Measuring the Political and Social Consequences of Government-Initiated Cyber Shutdowns

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Abstract

In the modern age, digital communication tools play a central role in the conduct of protests and assemblies during periods of social unrest. The foremost illustration of this was during the Arab spring, where digital platforms were leveraged to promote and sustain public protests. In response, countries attempted to dispel gatherings and limit public protest by 'shutting down' the Internet or blocking online access to social forums. Since then, dozens of states have begun to employ cyber-shutdowns. During a one year period, a study tracked 81 different instances of Internet shutdowns in 19 countries. This trend is only escalating. While significant resources have been invested in tracking the technical contest between governments and activists, no research has succeeded in acquiring individual level data regarding the political and social effects of Internet deprivation. This research paper reflects on two novel experimental designs that quantitatively measure how citizens respond to cyber blackouts. The first experiment consists of a controlled experiment that tests the ability of participants to complete tasks related to political participation under simulated treatments of Internet access or deprivation. The empirical findings support our hypotheses that the absence of Internet access significantly restricts the ability to engage in political activity. A second experiment extends this research beyond a laboratory setting by tracking the activity of Internet users in multiple countries during period of government-initiated Internet shutdowns. This allows us to determine whether modern forms of digital political participation have supplanted traditional offline avenues of political activity, and whether citizens are able to circumvent cyber blackouts.

1. Introduction

In the modern age, digital communication tools play a central role in the conduct of protests and assemblies during periods of social unrest. The foremost illustration of this was during the Arab spring, where digital platforms were leveraged to promote and sustain public protests. The importance of this medium in relation to protest activity was shown as countries attempted to dispel gatherings and limit public protest by blocking online access to social forums (Morozov, 2011). It is widely held that the disparate forces engaged in protest activities throughout the Arab world would not have been able to converge without modern communication technologies and social media (Arafa, 2016). Since governments began employing cyber-shutdowns during the Arab Spring, we have witnessed a drastic escalation in the

use of this tool. During a one year period between 2015 and 2016, a study tracked 81 different instances of Internet shutdowns in 19 countries (West, 2016). Notable examples include Turkey in 2015 where Twitter and Facebook were blocked in response to fears over the spread of images of a terrorist bombing (Dearden, 2015); India shut down mobile services during February 2016 in response to street protests (Dash, 2016); Brazil ordered telecommunication companies to block access to WhatsApp in May 2016 due to protests (Reuters, 2016). Even more recently, Iran shut down Internet infrastructure in December 2017 in cities where protests took place against the government's economic policies (Frenkel, 2018).

Significant resources have been invested in tracking the technical contest between governments and activists, and substantial data exists regarding the type and scope of the shutdowns. However there is far less understanding of the social and political effects. On one hand, scholars such as Morozov (2011) argue that the contribution of social media to popular demonstrations and democracy movements has been overhyped. By contrast, Chander (2011) argues that the very fact that governments immediately adopt Internet shutdowns in response to social unrest is very proof of the power of unrestrained Internet access. A report by researchers at the University of Washington identified 606 instances in the years between 1995 and 2011 where 99 different governments intentionally impeded the operations of their national Internet infrastructure (Howard, 2011).

In the context of public protests or political tension, authorities threatened with social dissent are increasingly utilizing the tool of Internet blackouts "as a method of controlling both the information landscape and citizens' ability to mobilize" (Searcey, 2017). Shutdowns can range from a complete closure of the underlying Internet infrastructure, to the closure of mobile Internet services or even particular subnational apps or services such as ViOP or WhatsApp. In recent years, we have seen a dramatic increase in the use of Internet shutdowns with more than 19 countries adopting some form cyber blackout.

The reason why this tool of cyber-blackouts is being adopted by governments is because the widespread diffusion of Internet access has upended traditional methods of political participation and civic engagement. Whereas traditional political acts were conducted offline and centered around electoral activity, today the scope of political participation has broadened. Political discourse and debate have largely moved to social media, social protests have adopted digital equivalents, and the Internet has become the primary intermediary for government-citizen interactions and access to information. These new digital avenues for civic engagement have done more than offer technological shortcuts for an Internet savvy generation – they have significantly reshaped our democratic processes and structures such

that Internet access is now a prerequisite to participate in civic life. But this centralization of democratic participation through a cyber funnel also offers unparalleled opportunities for governments to limit access, either to individuals or entire populations. Combined with heightened levels of susceptibility to cyber disconnectedness, we can observe a dichotomy of dependence and vulnerability, where citizens' reliance on Internet access to realize their basic civil rights are matched only by their vulnerability to Internet disconnection.

This research paper employs two experiments that quantitatively measure how citizens respond to these shutdowns, how it affects their political attitudes, and how they succeed (or don't succeed) in accessing and disseminating political information during periods of blackouts. The first experiment involves isolating participants under laboratory conditions and measuring the extent to which they can perform civic tasks under conditions of Internet access and deprivation. The results provide strong evidence that Internet access is the primary determinant of the ability to engage in political expression and association. Following this controlled experiment, we are setting in place a field experiment that will track Internet users in multiple countries during period of government-initiated Internet shutdowns.

The findings of these experiments relate to the fields of public policy, law and human rights. If we find that political participation has become so intertwined with Internet access that citizens are unable to realize their basic civic rights while disconnected, then this would alters the nature, and in time, perhaps, the legal status of cyber connectivity. This could impose negative duties on governments to refrain from restricting Internet access – from either the entire population, or from specific persons such as prisoners. Such a finding would support the re-characterization of Internet access as a protected public asset, and impose positive duties on governments to ensure affordable, secure and high-speed Internet access for its citizens. This would make Internet access akin to public utilities such as water or electricity. Taken to its most extreme conclusion, this research could lend support to the argument that Internet access is becoming a human right, requiring an even higher level of protection.

2. Political Participation and Internet Deprivation

2.1 Internet Access and Civic Engagement

In the short time that the Internet has existed, it has become a central medium of political dialogue and has transformed the nature of political participation. The growth in digital penetration has democratized public communication by allowing any person to broadcast at a whim their thoughts and opinions to a

global audience with the push of a button. Essentially, digital technologies and infrastructure have transformed the social conditions through which people speak" (Balkin, 2014). By lowering the cost of participation, citizens with few resources, who were otherwise excluded from the centralized corridors of political discourse, can participate in public dialogue (Balkin, 2004). But more than just facilitating mass participation, Internet generated civic participation in the twenty-first century differs in significant ways from movements of the past and often operates with a different logic (Tufekci, 2017). On the structural level, cyber participation overcomes the obstacle of geographical dispersion and is entirely asynchronous compared to traditional forms of media and participation (i.e. you can't attend a physical protest once its ends or question a politician in a public forum after question time ends) (Coleman, 2009). By facilitating lateral peer-to-peer discourse, the Internet pivots the traditional many-to-few forms of communication to a wider audience. Digital activities such as web forums and interactive media enable more active engagement compared to the traditional outlets that allowed only for passive participation (Coleman, 2009).

"There has been considerable optimism from many observers that digital media tools can stimulate voting and other forms of traditional participation" by making political information more accessible and encouraging engagement (Bimber, 2015). Research on the role played by digital connectivity has focused on a number of promising lines of focus. One direction has been to measure the extent to which cyber connectivity and usage increases the likelihood that people will engage in offline political activities, and numerous studies have found small but positive effects (Bimber, 2015; Bimber, 2013; Bakker & de Vreese, 2011). Another line of research has concentrated on the rise of digital forms of political participation such as 'clicktivism', 'hacktivism' (Skoric, 2012; Halupka, 2014; Neumayer, 2016) social media protests (George, 2018) and citizen journalism (Cram, 2015).

A central element of political participation is political expression. In this area, the digital revolution has not affected the content of free speech, but has had a transformative impact on its medium, in other words, the process of speaking freely. In the short time that the Internet has existed, it has become a central medium of political dialogue. In an American study, 66% of social media users, constituting 39% of American adults, engaged in civic or political activities through social media. Likewise, 73% of adult Internet users (representing 54% of all US adults) went online to get news or information during the 2010 congressional elections or to get involved in political campaigns (PewResearchCenter, 2016). This migration of discourse is taking place in all matters of substantive discourse and not just in media. The increasing predominance of digital journalism (Conaghan, 2015; Cram, 2015), the transition of academic

journals to Internet based formats (King, et al., 2003; Luther, 2002), the role of digital interfaces in promoting public opinion and the evolution of online receipt of letters to the editor, a symbol of popular participation in political discourse, all offer stark insight into the vital role played by the Internet in enabling modern speech.

Likewise for political association and interaction, another fundamental pillar of political democracy, the Internet plays a key role in easing and facilitating traditional forms of assembly by making possible instantaneous global communication and enabling the efficient and targeted recruiting of members. The Internet additionally enables the conduct of assemblies and forums in ways never before seen or imagined. "In a world where citizens are increasingly connected to the Internet, assemblies are not only planned and organised online, assemblies can occur entirely online" (Almstrom and Liddicoat, 2012). Physical proximity is no longer necessary for a group to conduct meetings. Face to face human interaction has become culturally archaic in light of efficient online forums that amplify attendance and ensure anonymity. The critical influence of Internet usage on the conduct of popular assemblies came to the fore during the Arab spring where digital platforms inspired public protests. The importance of this medium in relation to protest activity was proved time and time again as countries attempted to dispel gatherings and limit public protest by blocking online access to social forums (Morozov, 2010). It is widely held that the disparate forces engaged in protest activities throughout the Arab world would not have been able to converge without modern communication technologies and social media (Arafa, 2016).

Despite the enthusiasm for the stimulating effect of digital connectivity, research has identified significant negative side-effects. Foremost among these are the security vulnerabilities of digital platforms that can be manipulated more easily than traditional offline communication mechanisms. Recent elections in Europe and the United States have showcases how technology can be manipulated to undermine democratic practice, sow discord and entrench false narratives within mainstream discourse (Coleman, 2009). Other vulnerabilities include the censorial power of the moderator and the fear that new centers of digital power merely recalibrates the political elites rather than distributing power to the masses (Coleman, 2009). A ongoing line of research argues that the Internet will not necessarily encourage politically apathetic citizens to become more engaged, and will only serve to galvanize additional activity among politically active citizens (Boulianne, 2011).

2.2 Modes of Internet Deprivation

Involuntary Internet deprivation is not a theoretical phenomenon. While this paper will focus primarily on the phenomenon of government-initiated Internet shutdowns, there are common methods that serve to disconnect millions of people from the Internet. The most visible danger related to Internet deprivation is the risk of cyber attack. A key characteristic of cyber offensive tools is that this is an asymmetric resource. Sophisticated cyber-tools that were once the domain of government agencies are now commonly utilized by domestic and international cyber-criminals that target businesses and individuals. Government sponsored cyber-warfare has allowed even countries with relatively weak military strength to employ and utilize asymmetrical military tools, the results of which are spilling over into civilian life. The anonymity of cyber-attacks, or at least the difficulty in ascribing attribution, means that contrary to classical military conflicts, governments appear more willing to employ offensive cyber tools. In addition to the myriad targeted cyber-attacks that focus on intelligence gathering or sabotage and are limited to isolated institutions, there is evidence of cyber attacks targeting civilian networks such as the alleged Russian attack on the Ukraine in March 2014 that shut down mobile phone networks and hampered Internet connections for millions of Ukrainians (Lee, 2014). High profile ransomware attacks have infected more than half a million computers in over 150 countries and expanded the grounds for Internet deprivation to criminally motivated acts (Yellepeddi, 2017). Commercial espionage has also adapted to the cyber age with approximately 47% of US companies experiencing a ransomware attack or other online intrusion during a recorded 12 month period (Osterman Survey, 2016).

Another factor that leads to Internet deprivation is the digital divide. The digital divide refers generally to disparities in connectivity among segments of population groups, both internationally and within countries. The primary element of this phenomenon that is of interest to us is the divergence in connectivity within industrialized countries. Age, for example, is one key diverging factor that is strongly related to greater Internet connectivity. In a Dutch study, a country renowned for its high rate of connectivity, 19 percent of those aged 65 and older were found to lack regular Internet access at home, compared to rates of 5%, 1% and 0% among younger age brackets (Van Deursen, 2015). In Britain, 51 percent of the elderly population were found to lack Internet access at home in 2013 (Dutton, 2015). Poverty for obvious reasons can significantly impact connection rates owing to the cost of computer equipment, Internet connection fees, mobile phones and more.

A third common avenue leading to Internet deprivation is criminal punishment. States have long restricted Internet access to prisoners – most commonly for sex offenders and accused terrorists

(Wagner, 2012). The rationale for this deprivation is public safety – in that sex offenders could ostensibly continue to offend over the Internet, even behind bars, and members of terrorist groups and organized crime could continue to direct operations. This practice of deprivation has led to legal battles in state and federal courts of the United States, and in countries as diverse as India and the United Kingdom. The courts have consistently struck down Internet deprivation laws on the basis that it disproportionately harms the realization of free expression and other rights. The most significant legal ruling was handed down in 2017 by the United States Supreme Court in the case of Packingham v. North Carolina. In this case, the court unanimously struck down a state law that barred registered sex offenders from accessing social media (Packingham, 2016). Representing the majority position, Justice Kennedy made clear how the Internet has transformed civic life and assumed the role of the modern 'public square'.

'By prohibiting sex offenders from using those websites, North Carolina with one broad stroke bars access to what for many are the principal sources for knowing current events, checking ads for employment, speaking and listening in the modern public square, and otherwise exploring the vast realms of human thought and knowledge. These websites can provide perhaps the most powerful mechanisms available to a private citizen to make his or her voice heard. They allow a person with an Internet connection to "become a town crier with a voice that resonates farther than it could from any soapbox"'.

These modes of deprivation are not exhaustive. Among other possibilities, citizens can also choose to disconnect from the Internet in response to privacy concerns relating to surveillance or censorship; and religious groups can encourage members to avoid Internet connections for moral or communal reasons.

2.3 Government-Initiated Internet Shutdowns

At the same time that the judicial system is championing the rights of prisoners to maintain access to the Internet, governments across the world are implementing partial or comprehensive Internet disruptions that affect the wider population. These states, typically but not always characterized by autocratic governance features, have at times initiated some form of Internet blackout, relying on a series of justifications that include safeguarding government authority, reducing public dissidence, fighting terrorism, maintaining national security, or protecting local businesses. Authorities are increasingly utilizing this tool 'as a method of controlling both the information landscape and citizens' ability to

mobilize, in recognition of the fact that the Internet has become a fundamental tool for people to realize their rights and participate meaningfully in society' (Searcey, 2017).

In terms of pure numbers, the number of temporary government initiated Internet shutdowns has risen exponentially in recent years. One study conducted by University of Washington researchers identified 606 instances where 99 different governments deliberately interfered with Internet operations between 1995 and 2011 (Howard, 2011). Compared to a single disruption in 1995, and four disruptions in 1996, the number rose to 111 in 2010. During a one year period between 2015 and 2016, a Brookings Institute research project led by Darrell West tracked 81 different instances of Internet shutdowns in 19 countries (West, 2016). His research observed a cumulative total of 753 days of affected Internet services causing some USD $2.4 Billion in economic damage to the respective countries. A Deloitte study estimated that the per day financial cost of a temporary Internet shutdown in a country with high rates of connectivity would reach $23.6 million per 10 million population (Deloitte, 2016). This does not include the non-numerical value of the damage caused to the inability of citizens to fulfill particular democratic and social functions that rely on Internet access.

The most cited modern illustration of an Internet shutdown was by Egypt during the Arab Spring protests during 2011. In response to increasingly violent street protests that threatened the stability of the Mubarak regime, authorities adopted harsh steps to dispel protesters and end the popular uprising. As history shows, the clumsy response to the network-driven protests backfired, but governments have learned from this lesson and developed more sophisticated methods to neutralize those who would use digital tools against them (Tufekci, 2017). Today, it is notable that one of the primary steps taken to disperse protests that are being publicized online is to order ISPs to shut down all international connections to the Internet before they lead to physical demonstrations (Subramanian, 2011). In light of the relatively few ISPs in the country at the time with international digital connections, this had the effect of severing Internet services for civilians. Other notable recent example of government shutdowns include Turkey in 2015 following a terrorist bombing at a public rally (Dearden, 2015), India throughout 2016 and 2017 in response to frequent street protests (Dash, 2016), and Brazil following corruption protests in 2016 (Reuters, 2016). While the justification of most of these occurrences rely on maintaining law and order and protecting public safety, multiple countries including Uganda, Algeria, India and Iraq have disrupted Internet services owing to concerns about student cheating on national exams (West, 2016).

As the numbers of Internet users has grown, states have developed increasingly sophisticated techniques to censor content such as controlling central intermediaries and search portals, controlling the financial intermediaries, controlling the conduits and ISPs and search result filtering. Recently, the rise in processing power has allowed certain states to erect gatekeeper systems that ostensibly act as a buffer between the external Internet and all citizens. In Saudi Arabia for instance, "the government is quite open about its filtering practices, and the role of the proxy server is published on its website" (Subramanian, 2011). The most drastic step is a total cyber blockade. This step entails completely blocking all access from any entity inside to any entity outside, and vice versa. This is the step that has gained the popular parlance 'Internet Kill Switch' – even if no such switch really exists. Countries like Myanmar in 2007 and Egypt in 2011 initiated the 'kill switch' by ordering all ISPs operating in the country to shut down all international connections to the Internet. For this to work effectively, it requires that the country possess a relatively small number of ISPs and that the country possess weak judicial independence. Even then, the process of turning off the Internet can take days as the ISPs slowly wind down operations.

3. Experimental Methodology – Measuring the Effect of Internet Shutdowns

While exhaustive debate has focused on the national impact of pervasive Internet access, and new studies have considered the technical ability to circumvent censorship and other cyber disruption, no research has managed to acquire quantitative data on how Internet deprivation affects political participation or the realization of civil rights on an individual level. To counter this absence of data, we employ two complementary experimental research designs. The first experiment isolates the effect of Internet deprivation in controlled laboratory settings in order to explore the precise effect of deprivation on individual elements of political activities. To overcome the absence of an empirical test to measure the effect of Internet deprivation on an individual level, the author developed a new experimental procedure that was tested on a predominantly student population. The second experiment, still in the planning phase, moves to a real life setting of Internet shutdowns to explore how citizens in different countries respond to this phenomenon.

<u>Experiment 1 – Internet Deprivation Experiment Under Controlled Conditions</u>

The aim of this experiment was to develop a controlled, randomized methodology to gauge the ability of participants to complete political activities under the conditions of Internet access and deprivation. Three particular areas were chosen that reflect three central manifestations of political participation – political expression, political association and access to political information.

Methodology

Sixty participants were recruited to participate in an activity that was marketed as a 'scavenger hunt'. The experiment was conducted on a university setting and so included a population sample that largely included students, as well as a number of participants drawn from the wider community. Participants were given 60 minutes to complete three tasks that simulated the realization of the political activities that were being investigated – political expression, political association and access to political information. Participants randomly assigned to the treatment condition were forbidden access to the Internet, but could use all other tools available to them in a university library environment. Participants randomly assigned to the control condition had full use of all personal and environmental tools, including Internet services. To incentivize participation and good-faith attempts to complete tasks, the experiment was marketed as a scavenger hunt with financial remuneration based on the number of tasks completed. Following the 60-minute interval, participants ability to complete the tasks were measured according to a four point scale whereby four points indicated that participants were fully able to complete the task, and one point indicated that participants were unable to complete the task and unable to conceive of how to complete the task. The primary dependent variable in this experiment was political participation, and additional demographic variables such as age; gender; education level; political self-identification; family income; and average daily Internet usage were all collected.

Political Participation Measure - The primary dependent variable that the experiment measures is the ability to realize civic tasks / engage in political participation. We distinguish between three elements of political participation – political expression, group congregation or association and acquiring political information. To operationalize these activities, we selected tasks that simulate typical manifestations of expression, association and information in daily life. While these tasks do not reflect the full scope of each element of political participation, a challenge that is discussed further below, they were chosen to reflect rudimentary features of these elements in daily life. The tasks given to participants were: 1) Publicly critique a social or political issue such that it reaches a wide audience (expression). 2) Identify the topic and content of a local NGOs campaign slogan that is active in recent demonstrations (association) 3) Identify the names of the Members of Parliament who initiated a recent bill of parliament (information). The completion of these tasks were coded on a four-point scale from 4 – fully able to complete the task, to 1 – Entirely unable to complete the task or conceive of how to complete the task. Full completion of tasks required participants to successfully acquire the correct information being sought (for tasks two and three) or to effectively communicate their political position to a sufficiently large audience (task one).

Results

Our statistical analysis strategy for this experiment involved a combination of T-tests, chi-squared analyses and logistic regression analyses. As an initial step (a), we conducted a series of independent samples t-tests to measure the difference between control (Internet access) and treatment (Internet deprived) groups in the realization of each of the three components of political participation. Building on this (b), we ran a series of chi-squared analyses to determine whether the proportion of participants who completed the tasks under treatment and control conditions differed from the expected outcome. We were particularly interested in a success versus failure outcome, and so recoded the task completion variable into categories and used a chi-square analysis to test for differences between the conditions. Finally (c), we elected to run a logistic regression analysis to further support our hypotheses to show that the effect remains significant when controlling for additional variables. These tests allow us to confirm our hypotheses by quantifying the extent to which the Internet access variable affects the ability to complete the different tasks.

Our initial step of conducting independent sample t-tests revealed that the treatment variable (Internet deprivation) had significant negative effects on the ability of participants to realize the three tasks (see Table 1). In particular, the treatment effect on tasks one and two ($p < .007$ and $p < .002$) were highly significant, while the effect for task 3 was not significant. This supports our suspicion that access to political information was associated with but not yet completely reliant on Internet access. The effect sizes for all three tasks were medium to large, offering further support for our hypotheses.

For the subsequent chi-squared analyses tests, we converted the 4 point task outcome scale into a dichotomous variable whereby the original 4 points (full completion) = 1; and 1, 2 or 3 points (partial completion or lower) = 0. This conversion allows us to pinpoint the influence of Internet access on full task completion and reflects a stricter view that the realization of civic rights has only a binary outcome and does not fall on a gradient scale. This conversion has the added benefit of enabling a chi-squared analysis for a small N experiment where individual cell outcomes would otherwise be low. By comparing the observed results to the expected distribution (see Table 2), we find that Internet access substantially affected the distribution of success in the realization of political expression ($\chi 2$ ($df = 1$) = 6.46, p= .011) and political association ($\chi 2$ ($df = 1$) = 14.59, $p < .001$), and has a slightly less significant effect on access to political information ($\chi 2$ ($df = 1$) = 4.66, p= .031). Specifically, in the Internet access (control) condition,

61% of participants were able to fully engage in political expression, compared to only 29% in the no Internet access (treatment) condition. Similarly, 93% of participants were able to realize their right to political association in the Internet access condition, compared to only 47% in the no Internet access condition. And on the task reflecting access to information, 71% of participants were able to complete the task in the Internet access condition, compared to only 44% in the no Internet access condition. Of those who scored a combined task average of 3.00 or higher – indicating complete or partial completion of tasks – the difference was even starker with 89% of control subjects succeeding compared to 50% of treatment subjects (see Table 4).

To further test our hypotheses, we conducted logistic regression analyses to test the effect of the Internet access condition while controlling for the following demographic variables – age, gender, level of education, political identification, family income and average daily Internet usage (See Table 3 for results). The analysis was conducted in two stages, with the primary control / treatment condition used as the only variable in stage 1, and with demographic variables entered as simultaneous predictors in stage 2. During each stage, the logistic regression analyses were conducted three times – predicting task completion for each of the three tasks independently. These analyses indicated that the Internet access condition significantly predicted successful task completion for each of the three tasks even after demographic and other variables were added to the model, indicating that Internet access has an effect above and beyond the effect of these variables.

Experiment 2 – Political Participation During Government-Initiated Internet Shutdowns

A complementary second study that is currently being conducted will extend this research beyond a controlled environment to real-life situations of Internet deprivation. The experiment utilizes large N survey that are distributed immediately before and after an instance of prolonged Internet shutdown, with the aim of gaining insight into if and how civilians are able to circumvent Internet blackouts during periods of social protests. A central challenge to this research, and a reason for the absence of accurate data on how citizens respond to Internet shutdowns, is that by the very nature of Internet shutdowns, governments do not broadcast in advance when they intend to "switch off" the Internet. This second experiment is still in the planning stage, and we expect to publish results during the second half of 2018.

For the purposes of this experiment, pre- and post-outcomes will be obtained using closed ended structured questionnaires that include measures pertaining to political efficacy, trust in government,

political participation, daily functioning in the absence of Internet access and the ability to circumvent cyber controls. A central challenge to our research is to select locations to conduct the experiment without knowing in advance where and when an cyber-blackout event will take place. To overcome this, we rely on trends through which we can forecast likely locations of impending shutdowns. In 2016 and 2017 for example, the countries that experiences the largest number of unexpected Internet shutdowns were India, Iraq, Syria, Pakistan, Turkey and Brazil. These shutdowns took place in the context of civil dissent, protests and public violence. Extrapolating forward, we can rely on two predictive variables to forecast locations of likely Internet shutdowns during the subsequent twelve months. These variables are a) a country that has a history of using Internet shutdowns; and b) simmering dissent and social tension that is liable to generate protests during the subsequent period. Though these variables can not guarantee the likelihood of any shutdown, research indicates that these are the minimum conditions required for a shutdown to take place. We add to this a third variable which is that during periods of stability, Internet access and social media usage must be sufficiently pervasive such that it forms a natural avenue of political expression. This is necessary so that any interruption will have a measurable effect, which can then be extrapolated to other countries with high levels of Internet penetration.

4. Discussion

Our research findings up until this point indicate that citizens are generally unable to engage in political participation in the absence of Internet connectivity. The question for us is what this finding means for the phenomenon of Internet shutdowns. One perspective is that Internet disconnections are the cyber equivalent to employing crowd dispersal devices such as smoke grenades, sonic weapons, cavalry, etc. Internet disconnections could be considered a cyber smoke grenade if you will. Yet unlike traditional crowd dispersal tools, Internet disconnections are not subject to the same limitations. In democratic countries, freedom of expression is a prized right, and police only disperse protests in particular circumstances where the protest reaches the level of incitement, or the crowd poses a danger to the lives of others. Internet disconnections by contrast, are not typically associated with the violation of constitutionally protected rights such as freedom of expression, and so its use is viewed less threateningly.

Yet Internet disconnections affect more than the ability to congregate and protest. Our research shows how cyber deprivation substantially decreases the ability to engage in political expression or attain political information. It is for this reason that an Internet shutdown essentially prevents political activity, allowing for states to prevent political discourse during contentious periods. By looking at the instances of

disconnections reviewed above, we can see how states, usually but not necessarily characterized by an absence of democratic norms, use this tool during periods of political instability – during anti-regime protests for example. This lends credence to Chander's (2011) argument that the widespread use of Internet shutdowns by governments in response to social unrest is prima facie evidence of the contribution of Internet access to political participation.

Internet access has become inextricably intertwined with the ability to engage in political participation. As a result, cyber disconnections can mean that governments are disconnecting citizens from the ability to politically engage. The reason this statement is important, is that this is not the way that disconnections are commonly perceived. Insofar as cyber disconnections are tantamount to political disconnections, states should bear a negative duty to avoid any instance of Internet disconnections, apart from the most extreme circumstances that would warrant traditional security actions that can block traditional expression and congregation.

To the extent that we are talking about moderating state activity and imposing negative duties to refrain from extreme acts, this conclusion is not particularly controversial, and mainly demands a slight change in framing. Yet taken to the next level, our research reveals how people are highly dependent on Internet access to realize basic civil and human rights that are connected with political participation. At a minimum, this relates to freedom of expression, freedom of association and freedom of information, but this could conceivably extend to other rights such as the right to education, the right to employment, the right to personal and national development, etc. Under this interpretation, where Internet access facilitates the ability to realize basic civil rights, then in addition to a negative duty to avoid conducting Internet disconnections, governments could even possess a positive duty to actively provide Internet access to disenfranchised members of the population.

This new dichotomy of cyber dependence to realize basic civil rights weighed against vulnerability to cyber-disconnection may require a more comprehensive human rights framework. A demand to address modern cyber challenges through a human rights lens has been echoed by international institutions, national legislative bodies and courts around the world. The most prominent calls have come from the United Nations (United Nations, 2016) and European Union (Council of Europe, 2011; Council of Europe, 2015). In his landmark 2011 report, Frank La Rue, the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression proclaimed that 'the Internet has become an indispensable tool for realizing a range of human rights' in light of which 'states should develop a concrete

and effective policy […] to make the Internet widely available, accessible and affordable to all segments of population' (United Nations, 2011). A finding that Internet access is a human right would impose even stronger positive duties on governments to ensure the resilience of Internet access.

In building this human rights approach, four different streams have emerged by which Internet access could attain the status of a human right. The first approach relies on Article 19(2) of the ICCPR that declares: *'[e]veryone shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of his choice'.* The argument here is that the language used in this clause is sufficiently broad to apply to new technologies that facilitate the protected activities. The second approach to a human rights framework for Internet access is based on article 19 of the Universal Declaration of Human Rights, which guarantees similar protections. A third and more recent approach claims that national practice and rising levels of institutional support on the international level is sufficient to comprise customary international law and so grant Internet access the status of a human right. Finally, a fourth argument claims that Internet access has become an 'auxiliary human right' in support of a series of primary rights. An auxiliary right is a secondary human right that is so inextricably intertwined with a pre-existing primary right, that it attains the status of a human right unto itself. This claim asserts that a variety of civil, political and human rights have become entirely intertwined with Internet access, and that in the absence of Internet access the right would lose substance and value. In this case, the primary rights that it could connect to include freedom of expression, freedom of information, freedom of association, the right to national development, the right to education, the right to employment and more. Of the arguments reviewed here, our research most closely attunes with the auxiliary righthood argument, since we have measured a statistically significant relationship between Internet access and the ability to realize these primary human rights.

Widespread Internet access has transformed the nature of political participation and enfranchised millions of citizens who have gained a platform to make their voices heard. While this process of social transformation bears significant positives, the process of funneling a large portion of political activity through a vulnerable platform can form a major weakness. Much of this will depend on whether the new cyber modes of political participation have added to the repertoire of political activity, or whether they have supplanted traditional offline modes of participation that may no longer be available. For instance, many major newspapers no longer accept handwritten or posted letters to the editor, and younger generations are less aware of offline channels of political expression. The findings from our research show

exactly why governments are taking advantage of this chokepoint to cut off Internet access during politically sensitive periods.

5. Limitations and Contributions of this Research

There are a number of factors that limit the utility of this research. A primary limitation in the controlled laboratory experiments is that the tasks that simulate the realization of political participation are only partially reflective of its full scope. Political participation is a complex concept, and isolating its sub-categories (political expression, association, information) as dependent variables require pinpointing particular operationalizations. Political association, for example, includes a broad array of activities including participation in street demonstrations, signing petitions, joining labor unions and political parties, and much more. Political expression constitutes an even broader array of connected actions. In the United States, the scope of protected political expression has been extended by the courts to include baking cakes and making political donations. Under controlled conditions, our research asks participants to complete particular tasks that reflect the essence of each category, the results of which can be extrapolated to the full scope of that right. Future research should expand this methodology to additional activities.

A second and connected limitation is the manner in which a controlled campus experiment with a student population can be generalized to the wider population. To confidently generalize this research to a wider population, this experiment will need to be replicated with a larger and more representative population sample, observing a longer period of deprivation, and take place outside of the confines of a campus setting. Ideally this experimental methodology would take place in multiple countries to take into account the varying degrees of Internet saturation in different countries, the different dates of widespread Internet penetration, and the subsequent variation in reliance on Internet access to complete different tasks.

Despite these limitations, this experimental method still contributes highly valuable data. This is the first research to experimentally test and quantifiably measure the effect of Internet deprivation upon the realization of particular civil rights. The results of the first phase of this dual-experiment methodology succeeded in building an effective methodology to empirically analyze the consequences of Internet deprivation – measured separately for individual elements of political participation. A campus setting possesses many benefits as well, since it possesses many of the resources that would be available in a wider setting, such as large numbers of people, authoritative sources, newspapers, libraries and more.

There is also special interest in conducting this experiment among a student population since this is a segment of the population known as 'digital natives' – people who have never known a time without Internet access, and for whom we hypothesize that Internet deprivation will have a greater effect than for older generations. Finally, this initial controlled experiment lays the groundwork for the subsequent cyber-blackout research that takes place in the field. Our findings in the first experiment tested the creativity of participants to see whether they were able to realize basic rights under conditions of Internet deprivation. The motivation in this case was financial, with rewards offered for participants who could overcome the lack of Internet access. While this assisted in pinpointing the effect of deprivation on individual rights, we recognize that the motivation

6. Ethical and Research Challenges

Our research is premised on literature that attests to the negative psychological emotions stemming from prolonged Internet deprivation. Even our first 'scavenger hunt' experiment, which relied on a brief period of deprivation of one hour, recorded a small but statistically significant increase in self-reported feelings of frustration, anger and irritation. As we progress onward to further experiments that entail longer periods of deprivation (measured in the hours, days and weeks), we will need to be aware of conducting the research in such a way to limit the extent of the psychological harm caused by the manipulation of Internet deprivation.

The second field experiment also raises a number of ethical dilemmas considering that cyber blackouts are likely to occur in contexts of civil dissent (since this is the time during which government typically apply some form of Internet shutdown). Research in a conflict zone poses both methodological and ethical challenges. The guiding ethical principle of 'do no harm' is complicated in these situations due to heightened political polarization, the oftentimes presence of security and intelligence forces, the general unpredictability of events and the precarious security situation for many residents (Wood, 2006). For our particular research, where protesters are often trying to circumvent government controls on information distribution, we are keenly aware that the research findings could pose a danger to individual respondents to the extent that they can be identified. This leads to a number of ethical dictates and dilemmas that we will need to remain in the forefront of our minds when planning and executing the experiment. Firstly, the names of participants will not be stored. At no time will participants be asked to record their names, and identifying information such as IP addresses will be erased. Secondly, research subjects will need to provide full consent to their participation in full understanding of the potential risks and benefits. This is necessary due to ethical constraints, and it will also be important to verify the identity of the research

team so that participants feel comfortable sharing potentially sensitive information. We are aware that during a period of government-initiated Internet shutdowns, a research team asking information about how citizens circumvent government restrictions may raise red flags. Thirdly, securing the collected data will be of paramount importance, particularly sensitive data that might have political implications in the hands of certain interested parties. Securing the data includes constructing secure data collection methodology and storage processes, as well as processes for sending the data outside of the country. Fourthly, a later ethical dilemma will revolve around the publication of conclusions. If we discover that large segments of the population is utilizing a particular method to avoid Internet shutdowns, we face ethical concerns in publishing this data, and bringing it to the attention of the authorities. This is not something that we can resolve in advance, since not all circumvention methods will susceptible to heightened enforcement, but we note this possibility as a potential ethical scenario.

A more applied research challenge for this second Internet shutdown experiment will be to efficiently identify and take advantage of brief periods of cyber blackouts. Due to the very nature of government-initiated Internet shutdowns, we can not know in advance where and when such a shutdown will take place. Our expectation is that following the distribution of the pre-questionnaires, a shutdown will take place in at least one of the locations within a period of 6-12 months in order to ensure that the data is still viable. Though this does entail a risk that there will be no Internet shutdown, we believe that a) it is a risk worth taking due to the valuable and unique nature of the data; and b) the steps we have taken to mitigate the risks by selecting multiple locations to conduct the research based on variables that will increase the likelihood of a positive result will diminish the possibility of achieving no result.

References

Almstrom & Liddicoat (2012). APC submission to the UN Special Rapporteur on the Rights to Freedom of Peaceful Assembly. *Association for Progressive Communication (APC).* https://www.apc.org/en/pubs/apc-submission-un-special-rapporteur-rights-freedo.

Arafa, M., & Armstrong, C. (2016). Facebook to Mobilize, Twitter to Coordinate Protests, and YouTube to Tell the World": New Media, Cyberactivism, and the Arab Spring. *Journal of Global Initiatives: Policy, Pedagogy, Perspective*, *10*(1), 6.

Bakker, T. P., & De Vreese, C. H. (2011). Good news for the future? Young people, Internet use, and political participation. *Communication research*, *38*(4), 451-470.

Balkin, Jack M. (2004). Digital Speech and Democratic Culture: A Theory of Freedom of Expression for the Information Society. *New York University Law Review*, 79(1)).

Balkin, Jack M. (2014). Old-School/New-School Speech Regulation. Faculty Scholarship Series, Paper 4877, http://digitalcommons.law.yale.edu/fss_papers/4877.

Bimber, B., & Copeland, L. (2013). Digital media and traditional political participation over time in the US. *Journal of Information Technology & Politics*, *10*(2), 125-137.

Bimber, B., Cunill, M. C., Copeland, L., & Gibson, R. (2015). Digital media and political participation: The moderating role of political interest across acts and over time. *Social Science Computer Review*, *33*(1), 21-42.

Block, J. J. (2008). Issues for DSM-V: Internet Addiction. *American Journal of Psychiatry*, *165*(3), 306–307. https://doi.org/10.1176/appi.ajp.2007.07101556\

Boulianne, S. (2011). Stimulating or reinforcing political interest: Using panel data to examine reciprocal effects between news media and political interest. *Political Communication*, *28*(2), 147-162.

Bryce, Hannah, 'The Internet of Things Will Be Even More Vulnerable to Cyber Attacks' (2017) *Chatham House The Royal Institute of International Affairs.* Retrieved from www.chathamhouse.org.

Chander, A. (2011). Jasmine Revolutions. Cornell L. Rev., 97, 1505.

Charlton JP, Danforth IDW. Distinguishing addiction and high engagement in the context of online game playing. Computers in Human Behavior. 2007; 23(3): 1531–1548.

Coleman, S., & Blumler, J. G. (2009). *The Internet and democratic citizenship: Theory, practice and policy*. Cambridge University Press.

Conaghan, Jim (2015, September 15). Newspaper Digital Audience Peaks. *NewsMedia Alliance*, accessed on July 29, 2016, retrieved from http://www.naa.org/Trends-and-Numbers/Newspaper-Websites/Newspaper-Web-Audience.aspx.

Council of Europe, *Declaration by the Committee of Ministers on the Protection of Freedom of Expression and Information and Freedom of Assembly and Association with Regard to Internet Domain Names and*

Name Strings, (adopted by the Committee of Ministers on 21 September 2011), para 3, available at https://wcd.coe.int/ViewDoc.jsp?id=1835805;

Council of Europe, 'Committee of experts on cross-border flow of Internet traffic and Internet freedom (MSI-INT), Draft report on freedom of assembly and association on the Internet' (11 May 2015), accessed at: https://rm.coe.int/draft-report-on-freedom-of-assembly-and-association-on-the-internet/1680744cfb.

Cram, I. (2015). *Citizen Journalists: Newer Media, Republican Moments and the Constitution.* Edward Elgar Publishing

Dash, Nivedita (2016, February 19). Jat reservation protest in Haryana: Mobile internet services blocked in Rohtak. India Today. Retrieved from www.indiatoday.intoday.in

Dearden, Lizzie (2015, October 10). Ankara terror attack: Turkey censors media coverage of bombings as Twitter and Facebook 'blocked'. Independent. Retrieved from http://www.independent.co.uk/

Deloitte, 'The economic impact of disruptions to Internet connectivity' (2016). Available at http://globalnetworkinitiative.org/sites/default/files/TheEconomic-Impact-of-Disruptions-to-Internet-Connectivity-Deloitte.pdf

van Deursen, Alexander, Helsper, Ellen J, 'A nuanced understanding of Internet use and non-use among the elderly' (2015) 30 *European journal of communication* 2, 171.

Dutton, W., & Blank, G. (2015). Cultures on the Internet.

European Commission (2012). Digital Agenda Scoreboard 2012. Luxembourg: publications office of the European Union doi:10.2759/83934. http://ec.europa.eu/digital-agenda/sites/digital-agenda/files/scoreboard_life_online.pdf.

Frenkel, Sheera (2018, January 2). Iranian Authorities Block Access to Social Media Tools. The New York Times. Retrieved from http://www.nytimes.com

George, J., & Leidner, D. (2018, January). Digital Activism: a Hierarchy of Political Commitment. In *Proceedings of the 51st Hawaii International Conference on System Sciences*.

Halupka, M. (2014). Clicktivism: A systematic heuristic. *Policy & Internet*, *6*(2), 115-132.

Howard, P., Agarwal, S., Hussain, M. "The Dictators' Digital Dilemma: When Do States Disconnect Their Digital Networks?" Brookings Institution Issues in Technology Innovation, October, 2011.

Huang, C. (2010). Internet use and psychological well-being. *CYBERPSYCHOLOGY, BEHAVIOR, AND SOCIAL NETWORKING*, *13*(3). https://doi.org/10.1145/2739043

King, Donald W., Tenopir, Carol, Hansen Montgomery, Carol and Aerni, Sarah E. (2003). Patterns of journal use by faculty at three diverse universities. *D–Lib Magazine*, 9(10).

Kraut R, Patterson M, Lundmark V, et al. Internet paradox: a social technology that reduces social involvement and psy-chological well-being? American Psychologist 1998; 53: 1017–31.

La Rue, F. (2011). Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression.

Lee, David 'Russia and Ukraine in cyber 'stand-off'', *BBC News*, 5 March 2014.

Leung, L. (2010). Effects of Internet connectedness and information literacy on quality of life. *Social indicators research*, *98*(2), 273-290.

Lu Tan, Neng Wang, 'Future Internet: The Internet of things', *3rd International Conference Advanced Computer Theory and Engineering (ICACTE)*, 2010, vol. 5, pp.5 -376.

Luther, Judy (2002). White paper on electronic journal usage statistics. *Serials Librarian 41(2)*.

Mesch GS. Family relations and the Internet: exploring a family boundaries approach. Journal of Family Communication 2006; 6:119–38.

Mesch, G. S. (2016). Ethnic origin and access to electronic health services. *Health informatics journal*, *22*(4), 791-803.

Milbourne, Constance C., and Jeffrey S. Wilkinson. "Chasing Infinity: The Fear of Disconnecting." *American Communication Journal* 17.2 (2015).

Morozov, Evegeny (2011). The Net Delusion: The Dark Side of Internet Freedom. New York: Public Affairs.

Müller, K. W., Dreier, M., Beutel, M. E., Duven, E., Giralt, S., & Wölfling, K. (2016). A hidden type of internet addiction? Intense and addictive use of social networking sites in adolescents. *Computers in Human Behavior*, *55*, 172-177.

Neumayer, C., & Svensson, J. (2016). Activism and radical politics in the digital age: Towards a typology. *Convergence*, *22*(2), 131-146.

Nie, N. H. (2001). Sociability, interpersonal relations, and the Internet: Reconciling conflicting findings. *American behavioral scientist*, *45*(3), 420-435.

Norris, Pippa, *Digital divide: Civic engagement, information poverty, and the Internet worldwide* (Cambridge University Press, 2001).

Osterman Survey, 'Understanding the Depth of the Ransomware Problem', 2016, Retrieved from https://www.malwarebytes.com/surveys/ransomware/

Packingham v. State of North Carolina 15 U.S. 1194 (2016).

PewResearchCenter. Politics Fact Sheet. http://www.pewInternet.org/fact-sheets/politics-fact-sheet/, last accessed 4 January 2016.

Reuters Staff (2016, May 2). Brazil judge orders WhatsApp blocked, affecting 100 million users. Reuters. Retrieved from http://www.reuters.com/.

Romano, M., Osborne, L. A., Truzoli, R., & Reed, P. (2013). Differential Psychological Impact of Internet Exposure on Internet Addicts. *PLoS ONE*, *8*(2), 8–11. https://doi.org/10.1371/journal.pone.0055162

Searcey & Essomba (2017, February 10). African Nations Increasingly Silence Internet to Stem Protests. The New York Times. Retrieved from http://www.nytimes.com

Silcock, Rachel (2001). What is E-Government? *Parliamentary Affairs* 54(1).

Skoric, M. M. (2012). What is slack about slacktivism. *Methodological and conceptual issues in cyber activism research*, *77*, 77-92.

Starcevic, V., & Aboujaoude, E. (2017). Internet addiction: reappraisal of an increasingly inadequate concept. *CNS Spectrums*, *22*(1), 7–13. https://doi.org/10.1017/S1092852915000863

Subramanian, Ramesh 'The Growth of Global Internet Censorship and Circumvention: A Survey' (2011) 11 *Communications of the IIMA* 2.

Tenenbaum, Jason M. (2014, June). *Is There a Protected Right to Access the Internet?* International *Journal of Constitutional Law Blog*, *available at*: http://www.iconnectblog.com/2014/06/is-there-a-protected-right-to-access-the-Internet.

Tufekci, Z. (2017). Twitter and Tear Gas: The Power and Fragility of Networked Protest. Yale University Press.

United Nations, Human Rights Council (2011), Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, Frank La Rue, 16 May. A/HRC/17/27.

United Nations, Human Rights Council (2016), The promotion, protection and enjoyment of human rights on the Internet. 27 June. A/HRC/32/L.20.

Wagner, Adam, 'Is Internet access a human right?', *The Guardian*, 11 January 2012.

Wellman, Carl *'*The Proliferation of Rights: Moral Progress or Empty Rhetoric*?'* (1999) Westview Press..

West, Darrell, M., "Internet shutdowns cost countries $2.4 billion last year", Center for Technology Innovation at Brookings, October 2016.

Wood, E. J. (2006). The ethical challenges of field research in conflict zones. Qualitative sociology, 29(3), 373-386.

Yellepeddi Vijayalakshmi, Neethu Natarajan, P. Manimegalai, Suvanam Babu, 'Study on Emerging Trends in Malware Variants' (2017) 117 *International Journal of Pure and Applied Mathematics* 22.

Yoo, Y.-S., Cho, O.-H., & Cha, K.-S. (2014). Associations between overuse of the internet and mental health in adolescents. *Nursing & Health Sciences*, *16*(2), 193–200. https://doi.org/10.1111/nhs.12086

Young, K. S. 1999. Internet addiction: symptoms, evaluation and treatment. In VanDeCreekL.JacksonT. L. (Ed.), *Innovations in clinical practice*, (pp. 19–31). Sarasota, FL: Professional Resource Press.Vol. 17.

Table 1: T-Test Results for the Effect of Internet Deprivation on the Completion of Tasks

		M	SD	t	df	p	d
Task 1: Expression	Treatment	2.81	1.00	2.773	58	.007	.72
	Control	3.46	.79				
Task 2: Association	Treatment	2.88	1.26	3.294	58	.002	.87
	Control	3.79	.79				
Task 3: Information	Treatment	2.50	1.41	2.416	58	0.19	.63
	Control	3.32	1.19				

Note: The control condition reflects full Internet access; the treatment condition reflects no Internet access.

Table 2: Chi-Square Tests; treatment effect on task completion

	Task 1: Expression			Task 2: Association			Task 3: Information		
	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.459 [a]	1	.011	14.592 [a]	1	.000	4.659 [a]	1	.031
Continuity Correction [b]	5.200	1	.023	12.544	1	.000	3.600	1	.058
Likelihood Ratio	6.563	3	.010	16.274	1	.000	4.745	1	.029
Linear-by-Linear Association	6.351	1	.012	14.348	1	.000	4.581	1	.032
N of Valid Cases	60			60			60		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.13.

b. Computed only for a 2x2 table

Table 3: *Results of Logistic Regression on Task Success*

	Task 1: Expression				Task 2: Association				Task 3: Information			
Step 1 Model:	$\chi 2$ ($df = 1$) = 6.56, p = .01				$\chi 2$ ($df = 1$) = 16.27, p < .001				$\chi 2$ ($df = 1$) = 4.75, p = .03			
	b	*SE*	*p*	Odds Ratio	*b*	*SE*	*p*	Odds Ratio	*b*	*SE*	*p*	Odds Ratio
Condition (Control =0, Treatment = 1)	-1.37**	.55	.01	.25	-2.69**	.82	.001	.07	-1.17*	.55	.03	.31
Step 2 Model:	$\chi 2$ ($df = 7$) = 14.89, p < .001				$\chi 2$ ($df = 7$) = 24.41, p < .001				$\chi 2$ ($df = 7$) = 9.23, p < .24			
	b	*SE*	*p*	Odds Ratio	*b*	*SE*	*p*	Odds Ratio	*b*	*SE*	*p*	Odds Ratio
Condition	-1.61**	.64	.011	.20	-3.24**	1.00	.001	.04	-1.91*	.60	.04	.30
Age	-0.39	.50	.43	.68	.30	.54	.58	1.35	.60	.51	.24	1.82
Gender	1.31*	.68	.05	3.72	1.33	.79	.09	3.78	.94	.61	.12	2.55
Education Level	0.32	.45	.48	.73	-1.42*	.69	.04	.24	-.11	.42	.79	.90
Political Identification	-0.15	.20	.45	.86	-.19	.23	.42	.83	.02	.18	.91	1.02
Family Income	-.05	.14	.75	.96	.02	.17	.88	1.03	.05	.13	.72	1.05
Average Daily Internet Usage	.41	.48	.39	1.51	-.05	.51	.01	.95	.26	.42	.53	1.30

*$p < .05$, **$p < .01$

Table 4: Breakdown of Participant Scoring Per Task

	Task 1 Control	Task 1 Treatment	Task 1 Total	Task 2 Control	Task 2 Treatment	Task 2 Total	Task 3 Control	Task 3 Treatment	Task 3 Total
point – Unable to omplete task and nable to conceive f how to complete ask	4%	13%	8%	7%	25%	17%	18%	41%	30%
points – Unable o complete task, ut able to onceive of how to omplete task if not estricted to the ontrolled xperimental nvironment	7%	22%	15%	0%	9%	5%	4%	13%	8%
points – Partially ble to complete ask	29%	38%	33%	0%	19%	10%	7%	3%	5%
points – Fully ble to complete ask	61%	28%	43%	93%	47%	68%	71%	44%	57%
otal	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: The control condition reflects full Internet access; the treatment condition reflects no Internet access.