

See, Click, Control:

Predicting the Popularity of Civic Technology for Social Control

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Abstract

Many local news media no longer fulfill their surveillance and feedback control functions. Thus, cities rely on emerging media to maintain social order. This study found that large, pluralistic cities with higher levels of community stress had higher usage levels of the mobile app, SeeClickFix, which allows residents to snap and send photos of community problems to local governments. Implications for structural pluralism theory and research on social functions of emerging civic technologies are discussed.

Keywords: Structural Pluralism, Community Stress, Social Control, Civic Technology, Mobile, SeeClickFix

See, Click, Control:**Predicting the Popularity of Civic Technology for Social Control**

In the modern city, there is a high degree of diversity, which results in the paradox that at the same time there is increased physical contact (i.e., density), there is greater social distance between increasingly mobile residents of different familiar, ethnic, and cultural backgrounds. As a result of this increased social distance, city residents have less personal contact with, and individual control over, an increasingly large, pluralistic social structure. To have influence within the social structure and control necessary resources, residents of pluralistic cities organize along specialized interest group lines. The division of the population into these specialized interest groups results in more intense conflict over the distribution of limited public resources (Olien, Donohue, & Tichenor, 1995; Wirth, 1938). Given the increased intensity of conflict, pluralistic communities (i.e., modern U.S. cities), require more complex, more formalized mechanisms for sustaining a manageable level of conflict (Demers 1994a; 1994b; Olien et al., 1995; Viswanath & Demers, 1999).

The mechanisms of maintaining manageable levels of social conflict include various forms of mediated communication. Mediated communication facilitates communication across and between diverse groups of residents and the bureaucratic institutions charged with addressing and adjudicating conflicts (Olien et al., 1995; Viswanath & Demers, 1999). Historically, the news media played an important surveillance and feedback function, alerting society to potentially destabilizing problems that must be addressed in order to manage conflict. Technological changes and the

economic contraction of traditional communication industries, however, mean that the news media no longer play such a central institutional role in society. These technological and economic shifts, however, do not diminish the social need for mediated communication to manage conflict in an increasingly urbanized, pluralistic society. Cities do, however, require new channels of communication and social control, especially in pluralistic cities with higher levels of social conflict. This study seeks to explain the adoption of civic technology, specifically SeeClickFix, as an emerging channel of social control.

Founded in 2008 in New Haven, CT, SeeClickFix is a mobile-based app that residents can use to snap a photo of a problem in their neighborhood that they want the city to fix (MacMillian, 2013). Cities that subscribe to the service receive a report of the problem, and then can use the service to track response to the complaint, the progress of which residents can also track on their smartphone. Many cities have incorporated SeeClickFix into multi-platform bureaucracies for managing residents' non-emergency requests for city services, for example, by integrating reports from SeeClickFix into a system that also includes residents' telephone and web-based requests for non-emergency city services.

Previous studies have primarily applied structural pluralism theory to analyzing the growth of traditional media institutions (Demers, 1994a; 1994b) and the variability in the social control functions traditional media institutions (primarily newspapers) fulfilled based on the social structure of the communities in which the media were embedded (Donohue, Olien, & Tichenor, 1985; Griffin & Dunwoody, 1995; Griffin & Dunwoody, 1997; Hindman, 1996; Jeffres, Cutietta, Sekerka, & Lee, 2000; McCluskey, Stein, Boyle,

McLeod, 2009; Olien et al., 1995; Tichenor, Donohue, & Olien, 1980). This study extends this traditional body of research into the realm of emerging civic technologies and seeks to apply structural pluralism theory beyond a strictly institutional perspective in order to predict *residents' use* of the app.

Focusing on *residents' use* of SeeClickFix underscores the important theoretical point not emphasized by previous studies focused on traditional media, which is that changes in social structure also affect *individual* reliance on mediated communication to cope with increased social distance and social conflict in a pluralistic, urban environment. Specifically, this study predicts that the volume of use among SeeClickFix's "top-performing" cities is a result of a city's size (i.e., population), its degree of structural complexity (i.e., pluralism), as well as manifestations of social conflict (i.e., community stress). Implications for theory and future research on civic technologies beyond SeeClickFix are discussed.

Literature Review

Structural Pluralism

Structural pluralism is defined as "the degree of differentiation in the social system along institutional and specialized interest group lines, in a way that determines *potential* sources of organized social power" (Tichenor et al., 1980, p. 16, emphasis added). Structural pluralism increases with the size and heterogeneity of an urban city. Absent of strong familiar, cultural, and social ties enjoyed by residents of smaller, more homogenous, more agrarian communities with less division of labor, individuals must participate in specialized interest groups—such as neighborhood associations, but also labor unions, social clubs, religious institutions—in order to advocate for and acquire the

limited public resources they require (Olien et al., 1995; Tichenor et al., 1980; Viswanath and Demers, 1999). Because a greater number of interest groups are similarly advocating on behalf of their constituents, there is a greater amount and intensity of social conflict in larger, more pluralistic urban cities.

Conflict is not only an inevitable but necessary element of a pluralistic society. Conflict is necessary in order to “prevent the ossification of the structure, and thereby facilitate adaptability,” (i.e., social change), and stimulates communication, knowledge, and opinion formation of public issues (Olien et al., 1995, p. 303). Thus, the social concern is not to eliminate conflict, but to *manage it* through processes of social control (Olien et al., 1995; Viswanath & Demers, 1999). The dominant strand of mass communication literature to have applied structural pluralism theory examined the different social control functions—distribution or feedback control—fulfilled by newspapers based on the degree of structural pluralism in the city where a newspaper was based (Donohue et al., 1985; Griffin & Dunwoody, 1995; Griffin & Dunwoody, 1997; Hindman, 1996; Jeffres et al., 2000; McCluskey et al., 2009; Olien et al., 1995; Tichenor et al., 1980; Watson, 2015; 2014a, 2014b). Distribution control involves selectively distributing information. Feedback control, on the other hand, involves actively publicizing potentially destabilizing threats to social order. Feedback control can serve a pressure valve function, allowing an aggrieved social group an opportunity to vent its frustrations. Feedback control can also help the social structure respond to a potential problem through routine channels of “moderated change,” altering the source of discontent without significant shock to the social system (Olien et al., 1995; Viswanath & Demers, 1999).

Tichenor et al. (1980) suggested that because newspapers rely on access to the dominant social structure for claims of legitimacy, economic support, and sources of news, the news media act as “guard dogs” for the social structure in which they are embedded. Due to the greater social proximity of residents in smaller, more homogenous communities, when problems arise in homogenous communities they are more likely to be dealt with through interpersonal communication. The press acts as guard dogs for this social arrangement, engaging in distribution control, downplaying issues involving conflict in their coverage. However, in larger, more structurally pluralistic communities, marked by greater specialization and social distance, the dominant social structure is more reliant on mediated communication to communicate across more diverse, specialized groups. Because there is also greater social distance among residents of a pluralistic city, urban media must also play a more active role as a forum for discussing potential responses to conflict when it arises. Thus, news media in larger, more pluralistic communities are more likely to engage in feedback control, openly covering sources of social conflict, in part to alert the social system to potentially destabilizing issues that must be addressed. (By making non-emergency reports to the city via SeeClickFix, users of the mobile app are similarly participating in feedback control.)

Tichenor et al.’s (1980) research originally focused on newspaper coverage of controversial development and environmental issues in Minnesota. In a series of studies (see also Donohue et al., 1985) they found that there was more coverage of controversial issues by newspapers in more structurally pluralistic communities. Later research examined how structural pluralism affected not only the volume of coverage, but how that coverage was framed (Griffin & Dunwoody, 1995; Griffin & Dunwoody, 1997;

Hindman, 1996; Jeffres et al., 2000; McCluskey, Stein, Boyle, McLeod, 2009; Watson, 2015; Watson, 2014a, 2014b). McCluskey et. al (2009), for example, studied 40 years of Wisconsin newspapers' coverage of social protest and found that newspapers in more pluralistic communities were more likely to frame protests in a positive light that legitimized the protesters' concerns than were newspapers in more homogenous communities. Griffin and Dunwoody (1997) found that newspapers in more pluralistic communities were more likely to link industrial pollution to threats to human health, especially when the source of the concern was a local industry. Watson (2015) found that not only were newspaper reporters in more pluralistic Gulf Coast communities more likely to frame the 2010 BP oil spill in negative light, but Twitter users' Tweets about the oil spill followed almost identical patterns. Watson's research (see also, Watson, 2014a) illustrates that the influence of structural pluralism extends beyond traditional media institutions and that despite today's cities being more interdependent, and in many ways more similar to one another (Donohue et al., 1985), community-level analyses still have explanatory utility.

Structural pluralism research has also examined the effect of structural pluralism on journalists' patterns of sourcing; journalists in a more pluralistic community are more likely to rely on minority (Hindman, Littlefield, Preston, & Neumann, 1999) and female (Armstrong, 2002) sources. More immediately relevant to this current study, however, is another strand of the structural pluralism literature that found that adoption of more advanced forms of public communication, including more advanced city government websites, increases with the degree of pluralism in a given community. Demers (1994a) found that from 1850 to 1990, as the U.S. became more structurally pluralistic,

investment in advertising as a percentage of Gross National Product also increased. This increased investment in advertising reflects a need to invest more in mediated communication in order to reach an increasingly diverse, segmented, pluralistic audience. Demers (1994b) also found that media competition and the number of corporate newspaper chains increased as society became more pluralistic. Both the growth in advertising expenditures and growth in newspaper competition have economic explanations, but Demers (1994a; 1994b) controlled for these economic explanations. He argued that economics alone can not explain these changes: More formalized, institutionalized forms of communication grew out of the *social* needs for diverse interests to communicate with an increasingly pluralistic society. He (1994b) argued that the growth of the corporate newspaper chain especially reflected an effort to pool resources and take advantage of economies of scale in order to fulfill the more complex communication needs of an increasingly pluralistic society.

Demers' (1994a) broader theoretical argument was that within any type of organization, as size and structural complexity increase, so do the need for more numerous, formalized forms of communication, such as "formalized goals and policy statements, written rules and procedures, job descriptions, interdepartmental memos, and letters, bulletin boards, and internal newsletters" (p. 38). The same can be said for the growth of city governments: The larger and more structurally complex the community they serve, the larger the administrative function of the city government becomes, and the greater number of communication channels the city can be expected to adopt to communicate with both internal and external constituents.

Armstrong (2008) lent support to this hypothesis. She found that county governments and school boards in more pluralistic communities were more likely to post 13 different forms of public records, for example, meeting agendas, meeting minutes, elected official contact information, procedure manuals, budgets, and audio/video content from meetings. Armstrong (2008) interpreted her findings in the context of greater government transparency, which she theorized increases under conditions of less concentrated control of social power in a pluralistic community. Her findings, however, could just as easily be interpreted in terms of cities adopting more advanced communication technologies necessary to communicate with, to coordinate the distribution of scarce resources among, and to maintain social control of, an increasingly large, structurally pluralistic community.

Community Stress

While structural pluralism is built upon underlying assumptions of social conflict and the need for increasingly complex, formalized communication in order to help manage that conflict in large, pluralistic communities, measures of social conflict are largely absent from previous structural pluralism studies (Armstrong, 2002; 2008; Donohue et al., 1985; Griffin & Dunwoody, 1995; Griffin & Dunwoody, 1997; Hindman, 1996; Jeffres et al., 2000; Olien et al., 1995; Tichenor, Donohue, & Olien, 1980; Watson 2014a; 2014b; 2015). That despite the fact that as Watson and Riffe (2011) pointed out, it is possible to imagine two equally pluralistic communities with very different levels of community conflict, in part as a function of the *loss* of social control in some communities.

Watson and Riffe (2011) sought to predict the presence of public affairs place blogs, “blogs primarily about the public affairs of the city being studied and written by an author, or authors, within that city” (p. 890). They found that the presence of these citizen blogs in their study of 233 mid-sized U.S. cities was positively predicted by a community’s degree of structural pluralism. This finding is significant because it shows that as pluralism increases, not only do institutions’ adoption of more advanced forms of communication increase, but so does *residents’ use* of these new forms of communication.

Watson and Riffe (2011) also found, though, that community conflict, or more specifically community stress, was a better predictor than was structural pluralism of the presence of public affairs place blogs. While it is difficult to directly measure the amount of conflict in a community, the community effects literature, which examines neighborhood and community-level contextual variables’ (i.e., community stress’) effects on residents’ quality of life, suggests that markers of community stress are manifest indicators of underlying social conflict and the loss of social control (Perkins & Taylor, 1996; Sampson, Morenoff, & Gannon-Rowley, 2002; Wen, Hawkey, & Cacioppo, 2006; Woldoff, 2002). *Social stressors* including crime, poverty, and homelessness; *physical stressors* include deteriorating infrastructure and abandoned properties. Researchers have primarily focused on the negative social reinforcement of contact with negative urban stressors and the negative effects they have on residents’ physical and psychological health. Others, however, have reinforced the notion that community stress (and the underlying social conflict it indicates) can not only lead to greater communication about,

but actions to attempt to manage, or cope with, sources of community stress/conflict (Bachrach & Zautra, 1985; Woldoff, 2002).

Watson and Riffe (2011) theorized that public affairs place blogs represented an effort by residents in larger, more pluralistic communities to cope with sources of community stress in their cities. Blogging might serve as a form of emotion-oriented coping that seeks to vent the emotional reaction to negative contact with urban stressors, but a more targeted app like SeeClickFix encourages a focus on task-oriented coping, which takes direct action (i.e., requesting assistance from the city) to directly resolve the source of stress, and thus is associated with potentially longer-term improvements in quality of life (Kariv & Heiman, 2005).

Networked Social Control

Watson & Riffe (2011) primarily focused on blogging as an *individual* effort to cope with community stress. This current study, however, focuses on SeeClickFix as a *civic* technology and a form of *community-level* social control, though we do assume that residents' use of SeeClickFix is potentially motivated by the presence of community stressors, some of which they are reporting via the app. Wellman et al. (2003) warned, however, that the digital revolution, of which civic tech generally and SeeClickFix specifically are parts, has contributed to a shift "from densely-knit and tightly-bound groups to sparsely-knit and loosely-bounded networks," weakening residents' connection and commitment to traditional forms of community (i.e., neighborhoods) (The Turn Towards Networked Individualism and E-Citizenship section, para 1). Citizens have been liberated from traditional geographies, including neighborhoods, due to advances in transportation, for example, that allow individuals to live and work in different

communities. There has also been a shift in traditional social units of the neighborhood (i.e., the household), facilitated by changing communication technology, for example, mobile phones, which link individuals, replacing landlines that linked places (i.e., homes/households).

These shifts have led to the rise of “networked individualism” (Wellman et al., 2003). Digital communication technologies and increased physical mobility mean that individuals have many weaker ties to many more proximate and distant networks. These networks make up “personal communities,” which individuals access depending on their *individual* needs. Wellman et al. (2003) acknowledged, “neighborly get-togethers and local intruders will keep the local important.” The erosion of tight-knit communities and the accompanied loss of informal social control, however, create a challenge for mobilizing residents to fulfill local communities’ collective needs, including social control.

One implication of the loss of informal social control among tight-knit neighbors is that the modern, pluralistic city requires more institutionalized forms of social control, including governmental control. The increased demand for governmental control, however, imposes additional burden on city agencies. Civic technologies, however, seek to make government agencies more efficacious, improving engagement and communication among residents and between residents and government agencies (Kontokosta, 2015).

A key difference between civic technologies such as SeeClickFix and the citizen blogs that Watson and Riffe (2011) studied, is that blogs are managed by their individual authors, whereas SeeClickFix is a single, centrally-monitored network. As a result,

networked individualism—residents using the same app to report potential problems that are individually important to them (e.g., a pothole along their morning commute)—is marshaled as an effective form of feedback social control without having to deploy additional public workers to monitor and report potential problems. The network of many individual residents making reports helps more efficiently direct public resources towards where they are most needed in order to solve public problems.

Hypotheses and Research Question

Mediated communication plays a central role in helping to coordinate and manage conflict over the distribution of limited public resources in large, structurally pluralistic societies (Olien et al., 1995; Viswanath & Demers, 1999). More specifically, the news media in pluralistic communities were historically expected to serve a feedback control function, alerting the social system to potentially destabilizing conflicts over these limited public resources (Olien et al., 1999). This is why larger, more pluralistic communities have generally had more news coverage of conflict (Griffin & Dunwoody, 1995; Griffin & Dunwoody, 1997; Hindman, 1996; Demers, 1994a; 1994b; Jeffres et al., 2000; McCluskey et al. 2009; Watson, 2015; 2014a; 2014b). However, the decline in the news media's fortunes means that media institutions can no longer fulfill the central social functions they once did, and pluralistic cities have had to turn to new communication media to fulfill these control functions.

As pluralism increases so does investment in more complex forms of communication (Demers 1996a; 1996b). This includes greater investment by cities in using their websites, and potentially other digital technologies, to communicate with, and coordinate the delivery of city services to, increasingly diverse constituents (Armstrong,

2008). Residents' *use* of newer forms of online communication is also more common in more pluralistic communities (Watson & Riffe, 2011). Thus, the first hypothesis is:

H₁: Cities' degree of structural pluralism will positively predict usage levels of the mobile app SeeClickFix.

Structural pluralism theory is predicated on the fact that diversification and specialization of interest groups vying for access to limited public resources result in higher levels of social conflict and that mediated communication plays a social control function, sustaining manageable levels of conflict (Olien et al., 1995; Tichenor, 1980). The success of efforts to manage social conflict, however, vary from city to city, as do markers of the breakdown of social control, such as social and physical community stressors (Perkins & Taylor, 1996; Sampson et al., , 2002; Wen et al., 2006; Woldoff, 2002). While community stressors can have negative effects on residents, community stressors can also spur positive communication about public concerns, including task-oriented efforts to ameliorate the source of community stress (Bachrach & Zautra, 1985; Watson & Riffe, 2011; Woldoff, 2002), potentially including residents' use of the SeeClickFix app to request city government assistance. Thus, the second hypothesis is:

H₂: Controlling for cities' degree of structural pluralism, community stress will positively predict usage levels of the mobile app SeeClickFix.

In addition to tracking statistics of residents' usage of the app, SeeClickFix also tracks a "Result Score" of how efficiently cities respond to residents' requests made using the app. Previous literature has not addressed population, structural pluralism, or community stress as predictors of the *effectiveness* of communication. Thus, we also pose the following research question:

RQ₁: Do structural pluralism and/or community stress predict the efficiency with which cities respond to residents' requests for service made via the SeeClickFix app?

Methods

Dependent Variables

SeeClickFix (n.d.) maintains a continuously updated list of 217 “Top Performing” communities. For the purpose of this study, non-U.S. cities (mostly Canadian), as well as non-municipal U.S. communities, such as neighborhood associations (e.g., the Melrose Mercy/Pine Acres Neighborhood Association in St. Petersburg, Florida) were eliminated. This left 195 communities.

From the list of communities the two measures reported by SeeClickFix were used as dependent variables in separate models. The “Activity Scores” is a measure of the total number of users, reports, comments, and “watch areas,” or geographically designated areas—i.e., blocks or neighborhoods—that users are following ($M=2537.77$, $SD=10058.16$, $Skewness=9.90$, $Kurtosis=113.73$).

The “Results Scores” is a formula that calculates responsiveness over the last 90 days. According to the formula provided on SeeClickFix's (n.d.) website, it's calculated as: the number of reports X (percent of reports fixed+(percent of reports fixed/average days for those reports to be fixed)) ($M=150.79$, $SD=177.74$, $Skewness=10.83$, $Kurtosis=137.89$). Because of the highly skewed distribution of both variables, both dependent variables were log transformed prior to analysis (Tabacknick & Fidell, 2007).

Independent Variables

Independent and control variables were all drawn from the U.S. Census Bureau's 2014 American Community Survey (ACS) 5-Year Estimates (U.S. Census Bureau,

2015). The ACS 5-year estimates provide more accurate data estimates and include smaller communities than other ACS estimates.

Structural pluralism. Previous structural pluralism studies have primarily measured structural pluralism based on the percentage of residents in individual Census categories (i.e., percentage of non-white residents) (Armstrong, 2008; Griffin & Dunwoody, 1995; Griffin & Dunwoody, 1997; Demers, 1994a; 1994b; McCluskey et al. 2009; Nah & Armstrong, 2011). This is problematic because a community that is 100% Black (i.e., Boykin, Alabama) is no more pluralistic than a community that is 100% White (i.e., Chewton, Pennsylvania). Measuring the distribution of the population across multiple census categories does not guarantee the distribution of social power (Gandy, 1999), but it does measure the *potential* distribution of social power, consistent with Tichenor et al.'s (1980) original definition of structural pluralism.

Thus, structural pluralism was measured using the Blau's index to measure the distribution of a city's population across *multiple* census categories (i.e., different social groups) (Blau, 1975; 1977; Watson, 2014a; 2014b; 2015). Blau's index measures the probability (ranging from 0 to 1) that two individuals drawn at random with replacement will be from different social groups. Based on Armstrong and Nah's (2011) review of commonly used measures, an index of structural pluralism was created by summing the Blau's index score for six U.S. Census-defined racial/ethnic groups, including Hispanic ethnicity, five education levels, from less than high-school to bachelor's degree or higher, 13 civilian industry classifications, and nine annual household income levels, ranging from less than \$10,000 to more than \$200,000. The index was divided by four,

preserving the 0-1 scale of the Blau's index for ease of interpretation ($M=.78$, $SD=.06$, $range=.54, .83$).

Community stress. Following Watson & Riffe (2011), community stress was measured based on an additive index of variables representing both social and physical community stress. The social stress variable was the percentage of a city's population living under the Federal poverty level. Watson & Riffe (2011) also used crime data from the Federal Bureau of Investigations (FBI) as a measure of social stress, but these data are only available for cities with at least 100,000 residents (Federal Bureau of Investigations, 2015). (One-hundred and forty-one communities in this study had populations less than 100,000). Physical stress variables included the percentage of vacant homes; percentage of renter-occupied homes, and homes built prior to 1959 – an indication of aging physical infrastructure in a community. The community stress index was also divided by the number of items ($M=.26$, $SD=.09$, $range=0, .48$).

Control Variable

Demers (1994a) rightfully pointed out that a community's population is perhaps the best single indicator of its degree of structural pluralism, at least in the U.S. The problem with population as a measure of structural pluralism, however, is that it can be highly correlated with other potentially confounding variables. To illustrate, a newspaper may contain more coverage of social conflict not because of underlying social dynamics as predicted by structural pluralism theory, but rather simply because there are more potential readers in a city, hence higher circulation, and in turn more available resources for reporting on all kinds of stories (including stories involving social conflict). Likewise,

it is also possible that the number SeeClickFix users simply increases with the size of the potential user base (i.e., the city's population).

To avoid the potentially confounding influence of a city's population, we treat population as a control variable. That is, we examine whether structural pluralism and community stress have any explanatory power beyond the effects of a larger city simply having more potential SeeClickFix users. With the inclusion of population as a control variable, the current study is an especially conservative test of the potential effects of structural pluralism and community stress on adoption of the mobile app.

Results

Data analysis was conducted in SPSS Version 22, using OLS regression. Due to their skewness, the dependent variables were log-transformed prior to analysis. Residuals from the regression models were checked for normality and homoscedasticity, confirming that the models met the statistical assumptions of OLS regression (Tabachnick & Fidell, 2007). Model 1 (Table 1) predicted cities' SeeClickFix "Activity Scores"; Model 2 (Table 2) predicted cities' "Results Scores." Model 1 predicted 12.8 percent of the variance in "Activity Scores" ($R^2=.128$); Model 2 predicted 6.3 percent of the variance in "Results Scores" ($R^2=.063$).

H₁ predicted that cities' degree of structural pluralism would positively predict usage levels of the mobile app SeeClickFix. As shown in Table 1, as anticipated, population positively predicted the "Activity Scores" ($\beta = .164, p=.022$). After controlling for population, structural pluralism also positively predicted use of SeeClickFix (and was actually a stronger predictor than was population) ($\beta=.222, p=.002$). Thus, **H₁** was supported.

H₂ predicted that controlling for cities' degree of structural pluralism, community stress would positively predict usage levels of the mobile app SeeClickFix. As also shown in Table 1, while controlling for population and structural pluralism, community stress positively predicted use of SeeClickFix ($\beta=.141, p=.043$). Thus, **H₂** was also supported. It is worth noting that contrary to Watson and Riffe's (2011) finding in regards to civic blogs, comparing the results of **H₁** and **H₂** in this current study, structural pluralism was a stronger predictor of use of SeeClickFix than was community stress.

RQ₁ asked if population, structural pluralism, and/or community stress predicted the efficiency with which cities respond to residents' requests for service made via the SeeClickFix app. As shown in Table 2, only population significantly, and negatively, predicted the SeeClickFix "Results Scores" ($\beta=-.245, p=.001$). The larger the city, the less efficient the city was in resolving complaints made via the SeeClickFix app.

Discussion

Extant structural pluralism literature has suggested that larger, more pluralistic communities adopt more complex, institutionalized forms of social control—including mediated communication—in order to sustain a manageable level of social conflict (Demers 1994a; 1994b; Olien et al., Tichenor, 1995; Tichenor et al., 1980; Viswanath & Demers, 1999). While prior research has primarily focused on traditional news media, this current study expands the literature by finding that use of the civic technology app SeeClickFix is also more prevalent in larger, more pluralistic communities.

While measures of social conflict are absent from many other studies of structural pluralism, this study also found that controlling for levels of structural pluralism, communities that had more manifest conflict (i.e., community stress) also had higher

usage levels of the app. To the extent that community stress is indicative of the traditional civic institutions' inability to maintain social control (Perkins & Taylor, 1996; Sampson et al., 2002; Wen et al., 2006; Woldoff, 2002), these data illustrate a turn to a new outlet to regain control. SeeClickFix fulfills some of the feedback control functions formally thought to be the purview of traditional news media, raising alarms about potential problems in a community.

Unlike Watson and Riffe's (2011) findings regarding civic blogs, however, structural pluralism, not community stress, was a stronger predictor of use of SeeClickFix. According to structural pluralism theory, larger, more pluralistic communities rely on more institutionalized forms of social control. City governments implement and centrally monitor SeeClickFix, integrating the mobile app into their bureaucratic processes for communicating with and managing citizens' concerns. Thus, SeeClickFix exists as a centralized network, which helps to marshal users' "networked individualism" for the collective feedback control needs of the social system. Citizen blogs, on the other hand, are non-centralized and highly customized by each individual author. As Riffe and Watson (2011) suggest, blogs can help *individual* residents cope with personal reactions to living in a stressful urban environment. However, lacking the more centralized, institutional coordination on which structurally pluralistic communities rely, decentralized networks of individual bloggers lack the coordination necessary to effectively serve the social control needs of a pluralistic community.

Tichenor et al. (1980) theorized that traditional media served as guard dogs for the dominant social structure, including via feedback control, because the media rely on the social structure for sources of information, profit, and prestige. This current study,

however, found that individual residents in larger, more pluralistic communities are also more likely to participate in feedback control via SeeClickFix. The concept of social control is not nefarious or undemocratic; rather, it reflects an investment in the maintenance, continuation, and adaptation of society (Viswanath & Demers, 1999). This social investment extends beyond institutional actors (i.e., local newspapers) that have more direct, material investment in the existing social structure. SeeClickFix users may be engaging in a particularly weak form of citizenship, reporting problems that only reflect a desire to control their immediate personal surroundings. Nonetheless, the act of reporting problems via SeeClickFix does reflect on some level a desire to contribute to the maintenance of society. This finding extends the existing structural pluralism theory, suggesting that as communities become larger and structurally more complex, not only is there greater institutional reliance on more complex forms of mediated communication, but there is also greater citizen use of these communication outlets, contributing to social control.

This study examines one civic technology. Future studies should examine a broader range of technologies, as well as focus more specifically on outcomes of their usage. This current study examined whether population, structural pluralism, and community stress predicted government agencies' responsiveness (i.e., the "Result Scores"). We were only able to predict single-digit variance in responsiveness, and the only statistically-significant predictor was population: The larger the community, the less responsive the city government was to SeeClickFix reports. This finding does not necessarily suggest less commitment to serving residents by larger municipalities, but may reflect a greater administrative burden of handling and responding to the larger

number of reports more pluralistic cities receive. Civic tech has as a goal, though, to improve the efficaciousness of community administration (Kontokosta, 2015). Thus, evaluating what factors contribute to better performance in responding to citizens' requests for services is an important consideration for future research.

Future research should also examine the social outcomes of using apps such as SeeClickFix. Beyond their social control functions, the traditional media also contribute to community integration, which in turn is positively associated with civic and political engagement (Friedland & McLeod, 1999; Kan & Kwak, 2003; McLeod et al., 1996; Stamm, 1985; Stamm, Emig, & Messe, 1997). While in the era of "networked individualism" traditional communities, such as neighborhoods, may not play as central a role in residents' lives, local communities nonetheless remains relevant (Wellman et al. 2003). Thus, it is worth asking whether residents' use of civic tech, including apps such as SeeClickFix, likewise lead to community integration, particularly in larger, more pluralistic communities in which social distance is greatest.

This current study did demonstrate, though, that even as contemporary cities are increasingly interdependent and similar, community structural research generally, and structural pluralism theory specifically, continue to hold promise for explaining a range of local mass communication phenomena, spanning institutional and individual user perspectives. Furthermore, the utility of the local community structure approach appears to have no less utility for explaining processes involving emerging media (i.e., mobile civic tech) as explaining traditional media, illustrating that virtually networked communication technologies have not rendered traditional administrative and

geographical boundaries—and local community—unimportant for consideration in future research.

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Tables

Table 1
Predicting SeeClickFix “Activity Score”

Variables	B	SE(B)	β	<i>t</i>	Sig. (<i>p</i>)
(Constant)	1.161	.454		2.556	.011
Population	1.41E-07	.000	.164	2.302	.022
Structural Pluralism	1.972	.628	.222	3.141	.002
Community Stress	.867	.426	.141	2.038	.043

Note: “Activity Score” was log-transformed prior to analysis; $R^2=.128$.

Table 2
Predicting SeeClickFix “Results Score”

Variables	B	SE(B)	β	<i>t</i>	Sig. (<i>p</i>)
(Constant)	2.173	.166		13.112	.000
Population	-1.54E-07	.000	-.245	-3.302	.001
Structural Pluralism	.352	1.062	.024	.332	.740
Community Stress	-.230	.327	-.051	-.703	.483

Note: “Results Score” was log-transformed prior to analysis; $R^2=.063$.