Anti-Systemic Movements in the Attention Economy
Engaging the Cultural Political Economy Approach

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Abstract

In recent decades, anti-systemic movements feature new forms of communication for organizing efforts: the use of information and communication technologies. Research on information and communication technologies suggests that mobile phones and internet access have increasingly facilitated horizontal communication for anti-systemic movements across the world-system, creating space for rapid and instantaneous organization and mobilization. However, existing scholarship benefits from a critical evaluation of claims about horizontality by addressing the political economy of information and communication technologies from a world-systems analysis perspective. Specifically, information and communication technology devices and platforms— from cellphones to social media channels—are designed by powerful corporations that are often based in powerful core and semi-periphery nations. The majority of these corporations are based in the hegemonic core of the United States. Within the present context of waning material resources across the world-system, these corporations profit from an online attention economy. Just as traditional material economies exploit the labor and natural resources from the periphery to extract wealth for core states, the attention economy exploits the psychologies and behaviors of periphery populations to extract wealth for core countries. Thus, some of the most powerful institutions in the world-system control the algorithms and structures where anti-systemic movements compete for peoples' attention. This study utilizes the Mass Mobilization Data Project 1990-2018 historical dataset to determine which kinds of anti-systemic movements thrive as information and communication technology access expands globally. Using population-averaged negative binomial panel models on protest counts, I determine that as information and communication technologies expand, anti-systemic movements that are unlikely to threaten U.S. hegemony thrive, and conversely, anti-systemic movements that pose serious threats to U.S. hegemony and the present capitalist world-system are stifled. To unpack these findings, I draw from the cultural political economy approach, a framework that describes how some imaginations become a zeitgeist over competing imaginations for economic and political realities.

Keywords: Anti-Systemic Movements, Information And Communication Technologies, ICTs, Attention Economy, Culture, Discourse

> *The [concern] flagged in the [Communist] Manifesto, the material means of unity among those geographically separate, remains central. The means themselves, and the very form of their materiality, have been fundamentally transformed. More and more anti-systemic movements will find their own cohesion and coherence forged and destroyed by the newest of the means of mediating social relations.*
> – Arrighi, Hopkins, and Wallerstein, *Anti-Systemic Movements* (1989)

The pioneers of world-systems analysis remarked, in the above passage, that the means of communications used to form material unity amongst geographically disparate masses were "fundamentally transformed" by cutting-edge technological innovation of the time: the television (Arrighi, Hopkins, and Wallerstein 1989). Thirty odd years later, as most of the world functions virtually online through a historic pandemic, the fundamental transformation in the means of communication is remarkable beyond many brilliant imaginations. The "newest means of mediating social relations" of our time: information and communication technologies (ICTs)—like mobile phones and the internet—have firmly surpassed the unilateral communication models of television and technologies prior (Jung 2016). Communication today is nothing like communication in 1989, or ever before. It's constant. It's everywhere. It's with everyone. It's every moment of every day. Thus, it's time to ask: how have anti-systemic movements across the world-system "found their own cohesion and coherence forged and destroyed" in the age of the internet?

There is no dearth of scholarship on how ICTs played a role in some specific and highly visible movements such as the Arab Spring revolutions (Aouragh and Alexander 2011; Chokoshvili 2011; Stepanova 2011; Douai and Moussa 2016) and Occupy Wall Street (Maharawal 2013, Milner 2013, Vasi and Suh 2016; Daubs 2017) in the early 2010s.

Although notable cross-country studies have also emerged in recent years (Anderson 2020, Christensen and Groshek 2020), existing research benefits from further evaluation of how the overall trajectory of mobile and internet expansion globally has impacted overall rates of participation in anti-systemic movements over the last three decades. In this time period "the means of material unity among those geographically separate"—which both Marx (Marx and Engels 1967) and early world-systems scholars (Arrighi et al. 1989) emphasize as crucial elements of successful movements—have broken all previously existing boundaries. Today, the International Telecommunications Union (ITU) estimates that 75 percent of the total world population has a mobile phone subscription (ITU 2021), and 57 percent of the world population has internet access (ITU 2021). Although a global digital divide (Van Dijk 2020) continues to exclude marginalized and rural populations especially in low-income countries (Antonio and Tuffley 2014), the reach of these communication technologies remains historically unprecedented (ITU 2021).

In addition to reaching the broadest global populations, these technologies are also unique in their mechanisms of operation, presenting an entirely new way for the masses to communicate. Previous iterations of communication technologies including newspapers, radio and television

supported vertical models of communication (Häussler 2019), whereby information flowed from one direction—usually government authorities, and journalists—to the masses. ICT scholars argue that new media technologies, particularly the internet, maintains aspects of such vertical communication while also integrating horizontal models of communication (Jung 2016; Häussler 2019), whereby channels for direct political communication between the masses are opened. Top-down unidirectional news and other information through verified channels of authority continue to be accessible online. At the same time, scholars argue, the masses are able to produce their own sources of vertical information through blogs and websites, *and* engage in direct, horizontal communication through forums and social media platforms (Ananyev et al. 2019).

In other words, ICT scholars indicate that, as more people have more access to information and easier connection to activist networks, an increase in social movement participants is likely. This study formally tests for whether ICTs increase participation in social movements across countries and over time. Using the Binghamton and Notre Dame *Mass Mobilzations Data Project* historical data from 1990–2018 (Clark and Regan 2016), I estimate panel data models from 1990–2018 across 142 countries to determine how increase in mobile phone and internet access over these decades has influenced the size of protest participation across the world.

Nonetheless, the concept of horizontal communication becomes murkier when considering the political economic interests that design, implement and profit off ICTs. These technologies—including cellphones and social media platforms—are owned and operated by massive multi-national corporations (MNCs) like Apple Inc. and Meta Platforms Inc. (formerly Facebook Inc.). Many major ICT corporations (such as Apple, Meta, and Twitter Inc.) are based in the United States, and support the empiric core's economic hegemony in what now amounts to two distinct but interrelated world capitalist economic systems. The first system encompasses traditional material economies in the periphery and knowledge economies in core states. The second world capitalist economic system, a key focus of this study, is the online *attention economy* (Beller 2012; Tufekci 2013; Ciampaglia, Flammini, and Menczer 2015,). The attention economy that arose with the proliferation of ICTs neither dabbles in the exchange of tangible goods (like the material economy) nor in a marketplace of ideas and efficiency (like the knowledge economy) but buys and sells peoples' attention. In this twenty-first century economic system, the user's digital footprint is the commodity, and simultaneously, the user is the consumer (Tufekci 2013). As U.S. corporations lead this economy of attention, they support the continued dominance of the hegemonic core through a critical period that may risk a collapse of empire without necessary economic power.

In this study, I argue that anti-systemic movements that succeed through ICTs are anti-systemic movements that succeed in the attention economy (Tufekci 2013); therefore, most twenty-first century anti-systemic movements are bounded by hegemonic U.S. interests in the world capitalist system. The ideas of horizontal systems that are popular within the ICT literatures do not sufficiently acknowledge these political economic boundaries. Yet world-systems analysis by itself is not sufficient to explain the specific interests and power dynamics that promote certain anti-systemic movements within the attention economy over others. Because individual attentions

are bought and sold in an online cultural landscape where decisions about anti-systemic movement participation is often made (via *discourse)*, a complete analysis of twenty-first century anti-systemic movements requires political economic thought that incorporates the role of *culture* in determining which movements succeed.

Thus, this study draws from a cultural political economy (CPE) framework (Jessop 2004; Jessop and Oosterlynck 2008; Jessop 2010; Mueller and Schmidt 2020). CPE treats economic, political and cultural forces as co-evolving mechanisms that operate together to describe and explain social reality (Jessop 2004). In particular, it allows us to understand which political and economic systems come to be represented and legitimized in cultural discourse; that is, whose imaginations become a zeitgeist over competing imaginations for economic and political realities (Jessop 2004). Mueller and Schmidt (2020) have recently adopted some of these ideas to apply to world-systems analysis and anti-systemic movements more specifically. The CPE extension of world-systems analysis is best positioned to make sense of which kinds of anti-systemic movements are most likely to succeed in the attention economy.

In order to evaluate how the CPE framework may explain anti-systemic movement success in the twenty-first century attention economy, I break down the *mass mobilizations data* by protest types to understand which kinds of anti-systemic movements thrive in this context over others. I break down protest type by "protest demand" to assess the success of participation in movements that seek changes to the elements of the capitalist world-system, from movements that operate within this world-system. I further break down protest type by "protest group identity" to evaluate whether certain topics peaking in online cultural *discourse* succeed over others when it comes to *offline* protest participation.

Results demonstrate that, indeed, expansion in both mobile phones and the internet have increased protest participation across 142 countries from 1990–2018. However, I find that in the twenty-first century ICT environment, certain anti-systemic movements thrive over others, providing a critical evaluation of claims of horizontality. Specifically, the relative success—when measured as *offline* protest attendance—of movements that are popular in discourse depends on the boundaries negotiated by hegemonic U.S. interests (considering who owns and operates ICTs, including mobile devices and social media platforms). These boundaries result in the promotion of movements that are unlikely to threaten U.S. hegemony, and conversely, the stifling of movements that pose serious threats to U.S. hegemony and the present capitalist world-system.

The Promise of Horizontal Communication

Existing research by ICT scholars on social movements highlight three key mechanisms whereby ICTs may increase participation in anti-systemic movement protests along two dimensions of accessing information and coordinating mobilizations (Ananyev et al. 2019). First, social media aspects of the internet via platforms like Facebook and Twitter support both information and coordination by sharing a centralized platform amongst large number of collective users (Tufekci and Wilson 2012; Anderson 2020). Second, the hybrid nature of information dispersion connecting

digital media to traditional sources like radio and television reaches a wide and active audience (Jung 2016). Third, the low costs of access to mobile phone services—and subsequently their high penetration—allows for instant and unprecedented connection to critical masses, facilitating cheap and easy protest coordination (Tufekci and Wilson 2012; Anderson 2020). In this segment, I outline these arguments from scholarly research on ICTs, "horizontal communication," and social movement participation.

Any discussion of ICTs and anti-systemic movements is incomplete without addressing social media platforms. Scholars suggest that social media websites like Facebook and Twitter provide collective platforms for protest mobilizers to both share information and propaganda, as well as communicate with large groups in centralized platforms (Tufekci and Wilson 2012). Before social media, this kind of direct-to-mass communication was mostly limited to in-person organizational gatherings (Glenn 2015). Organizing such gatherings required jumping through many more logistical hurdles on the mobilizer side, and a greater commitment on the participant side (Glenn 2015). Disseminating relevant news and political propaganda was likewise limited to word-of-mouth connections and posting physical pamphlets around physical neighborhoods (Margerison 1998). Thus, before social media, it was generally more challenging for organizers to reach a wider population.

Scholars further suggest that social media streamlines many of the challenges associated with traditional organizing efforts. These platforms allow organizers to create dedicated pages in support of specific movement efforts and agendas that disseminate relevant information and propaganda to large masses of social media users (Anderson 2020; Tufekci and Wilson 2012). During the Arab Spring revolutions in the early 2010s, for example, the Arabic Facebook page "We are All Khaled Said" reached millions of Egyptian users (Tufekci and Wilson 2012; Alaimo 2015), who first mobilized online against Hosni Mubarak's authoritarian regime by sharing information about his abuses and state brutality (Alaimo 2015). In addition to easily informing larger populations, social media features such as forums and group messaging options facilitate collective communication amongst protest groups to share organizational tactics (Ananyev et al. 2019). Tactics are important elements of successful mobilizations as they direct participants on protest locations, methods and safety from law enforcement (Ananyev et al. 2019). Social media streamlines the process of quickly sharing these crucial bits of information horizontally across large groups of participants (Ananyev et al. 2019). Continuing with the example of Egypt in 2011, protest organizers used social media to disseminate relevant tactics to millions of users plugged into Facebook groups and forums (Alaimo 2015). Consequently, Tufecki and Wilson (2012) find that social media use substantially increased the odds of attending the first day of the Egyptian protests in Tahrir Square.

Additionally, media scholars coin the term "hybrid media systems" to describe the phenomena where ICTs engage traditional media channels and authorities in new forms of mass communication (Chadwick 2017; Häussler 2019). The internet, in particular, has transformed not only how the masses communicate with one another, but also how authorities and external information channels like journalists aggregate and disseminate information relevant to a given

movement (Jung 2016; Häussler 2019). Journalists' conception of what constitutes as news and information evolves as they respond to increasing proliferation of bloggers and independent entities disseminating information across web platforms (Häussler 2019). Jung (2016) describes the process of "cross-media story flows" to describe how news is configured in hybrid systems. In this model, news is both produced and shared across the micro level of individuals, meso level of networks and groups, and macro level of news agencies. In the case of the Arab Spring movements, for example, news stories first broke out on the micro-level, as individuals posted videos online of Mohamed Bouazizi, a Tunisian fruit seller self-immolating in protest of authoritarian leader Ben Ali's regime (Halverson, Ruston, and Trethewey 2013). The videos sparked many online groups on the meso level that shared the news via blogposts and social media pages (Halverson et al. 2013), until finally the story was picked up by major mainstream news agencies such as Al-Jazeera, CNN, and the BBC (Jung 2016). The increasingly larger reach of information at each level expands social movement propaganda, as news agencies first share information curated from the micro level on their own social media platforms, and ultimately on radio and television (Jung 2016). In this way, masses that may not participate in online communication also receive micro and meso level news and information about social movements through traditional media sources, increasing the likelihood of protest participation.

Beyond social media and the internet, scholars assert that access to massive networks of people is intensified at unprecedented rates due to the widespread availability and accessibility of mobile phones across the world population (Bailard 2009). As costs of owning mobile phones continue to decrease over time, more people garner the ability to access messages with movement related pictures and video content without needing to access the internet (Tufekci and Wilson 2012). By reducing the cost of mobilizations—both monetary and technical—mobile phones allow protest movements to rapidly reach critical masses required to successfully orchestrate mass mobilizations (Anderson 2020). In the case of Egypt during the Arab spring movements, for example, mobile phone penetration in the country had reached 80 percent of the total population by 2010, when the stirring of revolutionary sentiment first took hold (Tufekci and Wilson 2012). The penetration was estimated to be even higher in urban centers, and represented an overall increase of 24 percent from 2009 estimates (Tufekci and Wilson 2012). According to ICT scholars, the widespread availability and accessibility of mobile phones, thus, supports increased organizational reach and the likelihood of protest participation.

Existing scholarship on ICTs and anti-systemic movements identifies important mechanisms through which these technologies support movement participation. Additionally, there is a strong body of research evaluating the concept of "virality" (Sampson 2011, 2012), which is relevant for this study, where I try to unpack how certain anti-systemic movements get more attention than others (and thus experience, in a sense, more virality than others). Sampson (2011, 2012), for example, engages questions about how ideas spread online by applying and critiquing aspects of contagion theory. He makes the case that virality is contingent upon emotional affects generated by digital and social media platforms across the online social network, which may function as a single organism similar to a microbe (Sampson 2011). In this model, content that invokes strong

negative emotions like fear, as well as content strong positive emotions like love, is likely to experience virality (Sampson 2011, 2012). While there are many merits to such a model, its focus on individual affect and social network contagion does not directly capture the influence of larger structures like the U.S. empire.

Therefore, a critical evaluation of how ideas spread online using world-systems analysis can bring new insight to existing research on how ICTs drive anti-systemic movements. Such a perspective compels us to consider the underlying political economy of ICTs and the boundaries that are created around anti-systemic movements in the world capitalist system that may promote certain movements over others. In the next sections, I address gaps in existing literature by developing theoretical considerations from a global political economic lens. These theoretical considerations not only cast some doubt on the ultimate horizontality of ICTs, but also on how the success of twenty-first century anti-systemic movements is contingent upon boundaries created by the capitalist world-system.

World-Systems Analysis and Antisystemic Movements in the Twenty-First Century

Existing studies suggest that ICTs may support participation in social movements, but important considerations remain: which kinds of movements are supported by these technologies? Do these twenty-first century movements with ICT access (i.e., movements covered in the empirical timeline of this study) adopt important characteristics of past "world revolutions" (Arrighi et al. 1989) or are additional, newer classifications more helpful to understand these movements?

Wallerstein (1989) as well as Arrighi, Hopkins, and Wallerstein (1989, 1992) distinguish between different types of movements based on their history, tactics, and goals. For example, they differentiate "spontaneous" movements of the European spring in 1848 from the anti-systemic movements of the twentieth century. The latter, they suggest, involve explicit political organization and longer-term tactics (Arrighi et al. 1989). Furthermore, they differentiate conjunctural movements with short-term goals from structural movements with longer term agendas (Arrighi, Hopkins, and Wallerstein 1992). They additionally distinguish between national movements that focus on the struggles of oppressed identities from social movements that focus on the bourgeoise oppression of workers (Wallerstein and Zukin 1989).

Notably, these seminal texts about anti-systemic movements from a world-systems perspective that adopt these classifications were written before or around 1990 (Wallerstein and Zukin 1989; Arrighi et al. 1992, 2012). This was before the large-scale proliferation of ICTs that began in the early 1990s as laypeople began to access the internet. Use of ICTs expanded at the turn of the millennium as cellphones became more commonplace (Agar 2013). By the 2010s the invention of internet-enabled smartphones had permanently transformed the nature of distant human communication (Campbell-Kelly and Garcia-Swartz 2015).

Seminal works on anti-systemic movements within the world-systems literature have yet to capture the fact that in the process of this remarkable transition, *the world capitalist system split into two interconnected but distinct systems engaging to support the economic hegemony of the*

United States. Through the time-period considered in this analysis, the hegemonic "offline" economy began to rapidly transform from a material economy to a knowledge-based economy (Jessop 2004, 2005). The knowledge economy—which has received decent attention in the literature (Jessop 2005; Rooney, Hearn, and Ninan 2005; Brinkley 2006)—was distinct from earlier economic structures put in place to maintain U.S. hegemony, as the traditional exchange of material goods started to become replaced by a marketplace of ideas. As the world's natural resources were waning and MNCs rapidly ventured into peripheral and semi-peripheral zones, major core states like the United States began transitioning into an economic structure where knowledge was produced and sold, and information systems and technologies became key vehicles of operation (Jessop 2004, 2005).

Crucially, in the 2000s, the knowledge economy gave birth to a secondary capitalist economic system: *the attention economy* (Beller 2012; Tufekci 2013; Ciampaglia et al. 2015). This "online" economic structure differs from all previous iterations of the capitalist world-system because here we move completely away from not only the exchange of tangible goods (like in the material economy), but also the exchange of knowledge and services with notable benefit to societal functioning (like in the knowledge economy, where for example, increased efficiency might reduce the burden of mundane tasks). In the online economy of attention, the commodity is the consumer and the consumer's attention is the product. Yet the consumer is also still the consumer, consuming micro-doses of "information" from a massive swath of potential bits of information that determines simultaneously both where their attention flows and what information they consume (and thus, what "product" they become). What is sold in the market is "consumer data," or patterns of human online behavior, removing the very concept of functionality from the market in one sense. Rather than selling things or ideas of use to people, the attention economy sells peoples' psychology and behavior to the sole outcome of generating profits for corporations instead of filling gaps in societal needs or even improving the efficiency of social functioning.

Figure 1: The Word Attention Economic System
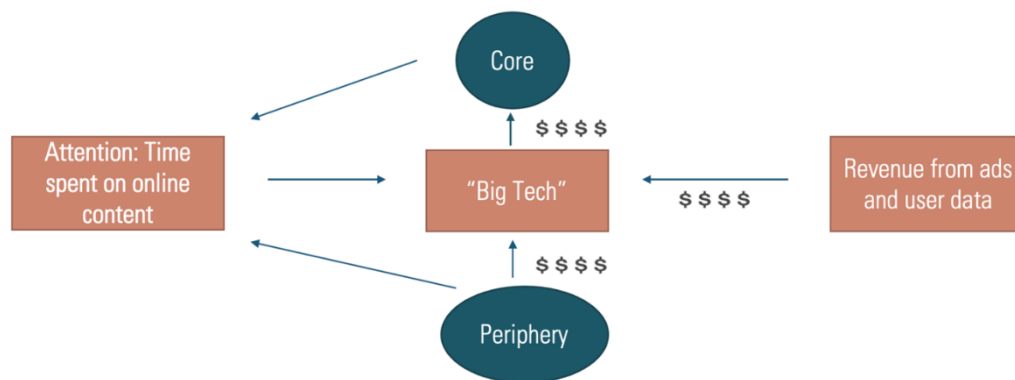
Through such an application of the knowledge economy towards an attention economy—that is, simply competing for *what* people are looking at online—massive profits are earned by the

largest U.S. corporations like Apple Inc. and Meta Inc (colloquially known as "Big Tech" companies). Figure 1 demonstrates how the world-system of the attention economy theoretically operates. As traditional economies struggle to accumulate unfettered capital in anticipation of waning material resources and impending climate catastrophes, Big Tech companies step in to generate wealth without relying as much on material resources. As more people in the periphery become connected to the attention economy via internet and mobile phone use, *the world-system innovates new forms of exploitation*. Just like traditional material economies exploit labor and material resources in the periphery to generate wealth for the core, the attention economy exploits the psychology and behaviors of periphery populations to generate wealth. Big tech companies funnel all the wealth generated from this exploitation to the core countries they represent, most prominently the hegemonic United States[1].

These very corporations that now sell people their own attention as the pillars of the last vestige of U.S. economic power also happen to provide some of the key platforms that support modern anti-systemic movements: social media. As the previous segment illuminates, there is a fairly strong body of research demonstrating how social media supports anti-systemic movements. However, evaluated within the context of the attention economy (Tufekci 2013) and its function in upholding U.S. economic power, online communication no longer seems so *horizontal*. The concept of *hybrid systems* also fails to sufficiently address all the relevant interests involved at the most macro historical level of the capitalist world-system. Therefore, we need a different framework that considers all competing interests and their relative power in the attention economy to determine which forms of communications, and thus, which kinds of anti-systemic movements, are able to thrive in the twenty-first century ICT environment.

This brings us to the "cultural turn" (Nash 2001). The complexities of online communication are complexities of semiotics. In other words, at the most basic level, online communication is a repository of symbols that represent nearly infinite possibilities of meaning. Yet the semiotics operate within and alongside hegemonic apparatus of global political economy. We can best unpack online communication by addressing it both at the level of symbols and macro-economic interests simultaneously. Jessop and colleagues (Jessop 2004, 2005, 2010; Jessop and Oosterlynck 2008) have addressed this need in the context of various other phenomena by developing a "cultural political economy" (CPE) approach. Mueller and Schmidt (2020) have recently adopted some of these ideas to apply to world-systems analysis and anti-systemic movements more specifically. The CPE extension of world-systems analysis is best positioned to make sense of which kinds of anti-systemic movements are most likely to succeed in the attention economy. Thus, I engage these ideas to develop new classifications of movements based on their relationship to the attention economy rather than their social and political goals. Previous classifications based on goals and tactics are not irrelevant by any means, but taking a different approach focused on

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[1] Notable semi-periphery hegemonic competitor China also thrives in accumulating capital through this attention-generation method as the second largest social media market.

understanding the nature of communication within the attention economy allows us to uniquely understand the role of ICTs in twenty-first century anti-systemic movements.

CPE and Anti-Systemic Movements in the Attention Economy

CPE is a framework that infuses cultural and semiotic analyses within economic and political contexts by neither minimizing the salience of material reality nor underplaying the role of culture and meaning-making in developing social formations (Jessop 2004). CPE treats economic, political, and cultural forces as co-evolving mechanisms that operate together to describe and explain social reality. Within this framework, social realities, specifically e*conomic systems* emerge at the nexus of various visions and interests—"imaginaries"—pushed by groups and institutions with varying levels of power to realize them (Jessop 2004). The economic imaginary of capitalism emerges against potentially competing economic imaginaries because elite economic and political forces develop, design, and legitimize which economic processes and activities construct and reinforce the cultural zeitgeist (Jessop 2004). These forces (e.g., MNCs, core nations, the World Bank) determine the boundaries of cultural discourse: by essentially controlling institutions that provide knowledge and education, they have a great influence on what constitutes a culture. Within this structure, mass media—the social institution incorporating ICTs—serves to navigate between competing imaginaries to generate necessary support from social actors at various levels of power to determine which ideas are infused into the discourse of a given cultural landscape (Jessop 2004).

Mueller and Schmidt (2020) make the case that adopting the CPE framework into world-systems analysis and global political economy addresses key critiques about world-systems analysis about treatment of culture. They posit: rather than treating culture as an after-thought with limited discussions of "geocultures," world-systems analysis benefits from transmuting the underlying concept—that economic and material power determines how liberalism became the dominant cultural paradigm—into a framework that underscores culture as the foundation where certain ideas, visions, and systems are legitimized over competing possibilities (Mueller and Schmidt 2020). Thus, the capitalist world-system co-evolves at the micro, meso, and macro levels of society as the reigning cultural political economic system. Notably, Mueller and Schmidt propose that the bridging of world-systems analysis and CPE can be appropriately applied to the case of anti-systemic movements (Mueller and Schmidt 2020). Anti-systemic movements seek to change either certain aspects of the capitalist world-system, or to change the entire system of historical capitalism to be replaced by a new system (Arrighi et al. 1989). Thus, anti-systemic movements navigate questions of which "imaginaries" (Jessop 2004) define social reality, and whether the boundaries for change reside within or outside of the world capitalist economic system. How do these ideas expand to address anti-systemic movements in the ICT era specifically?

To consider this question, I draw upon the Agency, Structure, Institutions, and Discourse (ASID) framework designed by Moulaert, Jessop, and Mehmood (2016) designed "to understand

socio-economic development." The ASID model posits that rather than a binary structure/agency model, socio-economic development can most robustly be understood by addressing the agentic "actions" that impact a process of development, the "structures" that limit or expand those actions, the "institutions" that promote or hinder actions and navigate between actions and structures, and the "discourse" that encompasses interactions between and across these three elements of society (Moulaert et al. 2016).

The ASID framework—a CPE effort—can be applied to understanding which kinds of anti-systemic movements are likely to thrive in the twenty-first century attention economy. "Agency" operates at the individual level of the ICT user, who has the theoretical volition to direct their attention wherever they chose: in terms of anti-systemic movements, potential participants have the agency to decide which anti-systemic movements to focus on in a digital landscape full of competing anti-systemic movements with different goals and interests. The theoretical volition is first complicated at the level of "structures" in that, when it comes to ICTs, there are literal structures in place in the form of platforms and algorithms. These structures moderate what is visible to each individual user, limiting the possibilities of anti-systemic movements (amongst a theoretically infinite pool of available anti-systemic movements) in which they could choose to participate.

The structures, of course, are deliberately designed and implemented by specific institutions with specific interests. When it comes to social media, these institutions are profit-oriented, powerful corporations like Apple Inc. and Meta Inc., who ultimately serve to maintain U.S. economic hegemony. These corporations have the most influence over the structure of ICT platforms, and by extension, considerable influence on individual choices to participate in any anti-systemic movements. Thus, via these corporations, U.S. hegemonic interests come to define the boundaries of structure.

Nonetheless, these corporations represent only one set of institutions that influence individual anti-systemic movement choice—though they have theoretically the largest share of power to influence given their governance of the underlying structure. When it comes to anti-systemic movements, competing interests come from two additional institutions that also exert different levels of influence on individual agency. The first such institution is social and political organizers of anti-systemic movements, who can exercise different levels of creativity in using ICTs to mobilize the individual user. Yet as long as they are using platforms whose structures are controlled by U.S. corporation, they operate within the boundaries of the economic imaginaries of the capitalist world-system. Movements outside these boundaries may face additional challenges in garnering individual attention, or they make garner attention but struggle to successfully generate offline mobilizations using these hegemonic digital structures.

The second such institution is the *social network* represented in the individual's ICT experience. Especially with social media, these networks can range from friends and families to celebrities and complete strangers. These networks post, co-post and share ideas, opinions, humor, outrage and all variety of emotional and intellectual content that makes up a user's online experience within the confines of the structures put in place by corporations. Such content is what

ultimately amounts to the "discourse" that is visible and accessible to each individual user online in the attention economy.

Discourse is what exists after all the agents, structures, and institutions have yielded relative influence and power over online communication. The relative power of corporations that design ICT platforms—and hegemonic U.S. interests, by extension—is by far the largest, but using CPE we can understand how this power is not the sole contributor to online discourse and competing institutions may exert different levels of power to push competing agendas. Competing institutions, however, have to exert more effort to realize their imaginations and represent their interests in discourse, and they face continual opposition from the more powerful institutions that moderate ICT structures and algorithms. To summarize, online discourse occurs at the nexus of various micro, meso, and macro level imaginaries and determines, to a great extent, which kinds of movements receive online attention and garner support in offline participation.

From this standpoint, after all relevant influences in the ASID framework are accounted for, twenty-first century anti-systemic movements can simply be divided into two broad categories: first, anti-systemic movements that succeed within the attention economy; and second, anti-systemic movements that are obscured by insufficient interests represented at the nexus of ASID to succeed in the attention economy.

Methods

Dependent Variable

The dependent variable is the *count of protest participants* across 141 countries from 1990–2018. This data is drawn from the Binghamton University and University of Notre Dame's joint data project *The Mass Mobilization Data Project*[2] (Clark and Regan 2016). The dataset covers citizen movements and protest demonstrations for 162 countries from 1990–2018, but some countries are dropped from the final analyses presented here due to listwise deletion on missing intendent variables (Humphries 2013). The data categorizes over 10,000 protest events across almost 30 years, cataloging the events where at least 50 or more participants engaged in demonstration (Clark

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[2] This data project is hosted by the Harvard University Dataverse and collected by scholars from Binghamton University and the University of Notre Dame, who received funding through a research grant from the Political Instability Task Force of the Central Intelligence Agency (CIA). Although a CIA grant may invoke certain skepticisms about the funding agency's agenda, it does not necessarily indicate potential issues with accuracy or misrepresentation of information presented in the dataset. In fact, given that the grant comes from the CIA's Political Instability Taskforce, there is potential for higher accuracy, as it is beneficial for such an institution to have an accurate picture of what social movements people are attending globally (for reasons that are implicated even by this very paper's conclusions). In terms of data accuracy, there is reason to be even more confident *because of the potential agenda behind the grant funding*, even compared to something like disease prevalence data about the Global South from the World Bank (which is normatively used in sociological research). In other words, the CIA's potential agenda to monitor political instability is only better served by improved data accuracy. Finally, it would be doubtful that the grant was given to the data project to support papers like this one, which are inherently critical of U.S. hegemony. More information about the project and funding sources can be found directly on the project's Dataverse website under "Metadata": https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/HTTWYL

and Regan 2016). This dataset has been previously utilized to assess how international sanction threats trigger domestic protests (Grauvogel, Licht, and von Soest 2017), and to evaluate how governments have responded to protest movements in Latin America and Eastern Europe (Lucas 2020).

In order to utilize all available data from this project as a count dependent variable, certain adjustments were made to the original dataset's coding schema. In most cases, straightforward numerical counts of participants were provided, and no recoding procedures were applied. In cases where the number was provided with a classifier such as N+, > N or < N, the data was recoded so the classifier was removed, leaving simply the N value for participants. For example, 500+, > 500, or < 500 was recoded as an estimated count of 500 participants. Finally, in where a range was provided such as N1 – N2, the data was recoded to represent the numerical average of the given range (N1 + N2)/2. For example, 500-1000 was recoded to 750 participants. The final recoded dataset includes only numerical counts of participants, which allows me to directly assess the effects of key independent variables on the size of protest participation across countries and over time.

Key Independent Variables

Mobile Cellular Subscriptions per 100 People. This data provides the percentage of people within a country with a mobile phone subscription (ITU 2020). Specifically, it captures the number of people with a subscription to a public mobile telephone service using cellular technology providing a minimum of voice and text-messaging services. I use this measure from the ITU to assess how the expansion in the number of people with mobile access impact protest participation across countries and over time. This data has been previously utilized to determine the effects of mobile expansion on greenhouse gas emissions (Miśkiewicz 2021) and the effects of mobile on transport industry development (Rajagukguk 2020).

In this study, mobile subscription data allows us to identify the percentage of the population that may not necessarily have access to more advanced ICT and internet functions, but are able to engage in voice calls and textual messaging services. This data is nonetheless highly correlated with internet use data (> 80 percent correlation), so it provides indirect proxy for exposure to the attention economy while more specifically accounting for general expansion in communication technologies.

Internet Users per 100 People. This data provides the percentage of people within a country with internet access (ITU 2020). Specifically, it captures the number of people who have used the internet in the past three months using any source including computer and mobile devices. I use this measure from the ITU to assess how the expansion in the number of people with internet access impact protest participation across countries and over time. This data has been previously utilized to determine the effects of internet expansion on environment and life expectancy in Asia (Lee and Kim 2019), and the effects of internet on national Gross Domestic Product (GDP) in Nordic countries (Amiri and Reif 2013). Internet user data allows us to identify the percentage of

the population that has access to more advanced ICT features such as social media and blogging. This measure more directly captures exposure to the attention economy and *discourse.*

ICTs * Protest Type: by "Demand". The Mass Mobilizations Data Project provides additional information on protest characteristics including protester demands (Clark and Regan 2016). These include seven categories: labor and wage disputes, land and farm issues, police brutality, political process, prices/taxes, removal of a politician, and social restrictions. I recode the final three categories into a single "other" category that denotes anti-systemic movements that are strictly political in nature, seeking changes to the political process or removing politicians. The final categories are: labor and wage disputes, land and farm issues, police brutality, and other. While the first three categories of anti-systemic movements seek changes directly to elements of the capitalist world-system, the final category focuses on political reforms within this world-system.

I interact the recoded demand variable with the ICT variables to assess which kinds of movements (movements against the capitalist world-systems versus within) are supported by mobile phone and internet expansion.

ICTs * Protest type: by "Protest Group Identity." The Mass Mobilizations Data Project also provides information on the identity of the protest group. There is a large number of variances in this categories, providing hundreds of identities. In order to assess for CPE patterns in these anti-systemic movements, I code protest identity categories based on their relevance in cultural *discourse*. The final categories are: Black radical, Indigenous, anarchist, labor/worker, and other[3]. The first three categories are key categories of interest from a CPE lens, given the increasing popularity of these movements in mainstream cultural *discourse* (Caniupan et al. 2020, Vysotsky 2020).

I interact the identity variable with both mobile and internet data. This allows me to understand how specific and often marginalized anti-systemic groups and identities relevant in discourse experience changes in protest participation with ICT expansion.

Other Relevant Variables

In addition to the key independent variables identified above, I control for additional factors that influence social movement participation cross-nationally. Research suggests that countries with certain economic characteristics are more likely to experience protest events (Korotayev, Bilyuga, and Shishkina 2018). In particular, countries that have mid-level GDP are most likely to experience protest activity compared to countries with the highest or lowest GDPs, as factors like education and expectations from governments increase when nations achieve middle-income status

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[3] Some of these categories may appear Western or U.S.-centric as they account for the role of hegemonic U.S. interests in developing the structure of ICT platforms, and thus the influence of U.S. corporations and U.S. interests on online discourse.

(Korotayev et al. 2018). *GDP per capita* is measured in current international dollars converted by purchasing power parity using data from the World DataBank (World Bank 2021).

I further control for levels of democracy using data from Freedom House (2020)[4]. Freedom House gives each country a rating on a scale of one to seven for political rights and civil liberties separately, where one represents highest levels of freedom, and seven represents lowest levels of freedom. I take an average of the ratings for political rights and civil liberties, and invert the values so that higher scores represent higher levels of democracy. The effect of democracy on protest participation is debated in the literature. On the one hand, autocratic regimes are likely to inspire anti-government action (Christensen and Groshek 2020), on the other hand, more democratic regimes allow for more political freedoms to participate in protests (Bernhagen and Marsh 2007, Moseley 2015).

Additionally, I control for *trade as a percentage of GDP*, *gross female secondary school enrollment[5]*, and *urban growth*; these data are accessed through the World DataBank (World Bank 2021). Levels of trade activity serve as a proxy for liberalization, which is associated with higher levels of inequality and increasing political dissent and protest participation (Wada 2005). Women's education signifies increasing political awareness amongst marginalized groups, which increases the likelihood of protest participation (Murdie and Peksen 2015). Lastly, urban areas support large populations that can participate in large demonstrations, so increasing urban population is likely to increase protest participation (Fox and Bell 2016).

Finally, I use the *total population* of a country as an *exposure* variable in the analyses. For count models, is important to include a variable that represents the maximum possible count of the dependent variable—in this case maximum number of people that could attend a protest as an exposure (Hutchinson and Holtman 2005). This data is also drawn from the World Databank (World Bank 2021).

Estimation Technique
This study evaluates the size of protest participation across countries over the period of 1990–2018. The unit of analysis for this study is country-year. The dependent variable, thus, is the *count of protest participants* in a given country-year. Multiple protest events are observed across many countries in many years, so the panel data involves repeated observations for protest counts each country-year unit. This count variable is overdispersed, that is, the variance is substantially larger than the mean; therefore, I estimate a negative binomial model, which is the preferred alternative to Poisson regression models when overdispersion is present in count data (Hilbe 2011). Furthermore, this data does not require zero-inflated negative binomial models because the *Mass*

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[4] I also estimated the levels of democracy versus autocracy indicator from the Polity IV database (Polity 2018) but this measure was non-significant in my models, while the rest of the findings were consistent with what has been presented here. Further, the Freedom House indicator has fewer missing cases and the Polity IV indicator noticeably dropped the total N. Thus, Freedom House measures are retained in the final analyses.

[5] As robustness checks I also controlled for primary and tertiary education, results were consistent. I retain the secondary enrollment measure in the final models because this data has the most robust coverage.

Mobilizations Project only catalogs protest events with 50 attendees or more (Clark and Regan 2016), leaving no cases with zero value for the count of attendees.

The negative binomial model is assessed using total population counts as exposure to account for the *maximum possibility of protest participation* count for each country-year (Hutchinson and Holtman 2005). I further apply a *population-averaged* Generalized Estimating Equations (GEE) approach, which describes the *average* effect of an independent variable on an outcome *across a population* (Ghisletta and Spini 2004; Bhandari and Shirazi 2022). This approach is favored against alternative estimation techniques when analyzing longitudinal count data outcomes (Zhang et al. 2012; Bhandari and Shirazi 2022).

Relevant diagnostic tests include tests for multicollinearity, heteroskedasticy, and outliers and influential cases. Mean VIFs for the models do not exceed a value of 1.94 and bivariate correlations reveal no correlation between a pair of independent variables exceeding 0.7, indicating no problematic multicollinearity is present in these models (Mansfield and Helms 1982). In order to correct of homoscedastic error terms, robust standard errors are used in all models. Relatedly, this study is unable to directly address potential first-order autocorrelation (AR1) in panel data due to repeated observations per country-year unit in the panel (Ahn, Lee, and Schmidt 2013). Therefore, I further rely on robust standard errors to minimally address any problems that may occur due to non-independence of protest events in a country over time. Lastly, a few outliers were detected but there were no influential cases that impact the conclusions of this study.

Results

Tables 1 and 2 displays the incidence rate ratios (IRRs) from the GEE negative binomial models[6]. The significant Wald tests across all models in Tables 1 and 2 indicate that each model has at least some additional explanatory power over a constant-only model. An incident rate indicates the *prevalence of an event* within a given population over a period of time; in this case, it demonstrates the *prevalence of a protest event over 28 years*. As with odds ratios in logistic regression models, an IRR greater than one indicates an increased rate of an event occurring, an IRR lower than one indicates a decreased rate of the event occurring, and an IRR of one indicates no difference (Cummings 2019). Within a GEE framework, all estimates are population-averaged (Hardin and Hilbe 2013). The IRR, thus, represents the *relative difference* in protest attendance in *an average country that experiences a change in each independent variable*, as compared to *an average country that does not experience a similar change*, net of all control variables.

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[6] See Appendix 1 for descriptive statistics and bivariate correlation matrix

Table 1. Population Averaged Negative Binomial Models: Incidence Rate Ratios (IRRs) – Internet and Protest Counts, 1990–2018

Variables	(1)	(2)	(3)	(4)
GDP per capita	0.999*	0.999*	0.999*	0.999*
	(0.000)	(0.000)	(0.000)	(0.000)
Democracy	1.196***	1.201***	1.185***	1.185***
	(0.055)	(0.055)	(0.056)	(0.056)
Women's Education	1.004	1.004	1.004	1.004
	(0.004)	(0.004)	(0.004)	(0.004)
Urban Growth	0.891	0.897	0.886	0.887
	(0.067)	(0.074)	(0.067)	(0.067)
Trade (% GDP)	1.006**	1.007**	1.007**	1.007**
	(0.002)	(0.002)	(0.002)	(0.002)
Internet Users Per 100	1.020***	1.019***	1.020***	1.020***
	(0.005)	(0.005)	(0.004)	(0.004)
Labor and Wage Disputes	0.792	0.566		
	(0.127)	(0.117)		
Land and Farm Issues	0.470***	0.282***		
	(0.088)	(0.075)		
Police Brutality	1.046	1.395		
	(0.239)	(0.485)		
Labor * Internet			1.011	
			(0.005)	
Land * Internet			10.13	
			(0.005)	
Police Brutality * Internet			0.989	
			(0.008)	
Anarchist			0.582^	0.254***
			(0.170)	(0.058)
Black Radical			1.340	1.674
			(0.606)	(0.891)
Indigenous			0.993	1.103
			(0.174)	(0.334)
Labor			1.149	1.214
			(0.217)	(0.354)
Anarchist * Internet				1.016*
				(0.007)
Black Radical * Internet				0.978**
				(0.007)
Indigenous * Internet				0.996
				(0.012)
Labor * Internet				0.998
				(0.006)
Constant	0.003***	0.002***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations (Countries * Protest Events over 28 years)	9,522	9,522	9,524	9,524
Observations (Countries)	141	141	141	141
Wald Chi^2	611.45***	885.46***	761.13***	857.06***

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.5, ^p<0.1

Table 1 displays the Incident Rate Ratios for population-averaged negative binomial models for protest counts along changes in internet users across 141 countries from 1990–2018. Model 1 demonstrates that internet access has a statistically significant IRR greater than one, indicating that increasing internet users is associated with an increase in protester counts. If an average country experienced an increase in internet penetration by one percent, the incident rate of protest count is

expected to increase by a factor of 1.020, relative to countries that did not experience a percentage increase in internet users. Model 1 further demonstrates the results of the categorical independent variable representing protester demands. Relative to "other" movements (the reference category), movements with demands focused on "land and farm issues" experience fewer protest counts. An IRR less than one of 0.470 indicates that over the given period of time, land and farm demands experience lower participation by a factor of 0.470 compared to demands in the "other" category. Movements that focus on "labor and wage" demands and demands against "police brutality" do not experience a significantly different rate of participation than other movements. Finally, looking at the control variables, GDP per capita has a negative IRR but since the IRR is almost close to one, the observed differences are negligible. Democracy and trade are positively associated with protest counts with IRRs larger than one, suggesting that increased democracy and increased liberalization are both associated with increased protest participation. Women's education and urban growth are not significantly associated with protest counts.

Model 2 adds the first set of key interaction effects to Model 1. Figure 1 supplements Model 2 in visually demonstrating the interaction effect between internet users and protest demands. Figure 1 shows when assessing predicted counts of protesters, as internet penetration increases from 20 percent to 100 percent, protests in all demand categories experience some increase in participation, with police brutality protests increasing very marginally compared to the other categories. In Model 2, the "other" category serves as a reference category. The positive and statistically significant IRR for the interaction between internet penetration and labor and wage demands (IRR: 1.011) indicates that as internet penetration increases, participation in protests for labor and wage disputes also increase. Likewise, the positive and statistically significant IRR for the interaction between internet penetration and land and farm issues (IRR: 1.013) indicates that as internet penetration increases, participation in protests for land and farm issues also increase. The negative IRR for demands relating to police brutality is non-significant, indicating no relationship between internet penetration and participation in protests against police brutality.

Model 3 swaps out protester demand with protest group identity, while retaining all other characteristics of Model 1. In Model 3, key independent variable for internet access has a statistically significant IRR greater than one, indicating that increasing internet users is associated with an increase in protester counts. If an average country experienced an increase in internet penetration by one percent, the incident rate of protest count is expected to increase by a factor of 1.020, relative to countries that did not experience a percentage increase in internet users. Model 3 further demonstrates the results of the categorical independent variable representing protest group identity. Relative to "other" identities (the reference category), movements with "anarchist" identities experience fewer protester counts.

Figure 2: Protester Counts at Levels of Internet and Protester Demands
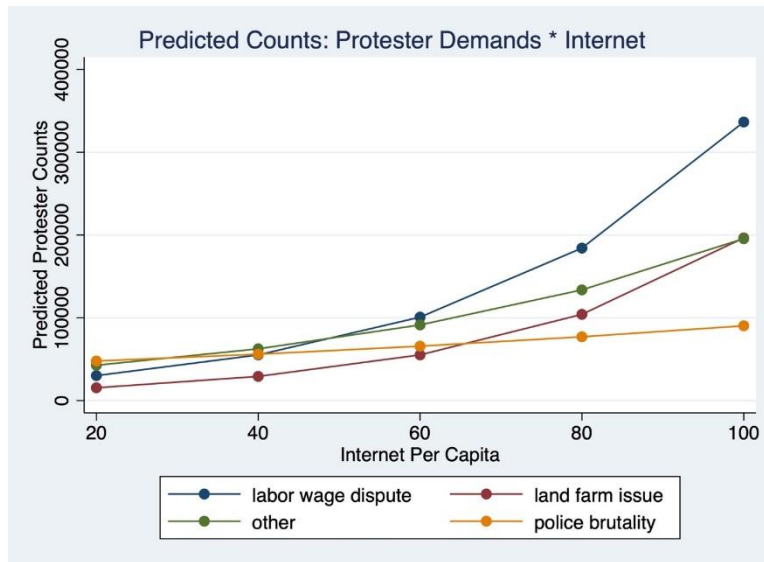
A marginally significant IRR less than one of 0.582, indicates that over the given period of time, anarchists experience lower participation by a factor of 0.582 compared to demands in the "other" category. Movements with "Black radical," "Indigenous," and "labor" identities do not experience a significantly different rate of participation than other movements. Finally, looking at the control variables, GDP per capita has a negative IRR but since the IRR is almost close to one, the observed differences are negligible. Democracy and trade and positively associated with protest counts with IRRs larger than one, suggesting that increased democracy and increased liberalization are both associated with increased protest participation. Women's education and urban growth are not significantly associated with protest counts.

Figure 3: Protester Counts at Levels of Internet and Protester Identity
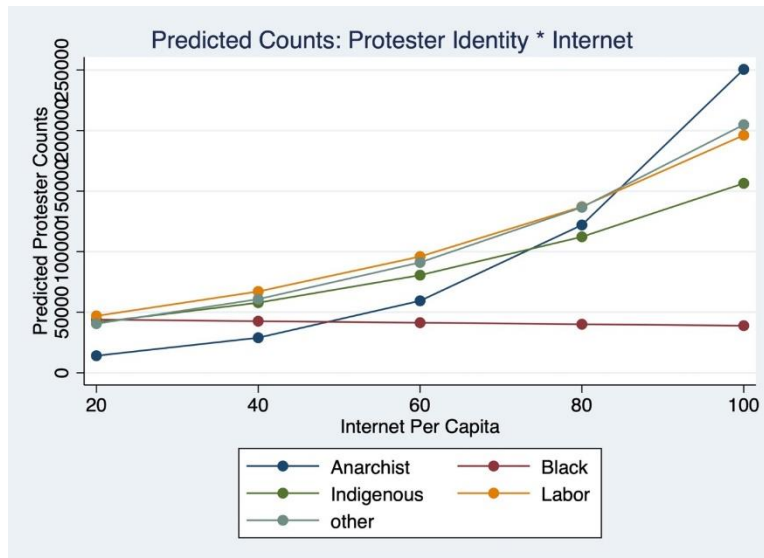
Model 4 adds the second set of key interaction effects to Model 3. Figure 2 supplements Model 4 in visually demonstrating the interaction effect between internet users and protest group identity. Figure 2 shows when assessing predicted counts of protesters, as internet penetration increases from 20 percent to 100 percent protest participation in "anarchist," "Indigenous," "labor," and "other" categories increase; however, participation in "Black radical" category experiences a slight decrease. In Model 4, the "other" category serves as a reference category. The positive and statistically significant IRR for the interaction between internet penetration and anarchist led movements (IRR: 1.016) indicates that as internet penetration increases, participation in protests led by anarchist formations also increase relative to other movements. On the other hand, the negative and statistically significant IRR for the interaction between internet penetration and Black radical led movements (IRR: 0.978) indicates that as internet penetration increases, participation in protests led by Black radical groups decrease relative to other movements. The negative IRRs for Indigenous and labor identities are non-significant, indicating no relationship between internet penetration and participation in protests led by Indigenous and labor groups.

Turning now to Table 2, it displays the Incident Rate Ratios for population-averaged negative binomial models for protest counts along changes in mobile phone subscriptions across 141 countries from 1990–2018. Model 5 demonstrates that mobile access has a statistically significant IRR greater than one, indicating that increasing mobile users is associated with an increase in protester counts. If an average country experienced an increase in mobile penetration by one percent, the incident rate of protest count is expected to increase by a factor of 1.004, relative to countries that did not experience a percentage increase in mobile users. Model 5 further demonstrates the results of the categorical independent variable representing protester demands. Relative to "other" movements (the reference category), movements with demands focused on "land and farm issues" experience fewer protest counts. An IRR less than one of 0.453 indicates that over the given period of time, land and farm demands experience lower participation by a factor of 0.453 compared to demands in the "other" category. The IRR for movements that focus on "labor and wage" demands is also negative and reaches marginal significance. An IRR 0.742 indicates that over time, labor and wage demands experience lower participation by a factor of 0.742. Demands against "police brutality" do not experience a significantly different rate of participation than other movements. Finally, looking at the control variables, democracy and trade are positively associated with protest counts with IRRs larger than one, suggesting that increased democracy and increased liberalization are both associated with increased protest participation. GDP per capita, women's education, and urban growth are not significantly associated with protest counts.

Table 2. Population Averaged Negative Binomial Models: Incidence Rate Ratios (IRRs) – Mobile Subscriptions and Protest Counts, 1990–2018

Variables	(1)	(2)	(3)	(4)
GDP Per Capita	1.000	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)	(0.000)
Democracy	1.208***	1.214***	1.196***	1.199***
	(0.055)	(0.055)	(0.055)	(0.055)
Female Education	1.001	1.002	1.001	1.001
	(0.004)	(0.004)	(0.004)	(0.004)
Urban Growth	0.873	0.884	0.868^	0.869^
	(0.072)	(0.075)	(0.067)	(0.067)
Trade	1.007**	1.007***	1.007***	1.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Mobile Subscriptions per 100	1.004*	1.004^	1.004^	1.004^
	(0.002)	(0.002)	(0.002)	(0.002)
Labor and Wage Disputes	0.742^	0.551**		
	(0.114)	(0.127)		
Land and Farm Issues	0.453***	0.242***		
	(0.088)	(0.077)		
Police Brutality	0.982	1.296		
	(0.219)	(0.450)		
Labor * Mobile		1.005		
		(0.003)		
Land * Mobile		1.008*		
		(0.004)		
Police Brutality * Mobile		0.995		
		(0.004)		
Anarchist			0.614^	0.0985***
			(0.162)	(0.026)
Black Radical			1.433	1.918
			(0.615)	(0.953)
Indigenous			1.015	1.657*
			(0.182)	(0.421)
Labor			1.194	1.235
			(0.219)	(0.302)
Anarchist * Mobile				1.017***
				(0.004)
Black Radical * Mobile				0.984**
				(0.005)
Indigenous * Mobile				0.990
				(0.008)
Labor * Mobile				0.999
				(0.002)
Constant	0.003***	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations (Countries * Protest Events over 28 years)	9,765	9,765	9,767	9,767
Observations (Countries)	142	142	142	142
Wald Chi^2	708.46***	972.23***	782.58***	1012.03***

Standard errors in parenthesis
*** p<0.001, ** p<0.01, * p<0.05, ^p<0.1

Model 6 adds the first set of key interaction effects to Model 5. Figure 3 supplements Model 6 in visually demonstrating the interaction effect between mobile users and protest demands. Figure 1 shows when assessing predicted counts of protesters, as mobile penetration increases from 20 percent to 180 percent protests the demand categories of "labor and wage disputes," "land and

farm issues," and "other" experience some increase in participation, while police brutality protests experience a decrease. In Model 6, the "other" category serves as a reference category. The positive and statistically significant IRR for the interaction between mobile penetration and land and farm issues (IRR: 1.013) indicates that as mobile penetration increases, participation in protests for land and farm issues also increase. The positive IRR for demands relating to labor and wage disputes and the negative IRR for demands relating to police brutality are non-significant, indicating no relationship between mobile penetration and participation in protests against labor/wage issues and police brutality.

Figure 4: Protester Counts at Levels of Mobile and Protester Demands
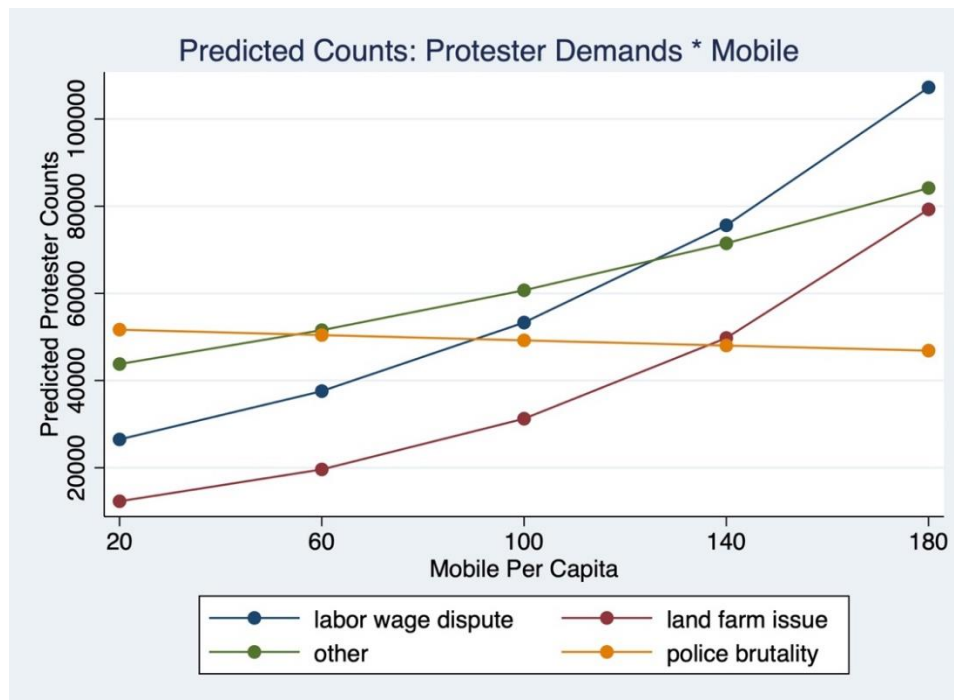
Model 7 swaps out protester demand with protest group identity, while retaining all other characteristics of Model 5. In Model 7, key independent variable for mobile access has a marginally significant IRR greater than one, indicating that increasing mobile users is associated with an increase in protester counts. If an average country experienced an increase in mobile penetration by one percent, the incident rate of protest count is expected to increase by a factor of 1.004, relative to countries that did not experience a percentage increase in mobile users. Model 7 further demonstrates the results of the categorical independent variable representing protest group identity. Relative to "other" identities (the reference category), movements with "anarchist" identities experience fewer protester counts. A marginally significant IRR less than one of 0.614, indicates that over the given period of time, anarchists experience lower participation by a factor of 0.614 compared to demands in the "other" category. Movements with "Black radical," "Indigenous," and "labor" identities do not experience a significantly different rate of participation

than other movements. Finally, looking at the control variables, democracy and trade and positively associated with protest counts with IRRs larger than one, suggesting that increased democracy and increased liberalization are both associated with increased protest participation. GDP per capita, women's education and urban growth are not significantly associated with protest counts.

Figure 5: Protester Counts at Levels of Mobile and Protester Identity
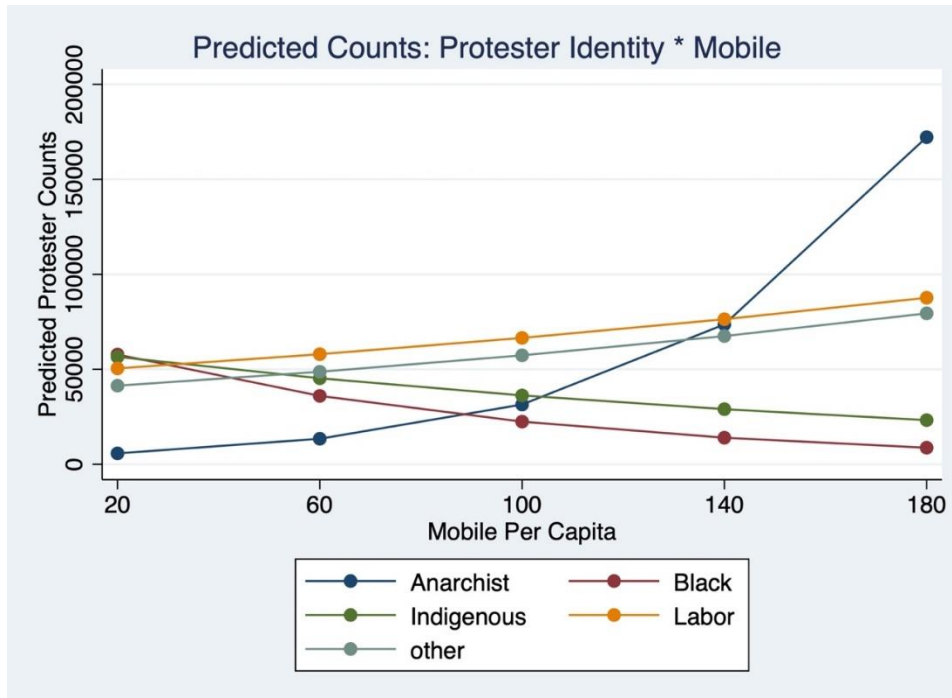
Finally, Model 8 adds the second set of key interaction effects to Model 5. Figure 4 supplements Model 4 in visually demonstrating the interaction effect between mobile users and protest group identity. Figure 4 shows when assessing predicted counts of protesters, as mobile penetration increases from 20 percent to 180 percent protest participation in "anarchist" movements experience the steepest increase, "labor" and "other" movements experience a very slight increase, and "Indigenous" and "Black radical" movements experience a decrease in participation.

In Model 8, the "other" category serves as a reference category. The positive and statistically significant IRR for the interaction between mobile penetration and anarchist led movements (IRR: 1.017) indicates that as mobile penetration increases, participation in protests led by anarchist formations also increase relative to other movements. On the other hand, the negative and statistically significant IRR for the interaction between mobile penetration and Black radical led movements (IRR: 0.978) indicates that as movement penetration increases, participation in protests led by Black radical groups decrease relative to other movements. The negative IRRs for

Indigenous and labor identities are non-significant, indicating no relationship between mobile penetration and participation in protests led by Indigenous and labor groups.

Discussion and Conclusion

The results from this study indicate that modern ICTs support increased participation in anti-systemic movements. The changes across distant communication systems afforded by ICTs encourages larger protest counts across countries and over time. The specific mechanisms of ICTs that support anti-systemic movements are murkier, given the generally similar effects of both internet and mobile phones in influencing protest participation. Nonetheless, internet demonstrates a more consistent, robust and highly statistically significant relationship with protest counts throughout, whereas mobile phones are only marginally significant in some models. It is worth addressing internet penetration's more robust correlation with protest counts compared to mobile phones, as we can gain valuable insight into some of the key characteristics of ICTs that best support movement participation.

Whereas mobile phones benefit from their widespread availability compared to all other communication technology in history, the internet provides more sophisticated features including social media. Internet use data thus directly captures users' exposure to the attention economy. Internet use also signifies potential participation in online *discourse*, which exists at the nexus of ASID after individual agency, algorithmic structures, and systemic influences of massive tech corporations (and thus, hegemonic U.S. interests) and other institutions (such as movement organizers) are accounted for. Although more recent mobile phones feature the ability to send and receive videos and images without internet connection, the exposure to the attention economy and the ability to participate in collective discourse is not comparable to internet enabled devices. In this way, mobile phones are relatively similar to older communication technologies, with added features of mobility, text, and image and video messaging. All these added features clearly support some organizational efforts as suggested by the correlation between mobile phone expansion over time and increased protest counts. Nonetheless, these features might be insufficient to completely capture the attention of the user in our attention economy: a process that has been streamlined by the internet, and social media in particular.

Social media forums provide live and active spaces to collectively express the kind of strong emotional reactions (discourse) that promote spontaneous protest participation. The interactive element of social media creates desirable spaces for organizers (institutions) to share their own news and propaganda using varieties of multimedia from blog posts to videos. Users can then collectively respond to this content, sharing emotional responses and may even form instantaneous bonds that mimic the kinds of bonds that were historically formed over time in traditional organizing spaces (agency). Thus, in spite of a greater digital divide between people who have access to the internet and those who don't (as compared to mobile phones), internet access is more robustly associated with protest counts across countries and over time.

However, these findings only provide a partial narrative on twenty-first century anti-systemic movements, as we have yet to account for the most powerful forces that create the boundaries around which this kind of discourse is visible in the attention economy. The social media algorithms that moderate discourse are designed by massive U.S. corporations like Apple Inc. and Meta Inc. so they effectively control how content (i.e., discourse) spreads, and which type of content receives the most attention. These corporations thus represent institutions with more power than protest organizers and social networks that may support movement participation. The majority of these corporations funnel the capital generated from exploiting attention towards the United States. Future studies should compare how the efforts made by hegemonic competitors like China to generate wealth via extracting attention compares to U.S. efforts.

For now this study concludes that the United States' interests to maintain economic hegemony determines the boundaries of online discourse. Thus, the anti-systemic movements that thrive in the attention economy are unlikely (but not impossible, given the smaller influence of agency and competing institutions with competing interests within the ASID framework) to seriously threaten the reigning order of the current world capitalist system. By comparing the relationships between type of protests by demand and identity with mobile subscriptions and internet users around the world, the data allows us to gain a sense of how the attention economy driven by U.S. hegemonic interests influences twenty-first century anti-systemic movements.

Type of Anti-Systemic Movement by "Protest Demand"

This study breaks down protest categories by protest demand. Isolating movements that demand changes to elements of the capitalist world-system from movements that seek changes within the system provides some insights. I note that both mobile phone and internet access increases participation in protests that seek land tenure and farm rights compared with protests that seek political changes. Given that this is a rural issue, and more people in rural areas across the globe are likely to have simple mobile phones over internet enabled devices, the similar effects of mobile phones and internet access are logically consistent.

In general, as connectivity increases in rural areas, so does participation in protests with rurally-oriented demands. Importantly, land reform within states in Global South nations is unlikely to impact the Global North and U.S. hegemony. For example, my own country of Nepal has attempted several land-reform initiatives (to different levels of success) in the decades following the Nepalese Civil War (Paudel and Saito 2015) that ended the historical monarchy following many years of armed conflict between Nepalese Maoists and the authoritarian government. Although the efforts to democratize Nepal and ongoing, and challenges remain due to continued governmental corruption (Paudel and Saito 2015), the changes Nepal has seen in developing a post-feudalist structure (or even the very act of revolution in 2006) have not impacted the global capitalist world-system and U.S. hegemony in any meaningful way. The issues of land and farm rights in this example appear to be entirely self-contained within the internal politics of Nepal, a periphery state that most people, institutions, and even "imaginaries" are unlikely to consider; that is, a nation that rarely gets any attention in discourse.

Internet expansion further moderates an increase in protests that demand labor and wage changes compared with movements that demand political changes; however, mobile phones have no relationship with these movements. Labor and wage disputes are more likely to occur in urban areas that support wage labor, and where internet access tends to be most widespread. Collective forums and private groups on websites like Facebook can serve as spaces for workers to deliberate union formations and share organizational tactics away from the workspace, and via blogs and web articles, unions can garner public support. Thus, worker issues pass the boundaries created by U.S. interests within the ASID framework. These issues continue to gain enough influence in discourse that they continue to be represented in the attention economy into the year 2022, when the United States is undergoing a supposed "labor shortage,"—that is, that workers are demanding better wages and working conditions. Notably, previous success of worker and labor movements via twentieth century anti-systemic movements did not correspond to radical changes to the U.S. economic structure and the current world-system (O'Connell 2011). Thus, worker issues may address certain elements of the capitalist world-system, they have not historically been a threat to the entire system.

Next, neither internet nor mobile penetration are moderating factors in movements against police brutality. Using the present data, I am able to conclude that prior to 2019, protests demanding an end to police brutality mobilized fewer protest participants compared to protests seeking political changes within the status quo (e.g., prices and taxes, or removing politicians). Given that law enforcement engages violence to protect the interests of the state (Fanon 1961), protests against police brutality represent a threat to U.S. power. Since the United States is involved in creating the boundaries around discourse, it follows that anti-systemic movements that threaten state power (specifically U.S. state power) are not supported by ICT expansion. Perhaps this non-effect is somewhat explained by the fact that the Mass Mobilizations Data Project only has data until 2018. Future research should utilize future iterations of this dataset to evaluate if the trends witnessed here hold through the year 2020, when movements against police brutality rapidly expanded starting in the United States and reaching across the globe. Although if I had to draw a conjecture based on the subjective evaluation of current collective attention patterns in 2022, many people may have moved on from this issue to more current issues receiving attention in discourse (e.g., war in Europe).

Types of Anti-Systemic Movements by "Protest Group Identity"
In addition to evaluating protest demands, I also evaluate protests by protest group identity. This allows me to assess how CPE framework helps to unpack twenty-first century anti-systemic movements. Focusing on the effects on movements led by three group identities that have experienced increased support in public opinion and discourse over the last decade, I compare how ICTs affect *offline* participation in Black radical, Indigenous and anarchist led movements relative to movements led by other groups. I find no moderating association between internet and mobile phones and Indigenous led social movements. In spite of popular public support for Indigenous rights connected to increasing *discourse* on issues like climate justice and natural resource use in

recent years, ICT access does not demonstrably support increased participation in Indigenous-led movements. Even more surprisingly, ICTs moderate a *decrease* in participation in movements led by Black radical groups across countries and over time, compared to other movements. Both mobile phones and the internet moderate a negative association between Black radical movements and protest counts.

Perhaps these findings suggest some prevalence of pseudo-investment for the purposes of "virtue signaling" in public online discourse when it comes to issues of Indigenous "imaginaries" and Black rights. People are perhaps so content with their online "slacktivism" (Glenn 2015) when it comes to these issues, that they are not motivated to participate in offline protests. From an ASID framework, such virtue signaling may be supported by algorithmic structures, as they encourage continued investment in online activity. This supports hegemonic U.S. interests by encouraging users to stay glued to their devices, generating profits for the social media corporations that buy and sell attention. Increased online activity—even online activism—may drain individuals causing resistance fatigue and prohibiting meaningful agentic action offline, further supporting U.S. interests. Given their relatively smaller influence on discourse, Indigenous and Black radical institutions struggle to recruit offline protest participants, and the movement suffers. These competing institutions cannot realize their competing "imaginaries" against the boundaries created by hegemonic U.S. interests. Crucially, hegemonic U.S. interests are not *necessarily* threatened by online chatter about supporting Indigenous traditions and Black rights, but are likely to be threatened by continued offline protests demanding an end to exploitation of Indigenous land and the dismantling of the U.S. police state. The capitalist world-system manifests itself in the core empire as *racialized* capitalism (Virdee 2019; Henry and Danns 2020) so utilizing the attention economy to promote "slacktivism" over offline activism over racial and ethnic causes supports the continued global hegemony of the United States in the current world-system.

Yet both internet and mobile phones moderate an increase in protests led by anarchist groups. Anarchism is a tricky concept to unpack as it is both a political philosophy and social movement (Gordon 2006). Anarchy as a political philosophy sometimes include ideas to dismantle neoliberal capitalism and thus the current world-system (Gordon 2006). This form of anarchy as a social movement, however, has both historically (Berry 1999; Iacovetta and Stradiotti 2013) and in contemporary forms (Williams 2018) manifested as protests against various forms of fascism and authoritarian governance. Protests against fascist governments are not the same as protests against U.S. economic hegemony and the capitalist world-system. In fact, all major successful revolutions in the twenty-first century—from Nepal to the Arab Spring revolutions—have been revolutions that succeeded in dismantling authoritarian governments and dictatorship. Needless to say, the capitalist world-system continues to survive these major revolutions against authoritarian governments.

The positive association between ICTs and anarchic movements, first, likely corresponds to increase in support for antifascist movements that tend to operate under the umbrella of anarchism (Bray 2017). With the global turn toward right-wing fascism in recent years, public *discourse* against fascism has escalated in online spaces. Unlike with the issues of Indigenous and Black

rights, it appears that the discourse corresponds to offline protest participation. Explanation for this discrepancy perhaps has to do with the nature of the attention economy. For example, with the collective social media attention focused on the public face of fascist tendences, the 45th president of the United States Donald Trump, antifascism has captured mass attention consistently from about 2014 onwards. By contrast, support for Black rights, for example, has been more transient in the attention economy, escalating when particularly brutal incidents of police violence are posted online, and deescalating when the collective emotional attention has moved to another topic. As a relevant tangent from present discourse at the time of writing this paper, I will share a personal narrative. I live in a small liberal town in the American South. My neighborhood is made up of kind people and proud democrats who show their support for social movements by placing bold signs on their yards. When I first moved into this town in the summer of 2020, every yard had an identical "Black Lives Matter" sign. Those signs remained there for a little while, until around February 2022, when literally overnight, every single sign in my neighborhood changed to identical "We Support Ukraine" proclamations. The most important part of this story from an attention economy standpoint is that in most cases these signs were not *added* to signs supporting Black lives, but *replaced* by signs supporting Ukraine.

The second explanation for increased turnout at anarchist protests as ICTs expand is that "anarchists" are not always anti-capitalist groups. Anarchy operates across the economic ideological spectrum. With a focus on government deregulation, many anarchist groups are explicitly pro-capitalists (AnCaps), and newer iterations of the AnCap movements within the context of the attention economy focus on creating new forms of deregulated capital including cryptocurrency (Vergne and Swain 2017). Their ideological goals, in congruence with the capitalist world-system, remains unfettered accumulation of capital.

In general, it appears that the CPE framework is supported in the context of online discourse. Protest participation increases with increased ICT access, as long as online discourse first, corresponds to topics peaking in the social media attention economy; and second, does not seriously threaten the capitalist world-system and U.S. hegemonic power. The attention economy exists to support U.S. economic hegemony and the boundaries of discourse within this economy are also drawn based upon how it impacts the United States' position in the current world-system. Thus, while ICT expansion does encourage an increase in offline protest participation, only participation in certain kinds of anti-systemic movements are supported given that these technologies are privately owned by capitalist interests that support U.S. hegemony.

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Disclosure Statement: Any conflicts of interest are reported in the acknowledgments section of the article's text. Otherwise, authors have indicated that they have no conflict of interests upon submission of the article to the journal.

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Appendix A: Bivariate Correlation Matrix

VARIABLE	Counts	Internet	Mobile	GDP	Democracy	Education	Urban	Trade	Demand	Identity
Protest Counts	1									
Internet per 100	0.001	1								
Mobile per 100	-0.0093	0.8244	1							
GDP per capita	0.0301	0.6701	0.4575	1						
Democracy	0.0445	0.3677	0.2148	0.6192	1					
Women's Education	0.038	0.5641	0.4473	0.6268	0.5063	1				
Urban Growth	-0.0238	-0.3674	-0.2314	-0.3304	-0.3893	-0.6627	1			
Trade	-0.0609	0.3217	0.3304	0.2791	0.1416	0.2843	-0.0855	1		
Protester Demand	-0.0113	-0.0291	-0.0067	-0.0809	-0.1253	-0.0475	0.0689	-0.0045	1	
Protester Identity	-0.0266	-0.0052	0.0372	-0.049	-0.1303	-0.1065	0.1029	0.0697	0.0833	1

Appendix B: Summary Statistics

VARIABLE	Obs	Mean	Std. Dev.	Min	Max
Protest Counts	15,109	16056.73	118765.5	10	7000000
Internet per 100	16,946	24.76365	29.15081	0	99.70151
Mobile per 100	17,988	56.99957	51.51744	0	345.3245
GDP per capita	17,861	11186.86	16697.47	95.1882	189422
Democracy	17,950	4.607967	1.844206	1	7
Women's Education	11,989	80.07481	29.83217	0	175.221
Urban Growth	18,420	2.11114	1.831249	-7.18234	17.7625
Trade	16,967	75.42281	45.87722	0.020999	860.8
Protester Demand	15,165	2.79822	0.7037672	1	4
Protester Identity	19,111	4.887918	0.4070236	1	5