



A sentiment analysis of U.S. local government tweets: The connection between tone and citizen involvement



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ABSTRACT

As social media tools become more popular at all levels of government, more research is needed to determine how the platforms can be used to create meaningful citizen–government collaboration. Many entities use the tools in one-way, push manners. The aim of this research is to determine if sentiment (tone) can positively influence citizen participation with government via social media. Using a systematic random sample of 125 U.S. cities, we found that positive sentiment is more likely to engender digital participation but this was not a perfect one-to-one relationship. Some cities that had an overall positive sentiment score and displayed a participatory style of social media use did not have positive citizen sentiment scores. We argue that positive tone is only one part of a successful social media interaction plan, and encourage social media managers to actively manage platforms to use activities that spur participation.

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1. Introduction

Scholars and practitioners agree that providing citizens with the opportunity to participate in governance practices can increase the legitimacy of the administrative state (Arnstein, 1969; King, Feltey, & Susel, 1998; Stout, 2013; Waldo, 2007) while encouraging administrators themselves to adopt a democratic-minded ethos that appreciates citizen participation despite inherent challenges (Irvin & Stansbury, 2004; Rawlings & Catlaw, 2011). Responsive governance embodies processes, politics, and partnerships that subsequently enhance administrative decision-making through transparency and citizen engagement. In contemporary times, information communication technologies (ICTs) – especially social media – are means through which administrators can increase citizens' access to government agencies and programs (Mergel, 2013a, 2013b).

Originally, static, one-way websites were platforms where people could engage in transactional relationships with governments, such as paying bills or filing forms (West, 2004). These one-way uses often are grouped together under the Web 1.0 moniker (Bryer & Zavattaro, 2011). More recently, however, social media technologies have emerged as key means through which government agencies at all levels are opening the doors of government, at least metaphorically, 24 h a day, seven days a week (Bryer & Zavattaro, 2011; Mergel, 2013a). Social media come in myriad forms but have in common capabilities such as instant information gathering and sharing, potential for networking,

knowledge co-creation, and interactivity (Bryer & Zavattaro, 2011; Mergel, 2013a, 2013b). As a result of these innovations, the opportunity exists to engage a significant number of individuals with varying interests in governmental affairs. Early government adopters, however, might not be taking full advantage of these interactional capabilities and thus are only increasing capacity for participation rather than meaningful citizen participation and engagement (Brainard & Derrick-Mills, 2011; Brainard & McNutt, 2010; Bryer, 2011; Hand & Ching, 2011; Mergel, 2013a; Rishel, 2011; Zavattaro & Sementelli, 2014).

As social media tools grow in popularity, it becomes important to understand how they can encourage meaningful citizen interaction (Brenner & Smith, 2013; Lutz, Hoffmann, & Meckel, 2014). This research builds upon the emerging literature that examines social media use at the local government level (Hand & Ching, 2011; Mossberger, Wu, & Crawford, 2014; Oliveira & Welch, 2013) by incorporating a construct within technology use: sentiment analysis (Dardenne, Dumont, Gregoire, & Sarlet, 2011; Stieglitz & Dang-Xuan, 2013). The purpose of this analysis is to determine how sentiment of local government social media posts influences citizen involvement on Twitter. To do this, Mergel's (2013b) framework for social media evaluation is coupled with machine-learning sentiment analysis.

In line with extant literature (Brainard & McNutt, 2010; Mergel, 2013a, 2013b), our results indicate that government agencies are adopting an overall neutral, informative tone via social media. We also found, however, that agencies that adopt a positive tone – and undertake activities such as retweeting information from other local agencies, responding directly to citizens on Twitter, sharing photos, and using exclamation points – are more likely to encourage citizen participation

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on Twitter than cities that simply share information in a push manner. In other words, simply using happy words or exclamation points are not enough in and of themselves to create citizen participation; a mix is necessary. Our findings show that administrators are not using the platforms to their full dialogic capabilities and are stopping short of creating what Bryer (2013) calls the empowered citizen, whereby administrators and citizens have equal chances to contribute ideas via social media. Put simply, government use of social media still has progress to make when it comes to creating meaningful collaboration, but our findings can show at least how to create environments for participation, which can bring us closer to collaboration.

2. Social media in public administration

Public administrators necessarily concern themselves with fostering meaningful and effective citizen participation and engagement (Arnstein, 1969; King et al., 1998; McGuire, 2006; Yang, 2005). Citizen participation is understood as citizen involvement with the administrative apparatus of government (Yang & Pandey, 2011), while engagement aligns with King et al.'s (1998) authentic participation, whereby there is "continuous involvement in administrative processes with the potential for all involved to have an effect on the situation" (p. 320). Often, the ideal is that online citizen involvement can create what Bryer (2013) calls an empowered citizen who is an active, equal partner in government decision making.

The focus of this research is on digital engagement through social media at the local government level, as local government managers face a number of contemporary challenges regarding how to better integrate citizen input into traditional service-delivery functions (Nalbandian, O'Neill, Wilkes, & Kaufman, 2013). Given that Mergel's (2013b) framework of social media deployment guides this analysis, her definitions of Mergel transparency, participation, and collaboration are given herein (and explained further later). For Mergel (2013b), using guidance from the White House, transparency involves the agency sharing information via social media with its followers about activities. She calls this "broadcasting government information" (p. 330). Participation is a step up from transparency on social media in that administrators will allow citizens' spaces to provide feedback on information the agency has shared (similar to participation as defined above). Finally, Mergel's (2013b) ultimate level is citizen collaboration, whereby social media platforms "can therefore be used to increase exchanges with citizens or collaboratively work with government stakeholders on innovative ideas to fulfill the mission of government" (p. 330; similar to the empowered citizen or authentic participation given above). As can be seen, there is a natural progression from full government control of information to citizens as equal partners (see also Bryer, 2013). For purposes of this research, these definitions are used to understand the manifestations of transparency, participation, and collaboration via social media.

Increasingly, citizen-government relations are turning toward co-production rather than top-down, government-led opportunities for engagement (Bryer, 2013; Clark, Brudney, & Jang, 2013; McGuire, 2006; Panagiotopoulos, Bigdeli, & Sams, 2014). This shift fits within a broader movement toward collaborative governance, which Emerson, Nabatchi, and Balogh (2012, p. 2, *emphasis in original*) define as "the processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished." Given this, social media tools are seen as means through which government agencies can achieve this co-productive call (Heintze & Bretschneider, 2000; Nograsek & Vintar, 2014). Social media "provide the opportunity to integrate information and opinions from citizens into the policy making process in innovative ways, to increase transparency by sharing information on social media channels, and collaborate

with the public to prepare decisions or create solutions for government problems" (Mergel, 2013a, p. 123).

Scholars, though, still are examining the links between online and offline citizen engagement and participation. For example, Vissers and Stolle (2014) find that online participation via Facebook does not easily translate into offline participation in political and civic activities. One exception they find is consistent with recent current events in the United States and France with people using Twitter hashtags as a means of protest or solidarity (#BlackLivesMatter, #JeSuisCharlie), then taking those forms of digital protest offline (Ferguson, Missouri, New York City, and countless other cities throughout the United State, for examples).

2.1. Why Twitter?

Some examples of contemporary social media include, but are not limited to, Facebook, Twitter, YouTube, Pinterest, LinkedIn, Instagram, blogs, wikis, and more. Interactive capabilities are not given in social media; the platforms only are as dialogic as users choose (Bryer & Zavattaro, 2011). Twitter was used for this research because the platform, as opposed to say Facebook, allows users to not only share their information with followers but also has an ability to easily "retweet" information from others, thus extending their own and others' reaches (Boiy & Moens, 2009). Twitter is one of many social networking websites that allows users to create digital webs of influence. Launched in 2006, Twitter is a microblog that allows users to share short updates of 140 characters or less called tweets. A microblog is seen as digital backchannel communication in that it is non-verbal, real-time, and non-interruptive (Ross, Terras, Warwick, and Welsh, 2011). According to the Twitter website Twitter (2014), as of this writing in early 2015, there are 288 million active monthly users, 500 million tweets are sent daily, and 80% of the users are on mobile devices. People can follow Twitter users by searching for a username, usually indicated by using the '@' sign. Exchanges via the site are searchable using hashtags, denoted by the '#' sign. "Twitter updates are seen as public conversations and are increasing not only transparency and potentially accountability, but can also – when used appropriately – lead to increased inclusion of public opinion in policy formulation through information aggregation processes" (Mergel, 2012, p. 6).

Scholars are beginning to study Twitter's efficacy in a myriad ways, including awareness of social causes (Thackery et al., 2013), corporate social responsibility (Lee, Oh, & Kim, 2013), public health information exchange (Neiger, Thackeray, Burton, Thackeray, & Reese, 2013), international political engagement Sobaci and Karkin (2013), U.S. presidential campaigns (Adams & McCorkindale, 2013; Conway, Kenski, & Wang, 2013), and disaster information sharing (Chatfield, Scholl, & Brajawidagda, 2013), to name just a handful. Oftentimes, marketing scholars and practitioners, for example, will use sentiment analysis to gauge how consumers feel about certain products (think how you use reviews on shopping or travel websites before making a purchase). Paltoglou and Thelwall (2012) move beyond this toward analyzing more informal interactions that most people on social media sites engage in regularly (updating a status, retweeting information, etc.). This kind of exploration is more in line with the research undertaken here to understand regular, everyday interactions between government agencies and citizens via social media sites.

Twitter is ripe for study because it often is used to rapidly share information with followers (Thelwall, Buckley, & Paltoglou, 2011). Thelwall et al. (2011), for example, took to Twitter to analyze the sentiment related to major current events. Studying events such as the Tiger Woods scandal, the Oscars award show, and The Bachelor television finale, the authors found that more negative sentiment was found when the events were first taking place but were largely insignificant when examined overall (Thelwall et al., 2011). They are careful to note that more important events did not trigger great sentiment changes in either direction, but that the construct still can yield insights into overall attitudes displayed via the social platform.

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