CITIZENS’ USE OF SOCIAL MEDIA IN GOVERNMENT, PERCEIVED TRANSPARENCY, AND TRUST IN GOVERNMENT

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ABSTRACT: Governments are adopting social media to provide complementary information dissemination, communication, and participation channels whereby citizens can access government and government officials and make informed decisions. Using 2009 national e-government survey data from the Pew Research Center, this study finds (1) that use of government social media is significantly and positively associated with perceptions of government transparency, (2) that perceptions of government transparency are positively and significantly related to trust in government, and (3) that perceptions of government transparency mediate the relationship between use of government social media and trust in government. These findings demonstrate that social media is an effective means for government to improve citizens’ trust in government by enhancing their perceptions of government transparency. The study contributes to the literature by providing empirical evidence of the mediating role of perceived government transparency in linking the use of e-government to trust in government.

KEYWORDS: perceived transparency, social media in government, trust in government.

Citizens’ trust in their government is a core concern in public administration, and public sector leaders have been concerned about its decline over the last several decades (Denhardt & Denhardt, 2009). Social science scholars have documented the diverse sources of trust in government (Cook & Gronke, 2005). For example, they have identified that an individual’s sociopsychological characteristics (Gabriel, 1995), social experiences and socialization (Coleman,
perceptions of government performance (Kampen, Van de Walle, & Bouckaert, 2006; Mizrahi, Vigoda-Gadot, & Van Ryzin, 2010; Newton & Norris, 2000; Thomas, 1998; Yang & Holzer, 2006), and perceptions of government transparency (Curtin & Meijer, 2006; Grimmelikhuijsen, 2009, 2011) are all closely related to trust in government.

Electronic government, also known as e-government—the use of the Internet and other digital media to deliver government information and services to citizens (United Nations, 2012; West, 2004)—can be an influential factor in the restoration of trust in government because it has the potential to improve government performance (e.g., productivity gains, improved decision processes) (Andersen et al., 2010) and transparency (Welch, Hinnant, & Moon, 2005). Several recent studies have investigated the relationship between e-government and trust in government (e.g., Holzer, Melitski, Rho, & Schwester, 2004; Moon, 2003; Smith, 2011; West, 2004). The relationship has been found to be significant in some studies (Sharoni, 2012; Welch et al., 2005) but not in others (Morgeson, VanAmburg, & Mithas, 2011; West, 2004). Most of these studies focus on information and transaction services on static government websites. What researchers have not yet examined is the relationship between e-government and trust in government as impacted by government use of social media (e.g., Facebook, Twitter, blogs). Given the proliferation of social media at all levels of government (Bertot, Jaeger, & Grimes, 2010; Bonson, Torres, Royo, & Flores, 2012; Mergel & Bretschneider, 2013; Purser, 2012; Snead, 2013), more empirical research on this topic is warranted.

The present study seeks to fill this research gap by offering a theoretical model of social media in government and trust in government. The model argues that citizens’ use of social media in government shapes their perceptions of transparency in government, which, in turn, affects their trust in government. In addition, the model emphasizes the role of citizens’ perceptions of government transparency in making connections between social media in government and trust in government (see Figure 1). In other words, the study argues that citizens’ perceptions of government transparency mediate the link between their use of social media in government and their trust in government. Testing the role of perceived transparency in government meaningfully extends the previous studies, since few of them empirically tested the mediating effect of perceived government transparency in linking use of e-government services (hereinafter: social media services) to trust in government.

This article contributes to the literature by highlighting why and how citizens’ use of government social media is related to their trust in government as related to their perceived transparency of government. The model was tested using data from the 2009 national e-government survey by the Pew Research Center. The
following section briefly reviews the literature on models of e-government/trust in government and identifies the research gap that the study fills. The next section discusses the theoretical underpinnings that inform the research model and hypotheses, and is followed by a section that addresses the data, measurements, and statistical techniques used to test the research hypotheses. Finally, findings, implications, and conclusions are presented.

**Literature Review and Conceptual Model**

Various studies have unveiled the link between citizens’ use of information and transaction services on government websites and their trust in government (Morgeson, VanAmburg, & Mithas, 2011; Sharoni, 2012; Smith, 2011; Tolbert & Mossberger, 2006; Welch et al., 2005; West, 2004). The findings from these studies are mixed. Several studies find a significant relationship between use of information and transaction services on government websites and trust in government (Sharoni, 2012; Welch et al., 2005), but others do not (Morgeson et al., 2011; West, 2004). For example, Welch et al. (2005) find that use of information services on government websites is positively associated with satisfaction with the services, and this, in turn, is positively associated with trust in government, but West (2004) reports no significant relationship between use of information and transaction services on federal government websites and trust in the federal government. Tolbert and Mossberger (2006) deliver mixed results. They find that use of information and transaction services on government websites is associated with perceptions of the effectiveness of the services at the federal level, of their accessibility at the federal and local levels,
and of their responsiveness at all levels of government, but accessibility and responsiveness are found to be associated with trust in government only at the local level. Meanwhile, Morgeson et al. (2011) concluded that there is no relationship between the use of information and transaction services on government websites and overall trust in government, while Sharoni (2012) and Kim and Lee (2012) report a significant link between online engagement with government and trust in government.

Implicitly or explicitly, many studies see effectiveness, accessibility, responsiveness, or satisfaction as a mediating variable that links use of information and transaction services on government websites to trust in government (Morgeson et al., 2011; Tolbert & Mossberger, 2006; Welch et al., 2005). However, citizens’ perceptions of government transparency have not been fully considered as a mediator between use of e-government services and trust in government. Although discussed theoretically (Welch et al., 2005), the role of perceived government transparency has not been empirically tested in previous e-government-trust models. That is, few studies have empirically examined the linkage between use of e-government services and trust in government through perceived transparency. Some studies have investigated the impact of government transparency on trust in government (Curtin & Meijer, 2006; Grimmelikhuijsen, 2009, 2011), but without the mediating role of government transparency between citizens’ use of e-government services and trust in government; even the findings from these studies, concerning the partial link between transparency and trust in government, are mixed. The lack of attention to the complete linkage of e-government, transparency, and trust in government warrants further empirical study, since transparency is considered to be one of the core values achieved through e-government services (Bertot, Jaeger, & Grimes, 2010; Mergel, 2013), and thus poses fundamental research questions about e-government (e.g., Jun, Wang, & Wang, 2014).

While previous e-government-trust models drew on information and transaction services on government websites, the use of social media in government has recently become a major trend in e-government. Social media can be defined as a group of Web 2.0 technologies that facilitate interactions between users; accordingly, social media in government can be understood as a platform for governments to interact with citizens (Criado, Sandoval-Almazan, & Gil-Garcia, 2013). By their nature, social media afford easy access to information through convenient devices like cellphones and tablets, enable user-created content, and provide visible social connections (Kaplan & Haenlein, 2010; Nakki et al., 2011). Social media have been rapidly and widely diffused at all levels of government (Bonson et al., 2012; Mergel & Bretschneider, 2013; Purser, 2012; Snead, 2013) because of their potential for more and better engagement. At the same time, various studies have investigated the tools of social media in government
(e.g., Facebook, Twitter, blogs, YouTube) and related open-government policy goals (transparency, participation, and collaboration) (Ganapati & Reddick, 2014), as well as the strategies and challenges they present (Criado et al., 2013). Among the goals, transparency is a one-way push to inform and educate citizens in order to achieve accountability and trust (Mergel, 2013). In fact, the reasons government utilizes social media can be summarized in one primary goal: “Representation of the agency on all available online channels” (Mergel, 2013, p. 330). Social media in government enhance citizens’ perceptions of government transparency by enabling them to access more up-to-date government information through more frequent interactions with government. Thus they come to perceive social media in government as making government information relatively more accessible. Despite their potentially reinforcing role in promoting transparency and building citizen trust, social media in government have not been sufficiently investigated in this body of research. The present study fills the research gap by proposing and empirically testing an e-government/perceived transparency/trust model, as shown in Figure 1, in which the role of citizens’ perceptions of government transparency, as enhanced by social media, is posited and highlighted as a mediator between their use of social media in government and their trust in government. The model provides an extended linkage that overcomes the limitations of previous research that did not test the relationship between e-government and transparency or only tested the relationship between transparency and trust in government.

SOCIAL MEDIA AND PERCEIVED TRANSPARENCY

Transparency can be understood as a composite construct involving multiple components, such as external accessibility and active disclosure (Grimmelikhuijsen & Welch, 2012). It has been defined in different ways, but most of the definitions see visibility as fundamental. A good working definition of transparency can be extended to include completeness and understandability (Grimmelikhuijsen, Porumbescu, Hong, & Im, 2013) or inferability (Michener & Bersch, 2013) of information, but it basically begins with “the availability of information about an actor that allows the other actors to monitor the workings or performance of the first actor” (Meijer, 2013, p. 430). Governments can promote transparency by actively disclosing information about their activities and decisions and then enabling citizens to access, monitor, and evaluate it. From the citizen’s point of view, government transparency is perceived when government information is publicly available. However, even if information is available, citizens will not perceive government transparency until they are effectively informed of government activities and decisions. In this regard, government transparency can be characterized as the extent to which citizens are able to access government agencies and
officials, and are informed about what the government is doing (Halachmi & Greiling, 2013). Social media can help government agencies and officials to be more transparent by enabling them to keep citizens up-to-date on government activities and decisions.

The concept of the omnipresence of citizens explains why government information can be shared so quickly and widely through social media (Zavattaro & Sementelli, 2014). According to Zavattaro and Sementelli (2014), one of the characteristics implicit in citizens’ omnipresence is accessibility. Social media enable governments to increase one-way information sharing. More and more information has become available on government social media. At the same time, the number of social media users has dramatically increased—as of 2014, approximately 70% of American adults were using social media (Duggan, Ellison, Lampe, Lenhart, & Madden, 2014). Citizens use social media to interact with one another and with government agencies and/or officials that share government information. As of 2013, approximately 56% of American adults were using a smartphone (Smith, 2013) that can social media. This fact explains how citizens are omnipresent in terms of interacting with fellow citizens and with government. Social media and convenient devices like smartphones together characterize the omnipresent citizen and enable frequent interaction with government. In addition, the many-to-many relations featured by social media contribute to knowledge sharing among citizens—not only those who use government social media, but also including nonusers who are connected through social media in general (e.g., as “friends” on Facebook or “followers” on Twitter) to other citizens who are users of social media in government. In this manner, citizens are likely to perceive greater transparency in government. When they use government social media, they are able to gain government information more frequently, receive more up-to-date information about what the government is doing, and thereby perceive a “higher level of transparency” (Bonson et al., 2012, p. 123). Therefore, this study proposes the following hypothesis, related to citizens’ use of social media in government and their perceptions of government transparency.

Hypothesis 1: Citizens’ use of social media in government is positively associated with their perceptions of transparency in government.

PERCEIVED TRANSPARENCY AND TRUST IN GOVERNMENT

Trust has been differently defined across different disciplines. One very widely held definition was proposed by Rousseau, Sitkin, Burt, and Camerer (1998): “trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another”
This definition, in turn, is based on a cross-disciplinary collection of writings on trust (e.g., willingness to be vulnerable) as proposed by Mayer, Davis, & Schoorman, 1995). According to Rousseau et al. (1998), scholars agree that risk (e.g., potential loss, as discussed in Coleman, 1990) and interdependence are the essential conditions that need to exist for trust to form. Other scholars have attempted to understand trust in government in order to find ways to restore it through better public performance and management (e.g., Berg, 2005; Bouckaert, Lægreid, & Van de Walle, 2005; Getha-Taylor, 2012; Hardin, 2002; Mizrahi, Vigoda-Gadot, & Cohen, 2009; Thomas, 1998; Van de Walle, & Bouckaert, 2003; Vigoda-Gadot, 2006). For example, Thomas (1998) identifies three broad conceptual dimensions of trust in government: fiduciary trust, mutual trust, and social trust. He suggests that citizen trust in government can be created, maintained, or restored by applying these three conceptions of trust along with Zucker’s three modes of trust production: institution-based trust, process-based trust, and characteristic-based trust. Among these, fiduciary trust and institutional trust are the most relevant to the context of citizen-government interactions through social media. Despite their conceptual differences, all of these scholars agree on the central importance of information (and thereby transparency) in explaining how citizens build trust in government. However, previous studies do not explain in any detail why having more information helps to increase trust in government.

Coleman (1990) proposes a theoretical framework that articulates what is being evaluated and elaborates the role of information in trust-building. “Three essential elements” are used in explaining what leads a potential trustor (e.g., the citizen) to vest trust in a trustee (e.g., the government): \( p = \) chance of receiving gain (i.e., the probability that the trustee is trustworthy), \( L = \) potential loss (if the trustee is untrustworthy), and \( G = \) potential gain (if the trustee is trustworthy) (Coleman, 1990, p. 99). According to the framework, a rational actor will trust a trustee if the ratio of the chance of gain to the chance of loss is greater than the ratio of the amount of potential loss to the amount of potential gain [i.e., \( p/(1 – p) > L/G \)], or, stated otherwise, if the potential gain times the chance of gain is greater than the potential loss times the chance of loss [i.e., \( G \times p > L \times (1 – p) \)]. It is clear from this formula that the higher either \( p \) or \( G \) or both are, the more likely that a potential trustor will trust a trustee. This can be applied in the context of trust in government in a way that defines gain (\( G \)) as achieving high performance or action in the citizen’s best interests and the chance of receiving gain (\( p \)) as the probability that the government is trustworthy in this regard. The implication is apparent: Improve the level of performance (or act in the citizens’ best interests) and/or increase the probability as perceived by the citizens. This is the context in which the role of information comes into play in trust-building.
According to Coleman (1990), information has the effect of moving a trustor’s estimate of the probability of gain as far as possible above the critical point where the trustor would be indifferent between making a positive decision and a negative one. As such, information is expected to influence citizens’ estimates of the probability that government will act in their best interests. This explains how Thomas’s and Zucker’s different modes of trust were produced (Thomas, 1998). For example, government institutions could increase their fiduciary or institutional-based trust by distributing information on their administrative processes, programs, plans, outputs, and outcomes to inform citizens of how the government operates in their best interests (Welch et al., 2005). Social media use by government is an outlet facilitating the dissemination of such information.

Unlike the previous studies that failed to clarify the relationship between transparency and trust in government, the present study posits that people will only trust the government when they know what it does (Grimmelikhuijsen, 2009). Negative information (i.e., information about government acting against the citizens’ best interests) may increase the potential loss (L) and/or the chance of receiving loss (the probability that the government is untrustworthy: 1—p), thus decreasing the level of citizen trust in government (Halachmi & Greiling, 2013). Literature provides evidence that a negative relationship of transparency to trust in government may possibly be caused by cultural values or the political environment (Grimmelikhuijsen et al., 2013; Worthy, 2010). However, it is unlikely that the government will voluntarily disseminate information about its poor performance via social media, and it may control the content of social media about government (Zavattaro & Sementelli, 2014). Welch et al. (2005) discuss a potentially positive relationship between perceived transparency and trust in government, but they did not test the relationship in their study. Increased government transparency can restore trust in government (Halachmi & Greiling, 2013) because transparency in government is expected to heighten citizens’ estimates of the probability of gain (p) related to building up fiduciary or institutional-based trust by informing citizens of how government works for them. Therefore, this study proposes the following hypothesis related to citizens’ perceptions of transparency in government and their trust in government.

Hypothesis 2: Citizens’ perceptions of transparency, as enhanced by government use of social media, are positively associated with their trust in government.

PERCEIVED TRANSPARENCY AS A MEDIATOR

Mayer et al. (1995) understand trust as an attitude of one party (i.e., the trustor: the citizen in this study) toward another party (i.e., the target or recipient: the
government agency or officials in this study) within a certain context (i.e., the use of social media by government), each of which is a social factor that may influence attitude. In psychology, attitude is considered to be a function of belief and evaluation of an outcome (Fishbein & Ajzen, 1975). That is, trust can be shaped by belief and evaluation of the outcome anticipated to occur in a given context (Kramer, 1996; Scott, 1980). In this regard, citizens’ trust in government, as enabled by social media in government, or by e-government in general, can be understood as their attitude toward government agencies or officials as shaped by their evaluations of the outcomes they expect to occur from the use of social media in government.

Existing e-government trust models position transparency or effectiveness (Tolbert & Mossberger, 2006; Welch et al., 2005), accessibility, interactivity (Tolbert & Mossberger, 2006), or simply satisfaction (Morgeson et al., 2011; Welch et al., 2005) as the outcome that citizens can anticipate from e-government, albeit without testing the outcome’s mediating role between use of e-government services and trust in government. Social media in government are expected to contribute to the achievement of transparency, public participation, and collaboration (Mergel, 2013). That is, government transparency is one of the outcomes that social media in government are expected to achieve (Bonson et al., 2012; Criado et al., 2013; Mergel, 2013). Thus, citizens’ trust in government (attitude), one may reasonably theorize, is shaped by their perception that government transparency (outcome) is increased through the use of social media in government (given context). Drawing on the preceding discussion, this study argues that citizens’ use of social media in government is indirectly related to their trust in government through their perceptions of transparency in government. Therefore, the following hypothesis is proposed related to the mediating effect of citizens’ perceptions of transparency in government between their use of social media in government and their trust in government.

**Hypothesis 3:** Government transparency, as perceived to be enhanced through social media in government, mediates the relationship between citizens’ use of social media in government and their trust in government.

**Research Methods**

**DATA**

To test the research hypotheses, the study used a national random-digit-dialed telephone survey, “Government Online 2009,” conducted by the Pew Research Center’s Internet and American Life Project, with 2,258 adults, ages 18 and
older, including 1,676 Internet users and 849 social network service (SNS) users. The original intent of the questions asked by Government Online 2009 was to investigate American adults’ Internet usage; it was the first survey to explore the impact of use of social media services in government on citizen attitudes (Smith, 2010). The survey was conducted between November 30 and December 27, 2009. Based on the original report on the survey results, it can be stated with 95% confidence that the error attributable to sampling and other random effects is ±2.4 percentage points for results based on the total sample, and ±2.8% percentage points for results based on Internet users (n = 1,676). Although not mentioned in the report, the error attributable to sampling and other random effects is estimated to be about ±3.5% based on 849 SNS users and with a 95% confidence level. The sample was weighted according to the demographic makeup of the U.S. population to compensate for potential nonresponse biases. Although the Pew survey was conducted for other purposes, it was adaptable for the present research because it included questions related to the most common uses of social media services in government (e.g., Facebook, Twitter, and blogs).

MEASUREMENT

This study has one exogenous latent variable in its research model: citizens’ use of social media in government. Three survey questions were used to measure the construct for citizens’ use of social media in government, as shown in Table 1. Respondents were asked to mark either “Yes, have done this” (coded as 1) or “No, have not” (coded as 2) for all three question items. The research model entails two endogenous latent variables: (1) citizens’ perceptions of transparency in government as enhanced by government social media, and (2) citizens’ trust in government. Perceived transparency is operationalized as the perceived effects of the use of social media in government by citizens in terms of (1) more access to government agencies or officials, and (2) more information dissemination, as shown in Table 1. These two items were rated on a 5-point Likert scale ranging from 1 (“Strongly agree”) to 5 (“Strongly disagree”). Finally, the construct of citizens’ trust in government, the main dependent variable for this study, is measured by the question, “How much of the time do you think you can trust—just about always, most of the time, only some of the time, or never?” The trust literature differs on whether trust can or should be measured by one question of this kind (e.g., Fisher, van Heerde, & Tucker, 2010; Hooghe, 2011). The identified dimensions of trust in government help explain what makes citizens trust government, and this has practical implications (Thomas, 1998). However, as far as measurement is concerned, Hooghe (2011) argues that political trust is a one-dimensional attitude because citizens
do not distinguish between different dimensions of trust in government. The coding scheme for this item is as follows: 1 = “About always,” 2 = “Most of the time,” 3 = “Only some of time,” 4 = “Never.” The construct of trust in government aggregates three measurement items, one for each level of government. Due to this aggregated measurement of trust in government, readers should be careful about applying the findings and implications of this study to a single, specific level of government. Different levels of government may have different levels of association between constructs; for example, citizens may have a higher level of trust in local government than in state or federal government (Moon, 2003).

The construct of citizens’ use of social media in government is modeled to be formative in this study because the causality direction is from the measurement items to the construct, and the measurement items do not necessarily have to be correlated (Diamantopoulos & Siguaw, 2006). The other two constructs—perceived transparency and trust in government—are modeled to be reflective.

**CONTROL VARIABLES**

Several sociopsychological variables were included in the analysis of the model in order to control the potential influences on citizens’ trust in government (Tolbert & Mossberger, 2006; Welch et al., 2005; West, 2004). These variables

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**Table 1. Constructs and Measurement Items**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measurement item</th>
<th>M</th>
<th>SD</th>
</tr>
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<tbody>
<tr>
<td>SM (Formative*)</td>
<td>Followed or become a fan of a government agency or official through their page on a social networking site</td>
<td>1.910</td>
<td>.286</td>
</tr>
<tr>
<td></td>
<td>Read the blog of a government agency or official</td>
<td>1.854</td>
<td>0.353</td>
</tr>
<tr>
<td></td>
<td>Followed a government agency or official on Twitter</td>
<td>1.925</td>
<td>0.264</td>
</tr>
<tr>
<td>PT (Reflective; ( \alpha = 0.715 ))</td>
<td>Makes government agencies and officials more accessible</td>
<td>1.996</td>
<td>0.936</td>
</tr>
<tr>
<td></td>
<td>Helps people be more informed about what the government is doing</td>
<td>1.921</td>
<td>0.914</td>
</tr>
<tr>
<td>TG (Reflective; ( \alpha = 0.763 ))</td>
<td>How much of the time do you think you can trust the federal government?</td>
<td>2.842</td>
<td>0.754</td>
</tr>
<tr>
<td></td>
<td>How much of the time do you think you can trust your state government?</td>
<td>2.738</td>
<td>0.748</td>
</tr>
<tr>
<td></td>
<td>How much of the time do you think you can trust your local government?</td>
<td>2.611</td>
<td>0.790</td>
</tr>
</tbody>
</table>

Notes: SM = Citizens’ use of social media in government; PT = Citizens’ perceptions of government transparency enhanced by social media in government; TG = Citizens’ trust in government; SE = Standard error. *Cronbach’s alpha is not appropriate in assessing a formative construct.
are respondent’s political party (“Republican” = 1; “Democrat” = 2), political ideology, and government employment of the respondent or members of the respondent’s immediate family (“Yes” = 1 and “No” = 2), as well as the respondent’s demographic characteristics, such as age, gender (“Male” = 1; “Female” = 2), educational level, and income level, all of which are known to influence trust in government (Christensen & Laegreid, 2005). Political ideology is measured using a 5-point Likert scale ranging from 1 (“Very conservative”) to 5 (“Very liberal”). Respondents were asked to answer the question “What is your age?” They were given seven different categories to choose from to indicate their educational level, with 1 representing “None, or grades 1–8” and 7 representing “Postgraduate training/professional school after college (toward a master’s/Ph. D., law or medical school)” —a higher score represents a higher educational level. Finally, nine income levels were provided for respondents to indicate their income level, with 1 representing “Less than $10,000” and 9 representing “$150,000”—a higher score represents a higher income level. A post-hoc analysis reveals that certain attitudinal or demographic variables reflect more experience with social media in government than others. Hence, these demographic characteristics may limit the generalizability of the findings in this research.

DATA ANALYSIS

Structural Equation Modeling (SEM) was performed to test the hypotheses in the study because of its analytical ability to handle both latent and measured variables (Kaplan, 2000) and to simplify the calculation of a mediating effect associated with two latent variables that are linked via one or more paths. The sample data in this research did not satisfy the multivariate normality requirement, and the model includes formative latent variables. These data and model characteristics indicated that it was necessary to conduct Partial Least Squares SEM (PLS SEM), which uses a component-based estimation approach, instead of covariance-based SEM (CB SEM). Despite certain disadvantages as compared to CB SEM (e.g., potentially biased parameter estimates, no global fit criteria provided), PLS SEM can handle both data with multivariate non-normality and a model with formative constructs (Chin, 1998). It should be noted here that the construct of perceived transparency has only two measurement items, as discussed in the measurement section above, whereas three or more are usually recommended for SEM. This limitation is due to the study’s use of a survey that was not originally designed for this research.

For the purpose of testing the mediating effect hypothesized in the model, the PLS SEM software uses macros developed by Preacher and Hayes (2004) that simplify the approach proposed by Shrout and Bolger (2002), which uses
bootstrapping for standard errors. Also presented is a four-step approach proposed by Baron and Kenny (1986), in which the significance of the path coefficients is examined at each step through different regression analyses.

**Findings**

**STRUCTURAL MODEL**

A PLS model needs to be evaluated by its measurement model and structural model (please refer to the Appendix for details of the measurement model). A structural model can be assessed in terms of the path coefficient’s algebraic sign, magnitude, and significance. The bootstrapping results demonstrate that the path coefficient’s algebraic signs are all positive, as hypothesized in the research model. Figure 2 shows that citizens’ use of social media in government is positively and significantly associated with their perceptions of transparency in government as enhanced by social media in government. Therefore, Hypothesis 1 is supported by the data ($\beta = 0.14, p < 0.001$), as expected. In addition, the results support Hypothesis 2 ($\beta = 0.19, p < 0.001$); the structural path between

![Figure 2. Results of PLS model](image)

**Note:** Solid arrows = Direct effect; Dashed arrow = $\beta_{\text{indirect}}$ = Indirect effect mediated by PT; SM = Citizens’ use of social media in government; PT = Citizens’ perceptions of government transparency enhanced by social media in government; TG = Citizens’ trust in government. *p < 0.05, **p < 0.001. Numbers in parentheses indicate standard errors.
perceived transparency and trust in government turns out to be positive and significant. It is the strongest relationship in the model.

Finally, the test results show that Hypothesis 3 is supported by the data. The approach suggested by Shrout and Bolger (2002) and Hayes and Preacher (2004) reveals that citizens’ perceptions of government transparency, as enhanced by social media in government, significantly mediate the association between their use of government social media and their trust in government. In other words, citizens’ use of social media in government is indirectly associated with their trust in government via perceived government transparency ($\beta_{\text{indirect}} = 0.027, SE = 0.005, p < 0.001$). The four-step approach proposed by Baron and Kenny (1986) supports full mediation of the perceived transparency between the constructs of social media in government and trust in government, since the effect of the perceived government transparency remains significant after controlling for the direct effect of social media in government on trust in government. The zero-order path coefficient ($\beta = 0.03$) between social media in government and trust in government is significant, albeit marginal ($p < 0.1$), but the significance disappears ($\beta = 0.01, SE = 0.02, p = 0.23$) when the effect of perceived government transparency is controlled.

**Discussion**

The findings suggest that social media in government enable citizens to gain easier access to government and be more informed about current events, policies, or programs, heightening their perception of transparency in government. The findings are consistent with recent studies (Lee & Kwak, 2012; Mergel, 2013) claiming that social media in government help citizens be more informed of government affairs because the early stage of social media use in government focuses on data transparency that aims to increase public awareness of government data and process. Government websites help government agencies stay close to citizens by overcoming the physical distance between citizens and government agencies. However, social media can also make government agencies and officials closer to citizens in the sense that they are accessible via convenient devices such as smartphones and tablets. More frequent communication with citizens about what the government is doing in their best interests can improve government-citizen relationships (Berman, 1997; Fairbanks, Plowman, & Rawlins, 2007), and this too may lead to citizen trust in government.

Social media enable citizens and governments to become omnipresent, allowing more frequent interactions between them. The study findings imply that when citizens are connected to government through social media, one may think of government as part of a larger online community where citizens are not only
connected to government but also tied to other citizens who do not actively use social media in government. This is because the interactions through social media are visible to anyone who joins a social media site. In this regard, the citizens who use social media in government play a crucial role in bridging and bonding government to other citizens who do not use social media in government. Social media in government serve as an effective means of disseminating government information, providing citizens with an opportunity to access the most up-to-date government information in a timely manner. Citizens, in turn, may gain a sense of more connectedness with government agencies and officials. The sense of being connected to government may increase their estimates of the probability that the government is trustworthy. That is, it is likely that citizens’ use of social media in government promotes process-based trust in government, intensifying the perceptions of transparency in government that lead to institutional-based trust in government.

The findings also show that simply offering social media in government does not necessarily increase citizens’ trust in government. While this study finds that citizens’ perceptions of government transparency are a significant mediator between their use of government social media and their trust in government, the direct relationship between citizens’ use of government social media and their trust in government is found to be insignificant. This means that social media in government can increase citizens’ trust in government only by achieving certain expected outcomes, one of which is government transparency as tested in this study. Social media use in government aims to increase not only government transparency but also citizen participation and collaboration in government (Mergel, 2013; Nakki et al., 2011; Snead, 2013). Since the adoption of social media in government is a relatively new phenomenon, communications via social media in government are mostly one-way (Norris & Reddick, 2012). Hence, a further question is yet to be answered: Are social media used in government in a way that effectively improves participation and collaboration in government as expected? Further empirical research is warranted to answer this question, drawing on the theories, practices, and empirical evidence in this body of literature (e.g., Yang & Callahan, 2005).

One might argue that citizens’ use of social media in government is influenced by their trust in government. Admittedly, the relationship between citizens’ use of social media in government, which is a type of civic engagement, and their trust in government is recursive. Brehm and Rahn (1997) posit a reciprocal relationship between civic engagement and trust. Keele accepts as “entirely plausible” a reciprocal relationship in which “trust in government will influence civic activity, since it may require some level of trust in government to participate in activities that engage political institutions” Keele (2007, p. 244). Therefore, we may posit that citizens who already have a high level of trust in government are likely to use social media services in
government. However, it is also possible that distrust of government may cause citizens to engage with government (Espinal, Hartlyn, & Morgan, 2006) so that they can monitor its activities. While an investigation of the causality between trust in government and use of social media in government is beyond the scope of this study, due to the difficulty of using cross-sectional data to test and claim a causal relationship between constructs employed in SEM, a post-hoc analysis of the data provides no evidence of a significant difference in the level of trust in government between citizens who use social media in government and those who do not.

The definition of transparency used in this study is its most fundamental conceptualization: visibility as operationalized by access and active disclosure. However, transparency can be understood as a composite construct that entails many other desirable aspects. For example, the government may disseminate information, but the information is useless unless citizens understand what it means (Grimmelikhuijsen et al., 2013) or if they cannot infer accurate conclusions from it (Michener & Bersch, 2013). There is a compelling need to comprehensibly measure these other aspects of transparency so as to obtain practical information with which to formatively guide government activities in this area.

Conclusions

This study has explored how citizens’ use of social media in government may lead them to have trust in government. Using survey data collected by the Pew Research Center, the study found that citizens’ use of social media services is positively and significantly associated with their perceived effects of social media in terms of government transparency, which, in turn, is positively and significantly associated with their trust in government. The study observed that the relationship between citizens’ use of social media in government and trust in government is significantly mediated by their perceptions of transparency in government.

The study contributes to the body of public administration and e-government research by using recent survey data to explore the role of social media in building trust in government. It demonstrates how citizens’ perceptions of transparency in government mediate the link between their use of social media in government and their trust in government by simultaneously testing the linked usage of social media, perceived transparency in government, and trust in government. Based on the findings, the study argues that accessing government and being informed of what government is doing together play a central role in the decision to trust the government. The study concludes that increased interactions with government through its social media services are a worthwhile and effective means to improve citizens’ perceptions of government transparency and their trust in government.
1. The estimation methods in CB SEM (generalized least squares and maximum likelihood) require normally distributed data. An alternative method—asymptotically distribution free—can be used to estimate parameters using non-normally distributed data in CB SEM, but a very large sample size (e.g., over 2,500) is needed and its ability to handle missing data is limited. Furthermore, CB SEM has limited ability to identify a model that includes formative latent variables; even programs like AMOS do not accept a model specification for a latent variable with multiple formative indicators (Blunch, 2008). While some scholars point out that CB SEM (e.g., LISREL, EQS, AMOS) was created only to handle reflective indicators (Chin, 1998), it is not impossible for CB SEM to include formative indicators (Jöreskog & Goldberger, 1975). However, identifying a model with formative constructs is not easy due to restrictive identification conditions (Bollen & Davis, 1994; Diamantopoulos, Riefler, & Roth, 2008; Jöreskog & Goldberger, 1975; MacCallum & Browne, 1993). For example, the MIMIC models suggested by Jöreskog and Goldberger (1975) require a specification of at least two additional reflective indicators; similarly, the so-called “2 + emitted paths rule” applies to modeling formative constructs (Diamantopoulos et al., 2008). The research model in this study does not satisfy these conditions or rules, thus making it impossible to use CB SEM.

References


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Appendix

Measurement Model

Ideally, all factor loadings should be greater than 0.7 (Chin, 1998), but smaller loadings are acceptable for exploratory research (Lederer & Sethi, 1992; Straub, 1989). Table 2 shows that all of the reflective indicators and most of the formative indicators have factor loadings greater than the ideal threshold (Chin, 1998). One of the formative indicators for the construct of citizens’ use of social media in government has a factor loading slightly lower than 0.7. This formative indicator with a low factor loading is retained in order not to omit a unique part of the composite latent construct (Urbach & Ahlemann, 2010). It is recommended that formative indicators should be retained in the model as long as the conceptual model can be justified (Henseler, Ringle, & Sinkovics, 2009).

It is appropriate to use discriminant and convergent validation techniques (Campbell & Fiske, 1959) and do reliability testing in validating a reflective construct. However, reliability testing in terms of internal consistency is not meaningful for a formative construct (Diamantopoulos & Siguaw, 2006). As shown in Table 3, the reliability coefficients for reflective constructs (i.e., perceived transparency and trust in government) are all greater than 0.7, and the average variance extracted (AVE) is above 0.5 in this study, as recommended (Fornell & Larcker, 1981). Table 3 also shows that the measurement model demonstrates acceptable discriminant validity, as all the correlation coefficients between paired constructs are less than the square root of AVE associated with each construct (both reflective and formative). As such, both reliability and convergent and discriminant validity are secured with the measurement model.

For a formative construct, indicator validity should be assessed by monitoring the statistical significance of the indicator weights by means of

<table>
<thead>
<tr>
<th>Indicator</th>
<th>SM</th>
<th>PT</th>
<th>TG</th>
<th>SE</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM1</td>
<td>0.733</td>
<td>−0.016</td>
<td>0.009</td>
<td>0.108</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>SM2</td>
<td>0.601</td>
<td>0.056</td>
<td>0.016</td>
<td>0.103</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>SM3</td>
<td>0.733</td>
<td>−0.030</td>
<td>−0.023</td>
<td>0.172</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>PT1</td>
<td>0.003</td>
<td>0.882</td>
<td>0.000</td>
<td>0.018</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>PT2</td>
<td>−0.003</td>
<td>0.882</td>
<td>0.000</td>
<td>0.021</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>TG1</td>
<td>0.008</td>
<td>−0.001</td>
<td>0.799</td>
<td>0.019</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>TG2</td>
<td>−0.001</td>
<td>0.024</td>
<td>0.855</td>
<td>0.019</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>TG3</td>
<td>−0.006</td>
<td>−0.024</td>
<td>0.817</td>
<td>0.018</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Notes: SM = Citizens’ use of social media in government; PT = Citizens’ perceptions of government transparency enhanced by social media in government; TG = Citizens’ trust in government; SE = Standard error.
bootstrapping (Efron, 1979). Also, multicollinearity among the formative indicators should be assessed with the variance inflation factor (VIF) as in multiple regressions (Fornell & Bookstein, 1982). Table 4 demonstrates that the measurement model in this study satisfies this additional requirement. All indicator weights for the formative construct employed in this study are statistically significant. Furthermore, all VIF values of the formative indicators are much less than 5, indicating that multicollinearity is not a serious issue for the measurement model.

Table 3. Construct Reliability and Discriminant Validity

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>CR</th>
<th>AVE</th>
<th>SM</th>
<th>PT</th>
<th>TG</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM</td>
<td>1.897</td>
<td>0.301</td>
<td>0.732</td>
<td>0.478</td>
<td>0.692</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PT</td>
<td>1.958</td>
<td>0.925</td>
<td>0.875</td>
<td>0.778</td>
<td>0.121***</td>
<td>0.882</td>
<td></td>
</tr>
<tr>
<td>TG</td>
<td>2.731</td>
<td>0.764</td>
<td>0.864</td>
<td>0.679</td>
<td>0.047*</td>
<td>0.214***</td>
<td>0.824</td>
</tr>
</tbody>
</table>

Notes: Square roots of average variances extracted (AVEs) shown on diagonal; SD = Standard deviation; CR = Composite reliability; AVE = Average variance extracted; SM = Citizens’ use of social media in government; PT = Citizens’ perceptions of government transparency enhanced by social media in government; TG = Citizens’ trust in government. *p < 0.05, ***p < 0.001

Table 4. Indicator Weights of Formative Constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>Indicator</th>
<th>Weight</th>
<th>SE</th>
<th>p-value</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM</td>
<td>SM1</td>
<td>0.511</td>
<td>0.078</td>
<td>&lt;0.001</td>
<td>1.111</td>
</tr>
<tr>
<td>SM2</td>
<td>0.419</td>
<td>0.114</td>
<td>&lt;0.001</td>
<td></td>
<td>1.052</td>
</tr>
<tr>
<td>SM3</td>
<td>0.511</td>
<td>0.087</td>
<td>&lt;0.001</td>
<td></td>
<td>1.111</td>
</tr>
</tbody>
</table>

Notes: SE = Standard error; VIF = Variance inflation factor; SM = Citizens’ use of social media in government.