Article

Social media and citizen engagement: A meta-analytic review

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Abstract
This meta-analytic study reviews empirical research published from 2007 to 2013 with an aim of providing robust conclusions about the relationship between social media use and citizen engagement. It includes 22 studies that used self-reported measures of social media use and participation, with a total of 116 relationships/effects. The results suggest that social media use generally has a positive relationship with engagement and its three sub-categories, that is, social capital, civic engagement, and political participation. More specifically, we find small-to-medium size positive relationships between expressive, informational, and relational uses of social media and the above indicators of citizen engagement. For identity- and entertainment-oriented uses of social media, our analyses find little evidence supporting their relationship with citizen engagement.

Keywords
Civic engagement, meta-analysis, political participation, social capital, social media

Introduction

The arrival of social media has re-energized the debate about the relationship between Internet use and citizen engagement. Scholars, pundits, and journalists have extensively

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discussed whether social media can be used to promote civic and political engagement, but have not been able to reach a clear consensus on the matter (Ellison et al., 2009; Gil de Zúñiga et al., 2012; Gladwell, 2010; Macafee and De Simone, 2012; Morozov, 2011; Tufekci and Wilson, 2012; Valenzuela et al., 2009). In general, research has not supported the pessimistic views suggesting a toxic impact of social media on engagement, but has also rarely provided any solid proof of social media's presumed revolutionary impact, beyond occasional anecdotal evidence.

The aim of this meta-analytic study is to review the existing empirical research and provide more robust conclusions about the relationship between social media use and engagement. Meta-analysis can provide a more specific quantitative understanding of a subject and, when combined with a narrative review, can improve the conclusion of the latter because it is accessible and subject to challenge by replication (Allen, 2009). Our intention is thus to provide a comprehensive review of the existing literature in a narrative form and derive specific numerical estimates regarding the relationship between social media use and engagement. To this end, we review existing research and re-analyze the data from the studies published during the 2007–2013 period. We aim to shed more light on the linkages between different patterns of social media use that occur across various platforms and specific forms of citizen engagement, namely social capital, civic engagement, and political participation. Our analyses, guided by the extant theoretical models from the literature, indicate a predominantly positive relationship between the use of social media and citizen engagement, with informational, expressive, and relational uses being of particular importance.

Literature review

Over the past 20 years, many scholars and researchers have examined the impact of new digital media on citizen engagement. While early research mainly focused on frequency and/or duration of Internet use (Kraut et al., 1998; Nie and Erbring, 2000), one of the seminal studies from the early 2000s adopted a motivational perspective (e.g. Katz et al., 1974) to examine how different patterns of Internet use predicted social capital (Shah et al., 2001). The authors found that while informational uses of the Internet had a positive relationship with the production of social capital, socio-recreational uses were found to be negatively related to it. Research suggests that increased access to public affairs information via the Internet may improve citizens' political knowledge, increase awareness of various political opportunities, and heighten interest in community and political affairs (Rojas and Puig-i-Abril, 2009; Shah et al., 2001). Informational uses are also theorized to be predictive of improved elaboration, as well as greater likelihood of engaging in political expression and discussion which are all precursors of social and civic participation (Shah et al., 2005). In contrast, since many social and recreational uses of the Internet circa 2000 could be described as anonymous and/or asocial, it is not surprising that they were initially found to have either negative or no relationship with social capital (Shah et al., 2001).

However, the Internet ecology has significantly changed since the early 2000s, as have people's expectations from media platforms and associated patterns of use. A more recent meta-analytic study published in 2009 indicated that Internet use had a positive

relationship with engagement but that this relationship was small and possibly not substantively significant (Boulianne, 2009). The author noted, however, that the size of the relationship seems to be increasing over time and that informational (online news) use had a stronger relationship with engagement compared to other measures of use.

In the past 10 years, the proliferation of affordable Internet devices and the rise of social media platforms has enabled highly decentralized (co)-production and dissemination of ideas, public discussion, and deliberation, and allowed for new forms of network organization (Bennett, 2008). We argue that these developments necessitate a new comprehensive assessment of the role of new media in civic and political life, as the Internet ecology of today is evidently different from that of 1995 and even 2005. The arrival of social media has changed the nature of everyday online interactions among citizens enabling new forms of personalized public engagement that no longer require significant organizational resources nor common identity and ideology (Bennett and Segerberg, 2012). For instance, social network sites (SNSs) such as Facebook enable easy maintenance of a large network of social ties and provide records of previous social interactions, which has positive implications for the development and maintenance of social capital and interpersonal trust (Ellison et al., 2007; Resnick, 2002). Social media platforms also allow for easy creation and dissemination of individualized political content in the form of personal action frames through which citizens express their reasons for (or against) participating in civic and political movements (Bennett and Segerberg, 2012). Such expressive acts may not be overtly political, but may instead take forms of identity- or entertainment-focused symbolic messages that can be quickly and easily diffused across online social networks. When these messages cascade across different egocentric publics enabled by SNSs (Wojcieszak and Rojas, 2011), new opportunities for discussion, debate, and deliberation are created which may in turn lead to specific behavioral outcomes. Indeed, whereas most research in the field has focused on "receiver" effects, scholars have also increasingly theorized and examined "sender" effects of online expression, which have both mediating (via interpersonal discussion) and direct relationships with citizen participation (Gil de Zúñiga et al., 2013; Pingree, 2007; Rojas and Puig-i-Abril, 2009). Given that, the repertoire of communicative actions potentially predictive of engagement has been expanded to include expressive, relational, identity, and entertainment uses of social media.

In this meta-analysis, our definition of social media encompasses SNSs such as Facebook and MySpace, media-sharing sites such as YouTube and Flickr, micro-blogging platforms such as Twitter and Weibo, and blogs. While offering significantly different technological affordance and user experiences, most of the above media can be described as individual profile-centric or media-centric platforms designed to promote social interaction, content sharing, and personal expression, usually in a non-anonymous or pseudonymous context (boyd and Ellison, 2007). Guided by the literature reviewed, we focus on both "consumptive" and "expressive" forms of social media use (Gil de Zúñiga et al., 2013) and separately analyze informational, expressive, relational, identity, and entertainment uses as predictors of citizen engagement. The scope of citizen engagement is defined broadly to include social capital, civic engagement, and political participation. We therefore include published research examining the relationship between social media use and (a) social ties and resources derived from them (Putnam, 1996), (b) behaviors

aimed at addressing community issues and pursuing common interests (Zukin et al., 2006), and (c) engagement with formal political institutions (Verba et al., 1995), respectively.

Social media and social capital

Social capital refers to the resources embedded in one's social networks that can be accessed for collective action (Lin, 2008). Involving both structural and psychological dimensions (Bourdieu, 1986; Shah and Gil de Zúñiga, 2008), social capital exists in the forms of trust, obligations, expectations of reciprocity, and information and knowledge provision, and is the strongest in a dense network of reciprocal social relations that people can draw on to achieve their interests (Coleman, 1988; Putnam, 2000). The psychological dimension motivates community participation, which reinforces trust and norms of reciprocity, fostering future civic involvement (Shah and Gil de Zúñiga, 2008). Nevertheless, the accruement of capital is dependent on economic and cultural forces that determine (or limit) the opportunities individuals or groups have for creating networks and drawing on the resources inherent in them (Arneil, 2006).

Granovetter (1973) and Putnam (2000) distinguished between two forms of social capital, namely bonding or strong ties, and bridging or weak ties. Bonding social capital comprises networks of strong, informal social ties maintained through frequent interactions, and provides emotional and social support, access to scarce and limited resources, and promotes reciprocity (Hodgkin, 2009; Williams, 2006). Bridging social capital brings together more diverse types of people although these ties are often weak as they typically involve loose contact (Granovetter, 1973). Bridging ties encourage people to be more open-minded, curious, and comfortable in trying new things, and to view themselves as part of a broader group in a society (Williams, 2006).

Scholars have sought to examine the role of social media platforms in the development and maintenance of bridging and bonding social capital, expecting it to play a role in fostering civic participation. Since escapism, diversion, and anonymity characterized many interactions of the Web 1.0 era, it is not surprising that such uses had negative implications for social capital (Shah et al., 2001). In contrast, some of the most popular social media platforms mainly tap onto existing offline networks of social ties, which has been shown to mitigate against some of the problems present in online interactions such as incivility and free-riding, while promoting reciprocity and commitment (Kavanaugh et al., 2005).

Social media enable users to intensify interactions with their online and offline contacts, expanding their social networks (Hampton and Wellman, 2003; Sessions, 2010), and consequently, social capital. Scholars further argue that the information exchanges and social networking online generate conducive environments for community engagement that sustain social capital (Campbell and Kwak, 2011; Shah and Gil de Zúñiga, 2008). Research evidence shows that the use of different social media platforms such as blogs, Facebook, MySpace, and other international platforms like QQ in China and Cyworld in Korea is associated with different forms of social capital (Ahn, 2010, 2012; Gil de Zúñiga et al., 2012; Ji et al., 2010; Skoric and Kwan, 2011; Vaezi et al., 2011; Zhong, 2011). The strength of this association varies however, and is dependent on the type of platform used, specific usage patterns, as well as users' cultural, demographic, economic, and psychological characteristics.

Ellison et al. (2011) conclude that Facebook is particularly useful in facilitating the conversion of casual connections or latent ties into weak ties that can be considered bridging social capital. Their 2007 study of college students, one of the first in the field, showed that young adults used Facebook to provide personal information and updates to their high school friends and people they knew in college (Ellison et al., 2007). In doing so, college students were enabling one another to identify who might be useful in some capacity in the future. Furthermore, Ellison et al. (2011) found that college students interacted differently online according to their intended objectives. The way students used Facebook, the study found, is linked with whether they were interested in meeting new people, maintaining existing relationships, or developing new connections with people they did not personally know but shared a common offline connection with.

Ahn (2012), for example, found that Facebook use among teenagers was associated with both bonding and bridging social capital, while MySpace use was associated with bonding social capital only. Interestingly, Ahn's (2010) experiment with Facebook-like SNS created specifically for young learners failed to find any association with social capital. The author concluded that the lack of significant findings is likely due to low participation in such non-mainstream, low-reach SNSs. The above studies suggest that technological affordances and user participation on different SNSs have an influence on social capital creation, raising further questions regarding possible ways to achieve an effective user engagement on these platforms.

Creation and maintenance of social capital are also influenced by the users' demographic and socio-economic characteristics. Greenhow (2011) found that lower-income students used MySpace more intensively than Facebook, and that MySpace use promoted more bonding social capital than bridging social capital. Lower-income students were able to obtain personal information, engage in emotional sharing and peer feedback, and exchange opportunities through MySpace. Furthermore, researchers have examined how users' cultural background can influence their use of social media and hence social capital. In Ji et al.'s (2010) comparison of users of SNSs sites in China, Korea, and the United States, it was found that users engage SNSs in different ways to obtain different forms of social capital. For international students in the United States, Facebook use promoted bridging social capital more than bonding social capital, and the amount of social capital increased with the intensity of use, the extent to which they identified with their people from their own nationalities and ethnicities, and how extroverted the students were (Lin et al., 2012; Phua and Jin, 2011).

Researchers have also explored psychological dimensions, examining how social trust and self-esteem associated with the use of social media influenced social capital. Trust and civic engagement, according to Putnam, are mutually reinforcing as people who trust their fellow citizens volunteer and participate more often in community and political activities. Social trust, which Putnam distinguishes from trust in government or other social institutions, refers to people's willingness to ascribe good intentions to other people and giving them the benefit of the doubt (Putnam, 2000). But studies indicate that trust on social media is not always easy to earn. While Skoric and Kwan (2011) reported that Facebook use enhanced sense of trust and commitment among student protesters, Vaezi et al. (2011) found that although blog use increased social connections and reciprocity among bloggers, it did not greatly increase trust among them. Social media services

where interactions are primarily based on existing offline relationships (e.g. Facebook) are more conducive of trust when compared to more anonymous or pseudonymous platforms, such as blogs, micro-blogs, or media-sharing sites. Studies also found that users with greater concern over their privacy limited the amount of information they posted on Facebook, and this in turn affected the amount of social capital they possessed (Ko and Kuo, 2009; Vitak, 2012). Those who disclosed more reported greater bonding and bridging social capital, which in turn help garnered them more social support.

Studies by Ellison et al. (2007) and Steinfield et al. (2008) found that Facebook use enabled users with lower self-esteem to gain more bridging social capital. The authors pointed out that browsing profiles and obtaining information such as personal characteristics and preferences before actually meeting people, helped lower barriers and reduce fears of rejection when initiating contact with weak ties online and offline. In addition, positive or negative experiences with interactions on SNS were also found to have a relationship with bonding social capital (Ahn, 2012; Steinfield et al., 2008).

In sum, extant research suggests that social media use is associated with the development and maintenance of social capital, particularly the bridging type. Both the type of social media platform and the nature of use have a significant bearing on the amount of bonding and bridging social capital users can accrue/maintain. Moreover, specific features and affordances of social media platforms, such as real-name registration, provision of records of previous interactions and reputational (third-party) information, as well as the ability to search and traverse other people's social networks, are all expected to have positive implications for interpersonal trust (Resnick, 2002; Walther et al., 2009).

Social media and civic engagement

Civic engagement refers to actions citizens take in order to pursue common concerns and address problems in the communities they belong to (Zukin et al., 2006). Examples of civic participation include volunteering for charities, raising awareness of community issues, and seeking help for particular groups. The published studies mostly agree that the use of social media has a significant positive relationship with civic participation although they differ in the reasons, extent, and nature of such relationships. Scholars argue that the "features of the Internet communication setting and the particular goals and needs of the communicators" inform and guide the impact of digital media on civic engagement (Bargh and McKenna, 2004: 579), and that the use of the Internet acts as one of several factors mediating rather than driving engagement with one's community (Kavanaugh et al., 2005). Furthermore, the concept of civic engagement is "deeply normative" (Bennett, 2008: 4) and needs to be understood in terms of how social media is used and functioning in the larger context of other forms of civic participation, civil society and its institutions, structures of legitimacy, and infrastructure. The rise of social media parallels the shift from traditional group-based citizen engagement to the one dominated by lifestyle and identity concerns, where civic organizations are replaced by flexible issue networks that address both local and global concerns (Bennett, 2008; Bennett and Segerberg, 2012). Social media use is associated with context collapse, in which the lines between the public and private are increasingly blurred, and in which

many previously isolated social circles are now intersecting (Davis and Jurgenson, 2014). Such situation may lead to increased flows of information from various sources, providing exposure to diverse and often conflicting information about public affairs (Brundidge, 2010; Kim, 2011), which is expected to have pro-civic implications.

In the United States, Zhang et al. (2010) found that the use of SNS was significantly associated with increased civic participation. Participants were asked to estimate the extent to which they used SNSs sites such as Facebook, MySpace, and YouTube as well as how much they engaged in interpersonal political discussion. Results show that reliance on both SNSs and interpersonal political discussion was positively related to civic engagement. However, the study did not differentiate between different types of SNSs, which may be important given distinct affordances and user cultures specific to individual platforms. Pasek et al. (2009), in acknowledging the importance of such distinctions, hypothesized that different features of Facebook and MySpace may have distinct implications for civic engagement. In their study, Facebook was found to have a stronger relationship with civic engagement, demonstrating that individual SNSs have specific "cultures" which may be more or less conducive of civic participation.

Valenzuela et al. (2009) hypothesized that the use of Facebook in general and the use of Facebook Groups is positively associated with civic engagement. Instead of depending on the frequency of use as a single measure of Facebook use, they adopted Ellison et al.'s (2007) measure which assessed the intensity of use on the number of friends, amount of time spent on the network on a typical day, and level of agreement with several statements gauging users' emotional attachment to the site. The use of Facebook Groups was measured using amount of time spent on reading and posting messages to Facebook Groups, frequency of reading/posting messages/posting new topics, and the nature of their participation in Facebook Groups. Although Valenzuela et al. (2009) found that both the intensity of Facebook use and Facebook Groups use were positively associated with civic participation, the relationship was weak when compared to demographic, social trust, and life satisfaction predictors.

In exploring the uses and gratifications of Facebook Groups use, Park et al. (2009) found that those who join Facebook Groups may do so because of their needs for information about activities, socializing, and for entertainment. These needs motivate them to participate in Facebook Groups, which in turn promotes civic engagement via increased feelings of reciprocity and sense of commitment. A study by Gil de Zúñiga et al. (2012) provides further support to the earlier findings regarding the use of SNSs such as Facebook to seek information, showing that news use significantly predicted civic participation although the relationship was quite small, explaining only 1.5% of variance in civic participation.

Rojas and Puig-i-Abril (2009) argue that the link between the use of social media and offline civic engagement may be mediated by several distinct processes. In their study involving a broader conceptualization of information and communications technology (ICT) use consisting of news consumption both online and via mobile phones as well as the use of blogs, no direct relationship was found between online expression, which was predicted by informational uses, and offline civic participation. Instead, the findings suggest that participants' own mobilization offline was preceded by their attempts to mobilize their social networks through SNSs and mobile phones.

Although the studies described here all confirm a link between social media and civic engagement, the relationship is rather weak or indirect in some cases, suggesting a mediating role of social media in this process. In summary, media use is often guided by the interaction between the features of the platforms and the context of use (such as the purposes, goals, and needs of human agents) (Bargh and McKenna, 2004) which helps us understand the diverse findings on the relationship between social media and civic engagement. Additionally, the measures of civic participation differ across all studies, but this can be partly explained by cultural, geographic, and institutional differences in which civic participation was examined.

Social media and political participation

Scholars have defined political participation as behaviors aimed at influencing formal political institutions (i.e. the government) and affecting their policy decisions (Verba et al., 1995). In addition to voting, these behaviors include protest activities, donating money to candidates and parties, campaigning, "liking" candidates on Facebook, displaying campaign buttons (Valenzuela et al., 2009), and may even include softer forms like political consumerism (boycotting and buycotting) that are more closely related to civic engagement (Gil de Zúñiga et al., 2014a).

Social media platforms offer multi-modal communicative affordances that can supplement traditional methods of participation and offer new outlets for information gathering, political discussion, and participation (Vitak et al., 2011) which often happen over networks of (relatively) trusted relationships. Several studies have examined the relationship between social media use and political participation, focusing on both online and offline forms of political action, predominantly in the context of the United States.

Research examining online political participation shows mixed findings, with some studies finding generic Facebook use to be predictive of increased political activity online (Bode, 2012; Vitak, 2012) and others suggesting no relationship (Gil de Zúñiga et al., 2012; Skoric and Poor, 2013). Research also shows that the use of blogs and micro-blogs is positively related to online (Chan et al., 2012; Gil de Zúñiga et al., 2009; Lewis, 2010) and offline political engagement (Gil de Zúñiga et al., 2013). Looking at the types of blog use more specifically, Gil de Zúñiga et al. (2013) show that only expressive uses, such as writing blog posts and comments, are predictive of both online and offline political participation, while consumptive uses, involving passive reading of blog posts and comments, are not, at least in the context of the United States.

Some studies indicate that generic, undifferentiated use of or attention to social media is not related to traditional political participation (Baumgartner and Morris, 2010; Kushin and Yamamoto, 2010; Zhang et al., 2010). In addition, there is no consensus about the nature of the relationship between generic Facebook use and offline political participation. While some studies show a positive relationship between the two (Bode, 2012; Park et al., 2009; Skoric and Poor, 2013), other studies found either no relationship (Gil de Zúñiga et al., 2012; Valenzuela et al., 2009) or even a weak negative relationship (Vitak et al., 2011). Research agrees on the importance of informational and political uses of social media, demonstrating a positive relationship between Facebook Groups use (Conroy et al., 2012; Valenzuela et al., 2009), political activity on Facebook (Vitak et al.,

2011), and SNS use for news (Gil de Zúñiga et al., 2012). Exposure to diverse news sources across social networks may improve citizens' reasoning and elaboration of news events (Gil de Zúñiga et al., 2012), which promotes participatory behaviors particularly when combined with exposure to mobilizing information that is easily disseminated via Facebook Groups (Valenzuela et al., 2009).

However, there is also evidence that Facebook use is associated with an increased gap in issue and civic knowledge and that Twitter use has a stronger relationship with participation among educated people (Yoo and Gil de Zúñiga, 2014), in line with the knowledge gap and rich-get-richer hypotheses. This may not be surprising, as Facebook contacts are usually based on existing offline ties which are likely to be demographically similar and may therefore perpetuate existing inequalities although online networks are still likely to be more diverse that the offline ones.

Research has also specifically examined the links between social media use and protest activity, suggesting that it could facilitate protest participation. SNSs enable protest movements to easily mobilize and organize supporters and scale up more quickly. They provide both the collective experience of expression and sharing of reinforcing information among peers and also act as information hubs for dissemination of mobilizing messages and live updates from protests (Bennett and Segerberg, 2012; Valenzuela et al., 2012). Still, research diverges on what kinds of SNS uses are most likely to promote and sustain protest activity. Macafee and De Simone (2012) found that for young college students in the United States, only expressive uses of popular social media platforms such as Facebook, Twitter, YouTube, and blogs, were related to protest engagement, while informational uses did not make a significant contribution. In contrast, Valenzuela et al.'s (2012) study of a youth protest in Chile indicates that using SNSs to socialize and get news was an important predictor of protest participation, while self-expression on SNS was not. A study of Egypt's Tahrir Square protests (Tufekci and Wilson, 2012) found that the use of Facebook, Twitter, and blogs was a significant predictor of the likelihood of participating in the protest.

To summarize, most studies suggest a positive relationship between informational, relational, political, and expressive uses of social media and political participation, whereas other types of uses, including generic, non-specific use, seem less like to promote it.

Method

Literature search

In order to collect studies that examined the relationship between social media use and citizen engagement, we performed a search query in the databases of Web of Science, PsycINFO, EBSCOhost, and ProQuest Dissertations and Thesis (PQDT; only dissertations were selected). We used a combination of the following keywords: "political participation", "political engagement", "political involvement", "civic engagement", "civic participation", "civic involvement", or "social capital", together with "social media", "social network site", "social networking site", "social networking website", "SNS", "blog", "Facebook", "Twitter", "YouTube", "Flicker", "Wiki", "Myspace", or "Weibo". The search criterion was journal articles (not applied in the PQDT search)

from year 2004 and onwards; peer-reviewed conference proceedings were not included. The initial search completed in mid-2013 resulted in about 200 articles.

A manual selection was then performed for relevance after using the query. Studies were included if they (a) examined the relationships between social media use and engagement, (b) measured one or more of our three criterion variables (i.e. political participation, civic engagement, social capital), (c) tested behavioral changes as a presumed result of social media use, which did not include attitude, knowledge, or interest variables, and (d) utilized a survey method. This resulted in a corpus of 35 studies published between 2007 and mid-2013.

The type of effect size examined in this meta-analysis was a Pearson's correlation coefficient *r*. However, most of the selected studies reported only standardized or unstandardized regressions coefficients. To resolve this problem, we contacted the authors of the selected 35 articles via email to request Pearson's correlation coefficient (two-tailed) scores and *p* values in May 2013, and followed up in September 2013 with reminder emails to those who had not replied to our data request. By 31 October 2013, we received the requested data from 22 authors. The collection of studies for the meta-analysis includes 22 articles published with a total sample size of 17,763 and 116 correlations (effects).[1]

Coding

The selected articles were coded for six dimensions of research settings, including sampling method, country of study, social media platform, type of social media use, measure of social media use, as well as engagement setting. For the coding scheme, please see Table 1.

Statistical analysis

Prior to calculating the combined effect size, we followed Hunter and Schmidt's (2004) variance-centered meta-analysis method to correct for potential biases and artifacts. However, as Lipsey and Wilson (2001) noted, the result reporting imperfection presents one of the biggest challenges to the data adjustment. That is, the information required to apply the adjustments was not available for all the effect sizes coded for the meta-analysis. For example, correcting for sampling error was not feasible because only three studies reported sampling errors. Given the consistency in reporting construct reliability of measurements, we corrected the attenuation in the effect sizes produced by measurement unreliability. The unattenuated effect size, *ES′*, was computed as

$$ES' = \frac{ES}{\sqrt{rxx} \times \sqrt{ryy}}$$

where *ES* is the reported effect size (Pearson's correlation coefficient) and *rxx* and *ryy* are the reliability coefficient of the independent variable and dependent variable, respectively.

Table 1. Coding scheme.

Dimension	Category	Definition
Sampling method	Probability sampling	Survey research utilizing probability-based sampling techniques such as random-digital dialing (RDD)
	Non-probability sampling	Survey research utilizing non-probability-based sampling techniques, such as convenience/student samples
Country of study	United States	The research sample was drawn in the United States and comprised of American respondents predominantly
	Other countries	The research sample was drawn in countries other than the United States and comprised of non-American respondents predominantly
Social media platform	Blogs	Weblogs
	SNS	SNSs such as Facebook
	Social media in general	Study did not specify the type of social media platform in their research questions or hypotheses
Type of social media use	Informational use	Seeking, gathering, and sharing various kinds of information via social media, including news, community information, and campaign information
	Expressive use	Using social media to express oneself and to articulate one's own opinions, ideas, and thoughts
	Relational use	Using social media to initiate, maintain, and strengthen relationships with others
	Identity use	Using social media to create and maintain one's identity, gain others' recognition, and enhance status
	Entertainment use	Using social media for entertainment
Measure of social media use	Use versus non-use	Measuring social media use as whether the respondents use or do not use social media
	Intensity	Measuring intensity or frequency of usage, or time spent on social media
	Group usage	Measuring use of social media groups such as Facebook groups
Participation settings	Online participation	Political participation and civic engagement carried out online; social capital formed and maintained online
	Offline participation	Political participation and civic engagement carried out offline; social capital formed and maintained offline

The effect sizes were weighted by the inverse variance, which is considered an optimal approach compared to sample size (Lipsey and Wilson, 2001). We calculated the weight using the formula below

$$w = \frac{1}{SE^2}$$

where *w* stands for weight and *SE* refers to the standard error of the correlation coefficient. The latter was calculated with the equation using reported sample size (*n*) and correlation coefficient (*r*) as following

$$SE = \sqrt{\frac{1-r^2}{n-2}}$$

The inverse variance, or the weight, was also adjusted for the attenuation by measurement unreliability, as recommended by Lipsey and Wilson (2001). The adjusted weight, *w′*, was computed as

$$w' = w(rxx)(ryy)$$

Simply, the weighted effect size was calculated by multiplying the adjusted effect size (*ES′*) by adjusted weight (*w′*).

In this meta-analysis, we examined both effect-level findings and sample-level findings. Individual effect sizes can be informative in terms of showing the direction and significance of the effects. In the sample-level analysis, we treated a subject sample as the unit of analysis, which means that a combined effect size was calculated for each subject sample. Specifically, in the case where a study included more than one sample (e.g. male and female sub-samples), a combined effect size was calculated for each sub-sample within the study. In the case where two or more studies used the same sample, only one combined effect size was calculated. In total, we had 21 samples based on the selected 22 articles. For the three sub-categories of engagement (i.e. political participation, civic engagement, and social capital), a combined effect size was also calculated for each sample using the related effects. In the case where a study using one sample measured more than one sub-category of engagement, combined effects were calculated for each sub-category separately. The combined effect size, $\overline{ES}$, as well as the standard error of the combined effect size, $SE\,\overline{ES}$, were computed as

$$\overline{ES} = \frac{\sum(w' \times ES')}{\sum w'}$$

$$SE\overline{ES} = \sqrt{\frac{1}{\sum w'}}$$

The reason for treating a sample as a unit analysis rather than using individual effect sizes is that multiple effect sizes generated from a study using the same sample are statistically dependent (Lipsey and Wilson, 2001). Simply averaging all the effect sizes would also generate a mean effect size that over-represents the findings from the studies that reported a large number of effects. Therefore, to address this issue, we produced the mean effect size by averaging the combined effect sizes of the 21 subject samples.

Results

Effect-level analysis

Table 2 presents the aggregate findings from 116 effects of social media on engagement together with the findings on political participation, civic participation, and social capital, respectively. Social media use generally had a positive relationship with participation and its three sub-categories. In all, 109 of 116 relationships were positive, of which more than three quarters were statistically significant. In contrast, none of the negative relationships reported were significant. Still, it is important to note that the positive relationships were predominantly small in size. As seen in Figure 1, 21.10% of positive effects ($N=23$) were between .00 and .10 which is considered very weak to negligible, while more than half (54.37%, $N=56$) could be described as weak, as they ranged from .10 to .30. Only 18.35% ($N=20$) and 9.17% ($N=10$) of the positive effects could be described as moderate (.30–.50) and large (>.50), respectively (Cohen, 1988).

Political participation had the largest number of effects studied ($N=57$), followed by social capital ($N=46$) and civic engagement ($N=13$). The effects in the political participation and civic engagement sub-categories were predominantly positive and statistically significant (82.46% and 76.92%). Social capital had the lowest percentage of significant positive relationships (58.7%) and the largest percentage of non-significant negative relationships (8.70%) among the three sub-categories (Tables 3).

Sample-level analysis

The mean effect size (averaging the weighted effect sizes within one subject sample and then averaging the combined effect sizes of individual samples) was .37 for the effect on engagement in general ($SD=.25$), representing a total sample of 14,822. In all, 15 studies examined the effect of social media use on political participation and generated a mean effect size of .37 ($SD=.22$), representing a sample of 13,263. Four studies focused on the effect on civic participation and generated a mean effect size of .24 ($SD=.10$), representing a sample of 5178. Seven studies examined the effect on social capital and generated a mean effect size of .36 ($SD=.29$), representing a sample of 1916. The findings indicate that social media use has a rather similar relationship with political participation and social capital, and that this relationship is generally larger than the one with civic engagement (Table 4 and 5).

Effects of research settings

Sampling. We tested whether probability-based sampling or non-probability sampling had an effect on the size of the relationship; only five studies used probability sampling, whereas 16 studies did not. Studies that employed probability-based sampling reported a larger mean effect size ($M=.42$, $SD=.21$) than those with non-probability sampling ($M=.36$, $SD=.23$).

Country of study. In all, 16 out of 21 samples focused on the United States, whereas only five focused on other countries. Studies using US samples reported a higher mean effect size ($M=.40$, $SD=.23$) than those using non-US samples ($M=.26$, $SD=.19$).

Table 2. Effect-level analysis: relationship between social media use and engagement.

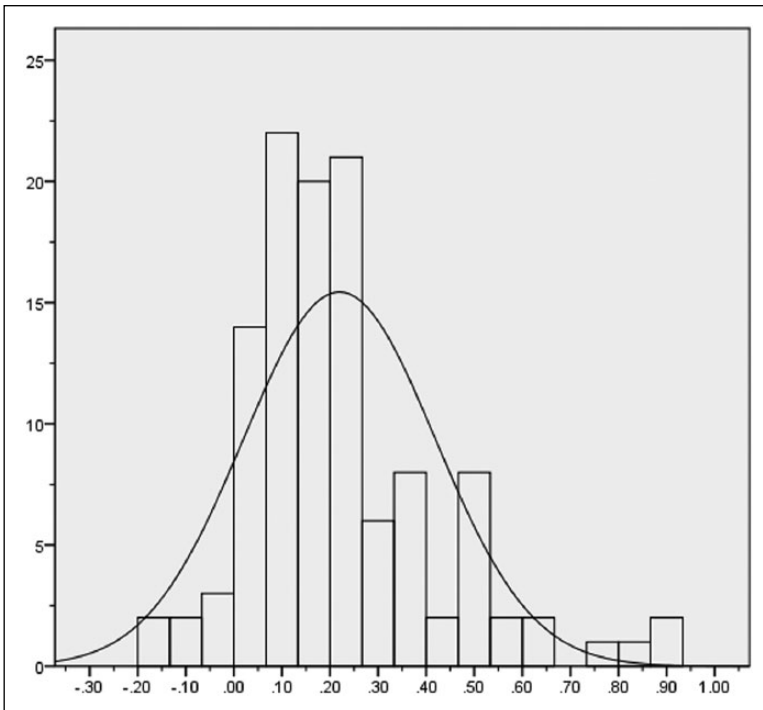|	Sig.*	Engagement	
		# of effects	% of effects
Positive	Yes	84	72.41
	No	25	21.55
Negative	Yes	0	0
	No	7	6.03
Total		116	100

*p < .05.

Figure 1. Distribution of coefficient r sizes.

Social media platforms. SNSs were the most-studied type of social media (N = 14, 66.7%), followed by three studies looking into blogs and four studying social media in general. In addition, all studies of blogs focused on the relationship with political participation, whereas those focusing on SNS tapped into the three aspects of engagement. Studies of blog use generated a larger mean effect size on political participation (M = .45, SD = .18, N = 3) than those of SNS use (M = .24, SD = .15, N = 6); SNS use was most strongly associated with social capital (M = .36, SD = .29, N = 7) and less strongly with civic engagement (M = .22, SD = .10, N = 3).

Table 3. Effect-level analysis: Relationship between social media use and engagement sub-categories.

	Sig.*	Political participation		Civic participation		Social capital	
		#	%	#	%	#	%
Positive effects	Yes	47	82.46	10	76.92	27	58.70
	No	7	12.28	3	23.08	15	32.61
Negative effects	Yes	0	0	0	0	0	0
	No	3	5.26	0	0	4	8.70
Total		57	100	13	100	46	100

*$p < .05$.

Table 4. Studies included in the meta-analysis and associated sample and effect sizes.

Study	Year of data collection	Sample size (N)	Overall ES (SE)	Political ES (SE)	Civic ES (SE)	S. capital ES (SE)
Conroy et al. (2012)	2009	455	.60 (.05)	.60 (.05)	n/a	n/a
Ekdale et al. (2010)	2006	62	.27 (.05)	.27 (.05)	n/a	n/a
Ellison et al. (2007)	2006	280	.34 (.04)	n/a	n/a	.34 (.04)
Ellison et al. (2011)	2008	403	.20 (.02)	n/a	n/a	.20 (.02)
Gil de Zúñiga et al. (2009)	2004	1324	.63 (.07)	.63 (.07)	n/a	n/a
Gil de Zúñiga et al. (2012)	2009	474	.26 (.02)	.23 (.03)	.31 (.04)	n/a
Gil de Zúñiga et al. (2013)	2009/2010	312	.21 (.03)	.21 (.03)	n/a	n/a
Greenhow (2011)	2008	534	.24 (.04)	n/a	n/a	.24 (.04)
Kushin and Yamamoto (2010)	2008	379	.32 (.04)	.32 (.04)	n/a	n/a
Lewis (2011)	2008	1589	.46 (.02)	.46 (.02)	n/a	n/a
Lin et al. (2012)	n/a	117	.11 (.03)	n/a	n/a	.11 (.03)
Macafee and De Simone (2012)	2011	200	.74 (.04)	.74 (.04)	n/a	n/a
Park et al. (2009)	2007	1693	.09 (.01)	.07 (.02)	.10 (.02)	n/a
Phua and Jin (2011)	2010	114	.91 (.03)	n/a	n/a	.91 (.03)
Rojas and Puig-i-Abril (2009)	2008	585	.59 (.03)	.78 (.04)	.32 (.04)	n/a
Scherman and Arriagada (2012)	2009	997	.24 (.03)	.24 (.03)	n/a	n/a
Skoric and Kwan (2011), Skoric and Poor (2013)	2009	249	.16 (.02)	.19 (.06)	n/a	.15 (.03)
Steinfield et al. (2008)	2006/2007	85	.57 (.11)	n/a	n/a	.57 (.11)
Valenzuela et al. (2009)	2007	2400	.21 (.01)	.19 (.01)	.23 (.01)	n/a
Valenzuela et al. (2012)	2010	877	.18 (.02)	.18 (.02)	n/a	n/a
Valenzuela (2013)	2011	1694	.43 (.01)	.43 (.01)	n/a	n/a

Table 5. Sample-level analysis: relationship between social media use and engagement ($N = 21$).

	Engagement	Political participation	Civic participation	Social capital
Number of ES (K)	116	57	13	46
Sample size (sum)	14,822	13,263	5178	1916
# of samples (N)	21	15	4	7
ES	.37	.37	.24	.36
SD	.25	.22	.10	.29

Table 6. Effect-level analysis: relationships between different types of social media use and engagement (N=47).

Type of social media use		Positive effect		Negative effect		Total
		Significant	Not significant	Significant	Not significant	
Informational use	No. of effects	15	0	0	0	15
	%	100	0	0	0	100
Expressive use	No. of effects	5	3	0	3	11
	%	45.45	27.27	0	27.27	100
Relational use	No. of effects	7	7	0	3	17
	%	41.18	41.18	0	17.65	100
Identity use	No. of effects	1	1	0	0	2
	%	50	50	0	0	100
Entertainment use	No. of effects	0	2	0	0	2
	%	0	100	0	0	100

Type of social media use. In total, 11 studies examined the relationships between specific types of social media use and engagement, yielding a total number of 47 effects. At the individual effect level, effects pertaining to informational use of social media are all significant and positive. Expressive and relational uses of social media had mixed results (Table 6). At the sample level (Table 7), the effect of informational social media use on engagement received most scholarly attention as eight studies focused on this type of use, followed by expressive use ($N=5$) and relational use ($N=5$), identity use ($N=1$) and entertainment use ($N=1$). In terms of the mean effect size across the five types of social media use, expressive use had the largest mean effect size ($M=.41$, $SD=.35$), followed by informational use ($M=.37$, $SD=.24$), relational use ($M=.15$, $SD=.11$), identity use ($M=.05$), and entertainment use ($M=.03$).

Measure of social media use. Studies using dichotomous measure of social media use (i.e. user vs. non-user) produced the largest mean effect size .52 ($SD=.34$, $N=3$) on average. Studies that measured social media use as intensity reported a moderate mean effect size .38 ($SD=.24$, $N=10$). Studies measuring the usage of the social media group functions on average generated a relatively small effect size .29 ($SD=.28$, $N=3$).

Engagement setting. Totally, 20 studies with 34 effects examined the effect of social media use on offline engagement, whereas 9 studies with 82 effects examined the effect of social media use on online engagement. Studies that focused on offline engagement generated a mean effect size of .33 with a standard deviation of .22. Those that focused on online engagement generated a mean effect size of .37 with a standard deviation of .24. The results suggest that on average social media use has a slightly stronger relationship with online engagement than with offline engagement.

Discussion

All statistically significant findings from our sample of studies suggest a positive relationship between social media use and engagement and only a handful of negative,

Table 7. Sample-level analysis: relationships between different types social media use and engagement (N = 11).

Type of social media use	Number of subject samples (N)	Number of effects (K)	$\overline{ES}$	SD
Expressive use	5	11	.41	.35
Informational use	8	15	.37	.16
Relational use	5	17	.15	.11
Identity use	1	2	.05	n/a
Entertainment use	1	2	.03	n/a
Total	11	47		

non-significant findings have been reported. The results weigh in on the ongoing debate about the role of social media in promoting citizen engagement, suggesting small-to-medium size positive relationships between informational, expressive, and relational uses of social media and different measures of engagement. For identity- and entertainment-oriented uses of social media, we find mainly non-significant relationships with engagement, noting, however, that these findings are based on only two published studies and that further research is needed.

The analyses show little evidence of "disengagement" effects, but they also warn against making claims of a "revolutionary" impact of social media on engagement. This is particularly the case for generic social media uses, which tend to be associated with social capital (Ellison et al., 2007), but are rarely found to have a significant relationship with traditional participation variables (Baumgartner and Morris, 2010; Gil de Zúñiga et al., 2012; Kushin and Yamamoto, 2010; Valenzuela et al., 2009; Zhang et al., 2010). More specific uses (i.e. SNS use for news, membership in political groups) seem to have a stronger relationship with offline participation (Conroy et al., 2012; Gil de Zúñiga et al., 2012; Valenzuela et al., 2009), but such uses may also be reflective of pre-existing interests and motivations for participating in civic and political activities, which bivariate correlations analyzed in this study did not control for.

The most robust finding in this study concerns the relationship between informational uses of social media and participation, which was found to be positive and significant across all studies and which yielded a moderate average correlation size (r = .37). This is consistent with the findings from an earlier meta-analysis by Boulianne (2009) who argued that easy and expanded access to diverse political information might reinvigorate citizen participation by improving political knowledge and stimulating political discussion. The study also suggested that the Internet could offer new opportunities for citizen networking and open up new venues for political expression, potentially activating those previously disengaged citizens. We find that this may indeed be happening although the patterns of findings are less robust than it was the case with informational uses, as expressive uses of social media yielded a slightly larger (r = .41), but far less stable relationship, with only 45% of correlations being statistically significant. Similarly, only 41% of relational uses were found to be significant, showing a small relationship size (r = .15) with engagement.

How can we explain this pattern of findings? Since a large number of everyday social interactions take place on egocentric networks in a non-anonymous or pseudonymous

setting, their nature is quite different from social and recreational uses that characterized the early Internet and which were found to have a negative implications for social capital and participation (Shah et al., 2001). A recent panel study demonstrates that the exposure to political information and social interactions on social media steers citizens on a path of political expression which may lead to political participation (Gil de Zúñiga et al., 2014b). The acts of political expression on social media are personalized and identity-focused and may be aimed at different audiences depending on a specific context. Given the number of potential social settings and overlapping audiences on egocentric networks, citizens engaging in political expression need to develop a broader repertoire of political selves which triggers a process of inadvertent civic learning and may lead to spillover effects on real-world political action. Research suggests that the mere expectation of expression that is followed by the composition and transmission of a message may lead to greater cognitive and emotional involvement of the sender (Pingree, 2007).

We therefore call for further research and theoretical explication of "sender" effects which have been shown to play both direct and mediating role in predicting citizen engagement in a social media context (Gil de Zúñiga et al., 2013, 2014b; Pingree, 2007; Rojas and Puig-i-Abril, 2009). Greater conceptual clarity should lead to the development of more robust measures of expressive uses of social media, including more nuanced approaches to evaluating their discussion- and deliberation-inducing properties. The theoretical models should also specify the conditions and social context under which political expression is most likely to be followed by political action (e.g. non-anonymous vs. pseudonymous platforms; voting vs. protest participation).

Limitations and recommendations for future research

It is important to note the limitations of this study, including its sole reliance on survey measures of social media use and participation. Such measures are unlikely to capture the nuances of social media behaviors and can be affected by social desirability biases especially when assessing civic and political engagement. There is evidence that non-random measurement error is present in self-report responses to mobile phone use questions and that over-reporting of media use may lead to an over-estimation of its effects on civic engagement (Kobayashi and Boase, 2012). It is thus plausible that similar non-random measurement error is present in survey-based estimates of social media use, which could result in an over-estimation of the size of the studied relationships. In addition, most of the survey studies included in this meta-analysis are based on non-probability, cross-sectional samples which limits our ability to generalize and make claims about the direction of causality and/or specific temporal sequence of the processes involved.

We also note that we were unable to include the data from around one-third of published studies, since the bivariate correlations were neither originally published nor provided by the authors when we requested them. This problem partially stems from absence of the common reporting standards for published research in communication and signals a need for journal editors and research community in general, to push for more rigorous and standardized ways of reporting data collection methods and statistical analyses (e.g. APA Publications and Communications Board Working Group on Journal Article Reporting Standards, 2008).

Future meta-analyses should aim to include studies utilizing computational and other empirical approaches that provide longitudinal measures of social media use and specific participatory behaviors. We hope that our meta-analysis presents a comprehensive social-scientific review of the state of art in the field, while also providing some theoretical contours and useful empirical benchmarks for future research on the relationship between social media use and engagement.

Declaration of Conflicting Interests

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Note

1. We compared the studies included in the meta-analysis ($N=22$) and those excluded due to missing data ($N=13$) in terms of the number of regression coefficients reported and the direction of the coefficients. The studies included in the analysis had 102 regression coefficients in total among which 91 were positive (89.22%), whereas those excluded had 182 regression coefficients among which 138 were positive (75.82%) ($z=2.74$, $p<.05$). It suggests that the result of the meta-analysis might over-estimate the relationship between social media use and engagement. However, the comparison of the two groups was based on the partial regression coefficients rather than zero-order correlations. Since partial regression coefficients are affected by the covariates that vary across each study, they cannot be taken as reliable benchmarks for comparison.

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