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Leveraging social media to achieve a community policing agenda☆

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ABSTRACT

This research investigates the communication behavior and engagement strategies in the bilateral use of social media between law enforcement agencies and the communities they serve. It advances existing work by studying municipal level government actors in a new communications environment where social media now play an important part. Grounded in agenda setting theory, our analysis identifies police departments' social media issue priorities, analyzes the responses of their audiences to those communications, and directly compares followers' own conversation priorities with the police agenda. Our data set includes all the content from the Facebook and Twitter accounts of five similarly sized and demographically situated police departments in the U.S., plus all the tweets and posts from the followers or friends responding to those accounts over a 90-day period. We performed both manual coding and machine cluster analysis to elicit major threads of conversation. In addition to the data analytics, we conducted interviews with the five police departments to understand the similarities and differences in agenda priorities resulting from their social media goals and use.

The study shows the priorities that comprise the police agenda, identifies both similarities and differences in what their audiences communicate among themselves about most frequently in the public safety domain relative to the police agenda, and finds evidence of positive response from the public to some of the agenda priorities communicated by the police. Our data also reveal that police are using social media interactively, which could, over time, advance community policing goals. The paper concludes by considering the implications of these findings for law enforcement and community policing and suggests directions for future research on agenda setting in this new media environment.

1. Introduction

Social media use by police departments has diffused widely and rapidly. Police social media use aims to reach the public, which includes both individuals (i.e., community residents) and organizations (e.g., peer police departments, media, and community groups). Most notably, social media has emerged as important for responding to crises (e.g., the Manchester, UK arena bombing,[1] Cleveland Facebook murder[2] and Orlando nightclub shooting[3]). However, law enforcement agencies still are experimenting with how to craft content, such as messages aimed at informing the community (notification) of events, rather than with involving citizens (interacting), connecting with the public (relationship building), or mobilizing the community (Edlins & Brainard, 2016; Kavanaugh et al., 2012).

While academic work has examined social media in private sector organizations, scant academic or practice-based work has rigorously

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[1] http://www.bbc.com/news/uk-england-manchester-40010366.
[2] http://www.newsweek.com/facebook-killing-cleveland-steve-stephens-stevie-steve-elderly-man-murder-585348.
[3] http://miami.cbslocal.com/2016/06/12/horrific-mass-shooting-in-orlando-unfolds-through-social-media.

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investigated non-crisis management patterns of appropriation and use among police departments. Police surveys suggest that most departments lack specific goals to guide developing social media strategies as well as to inform how to measure the success of social media efforts (International Association of Chiefs of Police, 2016). Further, while news reports underscore that emergency responders disseminate information using social media, we found little evidence of research that examines how police departments take advantage of social media or text analytics tools to assess how their audience responds to police department communications. Despite widespread recognition of social media's potential to support community policing[4] and a desire to leverage social media in that effort, many law enforcement agencies lack knowledge, training, time and financial resources to embrace new technologies quickly and to adapt to new patterns of use among stakeholders.

Given this limited understanding about how local law enforcement can analyze and leverage social media most effectively, we conducted a mixed methods study to identify and explain messaging patterns and community reaction to police social media usage. As described below, we ground our study of local policing and social media communications in agenda-setting theory. Understanding the interplay between police departments and their communities is the first step in the process of moving local issues and problems from the public agenda to a policy agenda whereby decision makers assess and respond to them (Birkland, 2007; Dearing & Rogers, 1996). Our study adds value to this discourse by examining whether social media can help establish and communicate a public agenda. To do so, we conducted interviews with five police departments and gathered social media data from Facebook and Twitter tied to those same five municipalities to garner understanding of how social media is used by local police departments to inform and respond to stakeholders as an agenda setting forum.

This article reports the baseline results of our mix-methods study of local policing and social media. We triangulate across quantitative analysis of actual tweets and Facebook posts and qualitative data obtained from interviews with the key informants responsible for social media at each of the five departments to glean insight into (1) whether and what agenda police generate in their social media messages; (2) evaluate the response to the police messages by the audience consuming them; and (3) determine the match between the emergent local police social media agenda and the topics that emerge in their audience's own conversations about police. Our self-report data from a subsequent survey of one of these police department's Twitter followers offers additional insights and a means to compare our methodological approach with correlational methods employed in traditional agenda setting studies. Our work provides a ground truth view of social media use, necessary for future research to glean insight into the power of social media to amplify local policing's impact on communities. Our objective then is to assess whether social media can be used to set and communicate a public agenda.

We begin by providing an overview of research on law enforcement and social media use. Next, we introduce agenda setting theory to explain potential patterns of police department social media use. Then, we describe our mixed methods of social media use by five local police departments and their audiences, and finally, results of social media use patterns found in this study. We conclude with a discussion of study results, limitations and future directions.

2. Literature review

Over time, social media interactions may help establish or enhance relationships between local police departments and stakeholders as online exchanges develop patterns of shared interests and understandings. In this section, we describe extant work on social media use by police to identify opportunities for developing a richer theoretical understanding of the interplay between local police use of social media and their interaction with stakeholders.

2.1. Social media use by police

We focus on two social media platforms: Twitter and Facebook. We do so because Twitter and Facebook, with the types of content they facilitate sharing (e.g., news, updates, comments, photos), represent the most commonly used social media platforms across United States police departments (International Association of Chiefs of Police, 2014).

Twitter and Facebook have been widely adopted by police departments in the U.S. A 2014 nationwide survey of social media use[5] by 500 U.S. law enforcement agencies reported that 95.4% use Facebook, followed by Twitter (66.4%) and YouTube (38.5%) (International Association of Chiefs of Police, 2014). In a 2016 survey by the same association (International Association of Chiefs of Police, 2016), notification of public safety concerns tops the list of social media uses (91%) followed by community outreach and citizen engagement (89%), public relations (86%) and notification of non-crime (traffic) issues (86%).

While widely adopted, evidence suggests that police departments operate with relatively lean social media budgets, which may hinder their effectiveness. Edlins and Brainard (2016) suggest resource and policy shortcomings explain inconsistent patterns of change in social media behaviors exhibited by the top ten U.S. police departments between 2011 and 2012. Adapting to new trends is the top barrier to successful police department social media use, followed by measuring the impact of social media and training personnel on its effective use. Social media policies are still evolving (11% in process; 9% lacking) and only 33% have identified measurable goals for the successful employment of social media resources. Many anecdotal compilations of social media practices and performance corroborate these patterns (cf. connectedcops.net and the European COMPOSITE project (Denef, Kaptein, Bayerl, & Ramirez, 2012)).

As much as lean budgets, some evidence suggests that context and path dependencies lead to differences in communication strategies across agencies (Meijer & Thaens, 2013; Yavuz & Welch, 2014). Variation in the amount and frequency of police-related social media activity can be a function of citizens' age and education (Ruddell & Jones, 2013) as well as citizen interests (selective attention) and features of the communication (van de Velde, Meijer, & Homburg, 2014). Citizens primarily redistribute what government agencies or police departments disseminate on social media, with crime and incident reports predominating (Heverin & Zach, 2010; van de Velde et al., 2014). In a recent U.S. study of large municipal police departments, Huang et al. (2016) find that the topics of Facebook messages posted by police departments are primarily about crime, traffic, and other announcements. For many government agencies and/or police departments, this variation in the amount and frequency of social media activity is often a function of both external factors (constituency demand characteristics such as urbanization (Thackeray, Neiger, Smith, & Van Wagenen, 2012) or population (de Guzman and Jones, 2012; Oliveira and Welch, 2013; Yavuz & Welch, 2014)) and internal capacities such as bureaucratization (Oliveira and Welch, 2013 and Yavuz & Welch, 2014), organization size and resources including budget and staff (Kavanaugh et al., 2012), superiors' resistance, managerial support and training (Briones, Jin, Kuch, Liu, & Jin, 2011).

[4] Community policing is a philosophy that promotes organizational strategies, which support the systematic use of partnerships and problem-solving techniques, to proactively address the immediate conditions that give rise to public safety issues, such as crime, social disorder, and fear of crime." http://www.cops.usdoj.gov/html/dispatch/january_2008/nugget.html.

[5] Results reported here are from the 2014 survey, which corresponds to the year of our data collection. Newer results from 2016 are available, reporting very similar statistics. (See IACP, 2016).

What is notable is that when using social media, public sector agencies generally and police departments in particular primarily disseminate information about their organizations and their activities, but rarely offer opportunities for engagement or what is also known as dialogic communication (Brainard & Edlins, 2014; Crump, 2011; Hofmann, Beverungen, Räckers, & Becker, 2013; Lovejoy & Saxton, 2012; Mossberger, Wu, & Crawford, 2013; Waters, Burnett, Lamm, & Lucas, 2009). That is, communication is typically one-way and asymmetrical (Waters & Williams, 2011). In their study of social media use by the 10 largest U.S. municipal police departments, Edlins and Brainard (2016) find that, over time, increased levels and kinds of social media use and adoption of standards for best practice has been slow and slight, and evidently more constrained, especially its use for dialogic communication with citizens. Their findings build on their earlier work showing that police departments primarily use social media for information dissemination rather than interactions with citizens or local organizations.

When dialogic, social media use generates additional forms of engagement for a limited group of people relative to face-to-face contact, especially in routine police patrol work, but less so in time-critical situations (Meijer, 2014). In a comparative study of social media use by different kinds of organizations, Bird, Ling, and Haynes (2012) find that users perceive government agency communications to be more accurate than those of community organizations, but the reverse was true for their perceived timeliness and utility. In a Korean study, Porumbescu (2016) found that social media use increased both trust in and satisfaction with government agencies. Grimmelikhuijsen and Meijer (2015) conclude from their findings that social media, and specifically Twitter, helps police strengthen their legitimacy somewhat, for a small group of interested citizens.

Interestingly, Facebook posts that generally involve 'networking' – posts about police department personnel that seek to increase familiarity and engender trust with citizens – receive more 'likes' than posts that broadcast information or that seek help from the community. Huang and colleagues also find that 'help requests' (to solve a crime or find missing persons, for example) generate more shares and comments than networking posts or broadcast information types of posts. It is clear that characteristics of posts such as their purpose or criticality results in differential rates of dialogic communication. Also important to note, one way communication is not always bad, as some researchers (e.g., Waters & Williams, 2011) have argued that one-way asymmetrical communication is the most useful and appropriate in certain law-enforcement situations such as emergencies. For example, Muralidharan, Rasmussen, Patterson, and Shin (2011) found that non-profits and news organizations effectively used social media for one-way dissemination and disclosure of information, but not for two-way communication during the Haitian earthquake. These findings suggest there is a need for research on local police and social media that understands when, or what forms of information, are best disseminated using one-way or dialogic communication strategies.

Moreover, whether one way or dialogic, research into stakeholder perceptions of police social media use shows that it sometimes helps realize community policing goals. Accenture (2012) found that three quarters of these respondents to a survey of 1300 citizens in six countries (U.S., Canada, U.K., the Netherlands, Germany and Spain) would like to see police use more digital channels to bridge the communications gap and increase citizen involvement in policing. These respondents preferred using Facebook (81%) and Twitter (35%), which aligns with the social media platforms departments have adopted. Further, research indicates that when local police departments use social media, they can increase public confidence (trust) and satisfaction (effectiveness and perceived legitimacy), which are key goals of the move toward community policing (Meijer, 2014; Ruddell & Jones, 2013). While preferred by citizens and law enforcement, it is worth noting that the number of followers of police social media accounts remains low, and the number and frequency of posts, comments or likes by the public to law enforcement posts is also generally low (Thackeray et al., 2012). This suggests a need for a richer understanding of how local police departments can engage more effectively with stakeholders through social media and thereby win their trust and increase satisfaction.

In summary, then, police department social media strategies are effective in particular situations, particularly crises, but we know much less about when to employ one way or dialogic social media strategies that can inform how local police departments support community policing. Understanding how to craft a social media strategy that offers timely information to stakeholders is critically important, as evidence suggests that this can increase the trust placed in them by members of the community. We next present Agenda Setting Theory as a means to inform understanding of local police departments' social media strategies and stakeholders' response to them.

2.2. Agenda setting theory

Agenda setting theory offers a useful lens for understanding and evaluating the formation and effectiveness of police social media strategies. Agenda setting refers to the process of identifying, recognizing and defining certain issues, problems or opportunities such that messages prompt leaders to generate and consider solutions or alternatives (Liu, Lindquist, Vedlitz, & Vincent, 2010). Traditionally, the domain and siting of agenda setting research directed attention to the transfer of issue salience from the mass media agenda to the public agenda, as manifest in the discussions and decisions of rulemaking bodies such as legislatures or city councils. For example, agenda setting research described and explained how the placement and amount of coverage accorded news stories shape public opinion about which issues and topics of the day become important (McCombs, 2014; McCombs & Shaw, 1972). Some later studies focused on how the repetition of a story or message on mass media would translate into the policy agenda of legislators (e.g., Birkland, 2007; Liu et al., 2010).

Dearing and Rogers (1996) differentiate the "public agenda setting" stream of early research (e.g., McCombs & Shaw, 1972) that compares the news media's ranking of issues by the amount and prominence of their coverage, with the public's ranking of the perceived importance of these same issues using self-report surveys from "media agenda setting" studies concerned with the influences on it, their causes and consequences, and from "policy agenda-setting" studies of the impact of media agendas on public policy agendas. We adopt Birkland's (2007) model, which conceives of these three types as different levels that follow sequentially and constitute the agenda setting process. We position our study within the first and second levels, and expand the early conception of who sets the agenda from news media to other actors and to the realm of local politics and governance.

Whereas before research could focus on news disseminated by radio, television, or print media, the advent of the Internet has led to a myriad of new communication channels and sources that inform decision makers and thought leaders who set public agendas (McCoombs, 2005). Indeed, at the local level, information disseminated across Internet channels by local leaders, government actors and interest groups may be more influential than mass media (Liu et al., 2010). For example, informal or social communication found on social media platforms such as Facebook or Twitter functionally operate as alternative channels of information to traditional media that can reinforce or dissipate concerns about issues such as fake news, immigration, and more (Erbring, Goldenberg, & Miller, 1980; Sayre, Bode, Shah, Wilcox, & Shah, 2010). The expansion of communication channels has relaxed the constraint of studying large scale distribution of identical messages on mass media and afforded opportunities to direct attention to understanding how local actors, such as police departments, set agendas, or themes, through tailored or focused messages that they share with stakeholders (McCombs, 2014).

In this new environment, agenda setting theory helps us frame our

investigation of how local police departments use social media to set agendas, where agendas are set, and how to evaluate whether communications and associated agendas have changed fundamentally. McCombs et al. (2014) suggest that in this vastly expanded communication environment, people balance the agendas of the civic community with their valued reference communities or social networks through a process they define as agenda-melding. Their model melds three agenda-melding sources: media that reach out vertically to broad general audiences such as newspapers, radio and television; media like magazines, blogs, websites and Twitter that reach out horizontally to audiences with special interests; and individuals' personal values. The agendas of the horizontal and vertical media each have an independent influence on the public whose personal values serve to moderate their influence and maintain balance. Because police converse in a special-interest community concerned with many aspects of public safety, our study of social media exemplifies horizontal media influence.

By applying agenda setting theory, we develop a rich explanation for how local police departments leverage social media to direct public perception of their agenda, and for how the public perceives and talks about public safety issues in their community. In addition, our study offers a means to evaluate the effectiveness of their engagement with stakeholders.

Social media offers local police departments many opportunities to set the agenda on issues that affect their ability to serve the community, whether that agenda aims to establish credibility or trust, to communicate important public safety information, or to source information from recipients of a message. Research has discovered many issue characteristics that can mediate agenda-setting effects (Meraz, 2009). These effects are stronger with unobtrusive or unfamiliar issues (Winter, Eyal, & Rogers, 1982), with more concrete issues (Yagade & Dozier, 1990), with events that involve drama and conflict (Wanta & Hu, 1993) or partisan framing (Cornfield, Carson, Kalis, & Simon, 2005), and a short time frame (Zucker, 1978). Some evidence shows that online media can set the agenda for traditional media (Cornfield et al., 2005; Sayre et al., 2010; Schudson, 2009) and for users of online media (Roberts, Wanta, & Dzwo, 2002). Thus, it appears that new media have the ability to change both the way information is delivered and how it is received by users (Simmons, 2008).

We suspect that social media is a particularly rich source of unobtrusive measures of the public agenda (McCombs (2014). Indeed, feedback from the messages and signals sent back to policy makers is one of the most important ways problems or opportunities gain their attention. In practice, when friends and followers of a Twitter account retweet, @ mention and or like tweets, the public is providing feedback about the problems identified in the agenda communicated by those government officials. We analyze this user-generated content on social media as a means to assess issue salience, that is, the attention its audience accords to specific topics. With these data, we can assess whether and how effective police online presence is for setting and communicating their agenda.

To understand the police social media agenda and the public's reaction to that agenda, we examine which types of issues are salient to each. Categorizing their content allows us to compare the two and assess the achievement of police goals if there is a match between police messaging and positive reaction to those messages. As an initial step toward establishing this match, we seek to answer specific questions that collectively contribute to the assessment and achievement of the police agenda. These include: When members of the public communicate about the police, do they emphasize the same or different topics and hence priority of concerns? Do certain types or characteristics of police-generated messages elicit stronger reactions (e.g., through "liking," "sharing" and "commenting") by the audience? These behaviors signal an evaluative judgment that particular content strikes a chord with the public. Audience reactions to police messages suggest the public is responsive to the subject in the police posts, and a match between message intention and reaction would contribute to the aims of the social media agenda.

3. Research approach

This research explores agenda setting behaviors inherent in social media use by local police departments and their followers. To do so, we collected and analyzed all the posts and reactions from five U.S. police departments over a ninety-day period. We examined the types of messages posted by police departments as a broad-brush portrayal of the content of their intended agenda. To this end, we conducted three sets of analyses of how local police departments use social media, specifically, Facebook and Twitter to set agendas and their audience's response.

- **Analysis of local police department agenda setting activity**
  In our first step, we content analyzed tweets and Facebook posts by five local police departments to discern whether identifiable patterns and categories emerge, such that their social media activity might be construed as agenda setting. We explored whether these patterns exist across the five police departments individually as well as collectively. Our results then informed deeper probes into the demographics and organizational context of the departments. By doing so, we were able to assess whether patterns in agenda content persist across departments, or whether each department pursued an agenda that promoted a distinct view of community policing.
- **Mapping the local police department agenda to public reaction**
  In our second step, we analyzed Twitter and Facebook data from community members that were either (1) a response to the local police posts or (2) direct messages about police. For this next task, we conducted two sets of analysis to determine whether there were discernable patterns of social media interaction between the five departments and their communities as well as within those communities around the police agenda.
  In the first of these, we probed whether specific sets of issues evoked audience responses, and what kinds (i.e., likes, comments, and shares) to determine whether the community is attentive to the police agenda. This provided an initial picture of the nature of public discourse, by establishing the categories of messages shared by police that their audience found most salient. This analysis demonstrates the utility of social media as a vehicle for communicating with citizens on matters police consider important, that is, worthy of public attention and input, which speaks to the underlying question of whether social media can be used to set public agendas.
- **Conversations about local police departments**
  We next examined what members of this social media community talk about when they mention police. This gives us a measure by which to gauge agenda setting effects. The purpose here is to ascertain the public's perspective on the police agenda and determine whether the issues that are salient in their communications are the same as those raised by the police. From this we can infer whether their audience accepts the agenda reflected in the types of messages the police share. That is, this second analysis lets us evaluate whether the police social media agenda can influence the content of community conversation around policing and its dissemination across wider networks.

4. Data

4.1. Police department data

This study reports analyses of social media data gathered from five U.S. police departments in the state of Massachusetts (i.e., the towns of Billerica, Burlington, Peabody, Waltham, and Wellesley). Table 1 shows that the five police departments represent communities of similar size and suburban demographics. They also exhibit varying levels of police

Table 1
Community demographics.

Locale	Population (2010)	Median income (2010)	Median age (2010)	Area (sqr. miles)	Police dept. budget (2012)	Twitter followers (2014)	Facebook friends (2014)
Billerica	31,029	$88,084	40	26.4	$6,994,575	11,534	609
Burlington	24,498	$90,856	42	11.9	$6,561,398	9265	1469
Peabody	51,251	$64,322	45	16.9	$9,161,116	5163	977
Wellesley	27,982	$130,575	38	10.5	$5,295,047	7188	390
Waltham	60,632	$66,940	34	13.6	$13,623,218	6264	208

Table 2
Tweets and Facebook posts by police departments.

Department	Number (%) of tweets	Number (%) of Facebook posts
Billerica	1046 (51.1%)	769 (62.8%)
Burlington	643 (31.5%)	231 (18.9%)
Peabody	21 (1.0%)	62 (5.1%)
Waltham	205 (10.0%)	57 (4.7%)
Wellesley	129 (6.3%)	105 (8.6%)
Total	2044	1224

Table 3
Interviews.

Department	Interview date(s)	Informants' rank & or job title
Billerica	4/10/2013 and 8/26/2014	(2) Lieutenant & Communications Manager; patrol officer
Burlington	4/15/2013 and 10/3/2014	Lieutenant and social media manager
Peabody	4/25/2013 and 9/16/2014	Media Relations Specialist & dispatcher
Waltham	4/18/2013 and 8/25/2014	(2) Sergeant & Personnel Assignments Officer; patrol officer
Wellesley	4/16/2013	Sergeant and social media initiator

social media activity (shown in Table 2). The study's data sets include content from Facebook and Twitter accounts of the five police departments.

We extracted the data in August 2014, using public APIs provided by Twitter and Facebook. Both the Twitter and Facebook data covered the period of May 1st through July 31st, 2014. The Twitter set includes all the tweets made via the official police department Twitter account as well as all the tweets from the followers of that account. The Facebook data include all posts made on the official police department Facebook wall as well as any responses to those posts. The resulting data sets contain almost three million tweets and 1348 Facebook posts with the total data set comprising nearly eight gigabytes. In the Twitter data, the five Massachusetts police departments posted 2089 tweets over the three-month period.[6] During data cleansing we removed tweets or Facebook posts that contained no useful texts (e.g., a single character, an incomplete URL, etc.). The resulting samples consisted of 2044 valid police-generated tweets and 1224 police-generated Facebook posts. Table 2 shows the breakdown by town.

Note that Twitter users have the option of having tweets post automatically to Facebook. For Billerica, all 769 posts on Facebook were reposts from tweets. For Burlington, 223 of the 231 posts originated as tweets while the remaining 8 posts were created directly on Facebook. For the remaining three police departments, none of the posts originated from Twitter. Because these 992 (81%) Facebook wall posts originated directly from Twitter, the analysis that follows omits posts that duplicate tweets.

In addition to our quantitative analysis on the initial police department data, we conducted a set of interviews with the individuals responsible for social media in the five police departments to understand their organizational context, motivations and current technology use. Table 3 lists the interviews conducted for this part of the study. We asked each interviewee a series of pre-specified questions related to their department's social media policies and activities. We manually recorded responses and used the resulting transcripts to assist in the understanding of the patterns discovered in scraped posting data.

4.2. Followers' data

Among the 3 M tweets, 2.85 M tweets were generated by 13,652 unique Twitter accounts, which were the followers of the police departments' Twitter accounts. In these 2.85 M tweets, followers wrote about a wide variety of topics (e.g., meals, pets, sports, and travel). We needed to extract only those tweets that were related to policing. From the 2.85 M tweets, we extracted those tweets that discussed policing in some manner using pattern matching (i.e., finding tweets mentioning the police Twitter accounts using the @ symbol and hashtags, as well as texts containing keywords such as “police”, “police department”, “Billerica PD”, etc.). The result was 191 K tweets (6.7% of total) generated by 6411 unique follower accounts (47.0%).

For the Facebook data, we were interested in the posts made on the police department pages. Some police departments allowed followers to post on the police wall while others did not. And unlike Twitter, because of how Facebook handles security, we were unable to get the wall posts of the individual followers. Both the Twitter and Facebook posts are public data scraped in accordance with the privacy policies established by each platform. Apart from the five police departments whose permission we obtained, we do not identify any account, follower or user, nor specific posts of those individuals. Our institution's human subjects review board approved the data extraction and cleansing processes used in this research project.

5. Method

We used several methods to prepare the data needed to answer our research questions. We first performed content analysis on the 2044 tweets and the 232 non-Twitter-originated Facebook wall posts created by the five police departments using a manual, open coding approach. Ten categories emerged in this process: Accident, Announcements, Crime, Events, Interaction, Promotion, Property/Pets, Safety, Traffic, and Weather:

Accident – Information about a specific incident such as a vehicle accident or a personal injury that might need medical attention.
Announcements – Messages containing general information, news, etc.
Crime – Messages related to a specific criminal incident. Seeks public assistance in solving a crime, reporting updates or arrests related to a crime.
Events – Information about a future activity often with a specific date and time. Messages aim to generate participation in the event.
Interaction –Messages aimed at a specific individual or individuals

[6] Note that there were other police/town related Twitter accounts that were not part of this initial analysis such as a K-9 and Animal Control account.

rather than information to the general public, or responses to them from others.
Promotion –Messages aimed at influencing the police department's image or policing in general.
Property/Pets – Messages informing public about lost and found, and pet care (e.g., hot car warnings).
Safety – Warnings to the public about safety concerns such as fraud schemes, ways to protect home or children, and general safety tips.
Traffic – Messages notifying the public either to avoid an area or that a prior avoidance is cleared up.
Weather – Messages providing the public with information about a weather event and needed preparations.

Two team members coded each message with an inter-coder reliability of 86% and Cohen's Kappa of 73%. Because these categories were not necessarily mutually exclusive, it was possible that the content of a message was related to more than one category. In this case, the category that captured its most prominent content was assigned to the message. For example, a message may be a response to a question by a specific individual regarding a traffic accident. Since the message was directed to the particular individual (using the @ sign), it was coded as Interaction rather than Traffic. Promotional messages specifically mention the department, police officers or policing activities. All messages that were coded differently were resolved by the in-depth discussion between the two coders in face-to-face meetings. In the meetings, they revisited the original Twitter or Facebook pages where those messages appeared, read the messages and the comments carefully, and exchanged opinions about message content before reaching an agreement. Eventually, each tweet or Facebook wall post was assigned a single, primary content category code using the 10 categories. We then analyzed the tweets based on the category and the top terms extracted for each category (see Table 4). The categories that proved the most challenging to distinguish were Traffic and Accident.

Due to resource limitations, the supervised approach taken with the police department tweets could not be used for the large number of Followers' tweets. Instead we turned to unsupervised methods to extract and classify relevant follower tweets. We began by conducting topic and clustering analysis using SAS Enterprise Miner to identify the categories of topics in the followers' tweets mentioning these police departments (N = 190,974 tweets from 6411 separate accounts). Based on the extracted high-frequency keywords representing each cluster (see Table 5), we identified nine topic clusters: Accident, Announcement, Crime, Events, Interaction, Promotion, Property/Pets, Safety, and Weather.

All nine topic clusters from analysis of the public reactions replicate categories produced by the manual coding of the police data. Recall that the police data resulted in ten total categories. The only topic not emerging from the Followers' tweets was traffic. This is not surprising since we had high overlap between those two categories in the manual classification of the police tweets.

6. Findings

6.1. Analysis of local police department agenda setting activity

Table 6 shows the distribution of police-generated tweets and Facebook posts across the ten manually coded categories. On Twitter, Announcements are the most commonly occurring category of police tweets (23.5%), followed by Traffic (18.1%) and Interaction (16.2%). The least common categories are Promotion and Events (together about 2.7%). Accidents, Safety, Crime, Weather and Property/Pets fall in the middle (average between 3 and 13%). On Facebook, the two most common categories are Traffic (25.2%) and Accidents (20.4%); and the least frequently posted categories are Events (1.4%), Property/Pets (1.3%), and Weather (0.9%). Overall, Announcements (20.9%), Traffic (20.8%) and Accidents (16.1%) were the most commonly circulated categories on social media, accounting for over half of all police generated content.

It is likely that police see less public safety relevance and therefore ascribe lower importance to Weather, Property/pets and Events, the kinds of non-critical issues the nationwide IACP survey ranked low in concern. They also reasonably could conclude that the public has other, better sources for information about Weather, Property/pets and Events and this category is not worth much social media resource investment.

The Crime finding is interesting and worthy of further examination in future research. Police in these five communities do not tweet frequently about crime despite its being a top job priority in general, and a highly valued social media purpose identified by the IACP nationwide survey in particular. This may represent reluctance on the part of the police, as crime is a sensitive topic for police at the same time it is one of the most pressing concerns for citizens, especially when the crime has observable (and typically negative) effects on them and/or their community. This also might be explained as reluctance on the part of civic leaders for projecting a bad image within and without the community. Alternatively, it may be the case that the number of shared crime posts is low because the ones police do share are those for which the police need to warn the public, or are intended to request aid from the public to locate suspects or gather crime-related information. In other words, crime information may be shared only on a need to know basis: public safety is at risk, or the public can help solve a crime. Our police contacts identified security concerns, legal constraints and a general unease about the medium among sworn officers and their superiors to explain the dilemma of whether and how to treat this topic in social media communications.

These findings show that police departments actively use social media as a means of keeping the public informed about many aspects of their work that together comprise their intended agenda. We can only infer how well actual posting patterns reflect departmental intentions and goals. Additional insight on this match can be obtained from our interview transcripts.

As indicated by a Billerica police officer and Communications

Table 4
Topic clusters from the tweets of the police departments.

Topic cluster	High-frequency keywords[a]
Accident	Accident, report, xx, mv, rd, route, boston, salem, concord
Announcement	Police, billerica, +story, daily, week, burlington
Crime	Arrest, old, yr, +male, billerica, +warrant, assault, +steal, upload
Events	Burlingtonpd, burlingtonma, today, winn, blood, legion, American, parade, run, bcattv
Interaction	Follower, +thank, good, burlingtonpd, +do, +get, nice, poltwt, yes
Promotion	Police, urban, day, shield, nemlec, swat, bpd, sgt, photo, media, congrats
Property/pets	Billericaac, call, +see, +miss, +know, +find, ac, please, area, +thank, rd, +belong, dog
Safety	+radkidsorg, +car, +scam, +child, +get, burlingtonpd, please, +kid, burlingtonmafd, safety, irs
Traffic	Possible, report, xx, rd, st, +vehicle, +disable, down, traffic, tree, +road
Weather	+flood, +tornado, +storm, severe, Middlesex, wpd, +area, nwsboston, +warning, wcvb, rain

[a] Terms with a + symbol indicate that there were multiple derivations of the word condensed into the single term.

Table 5
Topic clusters from the tweets of the police departments' Twitter followers.

Topic cluster	High-frequency keywords
Accident	+crash +police +road +scene +street accident car
Announcements	+report +school +service +time + campus +story +home +officer +public bluealertus
Crime	+arrest +help +home +public +robbery +search +shooting +suspect +case
Events	+happy +keep +support 4th community fireworks follow
Interaction	"Good luck" + keep +morning +time best better family friend
Promotion	+academy +full +honor +life +service +station +time + week +duty +hero +law +memorial +officer +service
Property/Pets	+people +police 7news bostonglobe found policing wcvb woman
Safety	"Week 2014" + page +post album facebook hpdpresslog incident kids
Weather	"Severe thunderstorm warning" + county +ma + state +thunderstorm counties hampden hampshire

Table 6
Combined distribution of police generated Twitter and Facebook posts by category.

Category	Number (%) of tweets	Ranking of tweets highest % = 1	Number (%) of Facebook posts	Total (%) of social media messages
Accident	275 (13.5%)	4	250 (20.4%)	525 (16.1%)
Announcements	481 (23.5%)	1	201 (16.4%)	682 (20.9%)
Crime	176 (8.6%)	6	122 (10%)	298 (9.1%)
Events	38 (1.9%)	9	17 (1.4%)	55 (1.7%)
Interaction	332 (16.2%)	3	66 (5.4%)	398 (12.2%)
Promotion	17 (0.8%)	10	186 (15.3%)	203 (6.2%)
Property/Pets	56 (2.7%)	8	16 (1.3%)	72 (2.2%)
Safety	219 (10.7%)	5	44 (3.6%)	263 (8.1%)
Traffic	369 (18.1%)	2	309 (25.2%)	678 (20.8%)
Weather	81 (4.0%)	7	12 (0.9%)	93 (2.8%)

Table 7
Town distribution of police tweets by category (ranks: 1 = most tweeted; 10 = least tweeted).

Category	Billerica		Burlington		Peabody		Waltham		Wellesley	
Accident	24%	2	1.4%	9	42.9%	1	4.4%	7	4.7%	5
Announcements	19.5%	3	27.7%	1	0		27.8%	1	25.6%	2
Crime	11.6%	4	3.6%	7	0		13.7%	4	3.1%	7
Events	0.3%	10	4.5%	6	0		1.5%	9	3.9%	6
Interaction	10%	6	24.1%	2	33.3%	2	23.4%	2	13.2%	3
Promotion	0.5%	9	1.4%	9	0		0.5%	10	1.6%	9
Property/pets	3.7%	8	1.4%	9	0		2.9%	8	1.6%	9
Safety	4%	7	21.9%	3	0		16.1%	3	2.3%	8
Traffic	24.6%	1	8.7%	4	4.8%	4	5.9%	5	33.3%	1
Weather	10.8%	5	5.3%	5	19.0%	3	4.9%	6	10.9%	4

Manager, and corroborated by other departments' interviewees, departmental social media priorities are: first, sharing knowledge, raising awareness, and educating the public; and second, to familiarize the public with what they do and make the police department visible to them. These two goals appear to match up well with the range of categorical posts in our data sample. We observe that our police department interviewees are consciously using social media as an outreach tool. The Media Relations Specialist that we interviewed from the Peabody police department captures this motivation explicitly in his comments: "Social media is a means to communicate with the community and facilitates their talking back", i.e., by cooperating to provide feedback that assists police functions. He goes on to say that longer term, "down the line," his objective is to build a relationship with his followers so they are not afraid to communicate with and trust their police department. To aid in relationship building, he personally responds to questions from citizens with accurate information. (We note that meeting these communication priorities comes with a cost, as evidenced by the list of top challenges provided by our Waltham police department Personnel Assignments officer: "it is hard to generate new content frequently.") Taken together with the findings in Table 6, we see that there is a range of message types that police departments communicate on social media to establish and share their community policing agenda.

In addition, police also want to get out in front of stories that often first appear in local media (e.g., by local TV stations or newspapers). Their Public Information Office prefers to be the source of record for breaking police news, to forestall incorrect "facts" or to dispel rumors from circulating. Reflecting on these informational and visibility priorities, the Billerica interviewee explains that "the public shouldn't rely on the media; they [the police] want to speak for themselves and to counter misinformation; the media often only report bad news or conflict". In other words, police prefer to set the agenda rather than having to respond to an agenda set in the media. Social media enables the police to disintermediate (horizontal) agenda-setting from the (vertical) print or televised media.

6.2. Variance in local police department social media content

Table 7 and Fig. 1 present the number and percentage of tweets of each topic category by town. The most and least common categories are similar across all five towns. A series of Wilcoxon signed rank tests show no statistically significant differences among the rankings of these categories across the five police departments (with p-values ranging from 0.144 to 0.878). This may reflect an inherent understanding of topics most appreciated by followers, or it may simply be that the number of postable items occurs at similar rates in these demographically similar towns. Despite the failure to find a statistical difference in rankings across the board, there are, however, noteworthy

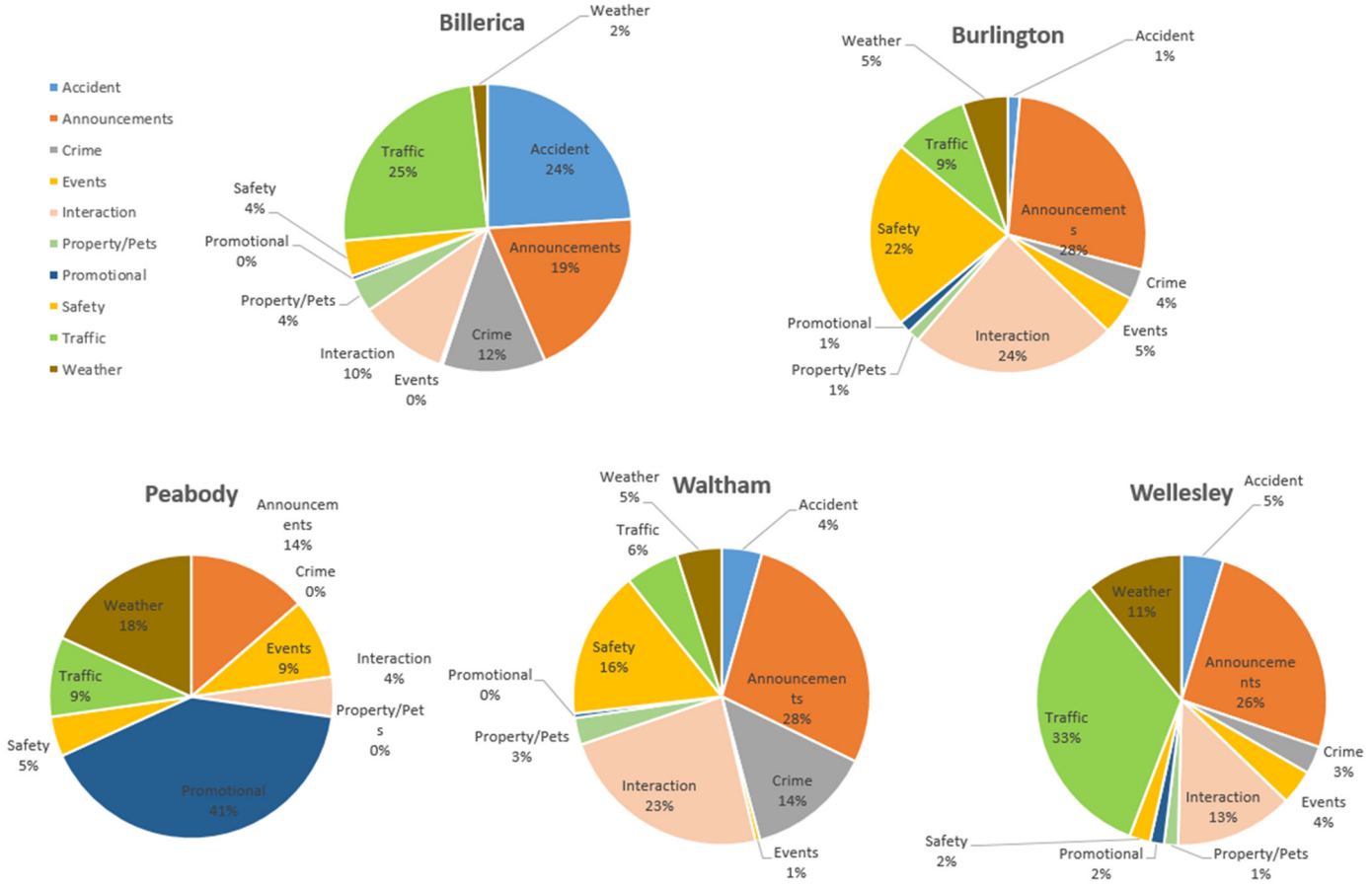

Fig. 1. Distribution of police department tweets by category and town.

differences on two of the middle categories, Accidents and Safety. The towns vary from 1 to 43% with Billerica and Peabody as outliers on Accidents (24% and 43% versus less than 5% for the other towns), and both Burlington and Waltham are outliers on Safety (22% and 16%, respectively versus less than 5% for the others). Our findings corroborate those of Hofmann et al. (2013) who likewise report both similarities and differences in topics posted by German city governments. We turn to demographic and interview data for enlightenment on our two differences.

Initially we sought an explanation by comparing indicators such as the number of accidents, miles of roads or population density across towns, but found no pattern. In responding to our follow-up inquiry about Billerica's high Accidents representation among their tweets, we were told[7] that they automated the reporting of traffic incidents. These were pushed out to social media directly from their dispatch system. This functionality was added after our Billerica interview of a year earlier. It demonstrates how technological advances in social media can have a strong effect on posting patterns even over a relatively short time period.

This observation further illustrates the differing levels of sophistication and methods of content creation that exist among police departments today. Our Peabody police department contact made this point explicitly. Peabody uses Facebook most of all, then Twitter, Nixel, Instagram, Envivo and YouTube. Twitter is connected to the mobile app My police department ("MyPD"), which sends notifications to iPhones. Unlike other police departments in his experience, our contact consciously thought about what content to send where and did not disseminate everything in every medium. On the other hand, at Burlington, the Lieutenant and Social Media Manager we interviewed noted that the uses of Facebook, Twitter and their other social media platforms are all interconnected – what goes out goes to all – they did not differentiate content among platforms. It is noteworthy that in contrast to the others, our Peabody contact who handles their social media is a "Media Relations Specialist" and dispatcher, not a sworn officer. Such a specialist has a different role and position as well as different time and resource constraints (or assets) than those of sworn officers.

These insights from key informants underscore the importance of qualitative interview data in interpreting and analyzing the empirical data scraped from the social media sites. Our finding of differences across the five local town's police agenda setters also confirms early agenda setting studies' findings of differences across news media agenda setters, for example, McCombs and Shaw (1972) who compared five newspapers, two newsmagazines and two television news broadcasts.

6.3. Mapping the local police department agenda to public reaction

Early studies that employed correlational statistics to compare news media's ranking of issues with the public's rankings typically did not control for audience exposure or receptivity. Without reaction, there is no evidence a communication has been received. When reactions vary in amount and kind, we detect the degree of attention that topics within the police agenda receive. Our analysis here provides evidence of whether their use of social media achieves a measure of success and points to where there might be missed opportunities in their communication strategy.

When considering how people interact with police we looked at how the community "liked", commented on, and shared the 1224 Facebook

[7] Personal e-mail exchange, August 25, 2014.

Table 8
Followers' responses to police Facebook posts by category.

Category	Avg. number likes	Avg. number comments	Avg. number of shares
Accident	1.72	0.55	0.84
Announcements	4.48	0.74	3.92
Crime	8.25	2.57	2.04
Events	5.81	1.65	1.88
Interaction	7.56	0.76	0.77
Promotion	12.31	1.46	1.75
Property/pets	12.81	5.13	56.06
Safety	6.70	1.80	8.34
Traffic	2.45	0.67	0.50
Weather	7.18	1.27	3.36

Table 9
Topic clusters and frequencies of followers' tweets.

Category	Frequency	Ranking of tweets 1 = highest %
Accident	21.51%	2
Announcement	7.45%	5
Crime	19.12%	3
Events	6.44%	6
Interaction	7.56%	4
Promotion	34.46%	1
Property	1.93%	7
Safety	0.64%	9
Traffic	0.00%	10
Weather	0.89%	8
Total	100.00%	

posts made by the police, among which 992 posts copied police tweets. Note that Twitter did not have the liking, commenting or sharing features at the time of our data collection. We captured the tweets on creation before the public had a chance to respond to the tweet, and our data extraction software did not capture retweets. Table 8 below shows the number of likes, comments, and shares per post by the category of post. Property/Pets posts garnered the greatest number of likes with the average post receiving 12.81 likes. This was followed closely by Promotion, and then the middle group of Crime, Interaction, Weather, Safety, Events, and Announcements; Accident and Traffic posts received the fewest likes. Followers were most disposed to comment on Property/Pets posts followed by Crime. They were least likely to comment on Accidents, Traffic, Announcements and Interactions. Interestingly, the number of shares per Property/Pets post (56.06) is far greater than the rest of the categories, which are shared between 0.5 and 3.92 times per post.

It is reasonable to believe that those who make the effort to like, comment or share messages are those individuals who already have positive affect for the person or organization whose account it is. If so, we can understand their liking a promotional post as simply responding to a feel-good communication in kind – and more frequently than they do for other types of posts. Conversely, not liking Accidents and Traffic posts as often may reflect the negative response people have to adverse events and situations. It is also likely that Traffic and Accidents are time-bound occurrences whose frequent updates would outlive any usefulness from commenting upon and sharing individual posts. We also see that although Announcements rarely receive likes or comments, they are shared frequently. If the purpose of an announcement or safety tip is to inform and raise consciousness within the wider community, our share data suggest that police social media outreach on these agenda items is meeting with some success.

6.4. Conversations about local police departments

To identify those who are participating in the conversation about police we culled all follower tweets that discussed the police in some manner. The result was a dataset containing 190,974 tweets, which represent posts from 6411 unique twitter accounts.

There is an observable difference in the distribution of police posts within categories in Table 6, columns 2 and 3 and the most frequently discussed topics among followers in Table 9. Results of our topic and clustering analysis (see Section 5 and Tables 4 and 5) of the followers' tweets show that Promotion is the most commonly occurring category of community tweets (34%). The next highest categories, Accidents (22%) and Crime (19%) are understandably high-profile issues for citizens, yet as we saw, these are only moderately reflected in the police departments' own tweets. As we noted above, our police contacts' security concerns, legal constraints and a general unease about the medium in law enforcement may account for the disparity in the relative importance to police and their followers, and frequency of police tweets in this category.

Promotion offers an interesting outlier as it is clearly the most prolific category for the follower audience, and rarely tweeted by police.[8] Recall that Promotion is defined as "messages aimed at influencing the image of police or policing." This would include both positive and negative comments, but it is remarkable that none of the public's clusters classified as Promotion could be interpreted as negative. Either those who choose to follow the police already have favorable perceptions (a positive result of agenda setting), or the outreach efforts of police through social media are successful in creating a positive image (framing by the police), or the followers don't use these accounts to spread negative comments about the police. In their sentiment analysis, Hofmann et al. (2013) report a similar finding. Only two of their topics, crime and information posted by the mayors generated negative responses; the large majority had neutral wording. These observations beg for subsequent detailed analysis of the content of posts, rather than the count of posts at the core of the present study.

The least common categories (occurring at a frequency of less than 2%) are Property/Pets, Weather, Safety, and Traffic. Possibly these latter categories represent infrequent or sporadic occurrences as distinct from crime for example, which extends beyond any specific incident to a more general, public concern. It is interesting that while Accidents received low levels of response on Facebook, this category appears frequently as a topic of followers' conversations. This may reflect a difference between the two platforms, Twitter being more useful for time-sensitive communications. This interpretation is consistent with Picazo-Vela, Fernandez-Haddad, and Luna-Reyes (2016) who find that the functionality of the platform affects social media strategies and use, noting that Twitter is faster while Facebook facilitates disseminating images.

Studies of agenda setting that predate the direct measure of public priorities available from the big data sets and analytics that social media afford typically compared citizens' self-reported issue priorities to the story topics newspapers most frequently or prominently reported (see Coleman, McCombs, Shaw, & Weaver, 2009 for a review). However, we were not able to isolate the Billerica followers' tweet clusters from the combined five town followers' data set[9] to approximate the degree to which the traditional methodology and the one adopted for this paper generate the same divergent categories and consequently low correlation with the police rank ordering (Spearman's rho = −0.22) as discussed in our comparisons of the combined town data sets (Table 9 vs. Table 6). Nevertheless, we collected similar self-report data in a survey conducted for a related research project that enable an imperfect means of corroborating the direct behavioral evidence in this current

[8] We attribute the discrepancy between the high frequency of police tweets about Traffic and low frequency of those mentions in their followers' tweets (the other outlier case) to the disproportionate volume of such tweets from the Billerica department (see Table 7), which comprises half our sample of police tweets.

[9] It is not possible to match a follower's identification to a specific police department as many follower tweet contents do not refer to a particular department or reference a location.

study.[10] The rank orderings of Billerica police tweets (from Table 7) and Billerica survey respondents[11] are very similar: Spearman's rho = +0.60, the traditional correlation statistic used in the early studies and with similar result here. The ranks for police followers' (five towns combined) actual tweet clusters and Billerica survey respondents' self-reported category preferences show the greatest divergence on Promotion and Traffic[12]

These results hold mixed lessons for social media strategies by law enforcement. Although social media may help to establish trust and endorse the police agenda, it reflects only a small, self-selected segment of the public (see also Grimmelikhuijsen & Meijer, 2015) who are not necessarily representative of those who live in the surrounding community. We also caution that the number of "like" responses to police Facebook posts for any category of post is extremely low and therefore not indicative of much, if any, citizen engagement by this means. This does not necessarily signify that police are not reaching citizens through social media in their communities, but that we may need additional means of identifying and measuring this reach. The small percentage of followers and friends relative to community population indicates that, no matter how successfully an agenda is engaged through this medium, other mechanisms must be in place to share it with the large proportion of the community who are not connected through social media.

7. Key findings and discussion

This exploratory study reveals interesting and important patterns of police and community social media use. From these findings, we glean insight into how local police departments can use social media strategies and assess their effectiveness in setting the agenda they intend.

Our first analysis studied how police are using social media in setting their agenda and whether goals relative to community policing are evident in this outreach. Police post and/or tweet about numerous topics related to their public safety functions and community policing goals. Although police surveys (e.g., conducted by IACP) and our own interview data shed some light on these, this analysis confines itself to synthesizing the ten distinct categories that occur with mostly similar frequency across the departments. Specifically, we found that our police departments leverage social media to provide the community with announcements, traffic management and accident information and build relationships through interacting directly with citizens. This agenda reflects an emphasis on what we have characterized as routine, daily functions. Police focus less on criminal investigations or problems and on Twitter infrequently engage in self-promotion. Unlike some prior studies (Brainard & Edlins, 2014; Crump, 2011; Hofmann et al., 2013; Lovejoy & Saxton, 2012; Mossberger et al., 2013; Waters et al., 2009); Edlins & Brainard, 2016), we observed that social media did facilitate some interactivity, i.e., dialogic communication, between police and citizens, an encouraging sign for those who would employ it for advancing community policing goals. This finding together with some of our interview data suggest that social media communications can support community policing efforts in ways that cannot be replicated by individual officers in the field, to reach a targeted set of audiences. It requires a relatively low investment of time, money and labor resources (Meijer, 2014) and can reach more people more quickly than face-to-face and many other communications media. Thus, police agenda setting through social media affords opportunities for departments wishing to expand their reach and interaction with their community networks.

Although we sampled comparable cities, we found that local police departments' social media messaging priorities differs (particularly in the case of accidents), which we attribute to department-specific rather than demographic factors. Variations in how departments in our sample of demographically similar communities prioritize different topics in their use of the same social media tool also reminds us that the context for problems, that is, real world conditions (e.g. the local crime rate, cf. Erbring et al., 1980) and focusing events (cf. Birkland, 1998) can influence agenda setting behavior. Departments do make independent strategic decisions about when and how to employ social media, not only because of context, but as our accident example shows, also based on their individual resources, tools and level of sophistication and culture. Absent a stronger legal or normative paradigm for how social media may be used by police departments, we anticipate that there will be heterogeneity, even inconsistency in how agendas are developed and implemented, even in demographically similar police departments. This finding resonates with Liu et al. (2010), and suggests a need for further research that extends understanding of how government actors and interest groups influence the agenda at the local level in the new, heterogeneous communication environment of which social media has a growing part.

The second set of analyses employed two types of data to assess community receptivity to the police social media agenda: their engagement (responses) with the prioritized topics and their own conversations about law enforcement and public safety. Based on our analysis of the frequency with which followers liked, commented upon and shared content about the topics on the police social media agenda, we noted several differences in their priorities. First, consistent with other studies (e.g., Neiger, et al., 2012) we found a low response frequency for all types of engagement. Moreover, the responses that occur are most often manifest in low effort actions such as likes and less so in higher effort actions such as comments. That said, the category Property/Pets, and to a lesser extent Crime received high levels of all three types of attention by followers, indicating these are salient issue about which followers have particular concern and interest. While our data also show that while police tend not to use Twitter to engage in self-promotion to any great extent, it is interesting to note that the public responds when they do so by liking these posts significantly more often than they do other categories. This result is consistent with Huang et al. (2016) who find that Facebook posts about police department personnel that increase familiarity with police and department staff (which they call 'networking' posts) receive more likes compared with posts that broadcast information and other types of announcements. While the police set the agenda with their own posts, reactions indicate different categories are of higher interest on the community, providing useful feedback that could encourage police to be more responsive to the public in their agenda setting and outreach. As Liu et al. (2010) show, feedback, whether internally from other governmental agencies or externally from the general public is one of the most influential factors in attracting policy makers' attention to issues.

The final analysis examined followers' own conversations around police and policing. Here we found a somewhat different prioritization from that of the departments. The police audience concerns itself with Promotion, Crime and Accidents, which confirms Heverin and Zach (2010) and van de Velde et al. (2014). The latter, Accident category is the only one also appearing in the top frequency group for police. While Announcements and Traffic top the police agenda, these are at or near the bottom of follower conversations. Our data do not speak to why the police do not use social media more assiduously for self-promotion, but suggest it may be a missed opportunity, assuming followers are not

[10] A 2017 electronic survey of police Twitter and Facebook followers, conducted in a related research study, includes responses from 163 Facebook and 123 Twitter followers of the Billerica police. For further information about the Billerica survey data, contact the lead author. Williams and Fedorowicz (2017) report our e-survey methodology and the findings (for a different city).

[11] This statistic was computed using the 123 Twitter follower responses collected in the survey. The survey asked respondents to indicate which of the 10 categories of police tweets interested them most.

[12] That 2017 electronic survey of police Twitter and Facebook followers, which includes a Billerica sample, asked respondents to indicate which of the 10 categories of police tweets interested them most. For further information about this study's Billerica data contact the lead author. Williams & Fedorowicz (2017) report the e-survey methodology and findings for a different city.

entirely self-selected "fans". That caution arises from Ruddell and Jones' (2013) finding that social media users have higher trust in and satisfaction with police than non-users. The Crime finding, which replicates Huang et al. (2016), is interesting and worthy of further examination in future research. Police sensitivities around this topic reflect its observable (and often negative) effects on their image together with the potential jeopardy to ongoing investigations and legal ramifications of disclosing certain information to the public. To conclude, the results of our two sets of follower analyses illustrate both successful agenda-setting behavior and potential missed opportunities by police departments in the five communities that we studied.

8. Limitations and directions for future research

In broad terms, our research informs understanding of how local police departments use social media as a tool or mechanism to set agendas that create long-term relationships that can lead to more informed, engaged citizens. This initial study employs an interdisciplinary behavioral approach that draws on and advances political science's understanding of the theory of agenda setting by applying social computational science (i.e., the study of communication behavior using text analysis) to a data set drawn from a number of governmental agencies. Our multiple case studies, combining interview data and social media analytics, provide context-rich cross-sectional data, expanding the corpus of knowledge on social media in the public sector. By studying routine, daily interactions we have extended prior research that primarily focuses on social media's use during non-routine emergency events and short-term crises management.

Our study makes several specific contributions to the literature. First, it examines agenda setting through the new communications channel of social media. Second, it considers a different set of actors as potential agenda setters, namely those in the public sector at the municipal level of government. Finally, we have employed several data analytic techniques that allow us to study directly the conversations members of the public have with each other about the same topics that appear on the police departments' own agenda. The latter have not been analyzed in traditional agenda setting studies, which rely instead on citizens' survey responses to questions on what they perceive to be the most important issues or problems facing the country (e.g., McLeod, Becker, & Byrnes, 1974; Shaw & McCombs, 1977; McCombs, 2014). Our data identify public concerns and priorities directly from citizens' actual conversations rather than the indirect method based on respondent perceptions. Using available self-report survey responses from a related study (see note 12) we were able to compare our findings with those produced by traditional correlational methods and offer suggestive methodological insights worthy of more rigorous future examination.

Work by McCombs (2005) and McCombs (2014) and Liu et al. (2010) expanded the scope of agenda setting theory by delineating a new environment populated with multiple arenas and multiple agenda setters. Our research contributes empirical evidence to support their reconceptualization. Using social media, local actors, police in this case, can and do set and disseminate an agenda directly to the public, that is, without filtering it through traditional news media outlets. Moreover, police's social media audience can and does respond directly to that agenda (through likes and comments) and can disseminate it more widely among their personal networks (through shares and their interpersonal tweeting). We now need to understand more about how these additional, new actors interact and compete in shaping the next-level policy agenda. In other words, further research is needed to discover how the agendas of vertical and horizontal media (McCombs et al., 2014) connect with each other, to the public and to political decision-makers.

We also recognize some limitations of our study. First, our data set is limited to one public sector domain, law enforcement, and to five co-located police departments in the state of Massachusetts. In this study we are interested in agenda setting by police directed at all of their social media account followers. However, those followers include both individuals and organizations - other police departments, other government agencies and actors, civic groups and the news media. The police agenda may resonate differently with each audience and will require further study to determine similarities and differences in these groups' engagement with the various categories communicated by police and in the topics prioritized in these audiences' communications among themselves. We also need to bear in mind that the audience for police social media is self-selected and thus not an accurate representation of the community as a whole. As noted above, a further limitation of our analyses is that evidence of agenda setting and its impact on shaping public perceptions of police and policing together with the resulting political and policy consequences rest on inferences from the data more than demonstrable causal connections. This is a problem common to most agenda setting studies, which few have addressed or have done so only indirectly (Coleman et al., 2009), that is without using a controlled laboratory setting (see Iyengar, Peters, & Kinder, 1982 for an illustrative exception).

What our data and analyses do demonstrate are the priorities that comprise the police agenda, the similarities and differences in what their audiences communicate among themselves about most frequently in the public safety domain relative to the police agenda, and evidence of positive response from the public to some of the agenda priorities communicated by the police. We also showed that police are using social media interactively, which could, over time, advance community policing goals. As this study was conducted at a single point in time, longitudinal research is needed to establish whether the social media agenda promoted by police and followers' responses to them will persist over time. Both time lagged analyses (see Wanta and Hu, 1994 for example) and experimental designs can assist in disentangling the direction of causal influences on each, while additional sources, i.e., agenda setters (see Winter & Eyal, 1981 for example) and control variables (see McLeod, et al., 1974 for example) can test whether alternative external forces are influencing both independently. It also will be important to replicate the findings from this study's big data/analytics approach and conduct a more systematic comparison with traditional self-report methodologies than our exploratory attempt here. The latter undertaking is particularly important given this new media environment of multiple channels and sources of communication (McCoombs, 2005). The agenda setting process as well as its mechanisms may differ in ways that do not reproduce those early studies' findings but lead us to augment if not alter underlying theoretical understanding.

The next agenda setting step, demonstrating its impact on the opinions and behaviors of policy makers, could be advanced by a before and after case study design. Ideally, a pre-test would measure public trust and confidence in police and perceptions about a specific issue or event, followed by an intervening set of police communications directed at shaping the agenda around that incident, and then post-test measures of change in the public's level of trust in their police and in perceptions of the issue or event. Boynton and Richardson Jr's (2016) study partially meets these criteria. A follow through to these steps then could determine if political debate or policy initiatives ensued in governing circles as a result of this agenda setting activity. Such a research design is not easily executed. It requires field or natural experiments, which must identify an issue or event prior to its appearance on the agenda and or have pre-test measures of public opinion and trust before its occurrence.

A major thrust of this study is to evaluate whether local police department social media behavior affects their friends and followers. Does it increase residents' awareness of particular issues or influence their perceptions of law enforcement more broadly? Ultimately, a larger public impact would be to prompt residents to take precautions, make an investment, a purchase or donation, or to organize or attend an event. Its organizational impact would be to make police departments more open, transparent and interactive in their relations with their

communities. If effective, agenda setting would have political and policy consequences as governmental actors address prioritized issues or problems that resonate with the public. A disconnect between the interests and needs of the specific police social media audience and citizens more generally could lead police to misinterpret the level of concern and agreement underlying particular agenda topics. Horizontal social media (Shaw and Weaver, 2014) offer a new and additional assessment tool, not a substitute for traditional, vertical channels for outreach and feedback. The end result of these effects can promote civic discourse and facilitate collaboration, or create fragmentation and polarization (McClurg, 2003; Sunstein, 2009), which may change or merely reinforce the existing power structure (Margolis & Resnick, 2000). Such long-term consequences have been identified by prior studies, but the context and technologies seem to play an important role in these contingent outcomes, and would be worthy of further, longitudinal study.

Our interviews shed light on how police articulate their social media goals and our data analyses document which content generates positive public reaction or indifference to the police agenda inherent in their messages. Ultimately, however, our research evokes an evaluative judgment about how to set the agenda – in this situation, by responding to citizen interest in or demand for information related to a particular topic such as crime, or based on the police departments' need to recalibrate their relationship with the public. Future research might connect social media activity to its ability to carry through to the mission of law enforcement (to protect public safety), detecting whether the police agenda and/or public response can play a role in enhancing this mission. We look forward to contributing to this discourse.

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