Twenty Years of Digital Media Effects on Civic and Political Participation

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Abstract

More than 300 studies have been published on the relationship between digital media and engagement in civic and political life. With such a vast body of research, it is difficult to see the big picture of how this relationship has evolved across time and across the globe. This paper offers unique insights into how this relationship manifests across time and space, using a meta-analysis of existing research. This approach enables an analysis of a 20 year period, covering 50 countries and including survey data from more than 300,000 respondents. While the relationship may vary cross-nationally, the major story is the trend data. The trend data show a pattern of small, positive average coefficients turning into substantial, positive coefficients. These larger coefficients may be explained by the diffusion of this technology across the masses and changes in the types of use, particularly the rise of social networking sites and tools for online political participation.

Keywords: digital media; political participation; survey; time series

Introduction

For more than 20 years, the Internet has captured the attention of pundits and artists offering accounts of how this media can or may transform our day-to-day lives. For example, in *The Circle* (2017), social network site developers sit around a table to discuss how to address low voter turnout, proposing a link between the user's profiles and voter registration along with a reminder to vote on election day. The idea evolves into allowing users to vote online, enabling "true democracy for the first time in human history" (*The Circle*, 2017). More than 300 studies have used survey data to test the relationship between digital media use, such as online news sources and social networking sites, and offline engagement in civic and political life, such as voting, volunteering, and protesting. With so many studies published in this 20-year period, it is difficult to identify the trends. How has this relationship evolved over this 20-year period? How has the introduction of social networking sites changed this relationship? No single study or data source can offer an account of how the relationship has evolved over a 20-year period. This study reports on a meta-analysis of existing research. This meta-analysis weaves together hundreds of studies to examine the evolution of the relationship over time as well as how this relationship differs across the globe. This project is a critical contribution to scholarship, because it offers a wealth of data to challenge or support existing narratives about the role of the Internet in civic and political life.

Several studies explore trends in digital media's role in citizen's political participation (Bimber & Copeland, 2013; Copeland & Bimber, 2015; Bimber, Cunill, Copeland, & Gibson, 2015; Strandberg & Carlson, 2016; Tolbert & McNeal, 2003; Vaccari, 2013). However, the focus has been on single countries and on participation in election campaigns, such as voting, attending rallies, and trying to persuade others to vote. While election campaigns are important,

they are not the whole story. Citizens engage in civic and political activities, such as contacting government officials, talking politics, boycotting, and volunteering in their community, on a daily basis. With a broader definition of participation, we can observe the relationship between digital media use and participation across time and space. As digital media use diffuses across the population, is the relationship growing? Does the relationship increase gradually or is there a period marking a dramatic change, i.e., the rise of social networking sites? How does the relationship differ cross-nationally? Does the relationship differ for more democratic systems, compared to less democratic systems? Is the USA distinctive in terms of digital media use and participation in civic and political life?

To answer these questions, this paper offers a meta-analysis of existing research that uses survey data to test the relationship between digital media use, such as social networking sites, online news sites, and other Internet uses, on offline participation in civic and political life, broadly defined to reflect manifestations across the globe. The size of this meta-analysis is exceptional, as evidenced by a recent meta-analysis of meta-analyses studies in communications (Rains, Levine, & Weber, 2018). These meta-analysis studies include, on average, 50 studies with a range between 14 and 165 studies (Rains, Levine, & Weber, 2018), whereas this study summarizes hundreds of studies. This large database is necessary to examine how the relationship has evolved over 20 years (1995 to 2016) and across more than 50 countries.

The findings suggest great variation in the effect sizes. Early research showed small, but positive coefficients between digital media and offline participation in civic and political life. More contemporary studies show substantial, positive coefficients between digital media use and participation. The trend is explained by the rise of social networking sites, more interactive websites, and the rise of online tools to facilitate political participation, such as Change.org and

similar sites. While there are some cross-national differences, they do not align with existing theories about cross-national differences in digital media effects. Finally, there is little evidence that the USA is distinctive and there is little evidence that democratic systems are distinct from non-democratic systems.

Digital media in election campaigns over time and across countries

Over the past 20 years, digital media use has been widely studied in relation to its impact on democratic practices. Political campaigns have adopted this technology with the expectation that it would connect candidates to voters and could be used to target campaign materials based on voters' interests and consequently increase electoral success (Howard, 2006). Beyond election campaigns, digital media can be used to acquire and share information as well as build and sustain networks to facilitate collective action on social problems (Boulianne, 2015). Outside democratic systems, digital media provide space to organize outside of state surveillance, creating international connections, raising funds, and activating support (Howard & Hussain, 2013). Ultimately, the goal is to challenge authoritarian regimes and advance democratic principles (Howard & Hussain, 2013). While this technology enables social change, digital media can also lead to dire outcomes on democratic practices, such as social control and political manipulation (Howard, 2015).

Early research showed small, positive coefficients between digital media and participation in civic and political life (Boulianne, 2009), but further research was fuelled by expectations of larger impacts. These expected impacts were described as: "more robust over time and not dependent upon a particular historical context" (Xenos & Moy, 2007, p. 715). The theories of larger impacts pointed toward the diffusion of digital media across the population and changes in the types of digital media use. In a book titled *Here Comes Everybody*, Shirky (2008) outlined

the possibilities presented by widespread adoption of digital media. Digital media offer tools for people to self-organize to solve collective problems, leading to quicker resolutions and working outside traditional institutional structures (Shirky, 2008).

As digital media use became more widely adopted or became "mainstream" (Xenos & Moy, 2007, p.704), the relationship was expected to increase over time. Bimber et al. (2015) tracked the rise in popularity of online political information in the 2001, 2005, and 2010 British election periods. Greater use of online information was expected to produce greater impacts on participation (Bimber et al., 2015). In particular, the effects of digital media were expected to increase as usage spread beyond those who are already interested and engaged to the average citizen. Rather than mobilizing a few citizens, the diffusion of digital media could enable the mobilization of the masses (Shirky, 2008).

Part of the explanation of an evolving relationship relates to evolving uses. Karpf (2016) made an obvious, but critical, point that:

> the Internet of 2016 is, in important respects, *different* from the Internet of 2012 or 2006, or 1996. The devices we use to access the Internet, the sites that we frequent on the Internet, and the ways we use those sites are all in a state of flux. And this is all happening while the medium itself diffuses to broader segments of the population (p. 17).

In the contemporary period, mobile phones and tablets have become popular devices. Social networking sites have become popular sites. Social networking sites may be distinctive as a form of digital media use. A meta-analysis focused on early uses of the Internet (1995-2005) found an average standardized coefficient of .07 (Boulianne, 2009). A meta-analysis of social media found a substantially larger average standardized coefficient of .125 (Boulianne, 2017). However, a

direct comparison of results is complicated by the different scope of these projects. The 2009 meta-analysis focused on the United States (38 studies), whereas the social media meta-analysis had a global scope (133 studies across more than 25 countries).

Social networking sites are not the only change. Websites moved from being simply broadcast tools into tools that citizens could use to send text messages to friends, self-organize and campaign on behalf of their parties (Bimber et al., 2015; Stromer-Galley, 2014; Vaccari, 2013). These changes in websites *could* prompt larger impacts of digital media on engagement. A meta-analysis of web interactivity experiments demonstrates positive outcomes on attitudes and behavior intentions (Yang & Shen, 2017). However, this line of research on political campaigns found the relationship to be minimal (Bimber et al., 2015; Stromer-Galley, 2014; Vaccari, 2013).

Few studies have examined the relationship between digital media use and political participation over time. Bimber and colleagues found idiosyncratic and non-linear relationships between digital media (exclusively online political information) across different types of election campaign-related activities from 1996 to 2012 in the United States (Bimber & Copeland, 2013; Copeland & Bimber, 2015; also see Tolbert & McNeal, 2003) and in the UK from 2001 to 2010 (Bimber et al., 2015). They suggested that the 2008 election may be an exception in a pattern of inconsistent digital media effects across different types of political activities (Bimber & Copeland, 2013, p. 134), because of the unique features of the Obama campaign and the rise of social media. They re-visited these findings with 2012 election data and concluded that the relationship continues to be idiosyncratic year to year (Copeland & Bimber, 2015). Bimber and colleagues offered theories of why the relationship might be idiosyncratic, including the media affordances offered by Twitter and YouTube as well as other platforms. These platforms offer

greater choices for elites to mobilize voters, which make digital media effects highly contextual and variant (Bimber et al., 2015). Finally, the rise of self-directed action and network effects make digital media effects path-dependent and non-linear (Bimber et al., 2015).

Vaccari (2013) was also skeptical of a linear relationship after studying multiple election cycles. He proposed that digital media technologies change across time, but the process is not linear, but rather nuanced and granular (Vaccari, 2013, p.11). The data offered on the 2007 and 2011 Australian elections suggest that the relationships between digital media use and different forms of participation vary in each election cycle, but do not show a consistent pattern of increasing or decreasing effects (Vaccari, 2013, p. 237). In the Italian elections of 2006 and 2008, the relationship was significant in 2006, but not in 2008 (Vaccari, 2013, p. 240). In contrast, Strandberg and Carlson (2016) found similar (positive and significant) relationships in the 2007, 2011, and 2015 Finnish elections.

Election campaigns are interesting because they are distinct periods of innovation in digital media technologies – high stakes games lead to innovations and risk-taking in the use of technology. These innovations feed into the next election cycle in part through the hiring of staff to work on new campaigns (Kreiss, 2012, 2016). This process of innovation may also have impacts outside the electoral context and across nations.

The US presidential election campaigns are closely observed internationally, which can lead to cross-national innovations in the use of technology. For example, innovations in the 2008 Obama campaign have served as examples for political campaigns across the globe. Kreiss (2016) described the Obama campaigns as prototypes, inspiring future campaigns. Chadwick (2013) offered many examples of how the Obama campaign strategies were considered in the UK 2010 election, because they were "tried and true methods" (Chadwick, 2013, p. 7). Bimber et

al. (2015) also noted the 2008 Obama campaign's impact in the 2010 UK elections, which led to some initial hypotheses about "stronger relationships in 2010 than the previous years" (p. 26), following results from the 2008 American National Election Study (Bimber & Copeland, 2013). This process of technology adoption presents a challenge and opportunity for studying the relationship between digital media and participation across time and space. While the distinct effects of Obama's digital media strategy would be evident in the 2008 results in the US, the effects would only be observed in 2010 in the UK. As such, each country would be following a similar trajectory but on a different timeline. Despite theorizing about the diffusion of effects from the United States to the United Kingdom, the data offered more significant relationships between digital media and various political activities in 2005 in the UK, not in 2010 as expected (Bimber et al., 2015). However, the findings point to the importance of looking simultaneously at how digital media effects differ cross-nationally and across time.

Vaccari (2013) wrote that "the implicit premise…has been that the difference between digital politics in the United States and in other Western democracies is simply a time lapse-that what happened and worked in America will sooner or later happen and work in other, somewhat similar countries" (p. viii). Vaccari (2013) argued the effects in the United States are specific to its institutional and organizational character, making it an exception or deviant case, rather than a model for Western democracies. While institutional structures are important, they seem most likely to explain why the relationship between digital media and citizen's election participation might be context specific. The mobilization processes around elections are structured by a country's election laws and unique institutional structures. Thinking about citizen's participation beyond election campaigns, the relationship may be more consistent across different countries.

Cross-national survey work has been limited and when this work is conducted, the measures of digital media use and citizen's participation are rather weak. For example, the World Values Survey includes a question about general Internet use and membership in civic organizations, which hardly covers the exhaustive ways of using digital media and being engaged in civic and political life. Gainous, Wagner and Abbott (2015) used the Asian Barometer survey (9 countries) to examine digital media effects and found that the effects do not differ by type of political system (Freedom House democracy index), but differ according to how participation is measured: election campaign (traditional) versus protest activities (signing petitions, street protests). In another paper, they used the Arab Barometer (7 countries) and find that the effects of Internet use on participation (voting, petitions, street protests) depend on the degree to which the Internet is free from restrictions (Wagner & Gainous, 2013). In both studies, Internet use was measured as frequency of use (daily, weekly, monthly, etc.) with no specificity in how this technology is used (Gainous et al., 2015; Wagner & Gainous, 2013). In sum, the cross-national comparisons suggest that contextual issues (e.g., Internet freedom, but not the Freedom House democracy index/aggregate scores) may be important to how digital media effects manifest themselves on citizen's participation. Furthermore, this research suggests that to understand cross-national differences requires examining citizens' participation outside the electoral process.

Digital media in civil society over time and across countries

Civil society includes the sphere outside state institutions. There are multiple streams of civil society to consider – the extra-institutional political sphere represented by social movement organizations, such as Greenpeace, with related platforms, such as Change.org. There is also the charitable sphere represented by non-profit organizations, such as the Red Cross, Oxfam, and

other charitable groups with related platforms, such as gofundme. Compared to research on election campaigns and digital media, there is far less research on digital media effects in civil society and on civic engagement (see Boulianne, 2015).

As discussed in relation to elections, the diffusion of technological innovations may originate in the United States and transfer elsewhere. For example, the UK's 38 Degrees, a "hybrid mobilization movement" (Chadwick & Dennis, 2017; Chadwick, 2013), is modeled after MoveOn.org (and Australia's GetUp!). However, there is likely more co-evolution of digital media and digital media effects on participation in civic life. This co-evolution could manifest as a consistency in digital media effects across countries, because of common platforms. For example, Change.org is the "world's largest social petition company" (Karpf, 2016, p. 64). The website boasts more than 100 million users, including more than 100,000 organizations across 196 countries (www.change.org/about). A similar organization, Avaaz.org also has a global presence with similar number of countries and members (https://secure.avaaz.org/page/en/about/). The tools of participation in civil society are international.

Furthermore, unlike elections where the major players are national parties, in civil society, the major players are international. For example, for Change.org, the target of these campaigns may be government, but they may be non-profit *international* organizations, such as the Red Cross or multinational corporations, such as Shell Oil or Fox Broadcasting Company (Karpf, 2016, Chapter 3). The process of mobilization facilitated through these sites may transcend national borders. This mobilization process starts with a petition, leads to collecting contact information then possibly the formation of a group; this group could then organize other activities, including offline protest events. Karpf (2016) provided many examples of movements

that begin as online petitions and lead to more robust movements. Earl and Kimport (2011) offered many other examples. They describe these processes as e-mobilizations, where "the web is used to facilitate the sharing of information in the service of an offline protest action" (Earl & Kimport, 2011, p. 12). This e-mobilization process may transfer across national boundaries. The mobilization processes are more transnational than the mobilization processes that happen around elections and in relation to voting. In terms of cross-national patterns, the mobilization process would be easier in democratic countries, which may be more receptive to petitions and protect the rights to assembly for groups. Nonetheless, the mobilization process could work outside democratic states. Again, the Freedom House scores related to democracy (political rights, civil liberties) are relevant moderators of the relationship between digital media use and participation in civic and political life.

The effects of digital media in the civic sphere may be more linear, because efforts to engage digital media do not follow the ebbs and flows of an election cycle. The work of civil society organizations continues linearly, rather than stops at the end of a specific campaign. Karpf (2016) argued that this is a key distinction between elections and political advocacy – elections end with a clear outcome, which can be evaluated as successful or not, whereas political advocacy is continual, with no clear end, and is evaluated in terms of small scale changes. In sum, the research questions are:

1) How does the relationship between digital media and participation differ cross-nationally? Does the relationship differ for democratic systems? Is the USA distinctive?

2) How does the relationship between digital media and participation differ across time? Is there a period marking dramatic change? Are the US trends different?

Methods

A meta-analysis is a "statistical synthesis" of data (Borenstein, Hedges, Higgins, & Rothstein, 2009, xxiii). Meta-analyses are most often used to summarize the effects of an intervention and often relies on "effect sizes" to assess the effectiveness of the intervention (Borenstein et al., 2009; Ellis, 2010). In this study, the analysis is restricted to those studies employing *survey research* to assess the relationship between digital media use and participation in civic and political life. The analysis of survey data tends to use systematic analysis approaches and standardized estimates, enabling some degree of comparison of estimates across studies. The value of this meta-analysis project, specifically, is to enable a comparison of coefficients across time and across different political contexts. Compiling the results of these studies into a systematic review helps to illustrate the big picture of how the relationship has evolved across time and space. This meta-analysis addresses a clear gap in the evidence about the relationship between digital media effects and participation. There is no study that can account for yearly variations in the effects of digital media on participation, covering a 20-year period. Likewise, there are no studies that can account for this relationship in more than 50 countries. Finally, there are no single studies that can claim to summarize the results from more than 300,000 respondents, as this meta-analysis does.

Search strategy

The studies were originally compiled using searches of academic databases and Google Scholar using a combination of keywords to measure digital media use as well as participation in civic and political engagement, such as (civic or political) and (engagement or participation). The search process began in May 2015 and concluded in October 2017.

Unlike other meta-analysis studies that run a query to produce a sample of studies from a handful of databases (Matthes et al., 2018) or focus on a handful of journals (Rains, Levine &

Weber, 2018), this study seeks a census of the entire body of research. Academic databases, such as Communication and Mass Media Complete, have a bias towards published manuscripts. The ISI Thomson Web of Science Social Sciences Citation Index (see Table 1) search was our starting point, but this database has known biases towards North American journals, which is detrimental to the research questions in this manuscript (Harzing, 2017). To address this problem, Google Scholar was used as a supplement to traditional academic databases.

The abstracts were reviewed to identify whether the study presented survey data. If survey data was used, the full study was tracked down and reviewed to determine whether the relationship between digital media use and participation was assessed. This search query and review process produced a set of more than 300 relevant survey-based studies that focused on campaign or news websites, email, social networking sites, blogs, chatrooms, petition-signing websites, etc. In terms of types of digital media to include, we included any measure of digital media use where the device or uses required an Internet connection, e.g., mobile apps that require an internet connection, such as online news sites. The most popular measures of digital media use were centered on political information, which includes use of online news sources and social networking sites' news features, as well as campaign websites. The second most popular measures of digital media use focused on generic measures of frequency or use versus non-use, as illustrated in the Gainous et al. (2015) and Wagner and Gainous (2013) findings. For offline participation in civic and political life, the activities studied were related to voting, volunteering, boycotting, participating in street marches, etc. The most popular approach to measuring offline participation was to blend civic activities and political activities, such as combining voting, volunteering in the community, and protesting. The second most popular approach is to focus on election campaign participation exclusively.

In addition, studies were excluded if they focused on behavior intentions (e.g., intent to vote) or attitudes towards digital media use (e.g., trust in online news, motivations for using social media), as the focus of this meta-analysis is on activities, not attitudes. For this specific paper, studies and/or coefficients were excluded when the measures blurred online and offline activities, such as measuring consumption of printed newspapers and online newspapers or if the measures blurred online and offline political activities, such as voting with signing online petitions. There were less than 15 studies that were excluded for this blurred measurement approaches (e.g., Chadwick, O'Loughlin, & Vaccari, 2017). These "hybrid" approaches (Chadwick, 2013) merit a separate analysis with distinct research questions. The core research questions center on how online activities relate to offline activities; the spheres are treated as distinct reflecting popular practice in the literature. This distinction also offers clarity around the independent and dependent variables. This topic is revisited in the Discussion section. The list of studies is published as supplementary material on the journal website, as are additional details on the search and analysis strategy.

Analysis strategy

While the database of research contains more than 300 studies and more than 2000 coefficients within these studies, the analysis presented in this paper focuses on standardized coefficients, largely derived from multivariate models accounting for the impact of demographic variables. Standardized coefficients are the most common estimates reported in this body of research. Sometimes unstandardized ordinary least squares coefficients are reported, alongside standard deviations and in these cases, we standardized the coefficients by multiplying the coefficient by the standard deviation of x divided by the standard deviation of y.

However, there is a good deal of research focused on logistic regression analysis, which does not have agreed upon standardization techniques. For example, Menard (2004) presents six different options for standardizing logistic regression coefficients. Within this body of research, few studies offer standardized logistic regression. Indeed, the literature on election effects across time all use logistic regression analysis (Bimber & Copeland, 2013; Copeland & Bimber, 2015; Bimber et al., 2015; Strandberg & Carlson, 2016; Tolbert & McNeal, 2003; Vaccari, 2013). Because of the lack of agreement on standardization of logistic regression coefficients, these coefficients are excluded from the analysis. However, there are many other studies using the multiple years of the American National Election Studies (e.g., Chan, 2014), so the omission is not detrimental to the research questions.

Several studies report more than one dataset within the study. These datasets are identified as distinct if they are based on different time periods (e.g., Kelm & Dohle, 2017; Emmer, Wolling, & Vowe, 2012; Pearce, Freelon, & Kendzior, 2014), by country (e.g., Chan, Chen & Lee, 2016) or distinct samples, such as teenagers versus young adults (Kim, Russo, & Amna, 2016). For this paper where the focus is on standardized coefficients, there are 225 studies containing 251 distinct datasets. After accounting for these different datasets within studies, the multiple coefficients are averaged at the dataset level, according to meta-analysis recommendations (Lipsey & Wilson, 2001). In other words, if the study included multiple measures of digital media use, e.g., campaign websites and social media use, these multiple estimates are averaged prior to using the coefficient in the analysis. This approach offers a high-level assessment of digital media effects, without getting into the specifics of measurement. The approach is necessary to provide a holistic view of digital media effects across twenty years of changing uses.

Likewise, if the study examined participation in election campaigns as well as in civic or protest activities (e.g., protest), these multiple estimates are averaged prior to using the coefficient in the analysis. This approach is a practical necessity since the most common method of measuring participation involves blurring electoral, civic and protest participation (Boulianne, 2015). The dataset-level averages are then used in computing the grand average, as well as the averages at the country-level and for specific years. While the different estimates are based on different measures of both the independent and dependent variables, as well as contain different statistical controls in the models (see discussion in Becker and Wu, 2007; Peterson and Brown, 2005), these challenges are offset by the benefits of conducting a meta-analysis. A meta-analysis of existing research is the only way to capture year to year variations across 20 years of data collection as well as to capture cross-national variations in the relationship between digital media use and engagement.

In addition to examining cross-national differences and year of data collection, we assess whether the relationship differs for democratic systems. We replicate the Freedom House scores analysis offered by Gainous et al. (2015). Using the Freedom House (2017), we coded each country's classification. These classifications are based on degree of democracy observed in each country, as measured by the extent to which civil liberties and political rights are protected (as mentioned, the right to assembly is critical), degree to which the Internet is free from restrictions (important to digital media effects, as per Wagner & Gainous, 2013), as well the degree to which the press is free and independent. In addition, Freedom House (2017) provided a summary score comprised of 25 different indicators. All of these classifications are assessed in trying to understand cross-national differences. The Freedom House (2017) edition is based on observations from 2016. Ideally, this information would be based on the year of data collection

for that country. Unfortunately, this report is only available after 2006, which is halfway through the time period covered by these studies.

Findings

As Figure 1 illustrates, the standardized coefficients ($k = 251$) range between -.090 and .686 on a scale between -1.00 and +1.00. The average coefficient is .137 with a standard deviation of .129. Approximately one-third of coefficients are between .05 and .10 on the standardized scale (± 1). Almost all of these coefficients are derived from multivariate models that account for the influence of demographic variables. On average, the models contain 12 independent variables and explain approximately 27% of the variance in the dependent variable. On average, the valid sample size used in the models is 1,400 cases. Figure 1 illustrates strong variation in the coefficients, raising questions about why the coefficients vary so dramatically. This paper investigates two possibilities: cross-national differences and trend differences.

[insert Figure 1 here]

Table 1 highlights the cross-national results of countries reporting more than one study. As mentioned, within each of these studies, there are multiple coefficients. These coefficients are averaged at the dataset-level before being used in the calculation of country-level averages. Based on 127 studies, the average coefficient for the United States studies is .130 (SD = .121), compared to .144 (SD = .138) for 124 studies conducted outside the United States. The difference was not significant ($F = .806$, $p = .370$, Anova). According to these results, the USA is not distinctive in terms of average coefficients. Indeed, the average coefficient for the USA is similar to that observed for Canada and Australia. In addition, the average coefficient for the USA is similar to that observed in Singapore, which does not have a free press system.

[insert Table 1 here]

Freedom House (2017) scores are used to assess whether the relationship differs for different types of political systems (Table 2). There are five classifications used in the Freedom House (2017) report. None of the classification systems correlate with the size of the coefficient. Using the three categories for press systems (not free, partly free, and free), the average coefficients are .139 (SD = .119, k = 21) for not free systems, .154 (SD = .119, k = 36) for partly free systems, and .128 (SD = .124, k = 183) for free press systems. The difference was not significant (F = 0.725, p = .485, ANOVA; also see correlation analysis, Table 2). Using the three categories for degree to which the Internet is free from restrictions (not free, partly free, and free), the average coefficients are .147 (SD = .132, k = 16) for not free internet systems, .139 (SD = .092, k = 23) for partly free internet systems, and .131 (SD = .126, k = 201) for free internet systems. The difference was not significant (F = 0.153, p = .858, ANOVA; also see correlation analysis, Table 2).

[insert Table 2 here]

Because there are few studies prior to 1998, these results have been pooled. These effects are averaged to form the start of the trend line (.025). There were only three studies conducted in 2016 with an average of .295. Figure 2 presents the average coefficients based on year of data collection. There is some volatility in the coefficients in the last few years, despite a large number of datasets tracking these trends. The average coefficient increases dramatically from 2012 to 2013, drops down in 2014, before returning to 2013 levels in 2015.

[insert Figure 2 here]

In Table 3, the yearly averages are provided with a 95% confidence interval. Greater variance in each year's average is a function of the number of studies in each year (more studies decrease the interval size) and variance of the estimates in each year (greater variance in the

estimates increases the interval). Some years offer a clearer picture of the effects, compared to others. However, the key point is that the effects are increasing across time. Put simply, there is a strong correlation between year of study and effect size (Pearson correlation of .322, $k = 244$, $p < .001$).

[insert Table 3]

For US studies ($k = 125$), the Pearson correlation between year of study and effect size is .310 ($p < .001$) and for non-US studies ($k = 119$), the correlation is .346 ($p < .001$). There seems to be little difference between the US and other countries. Figure 3 presents average coefficients US studies compared to non-US studies, starting with 2003 when there are a consistent set of estimates outside the US (see Table 3 for year-to-year variations). In both cases, the trend line shows a gradual increase in effects over time, but there are some years where the effect sizes are slightly larger than expected based on an assumption of monotonic changes. There are also some points in the trend line where the coefficients diverge for the United States compared to other countries. While the difference is dramatic, some caution is necessary given the small number of studies. The average coefficient in 2003 for the US is .129 (SD = .088, $k = 7$) and outside the US, the average is .009 (SD = .083, $k = 5$). Another point of divergence in the trend line is in 2011, the average coefficient for the US is .285 (SD = .304, $k = 2$) and outside the US, the average is .130 (SD = .079, $k = 7$).

Discussion

Clearly there is a positive relationship between digital media use and participation in civic and political life. Early research showed a small, but positive average coefficients and more contemporary research has shown a substantial, positive coefficient. These results provide some

reason to be optimistic about the significance of digital media in citizen's participation. Why are contemporary coefficients stronger?

Social networking sites explain some of this increase. A 2009 meta-analysis, based on the USA, estimated the average effect as .07 (Boulianne, 2009). This meta-analysis focused on early types of digital media use, such as online news, emailing, and time spent online. In contrast, a new meta-analysis focused exclusively on social media (based on studies across the globe) estimated the average effect as .125 (Boulianne, 2017). As such, social networking sites explain some of the trend line. However, social networking sites are not the only story, since the trend line did not show a dramatic and consistent change with the introduction of social networking sites. Websites have become more interactive, which may produce larger effects. In addition, the rise of digital media tools (e.g., Change.org) to enable online political participation helps explain the rise in offline forms of engagement (online petitions lead to boycotting, street protests, etc.).

As for cross-national differences, these findings do not support existing theories in this field of research. Following Gainous et al. (2015), we explored cross-national differences based on Freedom House scores, but did not find differences. The results do not suggest that the USA is distinctive in its digital media effects, addressing Vaccari's (2013) hypothesis. The US-specific trend line replicates the pattern of small coefficients becoming larger over time. The trend line does depict some idiosyncratic and irregular patterns, which were also observed based on data from the American and British election studies (see Bimber et al., various works). However, the dramatic increases do not align with the cycle for US presidential elections. By focusing on election periods, we cannot see the role of digital media in everyday political activities. The relatively little research on civil society compared to election campaigns (Boulianne, 2015) means we know little about how these effects have evolved over time for these forms of

participation. The meta-data offer a broad picture of increasing effect size, but we cannot infer that the relationship between any single political activity or any single digital media use increasing across time. Specifically, we cannot address whether the relationship between online political information and voting is increasing in the United States.

The year 2017 will likely mark another period of large effects between digital media use and participation in the USA. While 2017 is not an election year, this year seems to be a critical year related to the mobilization of citizens, particularly in the form of street protests. Digital media seem critical to the street protests, particularly the Women's March, March for Science, and People's Climate March (Fisher, 2018). This scholarship largely focuses on left-wing movements, leaving many unanswered questions about the use of digital media for right-wing movements. Indeed, research has largely treated all forms of participation as normatively good, when clearly, some forms of participation facilitated by digital media may have dire consequences, such as the white supremacy movement in the United States (see Hedrick, Karpf, & Kreiss, 2018).

Looking more globally, the relationship between digital media use and participation seems to gradually increase over time. These gradual effects may be linked to an incremental process of technological innovations by civic groups (Karpf, 2016). These technological innovations are not as bound to national context, which may explain why there are few cross-national differences observed in this meta-analysis study. As mentioned, key organizations and elites in the civil sphere are international players, which may also explain why we see similar effects across political contexts. This is not to say that each individual country does not have periods of peaks in their trend line connecting digital media use and participation; however, at the global level, there is some consistency in the trajectory of the trend line. While country-

specific trend lines would be interesting, such analysis has been limited to elections (Bimber &

Copleand, 2013; Copeland & Bimber, 2015; Bimber et al., 2015; Strandberg & Carlson, 2016;

Tolbert & McNeal, 2003; Vaccari, 2013).

In sum, the effects of digital media on participation were smaller in the early years and

have become much more dramatic. This overall trend is consistent across a variety of political

contexts. Further research should move beyond the comparative election focus in trying to

understand transnational effects of digital media on civic and political life. The focus on

elections restricts analysis to campaign participation, whereas citizens are engaged in civic and

political activities on a daily basis, e.g., boycotting and talking politics. Existing international

work suggests that cross-national differences are observed when exploring these types of

activities (Gainous et al., 2015). Further comparative work should move beyond the democracy

scores and similar classifications used in the present study and others (Gainous et al., 2015;

Wagner & Gainous, 2013). Instead, further research should look to transitioning systems

(moving towards or away from democratic practices) as well as those where the free press scores

and Internet restrictions do not align. In particular, what role do digital media play in a system

where the traditional press is not free, but the Internet is free from restrictions? These countries,

which include Israel, Italy, and Greece, may offer unique insights and perhaps unique effects of

digital media on participation in civic and political life. Finally, further research might want to

re-evaluate the separation of online and offline activities implicit in this body of research, opting

to study hybridity in media use (Chadwick, 2013) and mixing modes of participation, blurring

boundaries between online and offline activities. While these hybrid approaches are rare, they do

offer new lines of inquiry about media effects on participation.

Returning to the introduction's description of *The Circle,* there are limits to what digital and social media can and should do in a democratic system. In particular, the proposed strategy to reduce the effort to vote comes at a cost. The movie, as well as Howard (2015), points to the high potential for surveillance, social control, and political manipulation in digital media. While the Internet may be beneficial for collective organization, as suggested by Shirky (2008), the ease of organization is not limited to pro-democratic, high-consensus groups. As such, scholarship should attend to both the positive and negative consequences of online mobilization.

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Table 1

Highlights of cross-national differences in average effect sizes

Country	Number of studies $k = 243$	Average across studies	Standard deviation
Australia	3	.138	.053
Belgium	3	.064	.033
Canada	4	.127	.099
Chile	3	.120	.035
China	14	.163	.134
Colombia	4	.110	.026
Germany	13	.090	.092
Hong Kong	13	.162	.111
Israel	2	.146	.168
Italy	3	.310	.054
Lithuania	2	.257	.014
South Korea	10	.136	.153
Netherlands	3	.059	.005
Singapore	3	.136	.076
Sweden	9	.206	.240
Taiwan	5	.113	.134
United Kingdom	12	.195	.211
United States	127	.130	.121

Table 2

Pearson correlation of coefficients and Freedom House (2017) scores

	Average coefficient $k = 240$
Democracy score (25 indicators, low to high)	-.036 *p*-value = .582
Political rights* (low to high)	-.049 *p*-value = .453
Civil liberties* (low to high)	.024 *p*-value = .712
Degree of freedom of the press (not, partly, free)	-.057 *p*-value = .382
Degree of Internet freedom (not, partly, free)	-.036 *p*-value = .580

*Reverse coded from the original Freedom House (2017) scores

Table 3

Trend estimates with 95% confidence intervals, sample sizes

	All datasets, $F = 2.263$, $p =.002$, Anova					USA, $F = 1.903$, $p =.020$, Anova					Non-USA, $F = 1.586$, $p =.086$, Anova				
Year	**k**	average	se	lower 95% CI	upper 95% CI	**year**	**k**	average	se	lower 95% CI	upper 95% CI	**year**	**k**	average	se	lower 95% CI	upper 95% CI
1995	2	0.025	0.005	0.015	0.035	**1995**	2	0.025	0.005	0.015	0.035						
1996	1	0.015				**1996**	1	0.015									
1998	7	0.065	0.017	0.032	0.098	**1998**	6	0.062	0.020	0.023	0.101	**1998**	1	0.080			
1999	3	0.015	0.007	0.001	0.029	**1999**	3	0.015	0.007	0.001	0.029						
2000	8	0.077	0.022	0.034	0.120	**2000**	7	0.072	0.025	0.023	0.121	**2000**	1	0.116			
2001	4	0.062	0.030	0.003	0.121	**2001**	2	0.030	0.010	0.010	0.050	**2001**	2	0.094	0.056	-0.016	0.204
2002	2	0.049	0.036	-0.022	0.120	**2002**	2	0.049	0.036	-0.022	0.120						
2003	12	0.079	0.030	0.020	0.138	**2003**	7	0.129	0.033	0.064	0.194	**2003**	5	0.009	0.037	-0.064	0.082
2004	7	0.077	0.026	0.026	0.128	**2004**	6	0.085	0.029	0.028	0.142	**2004**	1	0.029			
2005	7	0.107	0.040	0.029	0.185	**2005**	2	0.166	0.102	-0.034	0.366	**2005**	5	0.083	0.042	0.001	0.165
2006	6	0.102	0.029	0.045	0.159	**2006**	3	0.119	0.052	0.017	0.221	**2006**	3	0.084	0.033	0.019	0.149
2007	8	0.090	0.032	0.027	0.153	**2007**	4	0.061	0.006	0.049	0.073	**2007**	4	0.118	0.065	-0.010	0.245
2008	33	0.158	0.020	0.119	0.197	**2008**	27	0.168	0.023	0.123	0.213	**2008**	6	0.117	0.024	0.070	0.164
2009	11	0.087	0.019	0.050	0.124	**2009**	6	0.092	0.019	0.055	0.129	**2009**	5	0.080	0.038	0.006	0.154
2010	23	0.126	0.026	0.075	0.177	**2010**	9	0.186	0.053	0.082	0.290	**2010**	14	0.087	0.021	0.046	0.128
2011	9	0.164	0.048	0.070	0.258	**2011**	2	0.285	0.215	-0.136	0.706	**2011**	7	0.130	0.030	0.071	0.189
2012	40	0.158	0.024	0.111	0.205	**2012**	19	0.123	0.023	0.078	0.168	**2012**	21	0.189	0.041	0.109	0.269
2013	16	0.235	0.049	0.139	0.331	**2013**	4	0.287	0.144	0.005	0.569	**2013**	12	0.218	0.048	0.124	0.312
2014	33	0.140	0.020	0.101	0.179	**2014**	10	0.103	0.025	0.054	0.152	**2014**	23	0.156	0.026	0.105	0.207
2015	9	0.248	0.047	0.156	0.340	**2015**	2	0.197	0.069	0.062	0.332	**2015**	7	0.263	0.059	0.147	0.379
2016	3	0.295	0.085	0.128	0.462	**2016**	1	0.362				**2016**	2	0.261	0.135	-0.004	0.526

Note. 95% confidence intervals (CI) calculated as average $\pm$(1.96*standard error). This table presents standard errors, whereas the rest of the paper presents standard deviations. The standard deviation can be computed by multiplying the standard error by the square root of *k*.
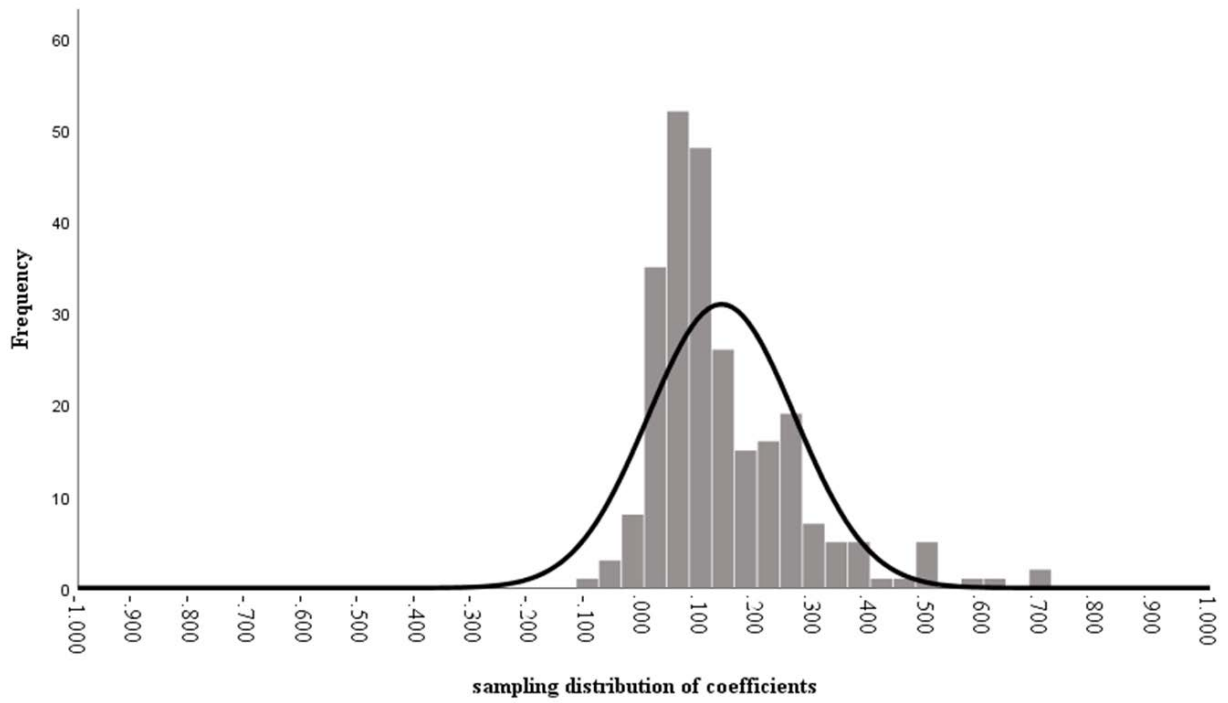
Figure 1

Standardized coefficients for 251 datasets
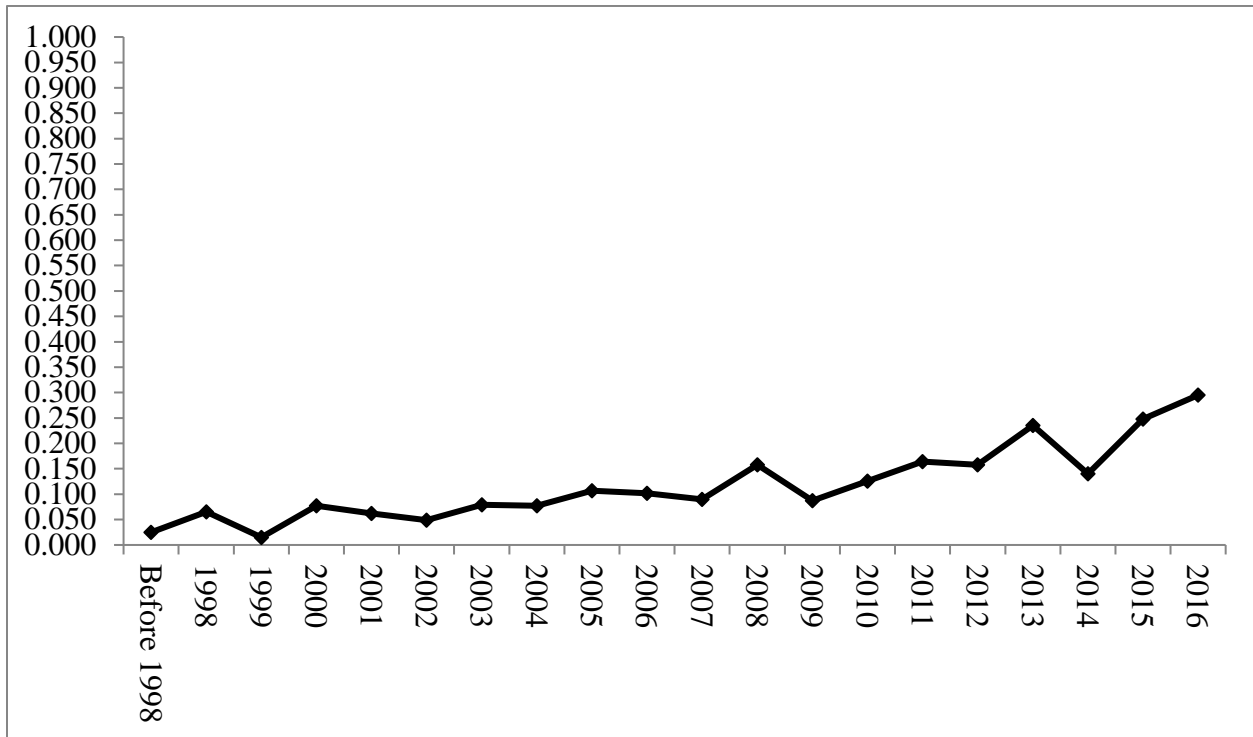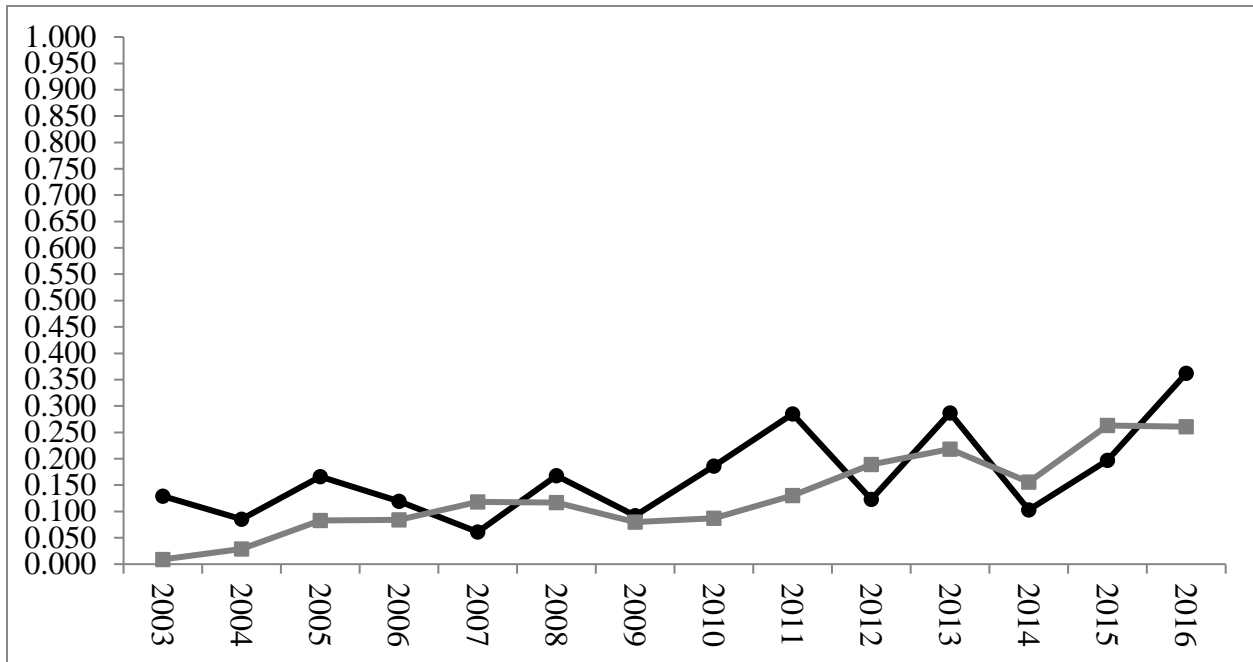
Figure 2

Trend line for all countries

Figure 3

US ● *versus non-US* ▪ *trend line*

Twenty Years of Digital Media Effects on Civic and Political Participation

Supplementary Materials

Shelley Boulianne

Supplementary Methods

Supplementary search strategy description

The studies were originally compiled using searches of academic databases and Google Scholar

using a combination of keywords to measure digital media use as well as participation in civic

and political engagement (Table 1). Specially, the following databases were used to run queries

based on the keywords listed in Table 1: EBSCO: Academic Search Complete, International

Political Science Abstracts, Political Science Complete, SocINDEX, and Communication &

Mass Media Complete, Proquest (includes Sociological Abstracts and PAIS), JSTOR, and

finally, Scopus, Web of Science, and Google Scholar.

Table A1
Social Sciences Citation Index number of hits

	Civic engagement	Civic participation	Political engagement	Political participation
Internet	367	336	484	830
Web	79	74	134	232
"Digital media"	35	32	59	68
Online	287	279	426	751
Blog	11	7	20	33
"social media"	175	152	271	376
"social networking sites"	30	26	32	50
Facebook	84	79	129	169
Twitter	32	32	80	112

Google Scholar was used to identify unpublished materials, such as conference papers, as

well as books. Omitting books would be a detrimental flaw given the research questions for this

meta-analysis paper. Many relevant pieces were found in edited volumes highlighting a specific region. For example, using Google Scholar, we found chapters from an edited volume on Brazil (see Breuer and Groshek, 2014 in Breuer and Welp, 2014), as well as an edited volume on Asia (see Chan, Lee, and Chen, 2016 in Wei, 2016). Furthermore, the edited book by Anduiza, Jensen and Jorba (2012), titled *Digital media and political engagement worldwide*, proved helpful. There are relevant chapters covering research in the United States, Germany, and Spain. If a conference paper or theses/dissertation and a published version of this work were both available, the published version was retained in the database, replicating an approach used by Yang and Shen (2017). For conference papers, we contacted authors to seek permission to use their presentation in our analysis. In most cases, authors sent us a published version of their paper to cite.

Supplementary analysis description

As one last note, the use of the term "effect" borrows from meta-analysis literature (e.g., Ellis, 2010). Most the studies are based on cross-sectional surveys, which can only assess correlation not causation. However, 26 of the studies included longitudinal analysis, such as surveys of the same respondents across time (e.g., Emmer, Wolling, & Vowe, 2012). Most of the longitudinal studies were conducted in the same calendar year and were coded as such (e.g., Boulianne, 2011; Towner, 2013). In the case of multiple years of data collection, the most contemporary year was coded as the year of data collection. This same practice was used for pooled data (e.g., Shah, McLeod & Yoon, 2001).

Furthermore, the meta-analysis scholarship offers a variety of ways to adjust for publication bias, weight effects based on sample sizes, and other transformations of the original coefficients reported in published papers (see Rains et al., 2018). We do not complete any manipulations of the coefficients for several reasons. First, the most common practice is to report

on standardized regression coefficients and we wanted to replicate the original estimates to maintain reliability and transparency in methodology. Two, we argue that the adjustments based on sample size are not appropriate – the core issue should be about randomness of the sample, after that, representativeness should be considered. The methodological reporting practices for most studies do not allow an assessment for these principles. Furthermore, sample size matters less once a certain threshold has been met. The smallest sample size was 109 (valid sample size from the table of analysis of Pew data, see Hoffman, 2012) and the largest was 50,268 (a study using the European Social Survey, see Geber, Scherer, & Hefner, 2016). Finally, recently published meta-analysis studies offer different effect estimates, after adjustments for sample size and other factors, such as publication bias. For example, Matthes et al. (2018) offer several estimations, but they end up with the same calculated effect ($r = .10$). As such, the adjustments may not be necessary.

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