jun 5) [length unknown]
- **Location:** Haryana (Rohtak)

India: Jammu and Kashmir cuts off mobile Internet following violent protests

- **4 days** (Jun 15-18)
- **Location:** Jammu & Kashmir (entire state)
- Triggered by incident where Muslim youth pelted stones at temple; protestors then turned on police
- http://www.medianama.com/2016/06/223-mobile-internet-block-jammu/

Algeria: Social media blocked to beat exam cheats

- **1 day** (June 19)
- **Location:** Nationwide
- Initial session marred by online leaking, so almost half the students forced to retake high school final exams (baccalauréat)
- http://www.bbc.com/news/world-africa-36570808?ocid=socialflow_twitter

Bahrain: Mobile networks shut down before protests → Nightly 'Internet curfew' in Duraz

- **192 days** (Jun 23-Dec 31), **ongoing in 2017**
- **Location:** Duraz + neighboring villages

- 3G and 4G shut down across all ISPs
- Fixed-line networks and Wi-Fi hotspots remain online ("throttling of cell towers"?)
- Reports only, no network tests
- 7 pm to 1 am daily until November and possibly longer
- Method: Disabling cell towers + dropping about 90% of packets on fixed-line connections
- Batelco, Zain, and Viva likely disrupting fixed-line and mobile data services, possibly under order from government
- Background: Duraz is the home of a prominent Shia cleric (Sheikh Isa Qassim) recently stripped of his citizenship, provoking peaceful protests
- Authorities do not admit to it
- Bahrain Watch estimates cost to residents at about $265,000 in total (3)
- Technical study by Bahrain Watch: https://bahrainwatch.org/blog/2016/08/03/bahrain-internet-curfew/
- https://www.accessnow.org/coalition-calls-bahrain-sneakily-shutting-internet/
- https://bahrainwatch.org/blog/2016/11/10/duraz-internet-shutdown-has-cost-residents-more-than-100000-bahraini-dinars-about-265000-usd/
- http://www.middleeasteye.net/news/bahrain-launches-cyber-war-shia-protest-village-1331912910

India: Jammu area shuts down mobile Internet before annual wrestling competition

- **1 day** (Jun 22)
- **Location:** Jammu & Kashmir (Jammu)
- People injured at same competition in 2014 following dispute over wrestling bouts occurring on burial grounds
- https://www.accessnow.org/internet-disrupted-bahrain-around-protests-wrestling-match-sparks-shutdown-india/

India: Mobile Internet suspended in Poonch district of Jammu & Kashmir

- **1 day** (Jun 22)
- **Location:** Jammu & Kashmir (Poonch)
- "Operational and security grounds and to [protect] law and order" (SFLC)
- http://www.greaterkashmir.com/news/pir-panjal/mobile-internet-services-snapped-in-poonch/221112.html

Pakistan: Federally Administered Tribal Area suffers shutdown in wake of armed clashes

- **203 days** (Jun 21-Dec 31). 450+ days (2016-17)
- **Location:** FATA

- 3G/4G mobile services targeted in area of already sparse Internet
- Clashes at Torkham border btwn Pakistani and Afghan forces (June 11, 2016)
- All 7 agencies (regions) of FATA affected
- Loopholes include border connections (Afghanistan) and broadband, but broadband is about 5% and requires approval by both political authorities and military
- Constitutionally, FATA is not an integrated part of Pakistan, so many of the constitutional provisions – including access to basic necessities and compulsory education – are not in force for citizens. In fact, a British law from 1901 – the Frontier Crimes Regulation – still deprives these people of fundamental human rights
- People in FATA were using Internet to raise awareness about issues like lack of electricity or injustice by security forces
- Families unable to talk to relatives working abroad, education, women, journalists have to travel long distances to send reports via Internet
- Recent announcement: 3 tribal agencies will have 3G back soon, but "technical complications" will probably make it impossible in rest for a couple of years
- Both sources below suggest there was a "stern protest demonstration" in wake of shutdown
- http://www.slate.com/articles/technology/future_tense/2017/08/the_internet_has_been_shut_down_in_pakistan_s_fata_for_more_than_a_year.html
- http://www.radiotnn.com/govt-decides-to-restore-cellular-internet-services-in-fata/

India: Rajasthan suspends mobile Internet after 1 death when police fired at crowd

- **2 days** (Jun 30 – Jul 1)
- **Location:** Rajasthan (Barmer, Jaisalmer)
- Calls for Bandh from community of the person killed

Iraq: Baghdad flips the switch on social media amid fears of protest

- **1 day?** (Jun 4)
- **Location:** Baghdad
- https://www.middleeastmonitor.com/20160604-baghdad-shuts-down-social-media/

Turkey: Social media throttled after suicide attack on Istanbul airport

- **2 days** (Jun 28-29)
- **Location:** Nationwide
- http://www.reuters.com/article/us-mideast-crisis-socialmedia-idUSKCN0ZM2O3

July 2016

Ethiopia: Facebook and other social media (including YouTube) blocked for exams

- **5 days** (July 9-13)
- **Location:** Nationwide
- After university entrance exams posted online
- Twitter, Facebook, Instagram, Viber
- First time social media has been blocked nationwide
- https://www.ifex.org/ethiopia/2017/06/06/internet-shutdown/

Zimbabwe: #ThisFlag: WhatsApp possibly blocked on some networks amid countrywide protests

- **1 day?** (Jul 6)
- **Location:** Nationwide
- Government puts out foreboding notice warning social media users of serious repercussions
- Points out that social media will not be blocked but will penalize those that spread rumors
- Countrywide 'shutdown' (#ThisFlag movement) – stay-away protest, businesses remain closed
- **Aftermath:** Government raises prices on cell phone data (knock-on effect on WhatsApp), continues to push legislation expanding police capacity to intercept data, seize equipment, and make arrests on loose charges of terrorism (5)
- Background (technology)**:** Mobile Internet skyrocketed during previous national unity gov't (2009-13), during which Nelson Chamisa served as Minister of Information, Communication, and Technology. Cost of SIM cards went from $180 to 50 cents + import duties removed + other policy changes = massive increase in cell phone use. 2010-2016: from 5 to 50% internet access (government sources), mostly cell phone
- 2015: WhatsApp data packages accounted for 34% of all mobile data used (government sources). Facebook was second (3%). WhatsApp requires less bandwidth, so it's also used in rural areas (Mugabe's traditional stronghold)
- Mugabe: "It's an Internet of dirty and filthy language," he said. "I just hear these things as I am told by others. I have no perception nor any interest of wanting to have direct links with the Internet."
- 1) http://www.techzim.co.zw/2016/04/zimbabwean-government-wont-ban-social-media-will-penalise-abuse/#.V45dVLgrLIU
- 2) https://www.washingtonpost.com/news/monkey-cage/wp/2016/07/15/did-recent-protests-in-zimbabwe-really-go-from-tweets-to-streets/

- 3) http://www.techzim.co.zw/2016/07/heres-zimbabwean-governments-warning-social-media-abuse/
- 4) ICT minister responds to queries on #ThisFlag + cybercrime bill on Twitter: http://www.techzim.co.zw/2016/08/ict-minister-takes-twitter-defend-proposed-social-media-clampdown-zimbabweans-question-proposed-cybercrime-laws/#.V8s6FpgrLIU
- 5) http://www.nytimes.com/2016/10/03/world/africa/zimbabwe-robert-mugabe-whatsapp.html?_r=0
- 6) https://mg.co.za/article/2016-07-06-zimbabwe-government-blocks-whatsapp-as-workers-stay-away-1

India: Jammu & Kashmir blocks mobile Internet following killing of Burhan Wani

- **176 days** (Jul 9-Dec 31), **203 days** (total); but mobile Internet restored in Jammu on Jul 26, post-paid mobile Internet restored in Kashmir Valley on Nov 19, and finally prepaid restored Jan 27, 2017
- **Location:** Pulwana district, Ananatnag, Shopian, Pulgam, Sopore [all towns], part of Srinagar
- Mobile Internet + calls
- All telecom providers blocked except state-run BSNL and landlines – and even those are blocked in North Kashmir, where violence led to several deaths
- E-commerce companies report not being able to transact business
- Business impact
    - ***Kashmir Courier Association (Zahoor Qari, head):*** Flourishing online businesses completely collapsed, courier companies suffering "daily losses of Rs 30-40 lakh [$45-60,000]." 25 courier companies employ about 1,000 people in Kashmir, but all sitting idle now.
    - ***Kashmir Box (Muheet Mehraj, CEO), e-commerce website***: Major losses, not able to promote or sell products online; backlog only.
    - ***Shahid Mohammad*** (entrepreneur selling Kashmiri garments): Not able to work
    - ***Private telecom***: Crores of rupees (1 crore Rs = ~$160,000) daily.
- Background: Killing of Burhan Wani, young commander of Hizbul Mujahideen in Kashmir, popular on social media. Attacks on Kashmiri drivers amid Amarnath land row (+ beef ban)
- Cable TV and newspaper offices also suspended: http://www.presstv.ir/Detail/2016/07/17/475615/India-Kashmir-newspaper-offices
- http://www.firstpost.com/india/kashmir-unrest-no-cell-phones-no-commodities-no-news-and-nowhere-to-go-2898790.html
- http://tribune.com.pk/story/1142158/analysis-kashmiris-voice-muzzled-offline-online/

- http://dailytimes.com.pk/pakistan/18-Jul-16/indian-held-kashmir-shutdown-enters-11th-day
- http://www.kashmirmonitor.in/Details/109888/the-closed-network

Turkey: Various disruptions (throttling) to Internet access amid attempted coup

- **1 day?** (Jul 15)
- **Location:** Nationwide
- No evidence of mechanism for blocking and hard to disentangle blocking from severe throttling
- Networks seem to have implemented some blocking *independent of each other*, even if an order was issued (which is uncertain)
- Internet traffic volume for CloudFlare slashed by approx. 50% on July 15, but other services didn't share traffic data
- Interestingly, Turkey was one of the countries that just recently promoted the HRC resolution against blocking and throttling of internet traffic
- June: Kill-switch amendment to security law passed. As a result, BTK (Turkey's ICT regulator) can now "partially or entirely" suspend Internet access due to war / national security; ministerial oversight no longer needed
- https://motherboard.vice.com/en_us/article/bmvdj4/turkey-throttled-social-media-during-coup-in-evolution-of-internet-censorship-twitter-youtube-facebook
- https://turkeyblocks.org/2016/08/25/social-media-blocked-turkey/
- Technical latency and anomaly study: https://labs.ripe.net/Members/emileaben/internet-access-disruption-in-turkey (RIPE Atlas, OONI)

Brazil: WhatsApp blocked for the third time in 7 months

- **1 day** (Jul 19)
- **Location:** Nationwide
- Judge Daniela Barbosa (Rio) issues order for Brazil's 5 mobile carriers to block following "non-compliance"
- Previous blocks by judges in Alagoas and São Paulo
- https://www.theguardian.com/world/2016/jul/19/whatsapp-ban-brazil-facebook

Iraq: Internet shut down for four hours in response to mass protests in Baghdad

- **1 day** (Jul 15)
- **Location:** Nationwide
- Protests are against rampant corruption, but nature of shutdown uncertain
- http://www.circleid.com/posts/20160715_internet_shut_down_in_iraq_in_response_to_mass_protests/

- https://twitter.com/akamai_soti/status/753936880593412096

Syria: Two complete shutdowns in quick succession; unexplained

- **1 day** (Jul 31)
- **Location:** Nationwide
- https://twitter.com/akamai_soti/status/759932757959139329

August 2016

Bangladesh: Internet shutdown drill

- **1 day** (Aug 1)
- **Location:** Dhaka
- Around Dhaka; response to Holey Artisan Bakery attack – apparently a test for crisis situations
- http://www.thedailystar.net/country/drill-shutting-down-internet-today-1262737

Ethiopia: Total Internet shutdown amid violent protest

- **5 days** (Aug 5-9), access to Internet seemingly restored after 2 days, but social media shutdown continued
- **Location:** Oromia
- Protests sparked by Addis Ababa City Integrated Master Plan, which aims to expand territorial limits of the capital into neighboring Oromo towns, possibly displacing millions of Oromo farmers and bringing the Oromo countryside under the Tigray-dominated government
- Blackout was probably not total – just certain regions, networks, or key websites, according to data
- 400+ deaths since November 2015
- http://blog.cipit.org/2016/08/10/ethiopia-internet-shutdown-amidst-recent-protests/

Syria: Internet shut down for 4 hours, probably for exams

- **1 day** (Aug 11)
- **Location:** Nationwide
- National high school exams (Chemistry final) – make-up
- Past years: questions start appearing on social media 30-60 minutes before exam
- Similar cheating blackouts observed in Iraq (at least twice), Algeria, Uzbekistan, and Gujarat
- Ninth time since Jul 31, according to Dyn
- http://research.dyn.com/2016/08/syria-goes-to-extremes-to-foil-cheaters/

Mali: Twitter and Facebook blocked after Bamako protests

- **3 days?** (Aug 17-19)
- **Location:** Nationwide
- #MaliOffline for at least one day, authorities do not admit to it
- Journalist Ras Bath (Mohamed Bathily) arrested the day before, leading to protests
- Government claimed it could have been a technical problem
- Other recent events in Africa: Uganda, Burundi, Chad, Niger, Republic of Congo
- http://www.rfi.fr/afrique/20160818-twitter-facebook-suspendus-mali-manifestation-ras-bath-bamako
- http://www.mfwa.org/mali-social-media-blackout/

Gabon: Internet completely shut down at night following disputed presidential election

- **29 days** (full shutdown for 4 days, Aug 31-Sep 4; rest Aug 31-Sep 28)
- **Location:** Nationwide
- Internet curfew (6 pm to 6 am), total or throttled
- Facebook, Twitter, WhatsApp blocked at all times
- "Longest interruption since Libya during the Arab Spring"
- Later at least three more 'Internet curfews' from 7 pm to 5 am on 3 consecutive days
- Incumbent Ali Bongo defeated Jean Ping in elections widely considered fraudulent
- Infrastructure: Only Gabon Telecom has international connection; other operators depend on it. Low overall resilience. Ownership: 51% Maroc Telecom, 49% Gabon
- Speed of access limited; computers that tried to access the Internet from Gabon had to share 0-18% of remaining bandwidth
- Number of Psiphon and VPN users spiked into the thousands
- Bongo claimed Internet "jammed up" as citizens massed onto network
- http://internetwithoutborders.org/fr/internet-bandwidth-limited-by-the-government-in-gabon/
- http://money.cnn.com/2016/09/16/technology/internet-censorship-blackouts-gabon/
- http://www.liberation.fr/planete/2016/09/05/gabon-debrancher-internet-le-reflexe-de-l-autocrate_1484703

Turkey: Twitter, YouTube, Facebook blocked by throttling from all ISPs

- **1 day** (Aug 25)
- **Location:** Nationwide
- All leading landlines ISPs in Turkey (TTNet, Uyudet, Superonline) as well as mobile carriers (Turkcell, Vodafone, Avea) complied; Instagram blocked by Superonline only
- 7 hours between 8/25 and 8/26

- No known connection to regional/national emergency
- Unconfirmed reports of power cuts. Military operations against IS also taking place on Syrian border
- https://turkeyblocks.org/2016/08/25/social-media-blocked-turkey/

India: Jammu & Kashmir suspends mobile Internet for part of day

- **1 day** (Aug 5)
- **Location:** Jammu region
- Bandhs declared in Chenab Valley to show solidarity with protests in Kashmir

India: Bihar shuts down all Internet services after video of desecration of Hindu deities goes viral

- **3 days** (Aug 6-8)
- **Location:** Saran district
- Communal clashes followed video
- https://www.indiatoday.in/india/story/bihar-clashes-between-two-community-in-saran-district-after-desecration-video-goes-viral-333653-2016-08-06

India: Arunachal Pradesh shuts down mobile for 2 days after death of former Chief Minister

- **2 days** (Aug 10-11)
- **Location:** Arunachal Pradesh (Itanagar)
- https://scroll.in/article/813798/fearing-backlash-congress-leaders-stay-away-from-funeral-of-ex-arunachal-chief-minister-kalikho-pul

India: Jammu & Kashmir adds ban on broadband services to mobile ban already in place

- **5 days** (Aug 13-17)
- **Location:** Kashmir Valley

Pakistan: Government suspends mobile services in more than 40 cities on Independence Day

- **1 day** (Aug 14)
- **Location:** Lahore, Karachi, Islamabad, Rawalpindi, Faisalabad, Multan, Gujranwala, Quetta, Peshawar, Sialkot, Mianwali, Sargodha, Sukkur, Bahawalpur, Jhang, Gujrat, Muzzafarabad.
- http://www.killswitch.pk/?q=node/50

September 2016

Turkey: Internet access in largely Kurdish Southeast completely blocked

- **1 day** (Sep 11)
- **Location:** Southeast (not precise; Southeastern Anatolia?)

- Landline and mobile Internet in 15 cities (~12 million people)
- 4 hours
- Background: 28 elected mayors dismissed amid post-coup crackdown
- https://turkeyblocks.org/2016/09/11/internet-shutdown-turkey-southeast/

Pakistan: Mobile phone service cut in Rawalpindi and parts of Islamabad for Defense Day

- **2 days** (Sep 5-6)
- **Location:** Rawalpindi, Islamabad
- http://www.killswitch.pk/?q=node/51

Egypt: Internet, SMS, and telephony blocked in Sinai Peninsula

- **3 days** (Sep 17-19)
- **Location:** Sinai Peninsula
- Possible intention was to prevent remotely detonated bombs and disrupt militants
- Reports of shutdowns since 2014
- https://advox.globalvoices.org/2016/09/22/netizen-report-internet-shutdowns-are-ever-present-in-egypts-sinai-peninsula/

India: Fixed-line Internet suspended in Jammu & Kashmir as precautionary measure against violence

- **6 days** (Sep 12-17)
- **Location:** Kashmir
- Mobile still banned

India: Internet blocked for 24 hours in Rajasthan after stabbing of young girl

- **1 days** (Sep 16)
- **Location:** Rajasthan (Bhilwara)
- https://timesofindia.indiatimes.com/city/jaipur/Internet-blocked-in-Bhilwara-to-curb-spread-of-rumours/articleshow/54369844.cms

India: Uttar Pradesh suspends Internet in a district after clashes

- **3 days** (Sep 18-20)
- **Location:** Uttar Pradesh (Bijnor district)
- Clashes due to alleged harassment of a schoolgirl
- https://www.indiatoday.in/mail-today/story/internet-curfew-up-bijnor-communal-clashes-harassment-341691-2016-09-18

October 2016

Iraq: Mobile Internet disconnected every morning for more than a week (exams)

- **8 days** (Oct 1-8)
- **Location:** Nationwide
- Order to all ISPs to disconnect every day 1-8 Oct 6-9 am for 3rd round of 6th grade placement exams
- Communicated in text message to all users
- https://twitter.com/DynResearch/status/783019684698423296

Montenegro: WhatsApp, Viber, and others blocked on Election Day

- **1 day** (Oct 17)
- **Location:** Nationwide
- Regulator ordered telecom operators to prevent use of messaging applications to prevent "unwanted communication" (spam, misinformation and disinformation, potentially mass messages on behalf of candidates/parties)
- Unblocked at 7 pm, after polling stations closed
- https://globalvoices.org/2016/10/17/whatsapp-and-viber-blocked-on-election-day-in-montenegro/

Pakistan: Cell phone services suspended across Pakistan during Muharram procession

- **2 days** (Oct 11-12)
- **Location:** Federal capital, all provincial capitals, Gilgit-Baltistan, Azad-J&K [nationwide?]
- 52 cities, 2 days
- Some cities experienced only partial suspension in sensitive areas
- Islamabad, all provincial capitals, Gilgit-Baltistan, Azad Jammu and Kashmir
- Preemptive
- http://www.dawn.com/news/1289270/cellphone-services-to-be-suspended-across-pakistan-during-muharram-processions

Ethiopia: Mobile Internet (and possibly more) shut off amid Oromo / anti-government protests

- **65 days** (Oct 8 – ~Dec 11?) [social media]
- **Location:** Nationwide?
- Internet slowed down until early December; didn't fully recover. YouTube seemed to barely be available for those months
- 55 killed over previous weekend (stampede + government forces may have opened fire)
- No official explanation

- Government previously blocked Internet in August + accused opposition of using Facebook and Twitter to organize protests
- State of emergency continued into December; some reports (3) claim ban on telecommunications, media, and Internet did too
- 1) http://qz.com/801390/american-citizen-killed-in-ethiopia-after-bloody-stampede-in-irreecha-thanksgiving-festival-lead-to-more-protests-and-arrests/
- 2) http://www.bbc.com/news/live/world-africa-37390903?ns_mchannel=social&ns_source=twitter&ns_campaign=bbc_live&ns_linkname=57f4d418e4b02d6ccd557c59%26Internet%20blocked%20in%20Ethiopia%26&ns_fee=0#post_57f4d418e4b02d6ccd557c59
- 3) http://abbaymedia.com/ethiopia-internet-users-continue-to-receive-bills-for-the-service-despite-the-government-shutdown/

Syria: Internet and social media down in Aleppo

- **6 days** (Oct 26 – Nov 2)
- **Location:** Aleppo
- Possibly government-directed blackout during rebel offensive; could also have been an accidental cable cut by a Russian ship
- https://www.thedailybeast.com/did-a-russian-ship-cut-syrias-internet-cables

India: Mobile Internet and bulk SMS suspended in Maharashtra amid protest after alleged rape

- **3 days** (Oct 10-12)
- **Location:** Maharashtra (Nashik)
- https://www.hindustantimes.com/india-news/mobile-internet-services-suspended-in-protest-hit-nashik/story-chybNWRPW1j7mH0onDhJON.html

India: Bihar blocks mobile and broadband amid violent clashes

- **6 days** (Oct 15-20)
- **Location:** Bihar (Bhojpur, East Champaran, Gopalganj)
- https://timesofindia.indiatimes.com/city/patna/Internet-services-remain-suspended-in-many-districts-of-Bihar/articleshow/54872666.cms

November 2016

Turkey: WhatsApp, Facebook, Twitter, and others blocked amid detention of pro-Kurdish leaders

- **1 day?** (Nov 4)
- **Location:** Nationwide
- WhatsApp, Twitter, Facebook, YouTube

- Background: 11 MPs from pro-Kurdish Peoples' Democratic Party (HDP) detained
- Skype and Instagram also affected
- First WhatsApp block in Turkey
- Parallel to arrest of editor of *Cumhuriyet*, Turkey's oldest daily newspaper
- http://www.telegraph.co.uk/technology/2016/11/04/turkey-blocks-access-to-whatsapp-facebook-and-twitter/

Gambia: Internet shutdown on eve of elections

- **3 days** (Nov 30 – Dec 2)
- **Location:** Nationwide
- Yahya Jammeh implemented 3-day shutdown before, during, and after election
- Complete Internet shutdown + international calls blocked
- Shutdown lifted on Dec 2 (Jammeh concedes), though Jammeh later refused to step down
- Background: Jammeh had been the ruler of the Gambia – the smallest country in mainland Africa – since 1994 (22 years), only the second president since independence in 1970
- https://www.accessnow.org/gambia-shuts-internet-eve-elections/
- https://qz.com/850002/gambias-government-has-shut-down-the-internet-on-the-eve-of-elections/

December 2016

Turkey: Facebook, Twitter, and WhatsApp blocked after assassination of Russian ambassador

- **2 days** (Dec 19-20)
- **Location:** Nationwide
- Users experience slowdowns, though not all users
- Most popular ISP (TTNet) not yet affected
- Turkish PM: "From time to time for security reasons we can use such measures," but "everything returns to normal" once danger passes
- http://www.telegraph.co.uk/technology/2016/12/20/turkey-blocks-access-facebook-twitter-whatsapp-following-ambassadors/?utm_source=dlvr.it&utm_medium=twitter

DRC: Internet services shut down as Kabila's term ends

- **~10 days** (Dec 19-28)
- **Location:** Nationwide
- Joseph Kabila has refused to step down at the end of his second term, eventually delaying elections until 2018
- Pre-announced directive to block social media to curb possible unrest (which did occur)

- Clearly affected YouTube as well
- Journalists arrested during clampdown
- http://www.africanews.com/2016/12/20/live-dr-congo-kabila-s-new-cabinet-teargas-gunfire-and-diaspora-protests/

India: Jammu & Kashmir suspends mobile services in places amid gunfight with militants

- **1 day** (Dec 8)
- **Location:** Anantnag (and other parts)

India: Rajasthan suspends in Bhilwara – communal tensions during Muslim religious function

- **1 day** (Dec 13)
- **Location:** Rajasthan (Bhilwara)
- Barawafat (Milad-un-Nabi) Festival

India: Manipur blocks in two districts amid turmoil due to economic blockade

- **13 days** (Dec 18-30)
- **Location:** Manipur (East Imphal, West Imphal)
- Blockade by United Naga Council (UNC)

India: Rajasthan disrupts again in Bhilwara

- **1 day** (Dec 19)
- **Location:** Rajasthan (Bhilwara)

India: Rajasthan once again disrupts in Bhilwara

- **4 days** (Dec 27-31)
- **Location:** Rajasthan (Bhilwara)
- Citizens' group had called for city-wide Bandh re: lack of action taken against accused of communal tensions
- https://timesofindia.indiatimes.com/city/jaipur/Net-services-suspended-due-to-strike-in-Bhilwara/articleshow/56191803.cms

January 2017

(**Saudi Arabia:** Communication app shutdown continues)

- **263 days** (Jan 1 – Sep 20)
- **Location:** Nationwide

(**Bahrain:** Duraz Internet curfew continues)

- **365 days** (Jan 1 – Dec 31)

- **Location:** Duraz

(**Pakistan:** FATA shutdown continues)

- **365 days** (Jan 1 – Dec 31)
- **Location:** FATA
- http://www.radiotnn.com/suspension-of-mobile-phone-services-creates-problems-for-tribesmen/

Cameroon: Complete three-month Internet shutdown in Anglophone regions following protests

- **93 days** (Jan 17 – April 20)
- **Location:** Northwest and Southwest Regions
- Possibly Africa's longest total shutdown to date, extensively covered by the media
- Buea and Bamenda are the largest cities in the two regions
- Sparked by separatist protest
- https://www.ifex.org/cameroon/2017/11/20/internet-shutdown/
- https://twitter.com/EricAcha1/status/821473982360809472
- https://www.bbc.com/news/world-africa-39665244

Philippines: Cell phone service (incl. data) shut down in Cebu for several days for various celebrations

- **6 days: 2 days** (Black Nazarene; Jan 9-10); **2 days** (Sinulog; Jan 14-15; *at least*); **2 days** (Dinagyang; Jan 21-22, 6 am – 2 pm; Iloilo City, Mandurriao, Jaro, La Paz, Bo. Obrero)
- **Location:** Cebu City [see above]
- Feast of Black Nazarene, Santo Niño (part of Sinulog), Sinulog parades. Sinulog was the biggest of the three
- PNP (Police) sent request to NTC
- Cite security reasons (potential IEDs)
- Government agencies plan to communicate through handheld radios in similar future situations
- Bomb scare in Cebu in November; terrorist attack (bomb) in December
- Mayor apologized on Facebook
- Some ATMs with trouble connection to network (esp. if away from branch)
- Simulation exercise assumed there would be signal jammers installed or cell sites shut down
- Uncertainty regarding how many cell sites were shut off
- Overbroad: events took place in Cebu and Mandaue cities but cell sites switched off in Lapu-Lapu, Talisay, south to Minglanilla and north to Consolacion / Liloan
- Technically we can count this as three separate events, esp. Dinagyang, which was in Iloilo City

- http://cebudailynews.inquirer.net/118868/pnp-asks-ntc-shut-cell-signal-sinulog
- http://www.ibtimes.ph/sinulog-festival-cebu-network-shutdown-philippines-5755
- http://pldt.com/news-center/article/2017/02/23/network-shutdowns-explained#.Wct0PsiGPDc
- https://www.rappler.com/nation/159055-cellular-network-shutdown-dinagyang-2017

Philippines: Cell phone service shut down in Cebu for Miss Universe swimsuit contest

- **2 days** (Jan 17-18, *from 4 am*)
- **Location: Lapu-Lapu City** (Mactan Island)
- Collateral effects reported in areas outside Lapu-Lapu. Officially a resort and waterpark as well as the internationall airport
- Unlike previous case, users not warned
- "*To suspend service in defined areas, we switch off cell sites serving these places. However, the signal of some cell sites in areas farther away may, for various technical reasons, also reach the shutdown zone. For example, some cell sites in higher elevations. We are thus compelled to shut down these cell sites as well.*"
- http://cebudailynews.inquirer.net/119511/netizens-not-informed-miss-u-signal-shut-outside-lapu-lapu

India: Nagaland disrupts mobile Internet services for at least 10 days

- **33 days** (Jan 19 – Feb 20) [AN], other sources claiming 20 days
- **Location:** Nagaland (Wokha, Phek)
- Additional shutdown implemented on Jan 30, some uncertainty in timing
- https://www.medianama.com/2017/02/223-nagaland-internet-block/
- http://www.thehoot.org/digital-media/internet-shutdowns-become-chronic-10463

India: Jat agitation in Haryana

- **2 days** (Jan 19-20) [AN]
- **Location:** Haryana (Jhajjar)
- Only registered in one source (AN), possibly a false flag

India: Jat agitation in Haryana

- **1 day?** (Jan 31)
- **Location:** Haryana (Rohtak, Bhiwani, Hisar, Sonipat, Panipat)
- http://www.newindianexpress.com/nation/2017/jan/29/jats-resume-quota-stir-in-several-parts-of-haryana-1564797.html
- http://www.tellyserialupdates.com/haryana-jat-agitation-news-30th-january-2017-rohtak-high-alert-internet-blocked/

February 2017

Gabon: Brief outage of unknown origin

- **1 day** (Feb 18-19)
- **Location:** Nationwide?
- 8 ASNs (~40% of IP address prefixes) down
- Cause unknown, outage occurred on the evening of the 18th
- Source: Google traffic data + Akamai SotI 2017 Section 9, which tied it to political turmoil

Iraq: Internet shut down to prevent cheating on 6th-grade placement exams

- **7 days** (Feb 1-8) [AN]
- **Location:** Nationwide
- https://www.accessnow.org/despite-everything-iraq-still-shutting-internet-school-exams-2017/
- https://advox.globalvoices.org/2017/02/07/why-are-we-still-doing-this-iraq-shuts-down-internet-to-prevent-exam-cheating-for-the-third-time/

India: Haryana (Rohtak)

- **3 days** (2/17 – 2/19) [SFLC]
- **Location:** Haryana (Rohtak)
- AN has no end date and says it began 2 days later

Pakistan: Balochistan begins prolonged mobile shutdown

- **312 days** (Feb 23 – Dec 31)
- **Location:** Balochistan (Chamman (Chaman) / Qila Abdullah (Qilla Abdullah), Turbat, Pishin, Qalat, Kharan, Panjgur, Dalbandin)
- Mobile services suspended across state, but morphed along the way
- No motive given, but suspicion is to combat militants
- http://digitalrightsmonitor.pk/mobile-internet-in-dalbandin-suspended-after-brief-resumption/

India: 2G, 3G, 4G, and GPRS suspended in Sonipat for "security"

- **2 days** (Feb 25-26)
- **Location:** Haryana (Sonipat)
- http://www.tribuneindia.com/news/haryana/internet-services-suspended-in-sonepat/369471.html

March 2017

India: Haryana Jat agitation

- **2 days** (Mar 18-19)
- **Location:** Rohtak, Sonipat, Jhajjar, Bhiwani, Panipat, Hisar, Kaithal, Charkhi Dadri, Fatehabad, Jind, Sirsa
- https://timesofindia.indiatimes.com/city/chandigarh/jat-stir-section-144-imposed-internet-services-suspended-in-haryana/articleshow/57709854.cms

Pakistan: Islamabad and Rawalpindi shut down mobile signal for Pakistan Day

- **5 days** (Mar 19-23)
- **Location:** Islamabad
- It is reported that Internet services were not restored in the city of Dalbandin for at least six months following this disconnection (see second link)
- http://www.killswitch.pk/?q=node/58
- http://www.pakvoices.pk/citizens-of-dalbandin-furious-over-internet-shutdowns/

Belarus: Mobile Internet shut down in Minsk and ≥1 regional capital for "Freedom Day" protests

- **1 day** (Mar 25)
- **Location:** Minsk, Brest
- https://freedomhouse.org/report/freedom-net/2017/belarus
- http://www.svaboda.org/a/28390548.html

India: Clash in Sikir district leads to mobile shutdown

- **1 day?** (Mar 31)
- **Location:** Rajasthan (Sikar)
- https://indianexpress.com/article/india/rajasthan-sec-144-imposed-mobile-internet-suspended-after-clash-in-sikir-district-4593891/

April 2017

Egypt: All VoIP services blocked

- **1 day?** (Apr 25? –) *[not much further information]*
- **Location:** Nationwide
- 3G also blocked in Sinai for 1 day during counterterrorist operation
- May have to do with complaints from telecoms about unfair VoIP competition

- Amid restrictive emergency law, which introduced state of emergency and gave sweeping powers to govt, including monitoring communications and raiding / shutting down media outlets.
- https://qz.com/967857/egypt-is-blocking-calls-on-whatsapp-facetime-viber-and-skype/

India: Mobile and broadband blocked in J&K to curb spread of rumors ahead of by-election

- **6 days** (Apr 8-13); initially only 3 districts, then all of valley. Broadband restored Apr 11, then suspended again on Apr 13 in light of re-polling in one district (only to be restored).
- **Location:** Kashmir Valley
- Imposed to curtail election campaigning, according to Human Rights Watch
- By-elections in Budgam (see below) took place on Apr 9.
- During unrest that occurred in the midst of this incident, a Major of the Indian Army used a man as a human shield by tying him to a jeep in order to allow a military convoy rescuing civilians from a polling station in Budgam to escape. The video went viral on the April 14, after the shutdown had ended, and its popularity triggered further protest.
- http://kashmirreader.com/2017/04/25/internet-fully-restored-within-3-days-police/
- https://timesofindia.indiatimes.com/india/internet-services-in-kashmir-valley-to-be-suspended-till-april-12/articleshow/58096701.cms

India: Internet suspended in Bhadrak amid communal violence over blasphemy against Hindu gods

- **3 days** (Apr 9-11)
- **Location:** Odisha (Bhadrak)
- http://www.newindianexpress.com/states/odisha/2017/apr/10/internet-shut-down-in-bhadrak-for-48-hours-post-communal-violence-1591981--1.html

India: Mobile Internet suspended yet again in J&K amid protests against police in Pulwama district

- **13 days** (Apr 17-29)
- **Location:** Kashmir Valley
- Clashes had taken place btwn students and police
- Network restored after instructions given to suspend 22 social media sites + apps on all platforms
- https://kashmirreader.com/2018/06/19/train-service-internet-suspended-in-south-kashmir/
- https://economictimes.indiatimes.com/tech/internet/social-media-ban-lifted-apps-restored-in-kashmir/articleshow/58867423.cms

India: Internet shut down in Udaipur (Rajasthan) after "religiously abusive" Facebook post

- **2 days** (Apr 18-19)
- **Location:** Rajasthan (Udaipur, Fatehnagar)
- http://timesofindia.indiatimes.com/city/jaipur/net-banned-in-udaipur-after-abusive-post-on-facebook/articleshow/58271116.cms

India: Concerns over Facebook post prompt 48-hour ban in Odisha

- **3 days** (Apr 19-21)
- **Location:** Odisha (Kendrapara)
- https://timesofindia.indiatimes.com/city/bhubaneswar/internet-service-suspended-in-odishas-kendrapara/articleshow/58263104.cms

India: J&K state government orders mobile shutdown for a month amid widespread riots

- **31 days** (Apr 27 – May 27)
- **Location:** Kashmir Valley
- https://www.firstpost.com/india/kashmir-unrest-state-govt-orders-suspension-of-internet-services-for-a-month-3406428.html

May 2017

Ukraine: VKontakte, Odnoklassniki, and Mail.ru banned

- **231 days** (May 15 – Dec 31?)
- **Location:** Nationwide
- VK and Odnoklassniki are Ukraine's top social networks; both are Russian
- Kaspersky services also suspended
- https://www.economist.com/europe/2017/05/19/ukraine-bans-its-top-social-networks-because-they-are-russian

India: Deadly caste violence prompts shutdown and arrests in Uttar Pradesh

- **10 days** (May 24 – Jun 3)
- **Location:** Uttar Pradesh (Saharanpur)
- Dalits had thrown stones at upper-caste Rajpur Hindus' houses and were attacked in retaliation
- https://www.aljazeera.com/news/2017/05/saharanpur-blocks-internet-caste-violence-170525103014935.html

India: Jammu & Kashmir suspends Internet services after killing of Hizbul Mujahideen commander

- **6 days** (May 27 – Jun 2)

- **Location:** Kashmir Valley
- Precautionary measure; commander was Sabzar Ahmad Bhat
- https://www.tribuneindia.com/news/jammu-kashmir/mobile-internet-services-suspended-in-kashmir/413570.html

Ethiopia: Internet shut down to stop Grade 10 exam cheating

- **9 days** (May 30 – Jun 8)
- **Location:** Nationwide
- https://qz.com/994990/ethiopia-shut-down-the-internet-ahead-of-a-scheduled-countrywide-national-exams/

Syria: Nationwide Internet disruptions over course of two weeks for exams

- **14 days** (May 30 – Jun 13)
- **Location:** Nationwide
- Oracle (Dyn) reports nine disruptions in this period
- https://blogs.oracle.com/internetintelligence/2017-internet-intelligence-roundup

June 2017

Congo Brazzaville: Alleged accidental shutdown due to cable damage

- **6 days** (Jun 9-14 or Jun 9-24); damage cleared up by June 25, but slowdowns continued
- **Election** (legislative) July 16
- Government claim: fishing vessel off Pointe-Noire snapsped submarine cable, thus cutting off Congo from West Africa Cable System (WACS), no evidence given though
- Protests in June and July led to gov't forbidding public gatherings
- October 2015: constitutional referendum crisis – removed presidential term limits and enabled Sassou Nguesso to "win" the election
- This led to mass protest and the arrest of opposition leaders + civil society
- Nguesso also launched military offensives in the Pool region, which surrounds Brazzaville; Pool is largely populated by ethnic Lari, who oppose the government
- Pastor Ntoumi's militia has also recently launched several offensives, which have killed government soldiers
- Note: this shutdown is not included in the dissertation data because multiple reports suggest it may have indeed been a technical failure
- http://africanarguments.org/2017/06/20/something-is-happening-in-congo-brazzaville/
- https://www.undispatch.com/internet-blackout-congolese-taking-streets-brazzaville-heres/
- http://www.africanews.com/2017/06/27/internet-connection-restored-in-congo-brazzaville-after-15-days/

Ethiopia: Week-long shutdown for exams

- **8 days** (May 30 – June 7)
- **Location:** Nationwide
- Service partially restored after 3 days
- Social media remained blocked
- https://phys.org/news/2017-06-ethiopia-mobile-internet-week.html

India: Maharashtra suspends Internet in Nashik after farmer protests turn violent

- **1 day** (Jun 5)
- **Location:** Maharashra (Nashik)
- https://www.hrw.org/news/2017/06/15/india-20-internet-shutdowns-2017

India: Madhya Pradesh suspends Internet after farmers protest for higher produce prices

- **6 days** (Jun 6-11)
- **Location:** Madhya Pradesh (Mandsaur, Ratlam, Ujjain, Neemuch, Indore, Dewas)
- First shutdown in MP
- https://www.hrw.org/news/2017/06/15/india-20-internet-shutdowns-2017

India: J&K government suspends mobile Internet after killing of civilian by security forces

- **3 days** (Jun 7-9) [AN]
- **Location:** Kashmir Valley
- https://www.hrw.org/news/2017/06/15/india-20-internet-shutdowns-2017

Iraq: Another shutdown to prevent exam cheating

- **7 days** (Jun 7-13)
- **Location:** Nationwide
- https://twitter.com/InternetIntel/status/870278975716831232

India: Uttar Pradesh suspends Internet in Saharanpur amid violence

- **5 days** (Jun 8-12)
- **Location:** Uttar Pradesh (Saharanpur)
- https://www.financialexpress.com/india-news/saharanpur-violence-minutes-after-bhim-armys-chandrashekhar-arrested-authorities-suspend-internet-services/708019/

Algeria: Internet shut down for high school exams

- **8 days** (Jun 12-19)
- **Location:** Nationwide
- Similar measure announced on Jun 21
- https://www.middleeastmonitor.com/20170612-algeria-blocks-internet-access-to-prevent-exam-cheats/

India: J&K suspends train service and 3G/4G Internet following clashes in Arwani village

- **4 days** (Jun 16-19) [AN: 14-20]
- **Location:** Kashmir Valley [AN: just Pulwama]
- CASO (Cordon and Search Operation) in Arwani
- https://kashmirreader.com/2017/06/16/3g-4g-internet-services-suspended-kashmir/

India: West Bengal shuts down Internet amid clashes in Gorkhaland

- **8 days** (Jun 18 + Jun 20-26) [AN: 47 days, Jun 18 – Aug 3; link broken]
- **Location:** West Bengal (Darjeeling)
- Deadly clashes between Gorkha Janmukti Morcha (GJM) supporters and police
- https://www.hindustantimes.com/india-news/gorkhaland-protest-darjeeling-internet-ban-may-extend-people-say-curbs-are-oppressive/story-84y8FZvgmifxKQcGROVQuN.html

India: Rajasthan shuts down Internet in two districts after Rajput protest killing of gangster

- **6 days** (Jun 30 – Jul 5)
- **Location:** Rajasthan (Nagaur, Churu) [SFLC does not mention location]
- Gangster in question was Anandpal Singh, killed in an encounter with police in Churu district
- http://www.thehoot.org/story_popup/internet-shutdowns-have-become-chronic-now-10196

July 2017

Iraq: Government cuts Internet every day for three weeks during high-school exams

- **~20 days** (Jul 2-Jul 23)
- **Location:** Nationwide
- https://www.accessnow.org/despite-everything-iraq-still-shutting-internet-school-exams-2017/

India: J&K suspends Internet in Anantnag

- **1 day** (Jul 1)
- **Location:** J&K (Anantnag)
- http://www.greaterkashmir.com/news/kashmir/south-kashmir-encounter-mobile-internet-services-shut-in-anantnag/253564.html

India: J&K suspends Internet in Kashmir Valley after three civilians killed by security forces

- **4 days** (Jul 6-9)
- **Location:** Kashmir Valley

- https://www.business-standard.com/article/pti-stories/internet-services-suspended-in-most-parts-of-kashmir-118070700500_1.html

India: J&K suspends mobile and broadband Internet amid "Kashmir awareness" campaign
- **1 day** (Jul 10)
- **Location:** Kashmir Valley
- https://www.news18.com/news/india/internet-services-suspended-in-kashmir-1457457.html

India: J&K suspends Internet in Jammu
- **3 days** (Jul 10-12) [AN: 10-25]
- **Location:** J&K (Jammu)

India: J&K
- **3 days?** (Jul 16-18?)
- **Location:** Kashmir Valley
- Actually two separate shutdowns – first mobile on 16th (restoration unknown), then broadband on 18th (restoration unknown)

China: WhatsApp services disrupted (particularly non-text content), fears of partial block
- **174 days** (Jul 11 – Dec 31?)
- **Location:** Nationwide
- New cybersecurity laws
- https://www.news18.com/news/india/internet-services-suspended-in-kashmir-1457457.html

Pakistan: Youm-e-Ali (martyrdom anniversary of Hazrat Ali ibn Ali Talib)
- **1 day?** (Jul 17)
- **Location:** Karachi, Hyderabad

India: J&K suspends Internet in Bugdam
- **4 days** (Jul 21-24)
- **Location:** J&K (Bugdam)
- Restored early on the 25th

Morocco: Slow or non-existent Internet connection during economic and corruption protests
- **1 day?** (Jul 20)
- **Location:** Al-Hoceima
- Also arrests of journalists covering 'million-man march' protest
- https://www.accessnow.org/morocco-complete-blackout-protests-al-hoceima/

- https://www.reuters.com/article/us-morocco-protests/moroccan-police-fire-tear-gas-to-disperse-protests-in-north-idUSKBN1A52JK

India: J&K suspends Internet in Pulwama after two militants killed in Tahab shootout

- **4 days?** (Jul 30 – Aug 2) [SFLC doesn't specify end date, AN does]
- **Location:** J&K (Pulwama)
- Protests erupted in Samboora and Tahab
- https://www.greaterkashmir.com/news/kashmir/tahab-gunfight-internet-services-shut-in-pulwama-clashes-erupt/256187.html

Syria: Alleged shutdown for exams

- **16 days** (Jul 28 – Aug 12)
- **Location:** Nationwide
- Source: Access Now, Oracle Internet Intelligence

North Korea: Cell phone service shut down during military parade, mass dance, fireworks event

- **1 day** (Jul 29)
- **Location:** Pyongyang
- Two separate but related incidents; 3G (for foreigners) and calls (for locals) affected
- https://www.nknews.org/2017/04/north-korea-shut-down-cellphone-network-twice-on-saturday/

August 2017

DRC: Government orders slowdown to prevent sharing of images amid clashes

- **~5 days** (~Aug 8-12)
- Clashes between gov't and anti-gov't Bundu dia Kongo sect (at least 14 dead), esp. on Aug 7
- Request to affect Facebook, WhatsApp, Instagram, YouTube, and Twitter
- YouTube traffic shows significant decrease; Google Search data do not, though a slowdown or other restriction seems to have taken place in early September
- http://www.africanews.com/2017/08/08/drc-opposition-observes-national-shutdown-government-blocks-social-media//
- http://www.kinshasatimes.cd/en/drc-government-orders-social-media-shutdown/

Iraq: Periodic shutdowns continue for at least 3 days, likely for exams

- **3 days?** (Aug 26-28)
- **Location:** Nationwide

- https://www.accessnow.org/despite-everything-iraq-still-shutting-internet-school-exams-2017/

India: J&K suspends mobile Internet after top militant commander's death

- **2 days** (Aug 1-2)
- **Location:** J&K (Kashmir Valley)
- Militant commander (Abu Dujana) belonged to Lashkar-e-Toiba
- https://economictimes.indiatimes.com/news/politics-and-nation/mobile-internet-services-suspended-across-kashmir-valley/articleshow/59860448.cms

India: J&K suspends Internet in Baramulla after 3 militants killed in Sopore

- **1 day?** (Aug 5)
- **Location:** J&K (Baramulla)
- http://www.greaterkashmir.com/news/kashmir/sopore-gunfight-cellular-mobile-internet-services-snapped-in-baramulla/256762.html

India: J&K suspends mobile Internet in Pulwama on most networks after Tral gunfight

- **1 day?** (Aug 9)
- **Location:** J&K (Pulwama)
- Service not suspended on state-owned Bharat Sanchar Nigam Limited
- http://www.greaterkashmir.com/news/kashmir/tral-gunfight-cellular-mobile-internet-services-snapped-in-pulwama/257131.html

India: J&K suspends Internet after army encounter with militants in Shopian

- **1 day?** (Aug 13)
- **Location:** J&K (Shopian, Kulgam)
- Three militants and two soldiers killed
- https://kashmirobserver.net/2017/local-news/3-militants-2-soldiers-killed-shopian-21849

India: J&K suspends Internet in Kashmir Valley for Independence Day

- **1 day** (Aug 15)
- **Location:** J&K (Kashmir Valley)
- http://www.tribuneindia.com/news/jammu-kashmir/i-day-internet-mobile-phone-services-suspended-in-kashmir/452460.html

India: J&K suspends Internet in Pulwama after killing of Lashkar-e-Taiba commander Ayub Lehlari

- **1 day?** (Aug 16)
- **Location:** J&K (Pulwama)

- http://www.greaterkashmir.com/news/kashmir/internet-services-snapped-in-pulwama-after-killing-of-let-commander-ayub-lelhari/257804.html

India: J&K suspends Internet in Pulwama after Fidayeen militants storm police lines

- **1 day?** (Aug 26)
- **Location:** J&K (Pulwama)
- http://www.uniindia.com/news/states/mobile-internet-service-suspended-in-pulwama/971057.html

Pakistan: Independence Day flag-hoisting ceremony

- **1 day** (Aug 14)
- **Location:** Islamabad
- Source: KillSwitch.pk

India: Punjab, Chandigarh, and Haryana all suspend Internet ahead of verdict in rape case

- **6 days** (Aug 24-29)
- **Location:** Punjab (entire state)
- Dera rape case involving Ram Rahim Singh
- Counted as one shutdown in dataset
- http://www.newindianexpress.com/nation/2017/aug/24/dera-chief-rape-case-verdict-mobile-internet-services-suspended-in-punjab-haryana-1647697--1.html

September 2017

Togo: Complete blackout of social media (and possibly more) amid massive protests

- **7 days** (Sep 5-11)
- Protesters demanding president Faure Gnassingbé step down
- Protests began ~August
- Gov't bent to protesters by introducing term limits, but protesters demand resignation
- AN estimated costs at $1.8 million
- Hashtags: #TogoDebout, #AskCina (Cina Lawson, Minister of Posts and Digital Economy)
- http://www.africanews.com/2017/09/06/togo-records-huge-turnout-at-anti-govt-protest-despite-internet-setback/
- https://www.theguardian.com/global-development/2017/sep/21/no-business-no-boozing-no-casual-sex-when-togo-turned-off-the-internet

Togo: Slowdown on whole network (bandwidth reduced) + WhatsApp block + SMS block

- **1 day?** (September 19 –?)
- Two weeks after first blackout

- People are using VPNs (Turbo, Cyberghost) to circumvent
- https://qz.com/1083741/togo-has-blocked-whatsapp-again-to-gag-anti-government-protests/

Pakistan: Three days of mobile shutdown for Ashura / Muharram

- **3 days?** (Sep 29 – Oct 1)?
- **Location:** Karachi, Hyderabad, Shaheed Benazirabad, Khairpur, Sukkur, Larkana, Shikarpur, Jaccobabad. In Balochistan: Quetta, Mach, Bolan, Sibi, Jhal Magsi, Naseerabad, Jaffarabad, Dera Murad Jamali, Dera Allah Yar
- **Location (alt):** Punjab, Singh, Balochistan (Karachi + 7 other cities); cities of Bahawalnagar, Faisalabad, Quetta, Gilgit-Baltistan
- First day along procession route; next two large-scale, total ban
- http://mediamatterspakistan.org/cellular-and-internet-services-remained-suspended-in-various-cities-across-pakistan-in-the-wake-of-ashura-gsm-tracker-enabled-cars-stranded-millions-affected/

India: Haryana suspends Internet in Sirsa during "sanitization" of Dera Sacha Sauda sect

- **3 days** (Sep 8-10)
- **Location:** Haryana (Sirsa district)
- https://economictimes.indiatimes.com/news/politics-and-nation/mobile-internet-services-suspended-in-sirsa/articleshow/60422462.cms

India: Rajasthan suspends Internet in Jaipur after deadly clashes

- **1 day?** (Sep 9)
- **Location:** Rajasthan (Jaipur city)
- https://www.tribuneindia.com/news/nation/1-dead-in-violent-clashes-in-jaipur-internet-suspended-curfew-imposed-at-4-places/464490.html

India: Rajasthan suspends Internet (mobile, Wi-Fi, broadband) after farmers' protests

- **1 day?** (Sep 11)
- **Location:** Rajasthan (Sikar)
- https://www.news18.com/news/india/sikar-standoff-farmers-lay-siege-to-collectorate-internet-services-shut-1515473.html

India: Bihar suspends Internet in Nawada after various communal clashes

- **39 days** (Sep 28 – Nov 5)
- **Location:** Bihar (Nawada)
- https://www.hindustantimes.com/india-news/internet-services-suspended-after-tension-grips-bihar-s-nawada/story-2calpmcLIMdGhb5uGlyUAK.html

India: Bihar suspends Internet in 7 districts; communal violence after discovery of cow carcasses

- **1 day?** (Sep 5)
- **Location:** Bihar (Saharsa, Madhepura, Supaul, Purnia, Katihar, Araria, Kishanganj)
- http://www.india.com/news/india/tejashwi-yadav-tweets-up-a-storm-says-internet-banned-in-flood-affected-bihar-districts-2451217/

India: Tripura suspends Internet in Agartala city after journalist hacked to death

- **5 days** (Sep 21-25)
- **Location:** Tripura (Agartala city)
- https://www.outlookindia.com/website/story/internet-services-suspended-in-tripura-after-journalist-santanu-bhowmik-hacked-t/301994

India: J&K suspends Internet in Baramulla after killing of militant commander Abdul Najar

- **1 day?** (Sep 26)
- **Location:** J&K (Baramulla district incl. Sopore town)
- http://www.greaterkashmir.com/news/kashmir/najar-killing-aftermath-internet-service-suspended-in-sopore-baramulla/261359.html

India: J&K suspends Internet after Sopore gunfight and unrest

- **3 days?** (Sep 9-11)
- **Location:** J&K (Kulgam, Anantnag, Baramulla)
- http://www.greaterkashmir.com/news/kashmir/gunfight-rages-in-sopore-in-north-kashmir-internet-suspended-schools-closed/259772.html

India: J&K suspends Internet in Kupwara after civilian is killed

- **1 day?** (Sep 4?)
- **Location:** J&K (Kupwara)
- http://kashmirglory.com/gns-impact-internet-restored-kupwara-30220/

India: J&K suspends Internet in Shopian and Kulgam

- **1 day?** (Sep 2)
- **Location:** J&K (Shopian, Kulgam)

October 2017

Spain: Possible throttling or shutdown in areas around some polling stations (Catalan referendum)

- **1 day?** (Oct 1)

- **Location:** Tarragona (Centro Cívico Cotxeres de Sants de Barcelona, IES Antoni de Martí i Franquès de Tarragona) – largest polling stations in Tarragona
- Some controversy regarding origin
- Other Internet censorship via other methods (DNS blocking of website) widespread
- http://www.europapress.es/catalunya/noticia-guardia-civil-corta-conexion-internet-puntos-votacion-electoral-20171001094529.html

India: Bihar suspends Internet during communal tension

- **5 days** (Oct 1-5)
- **Location:** Bihar (Arwal, Jamui, Bhojpur, Katihar, Sitamarhi, West Champaran)
- http://kashmirglory.com/gns-impact-internet-restored-kupwara-30220/

Pakistan: 13 Muharram procession

- **1 day?** (Oct 4)
- **Location:** Kot Diji, others?

Pakistan: Arrival of Jeep rally in Islamabad

- **1 day** (Oct 23)
- **Location:** Islamabad, Rawalpindi
- http://www.killswitch.pk/?q=node/70

Cameroon: Messaging services (Facebook, Twitter, WhatsApp) shut down following new protests

- **92 days** (Oct 1 – Dec 31); 59 days in 2018 (Jan 1 – Feb 28); **151 days total**
- **Location:** Northwest and Southwest regions
- Not as complete as previous shutdown, but highly disruptive to communication, with most communication channels except calls and text unavailable
- Government initially claimed it had no plans to disrupt communication
- https://qz.com/1091516/cameroon-internet-shut-down-as-southern-cameroons-ambazonia-protests-grow-in-bamenda-buea/
- https://www.ifex.org/cameroon/2017/11/20/internet-shutdown/
- https://www.accessnow.org/shutdown-ended-cameroonians-still-feeling-impact/
- https://monitor.civicus.org/newsfeed/2017/10/10/deadly-repression-protests-partially-shut-down-internet/

November 2017

India: Jammu & Kashmir suspends Internet in Pulwama after militant is killed

- **1 day?** (Nov 2)
- **Location:** J&K (Pulwama)

- http://kashmirglory.com/militant-killed-army-man-injured-ongoing-samboora-encounter-internet-suspended-pulwama-32994/
- https://www.tribuneindia.com/news/jammu-kashmir/soldier-killed-3-militants-gunned-down-in-pulwama-encounter/493409.html

Somalia: Somaliland announces plans to shut down Internet for presidential elections

- **5 days** (Nov 13-17)
- Lasted until results were announced
- https://www.hrw.org/news/2017/11/10/shuttering-social-media-during-somalilands-elections
- http://allafrica.com/stories/201711130095.html
- http://www.africanews.com/2017/11/12/somaliland-s-planned-social-media-blockade-during-election-challenged-in-court//
- http://www.somalilandpress.com/human-rights-centre-condemns-the-blockage-of-hadhwanaagnews-website/
- https://pinigeria.org/paradigm-initiative-statement-on-social-media-shutdown-in-somaliland/

Equatorial Guinea: Internet shut down across the country during elections

- **8 days** (Nov 11-18)
- **Location:** Nationwide
- Google data suggest practically no connectivity
- Opposition members arrested
- https://www.egjustice.org/post/government-blocks-internet-and-arrests-opposition-during-elections

India: Jammu & Kashmir suspends Internet in Tral after militant is killed

- **3 days** (Nov 20-22)
- **Location:** J&K (Tral)
- http://www.greaterkashmir.com/news/kashmir/militant-killing-shutdown-in-tral-internet-continues-to-remain-shut/266662.html
- http://thekashmirhorizon.com/2017/11/22/shutdown-second-consecutive-day-militant-killing-tral-internet-services-restored-2/

Pakistan: Cell service suspended for Chehlum of Hazrat Imam Hussain

- **1 day?** (Nov 10)
- **Location:** Karachi, Hyderabad, Peshawar, Quetta
- http://www.killswitch.pk/?q=node/71

Pakistan: Facebook, YouTube, and Twitter blocked amid protest crackdown

- **2 days** (Nov 25-26)
- **Location:** Nationwide
- News channels also blocked
- Protests surrounding the omission of the Prophet Mohammad from a law
- First countrywide shutdown in Pakistan
- http://mashable.com/2017/11/25/pakistan-blocks-twitter-youtube-facebook/

India: Mobile Internet services shut down in 13 districts of Haryana

- **3 days** (Nov 24-26)
- **Location:** Haryana (Jind, Hansi, Bhiwani, Hisar, Fatehabad, Karnal, Panipat, Kaithal, Rohtak, Sonipat, Jhajjar, Bhiwani and Charkhi Dadri)
- Preventive shutdown fearing Jat violence (but there was no violence preceding it)
- Similar tactic used in August (Haryana, Punjab, and Chandigarh for 72 hours)
- https://indianexpress.com/article/india/mobile-internet-services-suspended-in-half-of-haryana-ahead-of-two-caste-rallies-4953485/

December 2017

India: Rajasthan suspends Internet in three districts

- **1 day?** (Dec 3)
- **Location:** Rajasthan (Bhilwara, Chittorgarh, Nimbahera)

India: Rajasthan suspends Internet after rallies and protests around religiously motivated murder

- **2 days** (Dec 13-14)
- **Location:** Rajasthan (Udaipur, Rajsamand)
- 'Love Jihad' case: Precautionary measure after brutal murder of Muslim laborer by Hindu man (video was posted to social media); Hindu associations announced rally in support of perpetrator

India: Telangana suspends Internet in Adilabad after Adivasi-Lambada communal violence

- **1 day** (Dec 16)
- **Location:** Telangana (Adilabad)
- First shutdown in Telangana
- https://www.thehindu.com/news/cities/Hyderabad/adivasi-lambada-rift-internet-suspended-in-adilabad/article22288914.ece

Yemen: Widespread disruptions shortly after assassination of former President Saleh

- **2 days?** (Dec 2, 7)

- **Location:** Nationwide
- First restrictions on 2nd, 3 days after violent clashes allies of turncoat ex-President Saleh and Houthis (who would be assassinated on the 4th). Preceded by social media shutdown.
- Ministry had previously threatened to shut down Internet (2015) in four governorates, then the entire country, due to fuel shortages. However, analyses from Dyn and Google suggest disruptions did indeed take place on April 13, 2015 (power outage), and between May 30 and June 1, 2015. The latter, per the Houthis, was caused by a cable cut, though media sources dispute this
- Yemen has only one ISP (YemenNet)
- https://www.ifex.org/yemen/2017/12/11/internet-shutdown-houthis/
- https://citizenlab.ca/2015/10/information-controls-military-operations-yemen/

Ethiopia: Social media blocked again in some districts amid killings during ethnic tensions

- **20 days** (Dec 12-31) [lifted in 2018, date unknown]
- **Location:** Amhara Region (parts), possibly Oromia Region, possibly nationwide
- After killing of at least 16 people in Chelenko (Oromia)
- https://qz.com/1157890/oromo-protests-ethiopia-has-blocked-social-media-sites-facebook-twitter-and-youtube/

India: J&K suspends Internet in 4 districts for security reasons (three militants killed)

- **1 day** (Dec 11)
- **Location:** J&K (Sopore, Baramulla, Handwara, Kupwara)
- After killing of three militants in Yunso village (Handwara)
- http://www.uniindia.com/news/states/mobile-internet-suspended-for-security-reasons-in-north-kashmir/1072911.html

India: J&K suspends Internet in Kupwara amid protests after taxi driver is killed by Army

- **1 day** (Dec 17)
- **Location:** J&K (Kupwara)
- https://www.firstpost.com/india/jammu-and-kashmir-protests-in-kupwara-after-civilian-gets-killed-internet-suspended-across-district-4262681.html

India: J&K suspends Internet in Tral after killing of Jaish-e-Muhammad commander Noor Trali

- **1 day?** (Dec 26)
- **Location:** J&K (Tral)
- Probably lasted longer since shutdown of businesses was still in effect as of Dec 29
- https://kashmirreader.com/2017/12/26/killing-of-jem-commander-tral-shuts-internet-train-service-suspended/

- http://www.greaterkashmir.com/news/kashmir/tral-aripal-shuts-on-third-consecutive-day/270469.html

Iraq: Kurdistan cuts off Internet amid crackdown on wave of protest of public employees (salaries)

- **1 day?** (Dec 27) [possibly longer]
- **Location:** Kurdistan (Sulaymaniyah)
- Protests are against Kurdish govt's austerity policies
- Possibly 12/20 as well
- https://iraqnewsservice.com/2017/12/kurdish-forces-arrest-scores-of-civilians-cut-off-internet-in-sulaymaniyah/
- https://iraq.liveuamap.com/en/2017/20-december-some-internet-companies-have-cut-internet-service

Iran: Various disruptions amid Iranian protests, Telegram and Instagram blocked

- **2 days** (Dec 30-31+), Telegram unblocked 1/4, Instagram unblocked 1/13
- **Location:** Several cities [pending]
- Telegram and Instagram temporarily blocked; Telegram completely banned in late April
- In 2014, hardline cleric Grand Ayatollah Nasser Makarem-Shirazi issued a fatwa against the Internet
- https://t.co/i9EqlwJW1u
- https://english.alarabiya.net/en/News/middle-east/2017/12/31/Iran-cuts-off-Internet-service-in-several-cities-as-mass-protests-erupt.html
- https://www.nytimes.com/2018/01/02/technology/iran-protests-social-media.html
- http://www.newsweek.com/iran-protests-government-control-internet-dissent-776318

DRC: Internet and phone services cut ahead of anti-Kabila protests

- **2 days** (Dec 30-31+), 4 days total (Dec 30 – Jan 2)
- **Location:** Nationwide
- Election to replace Kabila scheduled for Dec 2018
- https://www.theguardian.com/world/2017/dec/30/internet-and-phone-services-cut-in-drc-ahead-of-anti-government-protests

India: Rajasthan: 2G, 3G, 4G, bulk SMS, WhatsApp, Facebook, Twitter and more shut down in Bundi

- **1 day** (Dec 31), 2 days total (Dec 31 – Jan 2)
- **Location:** Rajasthan (Bundi)
- https://www.hindustantimes.com/jaipur/internet-services-temporarily-suspended-in-rajasthan-s-bundi/story-Aegm9TH9HLuZHwmJiD3oTL.html

January 2018

Note: Numerous shutdowns that took place in Jammu & Kashmir and Rajasthan in 2018 are not accounted for here due to time constraints and large volume of cases to verify.

Continued

DRC: Anti-Kabila protests and shutdown continue

- **2 days** (Jan 1-2)
- **Location:** Nationwide
- https://qz.com/1169127/dr-congo-election-delay-seven-dead-in-anti-kabila-protests-internet-shutdown/

Iran: Telegram and Instagram remain blocked

- **13 days** (Jan 1-13), Telegram unblocked 1/4, Instagram unblocked 1/13
- *See above*

Cameroon: Anglophone shutdown continues

- *See above*

Pakistan: FATA shutdown continues

- *See above*

Pakistan: Balochistan shutdown continues

- *See above*

Ukraine: VK and Odnoklassniki ban continues

- *See above*

India: Rajasthan Bundi shutdown continues

- **1 day** (Jan 1-2), 2 days total (Dec 31 – Jan 2 *morning*)
- **Location:** Rajasthan (Bundi)

New

India: J&K suspends Internet in two districts after clashes and protests

- **3 days** (Jan 9-11)
- **Location:** J&K (Anantnag, Kulgam)
- https://www.kashmirmonitor.in/Details/140793/militant-killed-in-kokernag-gunfight-police

India: J&K, to prevent rumor-mongering during gunfight between militants and gov't in Chadoora

- **1 day** (Jan 8)
- **Location:** J&K (Budgam)
- http://www.greaterkashmir.com/news/kashmir/chadoora-gunfight-internet-service-suspended-in-budgam/271568.html

India: Maharashtra bandh called by Dalit organizations

- **1 day** (Jan 3)
- **Location:** Maharashtra (Aurangabad)
- https://www.oneindia.com/india/maharashtra-bandh-internet-services-suspended-in-aurangabad-2612897.html

India: Maharashtra applies another shutdown in Kolhapur following Dalit tension

- **1 day** (Jan 4)
- **Location:** Maharashtra (Kolhapur)
- http://www.asianage.com/metros/mumbai/040118/16-firs-registered-over-300-detained-in-mumbai-after-maharashtra-bandh.html

India: Uttar Pradesh suspends Internet is Kasganj; clashes following boy's death on Republic Day

- **2 days** (Jan 27-28)
- **Location:** Uttar Pradesh (Kasganj)
- http://www.news18.com/news/india/kasganj-49-arrested-borders-sealed-and-internet-shut-down-after-second-day-of-violence-1643427.html

DRC: Internet and SMS services blocked amid fresh anti-Kabila protests driven by Catholic leaders

- **4 days** (Jan 20-23)
- **Location:** Nationwide
- https://qz.com/1187929/maghreb-north-africa-nations-want-couscous-protected-by-unesco/

Chad: Total shutdown amid police repression during January 25 protests

- **6 days** (Jan 25-30)
- **Location:** Nationwide
- Google traffic report doesn't show a strong effect
- http://www.itwebafrica.com/ict-and-governance/367-chad/242590-chad-restores-internet-access-after-shutdown

February 2018

India: Uttar Pradesh suspends Internet in Firozabad after alleged assault by organized group

- **1 day** (Feb 16)
- **Location:** Uttar Pradesh (Firozabad)
- http://indianexpress.com/article/india/firozabad-three-bjym-members-booked-for-assaulting-police-two-muslims-5068285/

March 2018

India: Bihar suspends Internet in Bhagalpur to prevent communal riots

- **1 day?** (Mar 17)
- **Location:** Bihar (Bhagalpur)
- http://www.business-standard.com/article/politics/union-mos-ashwini-choubey-s-son-booked-for-communal-clashes-in-bhagalpur-118031900194_1.html

India: Odisha suspends Internet in Bhadrak district ahead of Ram Navami

- **2 days** (Mar 24-26)
- **Location:** Odisha (Bhadrak)
- https://timesofindia.indiatimes.com/city/bhubaneswar/internet-services-suspended-in-odishas-bhadrak-ahead-of-ram-navami/articleshow/63446249.cms

India: Bihar suspends Internet in Aurangabad to prevent Ram Navami communal violence

- **2 days** (Mar 26-27)
- **Location:** Bihar (Aurangabad)
- https://www.hindustantimes.com/india-news/prohibitory-orders-clamped-in-bihar-s-aurangabad-after-communal-clashes/story-eh0qHMNmkAsZt2oRK3cSKK.html

India: West Bengal suspends Internet in two cities after violence over Ram Navami procession

- **1 day?** (Mar 28)
- **Location:** West Bengal (Paschim Bardhaman: Asanol and Raniganj cities)
- https://internetshutdowns.in/indianexpress.com/article/india/west-bengal-internet-services-suspended-section144-crpc-clamped-in-asansol-raniganj-5115069/

India: Bihar suspends Internet in Samastipur to prevent Ram Navami communal violence

- **1 day?** (Mar 29)
- **Location:** Bihar (Samastipur)
- http://www.newindianexpress.com/nation/2018/mar/29/bihar-communal-violence-two-bjp-leaders-held-1794291.html

India: Bihar suspends Internet Nawada following communal clashes

- **1 day?** (Mar 30)
- **Location:** Bihar (Nawada)
- https://www.news18.com/news/india/idol-vandalised-in-bihars-nawada-sparks-communal-violence-again-1703689.html

Sierra Leone: Internet/phone service off after polls close in presidential election

- **1 day** (Mar 31 – Apr 1) (12 hours)
- **Location:** Nationwide
- Sources among ISPs said it was to prevent electoral bodies from sharing results with party affiliates before official announcement.
- Presidential runoff vote; rumors of assassination attempt on opposition candidate Maada Bio (SLPP).
- National Telecommunications Commission (NATCOM) denied reports that it had ordered the shutdown and pointed to an international fiber-optic cable issue, directing queries to the Sierra Leone Cable Company (SALCAB).
- https://www.bbc.com/pidgin/tori-43612522
- http://apanews.net/en/news/sleone-internet-shutdown-alleged-assassination-mar-run-off
- http://apanews.net/en/news/sleone-telecoms-regulator-denies-ordering-election-day-internet-shutdown

Chad: Facebook and WhatsApp cut off in N'Djamena + other disruptions

- **Ongoing** (Mar 28? –)
- **Location:** N'Djamena
- Rumors: triggered by dispute between cities of Amdjarass and Fada, as Amdjarass had just been declared the administrative center of the Ennedi Region [but Ennedi had been split into two regions in 2012, with the two cities as the capitals of Ennedi-Est and Ennedi-Ouest, respectively].
- Fada is the birthplace of Idriss Déby, President of Chad.
- https://www.journalducameroun.com/en/chad-restricts-internet-access-in-ndjamena/

April 2018

India: Punjab suspends Internet and other services after protests over SC/ST Act dilution

- **2 days** (Apr 1-2)
- **Location:** Punjab (entire state)
- Dalit groups calling for strike
- Only voice calls remain open

- http://www.dailypioneer.com/state-editions/chandigarh/punjab-to-shut-down-today.html

India: Madhya Pradesh suspends Internet in 3 districts during Bharat Bandh after 4 are killed

- **1 day?** (Apr 2)
- **Location:** Madhya Pradesh (Gwalior, Bhind, Morena)
- https://www.hindustantimes.com/india-news/bharat-bandh-live-mobile-internet-services-suspended-security-clampdown-in-punjab/story-4pBLmzsxGa2aRyKYBlmQ0K.html

India: Uttar Pradesh suspends Internet in 4 districts after violent protests

- **1 day** (Apr 3)
- **Location:** Uttar Pradesh (Meerut, Agra, Bareilly, Saharanpur)
- Protests were against Supreme Court's SC/ST Act ruling
- https://timesofindia.indiatimes.com/city/agra/-violence-rocks-west-up-dists-2-killed-over-500-held/articleshow/63586096.cms

India: Madhya Pradesh suspends Internet in four districts during Bharat Bandh

- **1 day?** (Apr 9)
- **Location:** Madhya Pradesh (Gwalior, Bhind, Morena, Jabalpur)
- http://www.india.com/news/india/bharat-bandh-on-april-10-heavy-security-in-madhya-pradesh-rajasthan-in-wake-of-call-for-shutdown-internet-suspended-in-sensitive-cities-2991276/

India: Uttar Pradesh suspends Internet in 2 districts amid OBC and Dalit protest

- **2 days?** (Apr 9-10)
- **Location:** Uttar Pradesh (Saharanpur, Hapur)
- http://indianexpress.com/article/india/bharat-bandh-live-updates-caste-based-reservation-sc-st-act-dalits-5131094/?#liveblogstart

India: Uttar Pradesh suspends Internet in Meerut after widespread Dalit protests

- **2 days** (Apr 14-15)
- **Location:** Uttar Pradesh (Meerut)
- https://timesofindia.indiatimes.com/india/phagwara-clashes-mobile-internet-sms-services-suspended-in-4-punjab-districts/articleshow/63762941.cms

India: Punjab suspends Internet in multiple districts after Hindu-Dalit clashes

- **3 days** (Apr 14-16)
- **Location:** Punjab (Kapurthala, Jalandhar, Hoshiarpur, Sahid Bhagat Singh Nagar)

- https://timesofindia.indiatimes.com/india/phagwara-clashes-mobile-internet-sms-services-suspended-in-4-punjab-districts/articleshow/63762941.cms

India: Punjab suspends Internet in multiple districts after death of young Dalit

- **1 day?** (Apr 29)
- **Location:** Punjab (Jalandhar, Hoshiarpur, Kapurthala, SBS Nagar)
- http://www.newindianexpress.com/nation/2018/apr/29/punjab-phagwara-again-tense-after-dalit-youth-injured-in-clash-died-mobile-internet-services-suspe-1807929.html

Appendix B

Chapter 4: Instruction Sheet for Event Classification

INSTRUCTIONS

Thanks for participating in this study. Your task is to **classify 100 protest events based on their participants**, according to a short description. Attached are an **Excel spreadsheet** with all the cases you're in charge of. For these cases, you call the shots!

•

There are **seven categories of participants**. You will find them all in the table on the next page (plus some examples). They are also listed along the top of your spreadsheet. **Make sure to read the table below carefully**, as it will save you time.

•

Category 7 includes everything that **can't be classified as anything else** – for example, when no specific actors are named ("There was a protest") or when the description is vague ("a group of men," "a group of women.")

•

When in doubt, use Google! There **will** be cases where the description will include a word, party, or organization that you don't know. **Google it!** For instance, one of the cases in the table below includes the "Adivasi Socio Educational and Cultural Association." If you google "Adivasi," you will discover that it refers to indigenous peoples in India. Therefore, it goes into the "Caste / Communal / Religious / Ethnic" category. In one example for Category 1 (Political), you're dealing with the "Shiv Sena youth brigade." Googling "Shiv Sena" will reveal that it is a political party – therefore, it goes into the Political category. **If you're dealing with an association/organization but you can't find any information about it, put it into Category 6** (Organizations / Professions). Additionally, you'll see terms such as *bandh* and *roko* – these are types of protests, but that distinction is not relevant to your task. If you are **unsure about your choice**, type in the number you think it could be and **highlight the cell in yellow**.

•

The whole thing should take **a little more than 1 hour to complete**. You will get your 2 EC points **only** if you fill out all 100!

•

If you have any questions or need more examples, feel free to **write Jan at janrydzak@email.arizona.edu**.

CATEGORIES

Pick a category for each protest based on the description. See **table below** for details and examples. **If multiple participants are named, use your own judgment** to decide which one is the most important (usually the first one).

Note this **may require a Google search** if a group / organization you don't know is named!

Category	Examples	What to include
Political parties / politicians **(CODE: 1)**	Last evening, **BJP party workers** burnt posters and banners of the party and vandalised the party's district office here at Barpara. They were protesting against the alliance with the AGP. SSB personnel were deployed in the office premises since this morning. Members of the **Shiv Sena youth brigade**, alleging that liquor vendors were charging more than the print price, held a protest at the District Magistrate's office today demanding a check on the functioning of liquor shops. **Supporters of Aam Aadmi Party candidate** Jagdev Singh Kamalu and supporters of Shiromani Akali Dal candidate Janmeja Singh Sekhon clashed during the last hour of polling at Maur on Saturday. The police intervened to bring the situation under control.	Include events where: • A **specific political party** or parties are named as participants/organizers • A **specific politician** or politicians are named as participants/organizers • **Supporters of a party/politician** are named as participants/organizers • **Youth wings** of political parties are named as participants/organizers
Labour unions **(CODE: 2)**	CPI(M) affiliate **Central Industrial Trade Union (CITU) state unit** burnt the effigy of Prime Minister Narendra Modi outside Deputy Commissioner office in Shimla on Dec 13 afternoon against the price hike and inflation. **All India Trade Union Congress (AITUC)** members took out a procession from Bannappa Park to Government Arts College grounds, which culminated in a public meeting.	Include events that **specifically mention unions** (except student and farmers' unions).
Students / youth **(CODE: 3)**	**Students protested** in Bhopal against the alleged discrimination of a Scheduled Caste student at the Makhanlal Chaturvedi National University of Journalism and Communication (MCNUJC). Police arrested 17 protesters. Protesters belonged to the National Students' Union of India, the All India Students Federation and the Student federation of India. **National Students' Union of India (NSUI)**, Manipur unit on 9/22 organised a protest at B.T. Road, Imphal demanding justice for Pravish Chanam and	Include **student unions** and any event where youth played a prominent role.

	whereabouts of the missing Manipuri student, Bitto Taorem. Clashes occurred between **youth protesters** and security forces in the Tukroo village of Shopian district. At least 5 people were injured in clashes when security forces fired pellets at protesters who attacked CRPF vehicles in the area.	
Caste / communal / religious / ethnic **(CODE: 4)**	Around 5,000 people under the banner of **Adivasi Socio Educational and Cultural Association** held their annual rally on RR Avenue in Esplanade. **Members of the Jat community** held demonstrations in Rohtak to protest against the registration of attempted murder charges against the five accused in the recent ink attack on BJP MP Raj Kumar Saini. On Jul. 04, **a cadre of Hindu Ezhuchi Munnani** lay siege to Theni Collectorate condemning the massive tree cutting on Megamalai hill. In Tregam, Kupwara, people congregated and **protested against the Indian state**, they later peacefully dispersed.	Include cases where: • A **specific caste / tribe / religion** is named as participant • The event **revolves or likely revolves around caste / communal / religious tension** • Classify as "Communal / religious" even if it's a caste-based or religion-based organization (see Example 1) • Include **separatist** (“against the Indian state”) and **Muslim protests** here (many are in Jammu & Kashmir). See Example 4. • Remember that some castes / ethnic groups are referred to as “communities.”
Farmers **(CODE: 5)**	**Various farmers' organizations** protested in Gadag district after the Mahadayi River Water Dispute Tribunal rejected a petition to release water to Karnataka. On August 22, in Raigiri, **more than 300 farmers** from 12 mandals in the district protested against the public hearing on proposed Kaleshwaram Lift Irrigation Project (KLIP), outside a private function hall.	Classify as "Farmers" event if it's a farmers' organization (see Example 1).
Organizations / Associations / Professions **(CODE: 6)**	On August 8, as many as **8,000 truck operators** from across Punjab had gathered a dharna at the District Administrative Complex in Jalandhar. Members of the **Jewellers' Association of Hubballi** and the **Federation of North Karnataka Jewellers' Association** staged a protest in Huballi against a proposed one per cent excise duty on jewellery. On June 18th, police detained a large number of Jammu and Kashmir **Casual Daily Wagers Forum** as they gathered outside the Civil Secretariat in Srinagar to protest in favour of their work demands. Members of the **All JK NHM Employees Association** held a protest on the second	Include cases where: • A specific profession is represented (e.g., jewellers, teachers, doctors, rikshaw drivers) • An NGO or other association is

	consecutive day in front of the office of the Chief Medical Officer in Doda.	participating (but **not** a labour union)
Other / Undefined **(CODE: 7)**	Enraged over the death of two kabaddi players in a road mishap, **residents of Israna village** in Panipat district blocked the Panipat-Rohtak National Highway 71-A for more than 45 minutes on Sunday. Following the death of a woman at a private hospital in Bathinda, **her relatives and residents of her village** sat on a dharna complaining of negligence on the part of the hospital. **Several parents** whose children were part of the Right to Education (RTE) quota staged a protest outside the school alleging that the management had refused to admit their children. **Hundreds of people** lined up along the Trans Asian Highway-1, displaying their strong resentment over the UNC's firm stand to roll back the newly created 7 Manipur districts.	Include cases where: • No specific actor is defined • General categories such as "residents," "villagers," or "women" (**unless** a profession or association) • A **loosely defined group of people** is involved - **not** part of an association (e.g., "parents")

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