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Internet freedom and social media effects: democracy and citizen attitudes in Latin America

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Abstract

Purpose – The purpose of this paper is to theorize the heightened exposure to information via the internet can lead citizens to be more critical about political conditions in their countries because using social media increases the likelihood of being exposed to dissident information. Further, the authors argue that the degree to which information is restricted, or internet access is limited, across countries can decrease this effect simply because the likelihood of exposure to a dissident flow is diminished.

Design/methodology/approach – The authors used survey data from the 2010 Latino Barometer to estimate a series of multilevel models to test whether citizens' attitudes about the political conditions and about democracy in their respective countries worsen, and whether this effect is stronger in countries with higher internet freedom.

Findings – The results confirm that social media use has a negative influence on citizens' attitudes about their national political conditions. In addition, respondents from those countries with more internet freedom tended to have more positive attitudes about their democracy and political conditions, generally. However, as a result of more internet freedom, the negative effects of internet and social media use on these attitudes was more pronounced in countries with more internet freedom.

Originality/value – These results suggest that the flow of information via the internet has substantial effect on how people feel about their government. This could be consequential for political stability, particularly in countries the conditions are not favorable. That said, these results also suggest that governments can actively decrease the odds of this dissidence building by controlling the flow of information.

Keywords Social media, Latin America, Digital information, Internet filtering, Political attitudes

Paper type Research paper

Latin America is the region with the fastest growth in internet users, and it dominates many of the top global rankings of online engagement with the internet and social media (Zain, 2013; Radwanick, 2011). The region presents several cases of critical mass penetration over 30 percent, and the overwhelming majority of users engage social networking sites (SNS)[1] (Prado, 2011). The Latinobarómetro (2015) report found that Facebook use in the regional more than doubled from 19 percent in 2010 to 42 percent in 2015. Thus, Latin America has one of the highest levels of internet penetration and rates of usage, which offers an early snapshot of how internet diffusion could affect attitudes in the developing world.

The growth in internet usage in Latin America raises important political implications. While the internet is important in established democracies, changes in political campaigns and institutions are often gradual, or even limited. In these states, political

actors develop strategies to use and master technology in campaigns, which can limit the internet's ability to alter the underlying calculus of political power in those nations (Bimber and Davis, 2003; Ward and Gibson, 2003; Ward *et al.*, 2003). Alternatively, in the developing world, the political structure is more vulnerable to the technology since the internet can reduce the ability of states to maintain themselves through rules, structures, and institutions that restrict political communication and organization (Wagner and Gainous, 2013). In these states, the internet is a much more direct challenge as it is a pathway to overcoming political and institutional barriers. It is a new avenue for information gathering and participation that can be outside traditional government controls. The internet provides multiple mechanisms through which people can influence political outcomes, including the distribution of mobilizing information or news not otherwise available, coordinating political activities, and creating places to join, participate with, and engage like-minded people (Bennett and Segerberg, 2011; Chadwick and Howard, 2008; Valenzuela, 2013; Gil de Zúñiga and Valenzuela, 2011). However, the effectiveness of the internet to overcome increasingly sophisticated state restrictions is mixed (Deibert *et al.*, 2008; Wagner and Gainous, 2013).

Latin America presents an important venue to answer questions about the influence of the internet on citizen attitudes about their state. Specifically, we ask whether individual-level internet use can shift political attitudes in Latin America and if this influence is conditioned by state-authored filtering schemes. If the internet can shift attitudes, then it is more than just a new tool to be used as part of the conventional political structure. We propose that the internet presents a new communication venue for disseminating information that differs from the state narrative and creates space for alternative political views and participation. As such, we expect, among internet users, to find more antagonistic political attitudes and more negative views of the state and government. However, we theorize that this effect is conditional on the level of filtering governments apply to public access to information on the internet. We expect to find the effect of the internet to vary across states based on the extent and effectiveness of their filtering schemes.

While large-N survey studies on the effects of the internet in the USA and other western nations are quite prevalent, there is simply not as much survey data available that address internet use and political behavior outside developed western democracies. As a result, there is very little large-N research on internet effects outside Europe and the USA (for exceptions see Lei, 2011; Nisbet *et al.*, 2012; Norris, 2011). This study attempts to expand that research. We use micro-level data from the 2010 Latino Barometer and macro-level data from the Freedom House 2012 Freedom on the Net Report to create multilevel modeling to test both the fixed effects of individual-level internet/SNS use and the random effects across 18 Latin American countries on attitudes about democracy and political conditions. Our results are largely consistent with our expectations and illustrate a significant relationship between the use of SNS and political attitudes. Also, as theorized, we found that effect influenced by access and limited by government filtering.

Below we outline the development of the internet and its effects on the attitudes about politics in Latin America. This foundation is coupled with a discussion about the limits on internet access in the Latin American context. We build on the theory that citizens' attitudes are shaped by the information they have cognitively accessible (Zaller, 1992) and the degree to which this information flows freely as a product of both structural and technological availability, as well as limitations resulting from government restrictions (Deibert *et al.*, 2008; Hoffmann, 2004, 2005).

Finally, we explain our model, present our results and conclude with some discussion about the future of democracy in Latin America and how the internet might shape this future.

A new dinner table: the internet and attitudes

The internet can shift the political landscape of a nation by altering the nature and cost of communication. It can provide people and politicians a new venue to engage with each other and the state, and as such, expand the political sphere while enhancing democratic values and activities (Allison, 2002). The internet is a new forum for political discussion and interaction, as it provides a largely open forum for political actors, interest groups, and third parties (Norris, 2001). This can change the nature and function of a political system, as outside groups can present a sophisticated image across the internet despite limited resources (Ward *et al.*, 2003; Schneider and Foot, 2002). In states with limited media or state-dominated media, this effect is substantial as the internet becomes one of the only avenues for opposing and divergent messaging (Gainous *et al.*, 2015; Wagner and Gainous, 2013).

Citizens' attitudes are a product of the information available to them, and the internet can be a crucial source of information for citizens. More directly, the information available defines what the average person can draw upon to form opinions (Zaller, 1992; Lodge and Taber, 2000). In addition, people keep a running tally of their views, and these considerations are constantly being updated based on the information available to them (Bizer *et al.*, 2006; Hastie and Park, 1986; Lodge and Taber, 2000; Zaller, 1992). The internet changes both cognitive processes by expanding the information that can be sampled, and by continually adding information which may cause shifts in each person's running calculation of an issue. As a new venue for the interaction and dissemination of information, the internet should influence the development of political attitudes by expanding and redefining the available information space. The internet also connects people who would be otherwise isolated, and it is especially useful for providing information through exchanges via social networks that might be otherwise restricted or unavailable (Gainous *et al.*, 2013).

If, as we theorize, the internet increases the opportunity to be exposed to dissent, such exposure should have the effect of stimulating negative attitudes concerning the state regime and internal conditions. Shifting attitudes would be the product of an altered information landscape informed by unrestricted internet communication. As the internet alters and expands the scope and substance of the information available, the attitudes in these nations should change as people process new alternative views. While this effect is limited by access, opposing media, and culture, there should still be a measurable shift in attitudes to be less supportive of the state. Hence, the internet can be a driver of significant attitudinal, ideological, and ultimately institutional change. This is especially true in states which maintain themselves through institutions that restrict political communication and organization as in these states the internet presents one of the only avenues for creating a new forum for political learning and engagement. For example, social media such as Twitter and Facebook are credited with helping organize and support democratic movements in the Middle East (Dyson, 2011).

The degree to which the internet can shift attitudes is variable in the scholarship. The significance of the medium appears to vary across both geography and time period. Some of the variance in importance may be a product of the various measures occurring during different time periods. As one might suspect, the internet is more important today than during its first years. Indeed, scholars have suggested that the

influence of digital technology is growing with each election cycle (Xenos and Moy, 2007). The gradual progression of political significance appears likely since the technologies required were expanding quickly. However, the pattern itself appears to be more irregular than initially thought. The growth itself, is not entirely linear or direct (Bimber and Copeland, 2013). The importance of technology is far more patchwork than linear, especially outside the USA. This uneven adoption and penetration of the technology can lead to varied effects.

One of the larger differentiators of internet influence appears to be state action. While the internet is a largely open protocol, states have made attempts to restrict and even co-opt it at times (Howard, 2011). The efforts to restrict or limit the internet have mixed results, but the online environment is subject to influence and control by experienced political actors seeking to defend the state or maintain the status quo. Even in nations where the state is not attempting to control the internet, political actors are often trying to openly influence the power of the internet to influence attitudes and political behavior (Gainous and Wagner, 2014). Given time, and the proper tools, it is possible that sophisticated actors may limit or normalize the online effects into the familiar electoral paradigm (Bimber and Davis, 2003; Ward and Gibson, 2003; Ward *et al.*, 2003).

Nonetheless, the most heavy-handed internet controls are often state-authored regulations (Deibert *et al.*, 2008). By limiting the information available, state control of the internet inside a nation limits its utility for change. Repressive states could use digital media to push a particular narrative or to filter out information that challenges the status quo and control the way they are perceived by the citizenry. The use of limited access, filtering, firewalls, and strict controls on search engines is increasingly common in such states (Howard, 2011). If done effectively, this filtering should limit the scope and depth on dissenting information, thus limiting the ability of the internet to create an alternative information sphere that could initiate a change in attitudes.

Restricting the internet is not easily accomplished. Even with sophisticated controls and blocks on particular websites or portals on the internet, there continue to be ways around filters, such as proxies and encryption (Chadwick, 2006). Other less sophisticated strategies to avoid filtering and restrictions use websites intended for sports or social interaction to convey political information indirectly (Howard, 2011). Yet, states have been successful in some areas. The clearest example of this is China where its efficient control has led not just to a state restricted environment, but an internet that can, at times, be seen as a source of government propaganda (Masterson, 2014). While other states have not yet had the success of China, strategies have been employed in other nations with some success. Filtering is routine in the Middle East, though often with variable success driven in part by the level of technological sophistication of the state attempting to implement the controls (Wagner and Gainous, 2013).

Internet restrictions are also limited by the desire of the state to have an open business environment, especially since conducting business is increasingly done online (Zheng and Wu, 2005). Some businesses will simply leave a nation, as Google did by exiting China. In addition, internet protocols such as e-mail, web pages and SNS are increasingly used by states to communicate with its citizens. As the network protocols are open and published, it is difficult for any actor to control the internet, though as indicated above, not impossible, at least in the short term. The more integrated the internet becomes in the state and the economy, the harder it is to stop and remove its more politically destabilizing uses.

A virtual revolution in Latin America

The expansion of internet access and use in the Latin America has been rapid yet uneven. Adoption rates of both the internet and SNS are high across the region, although there are stark digital divides both between and within states. There are also differences in state-level restrictions on usage. The 2010 Freedom House internet freedom rankings designated half of the region as free and the other half as partly free[2]. These labels mirror political regime freedom designations, but other factors of development or subregional distinctions are not as clearly reflected. Latin America therefore offers a context in which the internet is increasingly available to many, but the levels of access vary in terms of digital divide factors as well as filtering mechanisms.

Latin America has the third highest regional level of internet penetration after North America and Europe, and Latin Americans are highly engaged with the internet and SNS (Zain, 2013). In 2011, only five states in the region had more than one-third of their population using the internet (Argentina, Brazil, Chile, Colombia, Costa Rica), and even in the wealthiest states, only about 1 in 10 had a broadband connection (Prado, 2011). The percentage of Latin Americas who had never used the internet dropped from 55 percent in 2013 to 44 percent in 2015, and those who connected everyday more than doubled from 11 percent in 2008 to 23 percent in 2015 (Latinobarómetro, 2015). The figures do vary widely, however, ranging from 78 percent of Hondurans who had never used the internet to 34 percent of Ecuadorians (Latinobarómetro, 2015). The digital divide is shifting from quantity to quality, such that comparing the US citizen with a 24-hour broadband connection and the Andean peasant who checks his e-mail at a public access center maybe once a week overlooks dramatic and significant variations in connections (Hoffmann, 2005; Crespi et al., 2010; Ali, 2011).

Access to computers in Latin America grew from 5.5 per 100 inhabitants in 1995 to 11.3 in 2006 (Crespi et al., 2010). States in the higher income categories, such as Brazil, Chile, Uruguay, and Costa Rica, had roughly the same levels of access as the OECD countries, while in poor countries like Nicaragua and Guatemala, even the highest income brackets had negligible levels of access (Crespi et al., 2010). Internet users in Latin America may be significantly underestimated, however, if measured only by subscribers to internet services since this does not consider the role of public access points or the increasing use of cell phones (Hoffmann, 2004; Crespi et al., 2010; Prado, 2011; Zain, 2013). While more than 90 percent of Latin Americans online access the internet via PCs, those who access via mobile devices jumped from less than 3 percent in March 2012 to 8 percent in March 2013 (Zain, 2013). The 2013 Latinobarómetro survey found that in South America and Central America 85 percent and 84 percent of the population, respectively, have a mobile phone, and projections suggest that the mass use of this technology may soon eliminate the digital divide (Latinobarómetro, 2013).

In sharp contrast to Europe or North America where users overwhelmingly access from home, the most common place for internet access in Latin America is through public centers and followed by commercial centers like internet cafés (Crespi et al., 2010). The state has often taken the initiative to expand the internet through public access centers as in Peru, Costa Rica, and Colombia. The public telecentros, in contrast to profit-based internet cafés, are typically non-profit initiatives to offer services like e-mail, the worldwide web, education, and training services (Hoffmann, 2005). Another more grassroots approach has been through "chains of access" (Friedman, 2005, p. 3) or "multipliers" (Hoffmann, 2005, p. 35) in which those with internet access share digital information with and teach information technology skills to others. Networks of NGOs in Latin America have provided computers, training, and printouts of online

information (Everett, 1998; Friedman, 2005). Although unlikely to expand internet access broadly or rapidly, chains of access can provide targeted and dynamic communications among key actors and a means to circumvent government filters.

SNS use creates pathways for the dissemination of information and has become prevalent in Latin America among those who use the internet. Latin Americans account for 14 percent of global SNS users despite only having 8 percent of the world's population (Zain, 2013). In Latin American states with the highest penetration of internet users, between 80 and 96 percent of online users visited SNS (Prado, 2011; Radwanick, 2011). SNS users increased more than 16 percent between 2010 and 2011, and half of the top ten markets for SNS were in Latin America (Radwanick, 2011). Facebook was by far the most popular SNS, except in Brazil where nationally based Orkut had more members, although many Brazilians increasingly used both sites (Prado, 2011; Radwanick, 2011). In the region as a whole the use of Facebook doubled from 19 percent in 2010 to 38 percent in 2013, and increased to 42 percent in 2015 (Latinobarómetro, 2015). By 2015 in half of the states 50 percent or more of their populations used Facebook, and only four states had less than 30 percent who used it (Latinobarómetro, 2015)[3]. Twitter remained much less popular with only 11 percent of the region using it, which was the same as in 2013, although up from 4 percent in 2010. Regardless of the specific site, Latin Americans spent more than twice as much of their online time on SNS than any other type of online site (Zain, 2013). In 2015 only 2 percent of internet users in Latin America did not utilize any SNS, down from 7 percent in 2010 (Latinobarómetro, 2015).

Latin America has been one of the least filtered developing regions, but there are significant self-censorship practices, especially in partly free states like Colombia, Mexico, and Venezuela (Kim *et al.*, 2008; Castillo, 2014). The context of threatening environments for journalists are prevalent across the region, and in 2006 Mexico surpassed Colombia as the deadliest place in the Latin America for journalists, and it was second only to Iraq worldwide at the time (Kim *et al.*, 2008). Freedom on the Net 2013 found that 35 of the 60 countries assessed had broadened their technical or legal surveillance powers since 2012, and with such monitoring in several authoritarian states, activists reported that their e-mail and other communications were presented to them during interrogations or used as evidence in politicized trials, with repercussions that included imprisonment, torture, and even death. In Venezuela, for example, most TV and radio channels are either owned by the government or practicing self-censorship, and some reporters claimed to have anonymous Twitter accounts that enabled them to circumvent guidelines on reporting (Nagel, 2014). The government reportedly blocked Twitter users' online images or access to Twitter and/or the internet as opposition protest grew in early 2014 (Castillo, 2014; Kitroeff, 2014), but some protestors subscribed to a text message service to receive updates during the blackout (Laya *et al.*, 2014). It is noteworthy that Venezuela is the only country in the region in which Twitter was the second most accessed SNS (Radwanick, 2011), but the larger point is that government filtering practices are at work in the region.

Clearly, by 2010 SNS use in Latin America had reached a threshold that suggests there should be attitudinal and behavioral consequences if we believe that the consumption and exchange of information via SNS has similar effects to those demonstrated in studies outside the Latin American context (Bode, 2012; Gainous and Wagner, 2011, 2014; Pasek *et al.*, 2009; Valenzuela *et al.*, 2009). Although not the focus of this study, it is notable that internet users in the region also have high rates of accessing political information (Zain, 2013). The degree to which the internet influences attitudes in Latin America varies by the degree of the digital divide and the level of

government filtering. The region has been a forerunner in the developing world in the use of the internet, a site of rapidly expanding access and a highly engaged internet population, there has been significant evidence of the traditional digital divide factors of gender, urbanicity, income, literacy, and quality of access (Allen, 2009; Everett, 1998; Gómez, 2000; Crespi *et al.*, 2010; Friedman, 2005). The multilevel modeling in the next section explores these factors systematically by analyzing data from the Latinobarómetro survey in the context of internet freedom rankings. The models clarify the general regional trends by specifying the statistical relationships between internet and SNS engagement and political attitudes.

Data and measurement

The data for this study come from two sources including both individual level and aggregate observations. The individual-level data come from the 2010 Latino Barometer and the aggregate data from the Freedom House 2012 Freedom on the Net Report[4]. The 2010 Latino Barometer conducted public opinion surveys of 22,687 respondents in 18 Latin American countries with sample sizes ranging from 1,000 to 1,204 in the respective countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela)[5]. We merged these public opinion data with the Freedom House data. This created a nested data set where each respondent from each country, respectively, was assigned a non-unique value ranking internet freedom in their country. Our basic strategy is to estimate the multilevel models described below across countries and then examine those results to determine if there is a pattern in both the random intercepts and random slopes that can be accounted for by whether a country has partial or full internet freedom.

As highlighted above, our analysis is aimed at answering the following questions: first, does internet/SNS use vary across countries with varying degrees of internet freedom? Second, does internet/SNS use have a negative effect on citizen attitudes about democracy and the political conditions in their respective countries? Third, are attitudes about democracy and the political conditions generally better in countries with more internet freedom? Fourth, if there is a negative effect of internet/SNS use on these attitudes, is it more pronounced in countries with higher internet freedom?

The first question of whether or not internet/SNS use differs across countries with varying degrees of internet freedom is answered with some simple descriptive analysis. Then we supplement the descriptive analysis with a multilevel random intercepts model that estimates how much of the variation in internet/SNS use can be accounted for by cross-national variation in internet freedom while controlling for individual-level explanations of internet/SNS use based largely on the digital divide.

The second and third questions, respectively, ask if internet/SNS use has a negative effect on citizen attitudes about democracy and the political conditions in their respective countries, and whether attitudes about democracy and the political conditions (in respondents' respective countries) are generally better in countries with more internet freedom. These questions are answered with two multilevel random intercepts models: one of citizen attitudes about democracy and one of attitudes about the political conditions (both in respondents' respective countries). Level 1 of each model allows us to estimate the individual-level effects of internet/SNS on each attitude while controlling for other individual-level effects[6], and Level 2 allows us to determine if the intercepts of separate models for each country vary. We then classify these intercepts according to whether the country has more or less internet freedom, allowing

us to determine if attitudes about democracy and the political conditions are better in those countries with more internet freedom.

Finally, we estimate two multilevel random slopes models to answer the fourth question: if there is a negative effect of Internet/SNS use on these attitudes, is it more pronounced in countries with higher Internet freedom? These models allow us to determine if the effects of internet use on these attitudes vary cross-nationally. Again, after estimating the models we classify the slopes according to the degree of internet freedom to determine if the negative effects are stronger in countries with more internet freedom.

Our dependent variables, citizen attitudes about democracy in their respective countries and citizen attitudes about the political conditions in their respective countries, are measured with two separate indices (see, Appendix 1). Our Level 1 independent variable, internet/SNS use, was measured using an index based on the following indicators: have you ever used e-mail or connected to the internet? (never, rarely, occasionally, every day); and do you use any of these social networking services? (Facebook, MySpace, YouTube, Orkut, Twitter, Hi5, Windows Live Space, Sonico, Friendster). The first was rescaled to range from 0 to 1. The second was actually nine separate items coded as 1 if respondents said they had used each SNS, respectively, and 0 if they had not. We then summed all ten items ($\alpha = 0.74$). Using both frequency of use and SNS use combined provides for a more comprehensive indicator of use. Certainly we expect the effects of SNS to be stronger for those who use it more frequently. This measure does not directly capture frequency of SNS use, but we operate under the assumption that those who claim to use the internet more frequently and claim to use SNS likely use SNS more.

As for our Level 2 independent variable, the aggregate-level measure of internet freedom was generated from an index constructed by Freedom House. This index was aimed at capturing the entire "enabling environment" for internet freedom within each country using a set of 21 indicators divided into three subcategories: obstacles to access, limits on content, and violations of users' rights (see Appendix 2 for a complete description of the 21 indicators). Each individual indicator was scored with on a varying range of possible points. Countries were given a total score from 0 (best) to 100 (worst) as well as a score for each subcategory. Countries scoring between 0 and 30 points overall were considered to have a "free" internet environment; 31-60, "partly free"; and 61-100, "not free." Of the 18 countries in the Latino Barometer survey, nine were considered free (Argentina, Brazil, Chile, Costa Rica, Dominican Republic, El Salvador, Panama, Peru, Uruguay), nine were considered partly free (Bolivia, Colombia, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Venezuela), and 0 were considered not free[7]. For our purposes, we assigned a code of 0 to respondents from a partly free internet country and 1 to those residing in a free internet country.

Results

The results presented in Table I provide an in initial descriptive look at the story being told here. It is clear that the degree to which governments place restrictions on the internet accounts for some variation on whether citizens use SNS, whether they have personal access to the internet, and how frequently they use the internet. Clearly we cannot make a causal assertion from these bivariate results. That said, they certainly lay a foundation for the multivariate multilevel estimates that are to come. First, it appears that citizens are more likely to use SNS in those countries with complete internet freedom across four of the five platforms where the χ^2 statistic is significant at least at the 0.05 level. These include Facebook, YouTube, Orkut, and Hi5. Use of Windows Live space is slightly higher in those countries with partial internet freedom.

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	Partial internet freedom		Full internet freedom		p-value
Facebook	1,740	17.1%	2,148	21.5%	0.00
MySpace	73	0.7%	75	0.8%	0.77
YouTube	286	2.8%	505	5.1%	0.00
Orkut	64	0.6%	187	1.9%	0.00
Twitter	31	0.3%	22	0.2%	0.24
Hi5	63	0.6%	86	0.9%	0.04
Windows Live Space	190	1.9%	137	1.4%	0.01
Sonico	14	0.1%	6	0.1%	0.08
Friendster	2	0.0%	2	0.0%	0.99
Other	89	0.9%	75	0.8%	0.33
Limited access	8,319	71.4%	7,020	70.1%	0.00
	Mean	SD	Mean	SD	
Internet use (0-1)	0.28	0.11	0.31	0.12	0.00
Total *n* (in sample)	10,200		10,004		

Table I.
Social media use, access, and internet use across countries with varying internet freedom

Notes: Percentages represent the proportion who claimed to use each SNS, respectively, and percent who do not have some personal access to the internet (both with corresponding n in each category). *p*-values are generated from the χ^2 statistic for the SNS indicators and the *p*-value the internet use test is based on a *t*-test

Use of Sonico is also slightly higher (0.14-0.06 percent, not evident in the table due to rounding) but this difference is less reliable ($p = 0.08$).

Consistent with the USA, Facebook is the most popular SNS platform with about 17 and 22 percent claiming to use this platform in countries with partial internet freedom and full internet freedom, respectively. Nonetheless, this overall use is still considerably lower than in the USA where 62 percent claimed to use SNS in 2010 (Gainous and Wagner, 2011). Perhaps the difference in use across country type is, at least in part, driven by the quite significant difference (χ^2 p-value $= 0.00$) in the distribution of those who do not have personal access to the internet (use is restricted to internet cafes and free access places). Nearly 81 percent of those in countries with partial internet freedom lack personal access (in their home, another private home, or at work) relative to 70 percent in countries with full internet freedom. While the difference is stark, it is not as stark as the difference between personal access in Latin America and in the USA. By 2003 already 60 percent of US residents had internet access at home (Mossberger *et al.*, 2008). By 2008 this estimate had grown to 72 percent of those without personal access in Latin American countries with full internet freedom (see Talukdar and Gaur, 2011). Access appears to bleed over into general use, where the *t*-test suggests that those in countries with full internet freedom are using the internet more frequently (p-value $= 0.00$).

Before estimating the random intercept model presented in Table II, we first estimated a random effects ANOVA model to determine what portion of the variance in internet/SNS use could be accounted for by cross-national differences. The results suggested estimated it at about 9 percent (results and interpretation available in Appendix 3). While the random effects ANOVA results provide evidence that there is cross-national variance in internet/SNS use, they do not tell us if that variation can be accounted for by the level of internet freedom across these countries while controlling for digital divide factors. We move to the random intercept model presented in Table II to test for such. The fixed effects part of the model permits us to test for a relationship between traditional digital divide variables such as socio-economic status and age and internet and SNS use in Latin America while controlling for whether individuals have

	Estimate	SE	95% confidence intervals	
Fixed effects				
SES	0.17	0.01	0.14	0.19
Age	−0.13	0.01	−0.15	−0.11
Limited access	−0.15	0.00	−0.16	−0.14
Constant	0.36	0.01	0.34	0.38
n = 20,204				
Random effects/internet freedom				
Constant (SD)	0.01	0.00	0.01	0.01
Residual (SD)	0.07	0.00	0.07	0.07
Halved χ^2 *p*-value = 0.00				

Note: Entries are maximum likelihood estimates with robust standard errors (SE)

Table II.
Digital divide and country effects on internet/SNS use

limited access to the internet. The random effects part of the model allows the intercepts to vary across nations to accommodate for cross-national variation in the baseline estimate. Essentially, it allows us to see if the observed differences presented in Table I hold up when controlling for the digital divide. First, the fixed effects are quite clear. For every one unit increase in SES the model estimates a 0.17 increase in internet/SNS use. Also, for every one year increase in age the model estimates a 0.13 decrease in internet/SNS use. Finally, the fixed effects suggest that those who have limited access or are compelled to seek internet access at a cafe or free access spot are less likely to use the internet or SNS (−0.15).

There is also evidence that the intercepts vary. The halved *p*-value on the χ^2 statistic from the LR test reported in Table II indicates that we can reject the null hypothesis that the intercept is the same across nations. That said, these results alone do not tell us if people in those countries with more internet freedom are more likely to use the internet. For this, we classified these random intercepts across our dummy variable for internet freedom. The results suggested that the intercept fell above the mean in countries with full internet freedom roughly 68 percent of the time while it fell above the mean about only 47 percent of the time in countries with partial internet freedom. This difference was significant (χ^2 *p*-value = 0.00). This is considerable evidence that internet/SNS use is more frequent in those countries with more internet freedom. We also compared the outcomes in the random intercept model and the random effects ANOVA to see how much of the variance the fixed effects variables accounted for by dividing the summed constant variance and residual variance in the random effects component of the random intercept model by the same from the random effects ANOVA and then subtracting that quotient from 1 (see Steenbergen, 2012). The results indicate that the fixed effects account for about 59 percent of the variance. Remember that our purpose here was to see if the observed differences presented in Table I held up when controlling for the digital divide. If so, it makes sense to see if the variation in attitudes about democracy and the political conditions in these respondents' respective countries can be explained by the joint effect of internet freedom and internet/SNS use. Our theory suggests that heightened exposure to information via the internet will be consequential for attitudes, thus we should expect that cross-national variation in use would lead to variation in effects on attitudes across countries.

Our first task is to see how much of the variance in these two attitudinal outcomes can be accounted for by cross-national differences. Just as the previous example, we estimated, two this time, random effects ANOVA models to determine this. The models

suggested that about 9 percent of the variance can be accounted for by divergence across countries in the attitude about democracy model and attitude about political conditions model (results available in Appendix 4). Altogether, the model fit statistics suggest that this aggregate adjustment improves the fit of the models. The results presented in Table III are the fixed effects with random intercepts and slopes across both attitudinal outcomes allowing the slopes to vary by the frequency with which respondents use the internet and SNS cross-nationally. It is important not to forget that the central part of the story here is that internet/SNS use has an effect on these attitudinal outcomes. This fixed effects part of the story can easily be lost in the examination of the random effects. Really, the random effects part of the story is intended to further specify the models and add some accuracy to our fixed effects estimates. As clearly evidenced in Table III, the fixed effects of internet/SNS use are quite stark. There is a relatively considerable negative effect on citizens' attitudes about democracy in their respective countries. The more they gather information via the internet and SNS the less satisfied they are with how democratic their country is. The same can be said for how they feel about the political conditions. There is a strong negative effect across the models here.

Some of the control variables in the models perform quite well too. Those who support the status quo government feel better about democracy and the political conditions. Those who are more attentive to politics are more likely to feel good about democracy in their respective countries and there is also a positive relationship between socio-economic status and both attitudinal outcomes. Interestingly, whether citizens claim to have limited access to the internet has no effect on the attitudinal outcomes. That said, it is important to control for this to get an accurate read on the effects of internet/SNS use generally as well as controlling for age even though the effect is not significant.

There is also evidence that the intercepts vary across both models. The halved p-value on the χ^2 statistic from the LR test for each indicates that we can reject the null hypothesis that the intercept is the same across nations with varying degrees of internet freedom. Again, we compared the outcomes in the random intercept model and the random effects ANOVA (Appendix 4) to see how much of the variance could be accounted for by the fixed effects. The results indicated that the fixed effects in

	Democracy	Political conditions
Fixed effects		
Internet/SNS use	−0.07 (0.02)***	−0.08 (0.02)***
Support government	0.07 (0.01)***	0.10 (0.01)***
Political attentiveness	0.05 (0.02)***	0.01 (0.01)
SES	0.04 (0.02)***	0.04 (0.02)***
Limited access	0.00 (0.00)	−0.00 (0.00)
Age	0.00 (0.01)	−0.01 (0.01)
Constant	0.47 (0.02)***	0.51 (0.02)***
$n = 20,204$		
Random effects		
Internet/SNS use (SD)	0.08 (0.01)***	0.08 (0.01)***
Constant (SD)	0.04 (0.01)***	0.04 (0.01)***
Residual (SD)	0.13	0.12
Halved χ^2 p-value	0.00	0.00

Table III.
Models of attitudes about democracy/ political conditions

Notes: Table entries are multilevel maximum likelihood estimates with robust standard errors in parentheses. ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$

the models account for about 7 percent of the variance in the attitude about democracy model and about 12 percent in the attitude about political conditions model. Thus, the individual-level controls account for a fair amount of the variance in these attitudes but there is still variance that can be explained by cross-national differences in internet freedom.

Figure 1 provides a visual representation of how the intercepts vary across countries' differing degrees of internet freedom. These are empirical Bayes estimates of the random intercepts based on the models in Table III. They are essentially weighted estimates of the intercepts across countries with varying degree of internet freedom (see Hox, 2010 for a complete explanation). The figure represents the mean of these weighted estimates for countries with partial internet freedom relative to the mean of the same estimates for countries with full internet freedom. This allows us to look for a pattern in the random intercepts. The results suggest that intercepts vary significantly across both models. First, the grand mean is higher in the attitude about democracy model for those in countries with higher internet freedom suggesting that cross-national variation is considerable here and that people tend to feel better about democracy in those countries with more internet freedom. While not as stark, the same can be said for cross-national variation when it comes to how people feel about the political conditions in their respective countries. These are important results. It may seem counter to our theory that heightened exposure to dissident information leads to worse attitudes about democracy and the political conditions in respondents' respective countries, but it actually is not. It simply means that people in countries with more freedom tend to think their country is more democratic. This is not surprising. It does not mean that the effect of heightened exposure is less in countries with more internet freedom. Next, we get to the random slopes models, which were set up to test whether the negative effect of internet/SNS use is stronger in countries where citizens have more access to information.
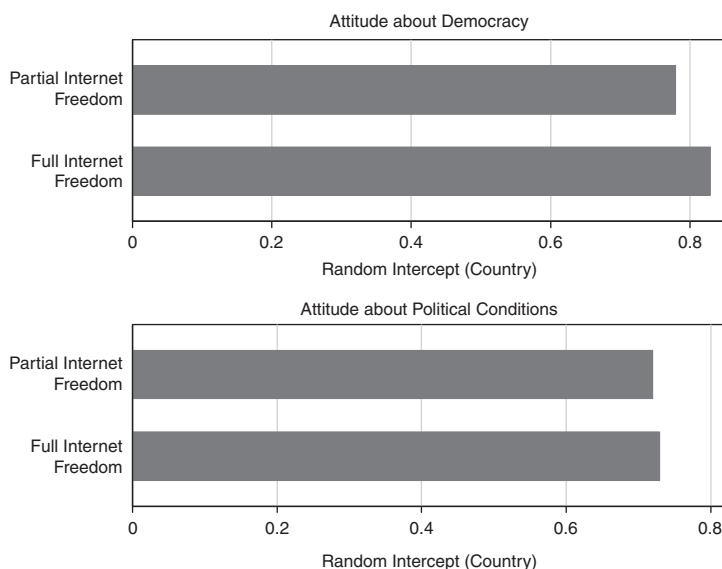
Note: Estimates are based on the mean empirical Bayes estimates of the random intercepts across countries with partial and full internet freedom

Figure 1.
Variation in the random intercepts across countries with varying internet freedom

Again, we also included a random slope to test for cross-national differences in the effect of internet/SNS use effects on both attitudinal outcomes, respectively. Simply, does the effect of internet/SNS use vary across country and is this variation a result of the degree to which the internet is free in these countries? The results are also presented in Table III. The evidence suggests that there is clearly some varying effects and the inclusion of the frequency with which people use the internet and SNS as a covariate in Level 2 explains more of the cross-national variation than the intercept only models. First, the random effects for internet/SNS use are relatively large in both models indicating that the effects vary cross-nationally. Next, the results in Figure 2 demonstrate that effects on attitudes about democracy and the political conditions are generally larger in those countries with full internet freedom (again these results are the overall mean of the Bayes estimates in each respective subset of countries with varying degree of internet freedom). Thus, the negative effect is more pronounced in those countries with more internet freedom. So, while attitudes about democracy and the political conditions are generally better in countries with more internet freedom (as demonstrated by the random effects), the potential for the internet to worsen those attitudes is stronger in those countries where people have more access to information. This would suggest that that the flow of information and access to that flow is consequential.

Conclusion

Our primary purpose was to determine if internet and SNS use influences attitudes about democracy and the political conditions in Latin America. If the internet can shift attitudes, then it is more than just a new tool to be used as part of the conventional political structure and presents a new communication venue for disseminating information that differs from the state narrative and creates space for alternative political views and modes of participation. We hypothesized that variation in these attitudinal outcomes could be
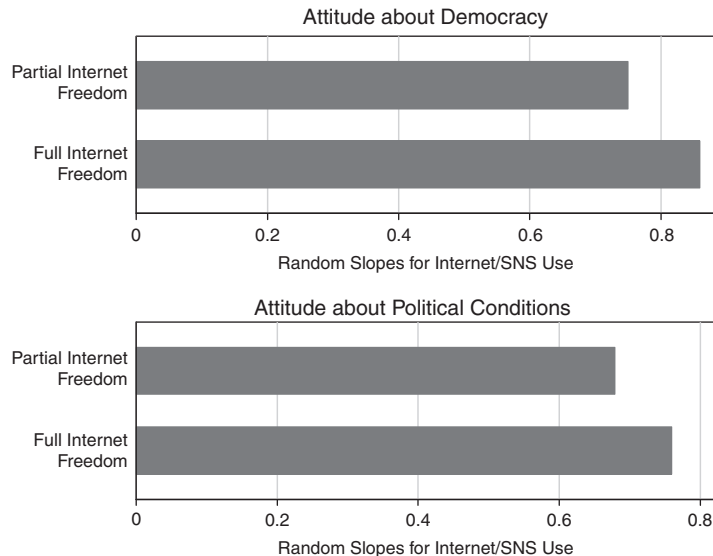

Figure 2.
Variation in the random slopes across countries with varying internet freedom

Note: Estimates are based on the mean empirical Bayes estimates of the random slopes across countries with partial and full internet freedom

accounted for, at least in part, by the degree of internet freedom across countries. Further, we also hypothesized that the effects of individual internet and SNS use on these attitudes would be stronger in those countries with more internet freedom. The results provide compelling evidence supporting each of these hypotheses.

In Latin America we see that the digital divide is narrowing but not uniformly and with certain caveats such as gaps in the quality of access across the region and internet filtering in half of the region. Internet freedom provides citizens lowered costs and increased exposure to more information about their own democracy, which is reflected in the moderate support for democracy and increasingly negative assessments of their own political conditions. States with free internet access report the most precipitous drop in opinions about the political conditions in their country, with states like Chile and Costa Rica enjoying high incomes and stable economic growth but sharp declines in attitudes about democracy and political conditions. If this discontent is organized into opposition movements, as we have seen in increasing mobilizations of youth in Chile, Brazil, and Argentina in the past few years, this may present challenges to existing political regimes.

Our study raises several interesting points that require further research, especially keeping in mind the increasing importance of the effects over time combined with the exponential expansion of internet/SNS. One of the most interesting findings that warrants considerable attention is the age divide that shows a generational effect. The combination of the newly wired, post-authoritarian generation that is able to utilize the internet and seemingly willing to engage it for political information may mean growing discontent with the conditions of their own democracy even as it strengthens their support for democracy as the most preferable political system. Although we focus on SNS use, research on other internet functions, such as accessing political information or e-government, may also have important consequences for democratic attitudes and practices. Perhaps more direct questions about the ways in which people in Latin America use SNS might shed light on how these effects are actually transpiring. It may also be worth exploring the different types of government restrictions and their effects on information gathering, especially in light of Freedom House reports of continuing trends toward declining internet freedoms. For now, it is clear that the internet is shaping the views and political engagement of people in Latin America.

Notes

1. We use SNS as a short hand that offers both brevity and clarity to refer to various social media platforms (see boyd and Ellison, 2008).

2. The free internet states were Argentina, Brazil, Chile, Costa Rica, Dominican Republic, El Salvador, Panama, Peru and Uruguay. The partly free internet states were Bolivia, Colombia, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay and Venezuela.

3. The eight with 50 percent or more were Argentina (59 percent), Ecuador (59 percent), Chile (56 percent), Costa Rica (54 percent), Uruguay (51 percent), Colombia (51 percent), and Venezuela (50 percent), and the four with less than 30 percent were El Salvador, Guatemala, Honduras and Nicaragua.

4. The Latino Barometer sampling strategies and methodology are available at: www. latinobarometro.org/lat.jsp. While the Latino Barometer data are getting dated we do not think this is a problem. In fact, given that internet use is becoming more widespread, we actually think the estimates we present here are conservative. These surveys were all conducted in Spanish and then translated to English with the exception of Brazil that was in Portuguese. Also, we used the 2012 Freedom House rankings because this was the first year that included

all the Latin American countries included in our data. Also, the measures were based on data gathered from the previous year so it nearly lines up with the time frame of the survey.

5. While generally there were very few missing cases, we replaced missing values using a multiple imputation process to prevent potential bias in our estimates. There were up to 12 and 13 percent missing (only on two indicator), and there were less than 10 percent missing on all other indicators. Our analyses are based on five replicate data sets, where the missing data in each replication were substituted with draws from the posterior distribution of the missing value conditional on observed values (Little and Rubin, 1987; see also Horton and Lipsitz, 2001). Our imputation model was based on a multivariate normal model including all indicators in the analyses to predict the missing values. Because we relied on the multivariate normal, the substitutions could vary continuously resulting in non-discrete indicators even if they were initially ordinal. Many of these single indicators were also used in indices increasing the number of possible values even further. This allowed us to largely rely on linear modeling for the following analyses.

6. We control for government vs opposition support assuming that those who support the government will tend to feel better about the conditions in their respective countries, political attentiveness to assure that any internet effects are not spurious as related to attentiveness, limited internet access to assure that the estimated internet/social media effects hold up regardless of access point, and basic demographics including socio-economic status and age to capture the potential digital divide (the operationalization these variables is included in Appendix 1).

7. Cuba is the only state in the region with a Freedom House rating of Not Free, and it is not included in the Latino Barometer. Nevertheless, the issue of internet freedom in Cuba has received some scholarly attention that warrants further consideration (see Hoffman, 2004, 2005; Henken, 2010).

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Appendix 1. 2010 Latino Barometer Measures (using their translation)

Attitude about democracy (in respondents' country)

- In general, would you say that you are very satisfied, quite satisfied, not very satisfied or not at all satisfied with the working of the democracy in (country)?

- With a scale of 1-10, please assess how democratic (country). The "1" means "(country) is not democratic" and "10" means "(country) is totally democratic" where would you put (country)?

Each was rescaled to range from 0 to 1 and the first was inverted. Then they were summed and then again rescaled to range from 0 to 1 ($\alpha = 0.48$).

Attitude about political conditions (in respondents' country)

- And how would you describe the country's political situation? Would you say that it is very good, good, about average, bad, very bad?

- Generally speaking, will you say that (country) is governed for a few powerful groups in their own benefit, or is governed for the common well of all?

- Do you approve or disapprove the government led by President (name)?

- Do you strongly agree, agree, disagree, or strongly disagree with the following statements? … the decisions of the government seek to privilege the few.

Each was rescaled to range from 0 to 1 and the first and third was inverted. Then they were summed and again rescaled to range from 0 to 1 ($\alpha = 0.54$).

Internet access

- Where do you access the internet (place of study/work, at home, at a private home, at a coffee place/paid place, at a free public access place)?

Responses were coded as a 1 if they had to go to a coffee/paid place or to a free access place with the assumption that this reflects limited access. All other options were coded as 0.

Socio-economic status (SES)

- Does the salary you receive and your total family income allow you to cover your needs in a satisfactory manner? Which of the following statements describes your situation? (it's sufficient and we can save, just sufficient and we don't have major problems, It's not sufficient and we have problems, not sufficient and we have major problems).
- What level of education do you have? What was the last year you completed?

Each was rescaled to range from 0 to 1 and the first was inverted. Then they were summed and again rescaled to range from 0 to 1 ($\alpha = 0.46$).

Age

- What is your age? (rescaled to range from 0-1).

Support government

- This variable was a dichotomous coding (0 = support for opposition party, 1 = support for governing party.

Political attentiveness

- How interested are you in politics? (very interested, some interested, few interested, not at all interested).
- How many days in the last week you look political news on TV?
- How many days did you read political news on the newspaper?
- How many days did you hear political news on the radio?

Each was rescaled to range from 0 to 1 and the first was inverted. Then they were summed and again rescaled to range from 0 to 1 ($\alpha = 0.50$).

Appendix 2. Freedom House freedom on the net indicators

Obstacles to access (0-25 points)

(1) To what extent do infrastructural limitations restrict access to the internet and other information communication technologies (ICTs)? (0-6 points):
  - Does poor infrastructure (electricity, telecommunications, etc.) limit citizens' ability to receive internet in their homes and businesses?
  - To what extent is there widespread public access to the internet through internet cafes, libraries, schools and other venues?

- To what extent is there internet and mobile phone access, including via 3G networks or satellite?

- Is there a significant difference between internet and mobile phone penetration and access in rural vs urban areas or across other geographical divisions?

- To what extent are broadband services widely available in addition to dial-up?

(2) Is access to the internet and other ICTs prohibitively expensive or beyond the reach of certain segments of the population? (0-3 points):

- In countries where the state sets the price of internet access, is it prohibitively high?

- Do financial constraints, such as high costs of telephone/internet services or excessive taxes imposed on such services, make internet access prohibitively expensive for large segments of the population?

- Do low-literacy rates (linguistic and "computer literacy") limit citizens' ability to use the internet?

- Is there a significant difference between internet penetration and access across ethnic or socio-economic societal divisions?

- To what extent are online software, news, and other information available in the main local languages spoken in the country?

(3) Does the government impose restrictions on ICT connectivity and access to particular Web 2.0 applications permanently or during specific events? (0-6 points):

- Does the government place limits on the amount of bandwidth that access providers can supply?

- Does the government use control over internet infrastructure (routers, switches, etc.) to limit connectivity, permanently, or during specific events?

- Does the government centralize telecommunications infrastructure in a manner that could facilitate control of content and surveillance?

- Does the government block protocols and tools that allow for instant, person-to-person communication (VOIP, instant messaging, text messaging, etc.), particularly those based outside the country (i.e. YouTube, Facebook, Skype, etc.)?

- Does the government block protocols and Web 2.0 applications that allow for information sharing or building online communities (video-sharing, social networking sites, comment features, blogging platforms, etc.) permanently or during specific events?

- Is there blocking of certain tools that enable circumvention of online filters and censors?

(4) Are there legal, regulatory, or economic obstacles that prevent the existence of diverse business entities providing access to digital technologies? (0-6 points).

  Each of the following access providers are scored separately: internet-service providers (ISPs) and other backbone internet providers (0-2 points); cybercafés and other businesses that allow public internet access (0-2 points); and mobile phone companies (0-2 points):

- Is there a legal or de facto monopoly over access providers or do users have a choice of access provider, including ones privately owned?

- Is it legally possible to establish a private access provider or does the state place extensive legal or regulatory controls over the establishment of providers?

- Are registration requirements (e.g. bureaucratic "red tape") for establishing an access provider unduly onerous or are they approved/rejected on partisan or prejudicial grounds?

- Does the state place prohibitively high fees on the establishment and operation of access providers?

(5) To what extent do national regulatory bodies overseeing digital technology operate in a free, fair, and independent manner? (0-4 points):

- Are there explicit legal guarantees protecting the independence and autonomy of any regulatory body overseeing internet and other ICTs (exclusively or as part of a broader mandate) from political or commercial interference?

- Is the process for appointing members of regulatory bodies transparent and representative of different stakeholders' interests?

- Are decisions taken by the regulatory body, particularly those relating to ICTs, seen to be fair and apolitical and to take meaningful notice of comments from stakeholders in society?

- Are efforts by access providers and other internet-related organizations to establish self-regulatory mechanisms permitted and encouraged?

- Does the allocation of digital resources, such as domain names or IP addresses, on a national level by a government-controlled body create an obstacle to access or are they allocated in a discriminatory manner?

Limits on content (0-35 points)

(1) To what extent does the state or other actors block or filter internet and other ICT content, particularly on political and social issues? (0-6 points):

- Is there significant blocking or filtering of internet sites, web pages, blogs, or data centers, particularly those related to political and social topics?

- Is there significant filtering of text messages or other content transmitted via mobile phones?

- Do state authorities block or filter information and views from inside the country – particularly concerning human rights abuses, government corruption, and poor standards of living – from reaching the outside world through interception of e-mail or text messages, etc.?

- Are methods such as deep-packet inspection used for the purposes of preventing users from accessing certain content or for altering the content of communications en route to the recipient, particularly with regards to political and social topics?

(2) To what extent does the state employ legal, administrative, or other means to force deletion of particular content, including requiring private access providers to do so? (0-4 points):

- To what extent are non-technical measures – judicial or extra-legal – used to order the deletion of content from the internet, either prior to or after its publication?

- To what degree does the government or other powerful political actors pressure or coerce online news outlets to exclude certain information from their reporting?

- Are access providers and content hosts legally responsible for the information transmitted via the technology they supply or required to censor the content accessed or transmitted by their users?

- Are access providers or content hosts prosecuted for opinions expressed by third parties via the technology they supply?

(3) To what extent are restrictions on internet and ICT content transparent, proportional to the stated aims, and accompanied by an independent appeals process? (0-4 points):

- Are there national laws, independent oversight bodies, and other democratically accountable procedures in place to ensure that decisions to restrict access to certain content are proportional to their stated aim?

- Are state authorities transparent about what content is blocked or deleted (both at the level of public policy and at the moment the censorship occurs)?

- Do state authorities block more types of content than they publicly declare?

- Do independent avenues of appeal exist for those who find content they produced to have been subjected to censorship?

(4) Do online journalists, commentators, and ordinary users practice self-censorship? (0-4 points):

- Is there widespread self-censorship by online journalists, commentators, and ordinary users in state-run online media, privately run websites, or social media applications?

- Are there unspoken "rules" that prevent an online journalist or user from expressing certain opinions in ICT communication?

- Is there avoidance of subjects that can clearly lead to harm to the author or result in almost certain censorship?

(5) To what extent is the content of online sources of information determined or manipulated by the government or a particular partisan interest? (0-4 points):

- To what degree do the government or other powerful actors pressure or coerce online news outlets to follow a particular editorial direction in their reporting?

- Do authorities issue official guidelines or directives on coverage to online media outlets, blogs, etc., including instructions to marginalize or amplify certain comments or topics for discussion?

- Do government officials or other actors bribe or use close economic ties with online journalists, bloggers, website owners, or service providers in order to influence the online content they produce or host?

- Does the government employ, or encourage content providers to employ, individuals to post pro-government remarks in online bulletin boards and chat rooms?

- Do online versions of state-run or partisan traditional media outlets dominate the online news landscape?

(6) Are there economic constraints that negatively impact users' ability to publish content online or online media outlets' ability to remain financially sustainable? (0-3 points):

- Are favorable connections with government officials necessary for online media outlets or service providers (e.g. search engines, e-mail applications, blog hosting platforms, etc.) to be economically viable?

- Are service providers who refuse to follow state-imposed directives to restrict content subject to sanctions that negatively impact their financial viability?

- Does the state limit the ability of online media to accept advertising or investment, particularly from foreign sources, or does it limit advertisers from conducting business with disfavored online media or service providers?

- To what extent do ISPs manage network traffic and bandwidth availability to users in a manner that is transparent, evenly applied, and does not discriminate against users or producers of content based on the content/source of the communication itself (i.e. respect "net neutrality" with regard to content)?
- To what extent do users have access to free or low-costs blogging services, web hosts, etc. to allow them to make use of the internet to express their own views?

(7) To what extent are sources of information that are robust and reflect a diversity of viewpoints readily available to citizens, despite government efforts to limit access to certain content? (0-4 points):

- Are people able to access a range of local and international news sources via the internet or text messages, despite efforts to restrict the flow of information?
- Does the public have ready access to media outlets or websites that express independent, balanced views?
- Does the public have ready access to sources of information that represent a range of political and social viewpoints?
- To what extent do online media outlets and blogs represent diverse interests within society, for example, through websites run by community organizations or religious, ethnic, and other minorities?
- To what extent do users employ proxy servers and other methods to circumvent state censorship efforts?

(8) To what extent have individuals successfully used the internet and other ICTs as tools for mobilization, particularly regarding political and social issues? (0-6 points):

- To what extent does the online community cover political developments and provide scrutiny of government policies, official corruption, or the behavior of other powerful societal actors?
- To what extent are online communication tools (e.g. Twitter) or social networking sites (e.g. Facebook, Orkut) used as a means to organize politically, including for "real-life" activities?
- Are mobile phones and other ICTs used as a medium of news dissemination and political organization, including on otherwise banned topics?

Violations of user rights (0-40 points)

(1) To what extent does the constitution or other laws contain provisions designed to protect freedom of expression, including on the internet, and are they enforced? (0-6 points):

- Does the constitution contain language that provides for freedom of speech and of the press generally?
- Are there laws or legal decisions that specifically protect online modes of expression?
- Are online journalists and bloggers accorded the same rights and protections given to print and broadcast journalists?
- Is the judiciary independent and do the Supreme Court, Attorney General, and other representatives of the higher judiciary support free expression?
- Is there implicit impunity for private and/or state actors who commit crimes against online journalists, bloggers, or other citizens targeted for their online activities?

(2) Are there laws which call for criminal penalties or civil liability for online and ICT activities? (0-4 points):

- Are there specific laws criminalizing online expression and activity such as posting or downloading information, sending an e-mail, or text message, etc.? (note: this excludes legislation addressing harmful content such as child pornography or activities such as malicious hacking).

- Do laws restrict the type of material that can be communicated in online expression or via text messages, such as communications about ethnic or religious issues, national security, or other sensitive topics?

- Are restrictions of internet freedom closely defined, narrowly circumscribed, and proportional to the legitimate aim?

- Are vaguely worded penal codes or security laws applied to internet-related or ICT activities?

- Are there penalties for libeling officials or the state in online content?

- Can an online outlet based in another country be sued if its content can be accessed from within the country (i.e. "libel tourism")?

(3) Are individuals detained, prosecuted or sanctioned by law enforcement agencies for disseminating or accessing information on the internet or via other ICTs, particularly on political and social issues? (0-6 points):

- Are writers, commentators, or bloggers subject to imprisonment or other legal sanction as a result of posting material on the internet?

- Are citizens subject to imprisonment, civil liability, or other legal sanction as a result of accessing or downloading material from the internet or for transmitting information via e-mail or text messages?

- Does the lack of an independent judiciary or other limitations on adherence to the rule of law hinder fair proceedings in ICT-related cases?

- Are individuals subject to abduction or arbitrary detention as a result of online activities, including membership in certain online communities?

- Are penalties for "irresponsible journalism" or "rumor mongering" applied widely?

- Are online journalists, bloggers, or others regularly prosecuted, jailed, or fined for libel or defamation (including in cases of "libel tourism")?

(4) Does the government place restrictions on anonymous communication or require user registration? (0-4 points):

- Are website owners, bloggers, or users in general required to register with the government?

- Are users able to post comments online or purchase mobile phones anonymously or does the government require that they use their real names or register with the government?

- Are users prohibited from using encryption software to protect their communications?

- Are there laws restricting the use of encryption and other security tools, or requiring that the government be given access to encryption keys and algorithms?

(5) To what extent is there state surveillance of internet and ICT activities without judicial or other independent oversight, including systematic retention of user traffic data? (0-6 points):

- Do the authorities regularly monitor websites, blogs, and chat rooms, or the content of e-mail and mobile text messages, including via deep-packet inspection?

- To what extent are restrictions on the privacy of digital media users transparent, proportional to the stated aims, and accompanied by an independent process for lodging complaints of violations?

- Where the judiciary is independent, are there procedures in place for judicial oversight of surveillance and to what extent are these followed?

- Where the judiciary lacks independence, is there another independent oversight body in place to guard against abusive use of surveillance technology and to what extent is it able to carry out its responsibilities free of government interference?

- Is content intercepted during internet surveillance admissible in court or has it been used to convict users in cases involving free speech?

(6) To what extent are providers of access to digital technologies required to aid the government in monitoring the communications of their users? (0-6 points):
   Each of the following access providers are scored separately: internet-service providers (ISPs) and other backbone internet providers (0-2 points); cybercafés and other businesses that allow public internet access (0-2 points); and mobile phone companies (0-2 points):

- Are access providers required to monitor their users and supply information about their digital activities to the government (either through technical interception or via manual monitoring, such as user registration in cybercafés)?

- Are access providers prosecuted for not doing so?

- Does the state attempt to control access providers through less formal methods, such as codes of conduct?

- Can the government obtain information about users without a legal process?

(7) Are bloggers, other ICT users, websites, or their property subject to extra-legal intimidation or physical violence by state authorities or any other actor? (0-5 points):

- Are individuals subject to murder, beatings, harassment, threats, travel restrictions, or torture as a result of online activities, including membership in certain online communities?

- Do armed militias, organized crime elements, insurgent groups, political or religious extremists, or other organizations regularly target online commentators?

- Have online journalists, bloggers, or others fled the country or gone into hiding to avoid such action?

- Have cybercafés or property of online commentators been targets of physical attacks or the confiscation or destruction of property as retribution for online activities or expression?

(8) Are websites, governmental and private entities, ICT users, or service providers subject to widespread "technical violence," including cyberattacks, hacking, and other malicious threats? (0-3 points):

- Are financial, commercial, and governmental entities subject to significant and targeted cyberattacks (e.g. cyber espionage, data gathering, DoS attacks), including those originating from outside of the country?

- Have websites belonging to opposition or civil society groups within the country's boundaries been temporarily or permanently disabled due to cyberattacks, particularly at politically sensitive times?

- Are websites or blogs subject to targeted technical attacks as retribution for posting certain content (e.g. on political and social topics)?

- Are laws and policies in place to prevent and protect against cyberattacks (including the launching of systematic attacks by non-state actors from within the country's borders) and are they enforced?

Appendix 3

	Estimate	SE	95% Confidence Intervals	
Fixed effects				
Constant	0.30	0.01	0.28	0.31
n = 20,204				
Random effects/internet freedom				
Constant (SD)	0.02	0.00	0.02	0.03
Residual (SD)	0.11	0.00	0.11	0.12
Halved χ^2 *p*-value = 0.00				
Note: Entries are maximum likelihood estimates with robust standard errors				

Table AI.
Internet/SNS use
and internet
freedom random
effects ANOVA

Consistent with the results in Table I the grand mean across nations was about 0.30 (splitting the difference between nations with partial and full internet freedom). The χ^2 statistic from the likelihood ratio (LR) test was significant (*p*-value = 0.00) suggesting that we can reject the null hypothesis that there is no cross-nation variation in internet/SNS use. The small *p*-value should actually be halved to obtain a less conservative test because we are testing a variance component so the alternative hypothesis is of necessity one-sided. Negative variances, which would be allowed under a two-sided test, do not make sense (see Steenbergen, 2012). Clearly, halving does not change the conclusion. The evidence suggests that the cross-national variation in internet/SNS use is considerable. The intra-class correlation estimate that is calculated using the estimate of random intercept based on the cross-national variance (0.001) and the residual estimate (0.01) indicates that about 9 percent of the variance can be accounted for by the divergence across countries.

Appendix 4

	Estimate	SE	95% confidence intervals	
Attitude about democracy				
Fixed effects				
Constant	0.51	0.01	0.49	0.53
n = 20,204				
Random effects/internet freedom				
Constant (SD)	0.05	0.01	0.04	0.06
Residual (SD)	0.13	0.00	0.13	0.14
Halved χ^2 *p*-value = 0.00				
Attitude about political conditions				
Fixed effects				
Constant	0.54	0.01	0.51	0.56
n = 20,204				
Random effects/internet freedom				
Constant (SD)	0.05	0.01	0.03	0.06
Residual (SD)	0.13	0.00	0.12	0.14
Halved χ^2 *p*-value = 0.00				
Note: Entries are maximum likelihood estimates with robust standard errors				

Table AII.
Attitudes about
democracy and
political conditions
and internet freedom
random effects
ANOVA

The χ^2 statistic from the likelihood ratio (LR) tests was significant (halved p-value $= 0.00$) in both models suggesting that we can reject the null hypothesis that there is no cross-national variation for these outcomes. The intra-class correlation estimates indicate that about 9 percent of the variance can be accounted for by divergence across countries in the attitude about democracy model and attitude about political conditions model.

About the authors

Jason Gainous is a Professor of Political Science at the University of Louisville. He has published two co-authored books, one with Oxford University Press (*Tweeting to Power: The Social Media Revolution in American Politics*) and one with Rowman and Littlefield (*Rebooting American Politics: The Internet Revolution*). He has also published various articles in journals including *American Politics Research*, *Journal of Information Technology & Politics*, *Political Research Quarterly*, *Political Communication*, *Social Science Quarterly*, and *Statistical Science*, among others. Jason Gainous is the corresponding author and can be contacted at: jason.gainous@louisville.edu

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