What do citizens communicate about during crises? Analyzing twitter use during the 2011 UK riots

GASCÓ, Mila, BAYERL, Petra Saskia <http://orcid.org/0000-0001-6113-9688>, DENEF, Sebastian and AKHGAR, Babak <http://orcid.org/0000-0003-3684-6481>

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- Citizens' tweets change systematically in sentiments and content during a crisis.
- Twitter serves for sense-making especially in early and late phases of a crisis.
- Audience fragmentation requires flexible crisis communication strategies.
- Miscommunications can block Twitter's value as crisis communication channel.
- Citizens can be allies in co-shaping organizational reputation during a crisis.

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Dr. Mila Gascó (corresponding author)

Center for Technology in Government & Rockefeller College of Public Affairs and Policy

University at Albany, SUNY

187 Wolf Road, suite 301

Albany, NY 12205 (United States)

mgasco@ctg.albany.edu

Dr. Petra Saskia Bayerl

Rotterdam School of Management, Erasmus University Rotterdam,

Burgemeester Oudlaan 50

3062 PA Rotterdam (The Netherlands)

bayerl@rsm.nl

Dr. Sebastian Denef

Fraunhofer IAO

Hardenbergstr. 20

10623 Berlin (Germany)

sebastian@denef.com

Babak Akhgar

CENTRIC – Centre of Excellence in Terrorism, Resilience, Intelligence and Organized Crime Research

Sheffield Hallam University

Cantor Building

153 Arundel Street

City Campus

Sheffield, S1 2NU (United Kingdom)

b.akhgar@shu.ac.uk

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Abstract

The use of social media during crises has been explored in a variety of natural and man-made crisis situations. Yet, most of these studies have focused exclusively on the communication strategies and messages sent by crisis responders. Surprisingly little research has been done on how crisis publics (i.e., those people interested in or affected by the crisis) use social media during such events. Our article addresses this gap in the context of citizens' Twitter use during the 2011 riots in the UK. Focusing on communications with and about police forces in two cities, we analyzed 5,984 citizen tweets collected during the event for content and sentiment. Comparing the two cases, our findings suggest that citizens' Twitter communication follows a general logic of concerns, but can also be influenced very easily by single, non-crisis related events such as perceived missteps in a police force's Twitter communication. Our study provides insights into citizens' concerns and communication patterns during crises adding to our knowledge about the dynamics of citizens' use of social media in such times. It further highlights the fragmentation in Twitter audiences especially in later stages of the crisis. These observations can be utilized by police forces to help determine the appropriate organizational responses that facilitate coping across various stages of crisis events. In addition, they illustrate limitations in current theoretical understandings of crisis response strategies, adding the requirement for adaptivity, flexibility and ambiguity in organizational responses to address the observed plurivocality of crisis audiences.

Keywords: Twitter, social media, crisis, crisis communication, police, citizens' comments

1. INTRODUCTION

Crises of all types, be they caused by natural hazards or by man-made situations, are characterized by threat, urgency and uncertainty (Rosenthal et al., 1989). In these situations it is vital for citizens to obtain clear information on events and direction for action, as well as assurance of their safety. Otherwise, social unrest and a breakdown of public order are possible, as was tragically demonstrated, for instance, in the aftermath of hurricane Katrina in New Orleans in 2005 (Nelson et al, 2010). Communication between crisis response organizations and the public is, therefore, essential for coping with crises. Conversely, responders' failures in addressing a crisis have often to do with communication-related challenges (Allen et al., 2014; Fisher et al., 2016; Van Gorp et al., 2015).

Numerous studies have therefore aimed to understand how crises responders do and should communicate with affected citizens (e.g., Mergel, 2014; Takahashia, et al., 2015; Wukich & Mergel, 2015). The opposite view – crisis communication by citizens with and about crises responders – has received considerably less attention (Pang & Ng, 2016). This one-sided view is problematic, as the ways crisis communication is accomplished is shifting, primarily due to the growing role of social media during crisis events.

Social media, including networking sites such as Facebook and microblogging services such as Twitter, afford quick, efficient and widespread distribution of multiple-source information, warnings and calls for action, as well as the collection of information to improve situational awareness (Wukich, 2015). The use of social media during crises represents a shift in crisis communication from the mere transmission of a message to interaction between organizations and the public. As Wukich (2015) phrased it, "the public becomes a much more active and potentially empowered participant in the event, as opposed to a passive receiver of responder-

produced messages" (p. 132). It is therefore important to understand communicative behaviors of crises publics, as this provides vital knowledge for crisis responders on how to effectively prepare, shape and manage communications during ongoing crisis events (Brummette & Fussell Sisco, 2015).

Using the well-studied case of the 2011 UK riots, our interest in this paper focused on citizens' Twitter communications with and about police forces to better understand the usage of the medium and the changing concerns of publics voiced through social media throughout a crisis event. We focus on Twitter, as this fast-paced short-messaging service is one of the most frequently adopted social media platforms by police forces (and first responders more generally) for all phases of crisis management. In our study, we concentrate on the stage of crisis response (Coombs, 2012) given that the UK riots were a public disorder event in which the use of Twitter followed the sudden escalation of disorder. According to Panagiotopoulos et al. (2016), these types of events do not give the opportunity to observe a pre-crisis stage, which differentiates them from, for example, natural hazards. Further, we focus on police, as police organizations are a primary player in nearly all forms of crisis situations standing at the forefront of efforts to keep 'law and order' during tense and often chaotic times. Police forces are thus often the most visible representatives of a government and its ability to react to and manage crisis events.

The remainder of this paper is organized as follows: in the next section, we review the literature on crisis communication and on social media as a crisis communication channel. Next, the study context and the research design are explained. Subsequently, we present and discuss the results of the fieldwork. Finally, we describe the theoretical and practical implications of our findings in answer to our main research questions.

2. LITERATURE REVIEW

2.1. Crisis events and crisis communication

Several terms for crisis exists and have often been used interchangeably (e.g., emergency, disaster or catastrophe; Fischer et al., 2016). In this article, we adopt the definition of Kreps (1984), who defines crises as "events, observable in time and space, in which societies or their larger subunits (e.g., communities, regions) incur physical damages and losses and/or disruption of their routine functioning" (p. 312). Crises move through several stages with disparate characteristics and requirements for governments and first responders. Lettieri et al. (2009) differentiated four stages in a crisis lifecycle: two pre-crisis phases (mitigation and preparedness) and two post-crisis phases (response and recovery). Coombs (2012) referred to three phases, which overlap with those of Lettieri et al. (2009): pre-crisis (prevention and preparation), crisis response (actual response to a crisis), and post-crisis (preparation for the next and commitments during the crisis with follow-up information). Crisis response is probably the most critical and important phase, as it is highly visible to citizens and significantly influences public opinion and what citizens think of responders handling the crisis.

An important component of crisis management is crisis communication. During a critical event, communication serves multiple purposes from information collection to coordination, information dissemination, planning for and management of a crisis, but also relationship building (Sellnow & Seeger, 2013). According to Terp Søland (2016), during crises "a legitimacy gap may occur if there is a perceived discrepancy between an organization's actions and society's expectations. Such a gap can threaten both the image and reputation of an organization" (p. 7). Effective crisis communication can help preventing or closing such gaps, restoring the legitimacy and reputation of crisis responders (Coombs & Holladay, 2014), particularly when their image has been damaged as a result of the crisis itself (Schultz et al.,

2011). The role of communication for responders' reputation and legitimacy are of such importance to organizations that an extensive body of knowledge concerned with crisis communication has developed, and several theoretical approaches for responding to crises exist within the literature. Two of the most important ones are Image Repair Theory (Benoit, 1995) and Situational Crisis Communication Theory (Coombs, 2009).

According to Benoit's *Image Repair Theory* (1995, 1997), organizations involved in crisis events are liable to receive attacks from the public. Such attacks or complaints have two components: the accused is held responsible for an action and that act is considered offensive. Because both the image of an organization and the threat to that image are perceptual, effective communication may mitigate such threats. Consequently, Image Repair Theory focuses on the content of crisis communication messages and presents five broad categories of image repair strategies (i.e., communication strategies): denial, evasion of responsibility, reducing offensiveness of the event, corrective action, and mortification. These strategies are grounded in a belief that communication (words and actions) affects how the public perceives the organization involved in the crisis (Coombs, 2014) and can thus be actively used in shaping and changing such perceptions.

Benoit's Image Repair Theory has received wide criticism. Of particular importance is the fact that the author ignores the contextual background of organizations and crises, as his theory builds on a rhetorical tradition, which emphasizes the spoken or written word rather than the environment and the context (Skriver Jensen, 2014).

Opposite Benoit's theory, Coombs's theory is primarily context-oriented and based on public relations (Coombs, 2009). *Situational Crisis Communication Theory* (SCCT) explains how communication protects an organization's reputation during a crisis, but goes one step further than Image Repair Theory by linking crisis response strategies and elements of the crisis

situation (Bell, 2010). On the one hand, the theory predicts reputational threat through three factors: initial crisis responsibility, crisis history, and prior relational reputation. On the other hand, it recognizes that crisis response strategies vary depending on the type of crisis and the stakeholder's attribution of responsibility (see Table 1), which results in four communication strategies adjusted to different crises and publics (Skriver Jensen, 2014; Bell, 2010): denial, diminishment, rebuilding, and bolstering (Coombs, 2009).

Table 1. Crises types by level of responsibility (Source: Coombs, 2014: 150)

Victim cluster: Very little attribution of responsibility
Natural disasters
Rumors
Workplace violence
Malevolence
Accidental cluster: Low attribution of responsibility
Challenges
Technical-error accidents
Technical error-product harm
Preventable cluster: Strong attribution of responsibility
Human-error accidents
Human error-product harm
Organizational misdeeds

Despite the contributions of these two theories to the field of crisis communication, both Coombs and Benoit focus primarily on the sender, which is why they neglect the receivers' perception of the sender's stimuli choice of strategy. Further, they pay limited attention to the active role of citizens: both focus squarely on organizational communication and do not recognize that crisis communication may consist of communicative actions between several senders and receivers (Johansen & Frandsen, 2007). This reduces their potential to guide organizations in shaping as well as adjusting and flexibly reacting to (potential) shifts in communications by crisis publics. Only recently, SCCT's researchers have begun to examine how crisis publics communicate during crisis events. These discussions shift the focus to the receiver (Coombs & Holladay, 2006;

2009; 2012; 2014), building on the concept of the rhetorical arena (Frandsen & Johansen, 2007), where crisis responses emanate from different types of actors, including the public: "the rhetorical arena considers the voices of any actors trying to communicate about the crisis as crisis communicators. From this perspective, multiple voices can attempt to influence crisis publics, not just the one, organizational voice. A rhetorical arena opens around a crisis. Various actors enter into this arena by engaging in communication about a crisis or potential crisis" (Coombs & Holladay, 2014, p. 42).

Under this view, communications of crisis publics play two meaningful roles (Coombs & Holladay, 2014): on the one hand, they can indicate whether or not the crisis response messages have been accepted; on the other hand, the public's messages are important in shaping organizational reputation and legitimacy and thus the possibility of these organizations to act as effective crisis responders in current but also future crises. In Coombs and Holladay's words: "unfavorable comments can increase the reputational damage, while favorable comments can help to mitigate the reputational damage for the organization in crisis" (p. 45).

Additionally, Skriver Jensen (2014) criticizes that neither theory considers choice of medium; i.e., the authors seem to suggest that organizations communicate in the same way across different media channels. This is problematic as communication channels differ in important ways, and public communication expectations and behaviors certainly in social media have shifted compared to more 'traditional' media (Skriver Jensen, 2014).

2.2. Crisis communication on social media

Social media is gaining increasing popularity in the public relations and communication arenas. Especially the possibility to easily and openly share and participate in the creation of content make them an important communication tool (Lee et al., 2012). Not only can information be

disseminated immediately, but social media also enables fast, efficient and cost-effective interactions and question-answer scenarios (Veil et al., 2011). This results in a new digital environment, in which peer discussion or a "many-to-many" model replaces the "one-to-many" model encouraged by traditional media (Wukich & Mergel, 2015). The pervasive nature of social media culture further dictates that information flows are constant, interactive and involve users as message actors, agents, and creators (Stewart & Gail Wilson, 2016). Hence, citizens become both consumers and active contributors of information shifting the dynamics of their interactions with organizations. According to Currie (2009), the main emphasis is no longer on organizations talking to their publics, but publics talking back to the organizations and, most importantly, publics talking to each other. This makes social media an attractive tool for crisis management. The use of social media for crisis communication has been explored across a variety of natural and man-made crisis situations from hurricanes, earthquakes, and floods to the aftermath of the 2013 Boston marathon bombings and the 2015 Charlie Hebdo murders in Paris (e.g., Cassa et al., 2013; Hughes et al., 2014; UK Cabinet Office, 2012; Yates & Paquette, 2011). Also, the public's use of social media during a crisis to ask for help or simply for creating personal situational awareness is well documented (Baker, 2012; Li et al., 2014; Takahashia et al., 2015; Tapia et al., 2014). These experiences demonstrate that social media as a communication channel can provide crucial services for first responders during as well as in the aftermath of crises events. No wonder therefore that social media, and particularly Twitter, has been widely adopted during crises and for emergency response by first responders and citizens alike (e.g., Gaspar et al., 2016, Panagiotopoulos et al. 2014; Shih et al., 2015; Simon et al., 2015).

However, social media might be seen as a double-edge sword, adding complexity to crisis management (Ott & Theunissen, 2015). As an example, the limited information in a tweet can

make it difficult to identify its meaning and context, and the massive volume of messages challenges crisis responders to quickly analyze incoming information and to make efficient decisions based on the analysis (Hughes et al., 2014). Also, the combination of speed and virality can present an unprecedented vulnerability (Lillqvist & Salminen, 2014), as rumors and false information spread quickly and easily, and users often prefer to spread the negative and dramatic instead of the factual (Li et al., 2014; Starbird et al., 2014; Wendling et al., 2013). In addition, Mulder et al. (2016) found that a focus on social media communication during crises may create or sustain social inequalities and lead to the inefficient distribution of resources: in one case, less threatened but more vocal urban communities received more help than poorer but less vocal rural communities despite the latter's greater objective need. Citizens and their use of social media thus have an important – supportive as well as complicating – role when it comes to crisis communication efforts; a role that is vital to understand if first responders want to react and interact efficiently throughout crisis events.

Yet, despite the relevance of crisis publics and their communicative choices and reactions on social media, most of the literature in the field of crisis communication and on the use of social media during crises has focused on the communication strategies, processes and messages of the organizations involved in the crisis, prioritizing the sender's perspective (Benoit, 2015; Liu et al., 2011; Pang & Ng, 2016; Schultz et al., 2011). Thus, the function of the public in shaping crisis discourses remains underexplored and undertheorized. Our study addresses this gap by analyzing the sentiments and content of Twitter messages sent by citizens during the 2011 UK riots. Our objective is to shed light on how citizens use Twitter over the course of a crisis event in relation to first responders such as police forces leading to new insights for the planning and implementation of effective and adaptive crisis communication.

3. RESEARCH DESIGN

3.1. The 2011 UK riots: A short description of events

On Thursday August 4th, 2011 Mark Duggan, 29, was shot dead by the police in Tottenham in the Greater London area, during an operation aimed to arrest him. Questions about whether or not Duggan shot first and whether the fatal shot had been an act of self-defense by police started a debate that put the police actions into question. On Saturday evening, August 6th, a crowd of about 300 people gathered at a police station. What started as a peaceful demonstration turned into a forceful riot that spread in the following days across neighborhoods and to other cities such as Birmingham, Liverpool and Manchester (Briggs, 2012). Buildings were set on fire and stores were looted. Thousands of people were arrested. Five people died and over 200 people injured; 186 of them police officers. In London alone, 3,443 riot-related crimes were reported, which caused damages of over 200 million pounds.[1] Throughout the riots, UK police forces used social media, and especially the micro-blogging service Twitter, extensively to reach out to the public (Crump, 2011). Twitter was also used extensively by citizens throughout the events offering a window into their sentiments and concerns, as well as their interactions with and about police forces over this period.

3.2. Data collection

To investigate citizens' Twitter communication with and about police forces during the riots we decided to focus on two police forces, the Metropolitan Police in London (MET) and the Greater Manchester Police (GMP). The choice of these two forces was deliberate due to the very disparate approaches to crisis communication as identified by Denef et al. (2013). They found that the two police forces differed considerably in their tone and formality as well as in how they

[1] See, among others, http://www.mirror.co.uk/news/uk-news/london-riots-more-than-2000-people-185548, http://reut.rs/peJcRx and http://www.cbc.ca/news/world/story/2011/08/09/f-ukriots-faq.html.

reacted to questions, requests and information sent by the public: MET, on the one hand, adopted an unidirectional, formal and impersonal approach; GMP, on the other hand, used a highly personalized and informal style that included direct and personal interactions with citizens. The decision to select these two forces was thus based on principles of theoretical sampling (Yin, 2009): concentrating on MET and GMP allowed us to compare two police forces with different approaches to Twitter communication during the same event, providing a potentially broader perspective on citizens' communications with and about police.

As data basis we collected citizens' tweets in the period from August 6th-14th, which specifically addressed these two police forces. In order to obtain a comprehensive picture of citizens' communication with and about the two police forces we included follower tweets as well as tweets from 'unaffiliated' Twitter users. To handle the large amount of messages we collected tweets using social media analysis service peoplebrowsr.com. We searched for messages addressed to @metpoliceuk and/or @gmpolice in the specified time window (August 6th-14th). We excluded forwarded messages (retweets), as they did not contain new information. This led to a set of 5,984 citizen tweets that we stored in a custom database. Next to the original tweet text we stored the timestamp of when the tweet was sent (day and time), the handle of the Twitter user and the recipient of the tweet (MET, GMP or both). This corpus constituted the basis for all subsequent analyses.

3.3. Preparation of the data: Coding of tweets

To understand citizens' communication, we coded all collected tweets on the sentiment they expressed towards police as well as their content. Each of the 5,984 tweets was thus coded twice: once for how positively or negatively they referred to police (sentiment coding), once for their topic (content coding). All coding was conducted manually by the authors.

To differentiate sentiments towards the police we used a scheme of five categories: supportive, critical, ambivalent, neutral, and unclear. The five categories were operationalized as follows:

- *Supportive tweets*: tweets portraying police in a positive light and/or expressing a positive attitude towards police actions or the police as organization (e.g., *All the praise in the world for our brave emergency services!! The country is behind you!! @LondonFire @metpoliceuk @Ldn_Ambulance @gmpolice*).
- *Critical tweets*: tweets portraying police in a negative light and/or expressing a negative/critical attitude towards police actions or the police as organization (e.g., *@gmpolice @name Police state! Police brutality!*).
- *Ambivalent tweets*: tweets that commented on police actions or the police organization, but mentioned positive and negative aspects in the same tweet leading to ambivalence in the sentiment (e.g., *Unimpressed with the (lack of) @gmpolice presence as the looters ran riot. The follow up op seems to be efficient and merciless though.*).
- *Neutral*: The tweet did not express a sentiment (positive or negative) about the police force (e.g., *@gmpolice why all the sirens down chester road, stretford?*).
- *Unclear*: The tweet did not provide enough information to make a judgment about its sentiment with respect to police (e.g., *@name You're an idiot. @metpoliceuk*).

In a second step, we coded the same tweets for their content. The topics were inductively developed through open coding in several rounds of coding and consolidation discussions amongst the authors to systematically identify and classify emerging themes (Krippendorff, 2013). This process led to a set of 29 higher-order topics, which fell into five themes: 1) *general comments about police*, 2) *comments on police activities*, 3) *comments on police communication on Twitter,* 4) *comments directed to co-citizens (i.e., not directed to police)* and 5) *non-riot*

related comments. Unclear tweets were coded using a rest-category. The final set of themes and topics is presented in Table 2 together with examples from our data.

Table 2. Topics identified in citizen tweets

THEME 1: GENERAL COMMENTS	
Topics	**Example**
1. General praise	@gmpolice keep up the amazing work, bad guys never win!!!! :-)
2. General critique	@name @gmpolice Sad to say but policemen ARE like that.
3. Caring	@metpolice bring in the army, you guys need some backup out there, you shouldn't have to fight this war on your own!! #bringinthearmy
4. Thanks	I think we all owe @gmpolice & @metpoliceuk a HUGE thank you this week.
5. Insult/ridicule	@gmpolice arrest yourselves.
6. Threat	Hey, @metpoliceuk bribes u took 4 global phone hacking make u a criminal organization, you will be closed #Anonymous
7. Riot is police fault	@name @name @metpoliceuk no i think you'll find it's the police who've been inciting disorder
8. Situational comments	@gmpolice I'd really hoped as the city of manchester, we could have risen above such vile and pathetic behaviour.
9. Force-comparison	I think the Met have a lot to learn from forces like @gmpolice
THEME 2: COMMENTS ON POLICE ACTIVITIES	
10. Praise of activities	@metpoliceuk hurrah! Well done. X
11. Critique of activities	@name @gmpolice seems heavy handed, contradicts policy http://t.co/cPCmvvX
12. Way of operating	@metpoliceuk There clearly are not enough police officers, fire engines to restore order, Order a curfew #londonriots #ukriots
13. Request for information	@gmpolice How is King Street? Any further damage?
14. Offer to help	@gmpolice anything we can do to help? #manchesterriots
15. Request for performance	@metpolice I don't care about exact number of arrests - put a stop to this NOW please. From a taxpayer #hackney
16. Disbelief information	@name: RT @metpoliceuk: Police have not requested a #mediablackout and are continuing to provide updates < Liars
17. Question integrity	[name] (2) Which raises the question whether @gmpolice accept the principle of the presumption of innocence.
18. Question justice/activities	@gmpolice Yes, he probably did something truly heinous. Like littering.
19. Police violence/abuse	And yet try standing in the street to make a valid political point and @metpoliceuk will come down on you like a ton of bricks. #ukriots
20. Question competence	@gmpolice just hashtag it 'EducatedGuess'
21. Protection of co-citizens	@name @name @name @gmpolice [name] had nothing to do with the looting he was on his way home from blackpool

Table 2 (continued).

THEME 3: COMMENTS ON TWITTER COMMUNICATION BY POLICE	
22. Way of communication	@gmpolice use tweeters initials to sign off. Then we get the change of tone x Jo
23. Praise of communication	Amazing use of tech RT:@metpoliceuk: Help us identify London troublemakers on our Flickr pages [link]
24. Critique of communication	@gmpolice Give the swashbuckling a rest.
25. Information on IT issues	@metpoliceuk link not working :-(
THEME 4: COMMENTS DIRECTED AT OTHER CITIZENS	
26. Information exchange amongst citizen	@name @gmpolice << what did they say mate?
27. Request to support/respect police	Please help the @gmpolice any way you can to bring the criminals to justice #riots
28. Defense against critique	So @metpoliceuk shoot a dangerous criminal with a gun and its their fault??? I think not... #tottenham
THEME 5: NON-RIOT RELATED	
29. Non-riot	Fill in the @gmpolice survey about how they police football matches and you could win tickets to see England at Wembley [link]
REST CATEGORY	
(Unclear)	@gmpolice It clearly was!

4. FINDINGS

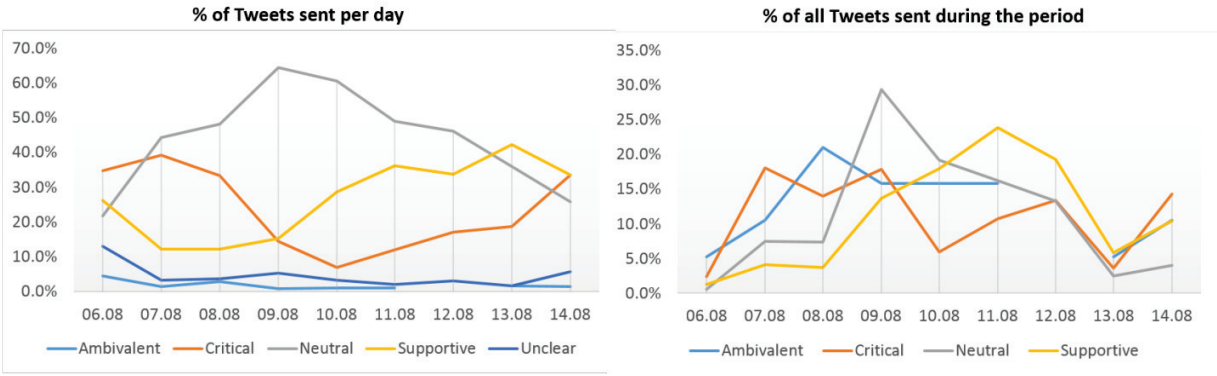
Our analysis of citizens' Twitter communication with and about the two police forces yielded interesting similarities as well as differences in the development of sentiments and content of tweets over the course of the riots. To provide a clear picture of each case, we detail citizens' communications throughout the riots for each police force separately.

4.1. Citizens' communication with and about MET police

The riots in London started on August 6th and wound down around August 14th. Hence, our analysis window for citizens' communication around MET police covers these nine days. Figure 1 shows how the tone of citizens' tweets changed over this period. Considering sentiments per day (left side of Figure 1), the majority of tweets on the first day were of a critical nature (34.8% of tweets sent on this day; e.g., "*Just seen live pics of @metpoliceuk response in #Enfield! Are you looking for a war? If anything will bring out everyone with a grudge…*") compared to 26.1%

of tweets with a supportive and 21.7% of tweets with a neutral character. This picture changed considerably over the course of events. Critical tweets decreased to only 6.9% of tweets (August 10th), but climbed back to nearly the previous level on the last day of our analysis period. In the same time, neutral tweets showed a sharp rise and drop, while supportive tweets consistently increased over time. On the last day of our analysis period, supportive, neutral and critical tweets appeared to nearly equal proportions (33.6%, 25.9% and 33.6%, respectively). If we consider the total amount of citizen tweets during the event (right side of Figure 1), we get a similar picture, with most critical tweets sent in the early days of the riots, the majority of positive tweets during the later days and most neutral tweets in the intermediate period.

Figure 1. Change of sentiments in citizen tweets over the course of the riots: MET police



To understand these shifts in sentiments, we took a closer look at the topics of citizens' tweets over time. Figure 2 presents the changes in topics grouped for sentiment (left side) and content (right side). The majority of initial, critical messages about the riots on August 6th focused on the reason for the riots – suggesting that the riots may be the fault of MET police (e.g., "*@metpoliceuk "communication doesn't work with these thugs" (thugs in uniform) - This is why people have to take to the streets. #tottenham*") – but also their initial handling by MET police (e.g., questioning competence, integrity or justice of actions, e.g., "*@metpoliceuk GREAT! Totally reactive - why so little proactivity?!? #ukriots*"). These critical messages can be

interpreted as an effort of sense-making by citizens about the cause of the riots and their fast escalation (with the rioting starting around 8:20, fire services reported 49 'primary' fires in Tottenham only 25 minutes later), as well as a sign of the helplessness felt in the face of the events. On the other hand, citizens also sent messages of praise and caring: *"@metpoliceuk you don't need this now but sending thoughts and support to all officers out this evening. Heroic every one*". The early Twitter reaction of citizens thus fell largely into two factions: a larger part critical to hostile towards MET, the other voicing empathy and support. Questions about MET's competence remained one of the most frequently voiced critiques throughout (Figure 2 bottom), although overall critical voices decreased during the middle days of the riots (cp. Figure 1). Instead, neutral and crisis related tweets became the majority of tweets sent per day. Their main purpose were requests for performance; either as general calls for action (e.g., "*@mepoliceuk Doooo something!*") or as specific pointers for police to act on (e.g., "*@metpoliceuk A looter poses with his swag. Please RT. Bring him to justice! [link]*"). The main focus thus shifted from police as 'suspect' of causing the riots to the main actor responsible for 'sorting it out'. Such requests signal the need of citizens to see police actively handle the crisis and were the most frequent type of crisis related and neutral tweets during the height of the riots (71.0% and 68.1%, respectively, of tweets sent per day).

In the final stage and the aftermath of the riots (August 12th-14th), calls for performance declined and additional topics emerged more prominently. To the extent that police made arrests on the streets and reported them online, the tone shifted to the positive – praising MET's work ("*Keep up the good work @metpoliceuk #londonriots your doing great job :-)*") as well as specific police actions ("*@metpoliceuk The Met has now arrested 1401 people in connection with violence, disorder and looting.808 of these have been charged -- Awesome*"). At the same time,

critical tweets became more prevalent again. As during the initial days, they mostly voiced concerns around the integrity of MET police and their actions as well as their potential role in aggravating the riots:

- "*@metpoliceuk and where were the police? Standing back to allow disorder to justify cuts. Sick. Not in gangstaspeak, plain disgusting way*."
- "*[name] @metpoliceuk Charging a small towns worth of people wont solve the problems that *actually* created these unconscious feelings*."
- "*@name That'd be mainly @metpolice If they had sorted this lawlessness out in first two days this wouldn't have spread elsewhere!*."

In the aftermath of the riots citizens' messages thus turned back to sense-making about the riots and discussion about the reasons for their emergence and spread. Yet, also non-riot related tweets resurfaced again, demonstrating a shift of attention away from the riots to other issues (e.g., "*youtube.com/[…] via @youtube please watch this video cars blocking the hard shoulder after accident on m1 @hantspolice @metpolice*").

Overall, in the case of MET, the attention of citizens and their communication on Twitter followed a clear pattern of initial efforts for sense-making of the riot's causes followed by universal calls for action. In the final stages, critical and supportive voices appeared to nearly equal measure again, continuing the discussion on blame as well as simple relief and gratefulness for MET's actions and presence. Interesting to observe is that Twitter related messages were very rare throughout the events (cp. Figure 3), indicating that citizens spent little time commenting or reflecting on MET's Twitter communication. If citizens commented, they mostly criticized MET's communication style (e.g., "*@metpoliceuk do you have to say 'public disorder'*

rather than riot??") or more generally their way of communicating (e.g., "*Apart from that @MetPoliceUK haven't really tweeted much*").

Figure 2. Topics of citizens' tweets over the course of the riots (% of tweets per day): MET police

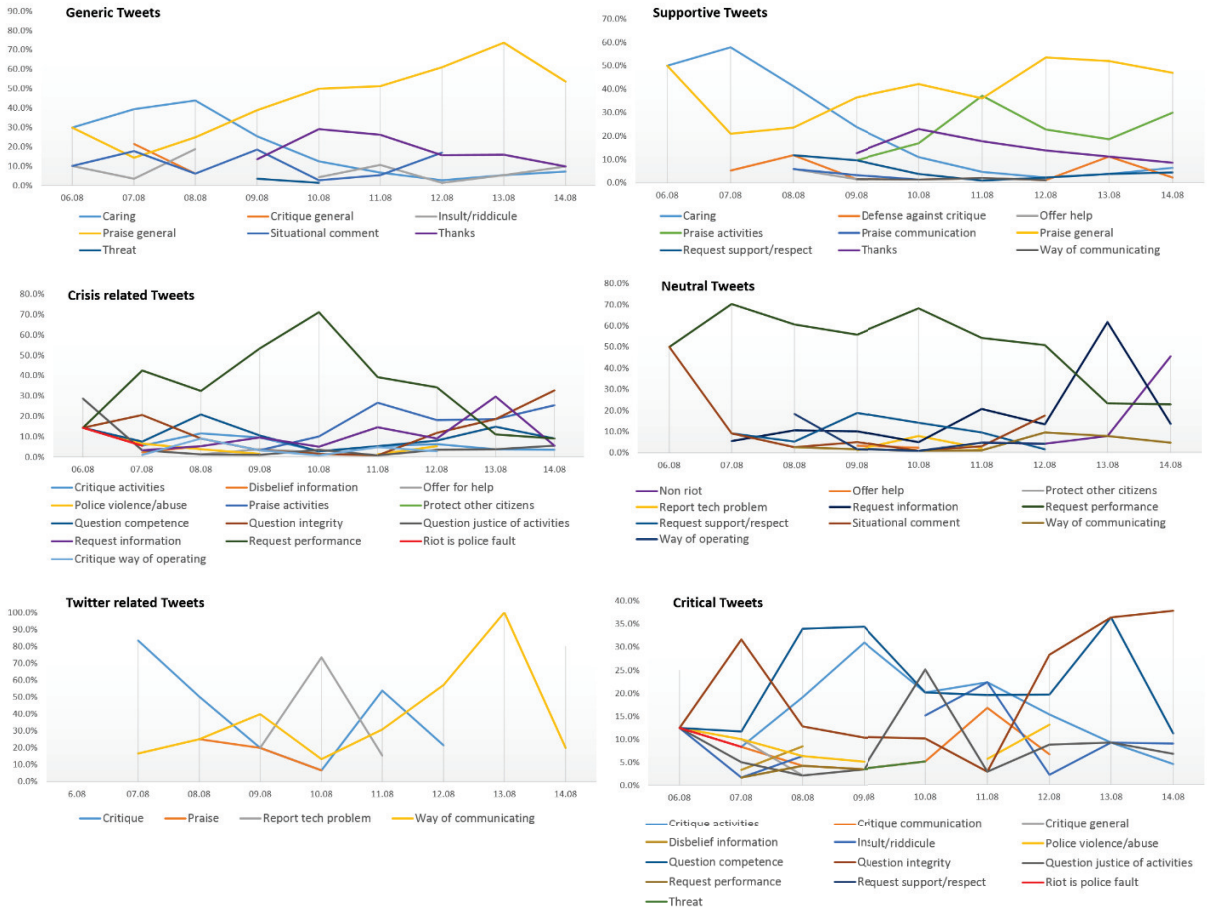
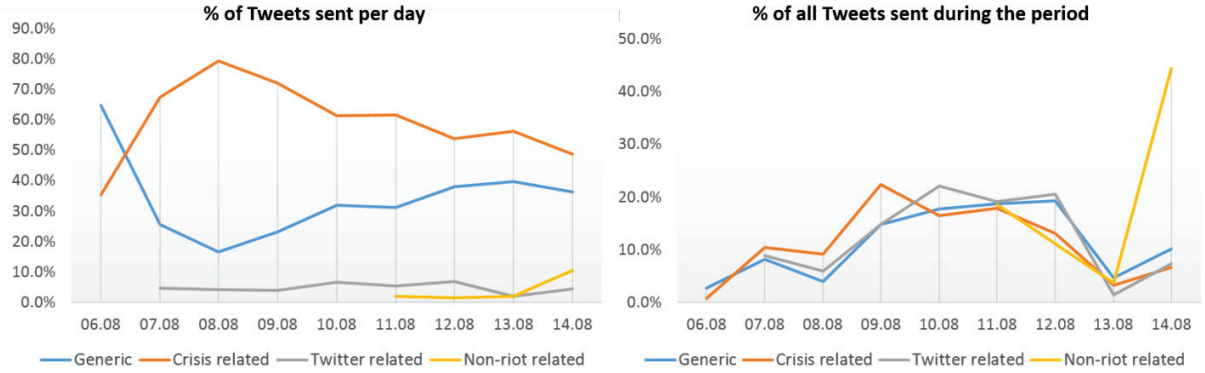


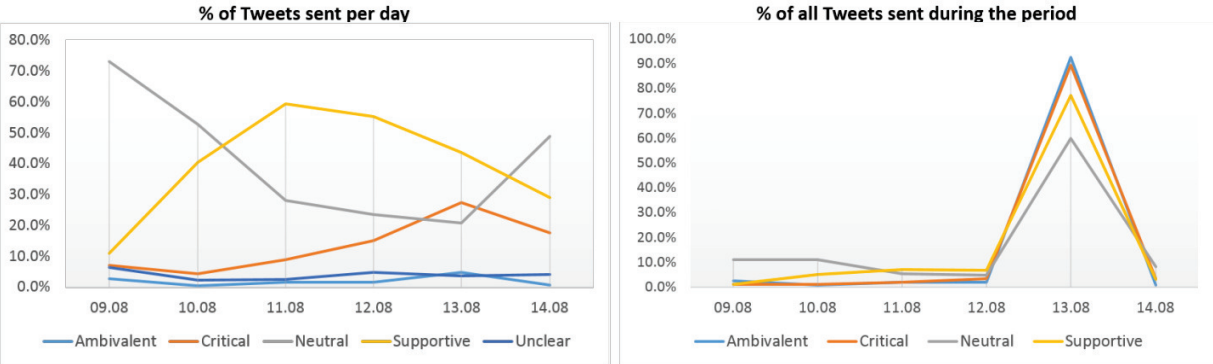
Figure 3. Changes in content of citizen tweets over the course of the riots: MET police



4.2. Citizens' communication with and about GMP police

The riots reached Manchester on August 9th, three days after their onset in London. Hence, our analysis of citizens' communication around GMP police covered the period from August 9th-14th. Figure 4 presents the development of sentiments in citizens' tweets over this time. As this first view illustrates, citizens' communication with and about GMP differed somewhat from messages sent to and about MET police. Most notable is the low percentage of critical tweets (avg. 13.5% of tweets sent per day vs 23.5% for MET; cp. Figures 4 and 1). Also, while criticism of the MET police was more common at the beginning and during the last two days, in the case of GMP police critical tweets appeared primarily towards the end of the riots, but they never reached the level of supportive messages. Most tweets in the early days were neutral (e.g., "*@gmpolice I am glad Manchester is OK, is all well in the other 9 boroughs of Greater Manchester?*"), while the citizens' tone in the middle days appeared mostly supportive (e.g., "*@gmpolice Well done GMP - you work hard and there isn't enough appreciation!*"). Interesting is further a view at the distribution of tweet volume over time (Figure 4, right sight): the majority of messages (74.6%) was sent on only one day, August 13th.

Figure 4. Change of sentiments in citizen tweets over the course of the riots: GMP police



To understand this picture, it is again indicative to look at the content of citizens' communication. The positive sentiments were primarily driven by a high level of general praise for GMP police throughout the period (cp. Figure 5 top; "*@gmpolice keep up the good work lads! Behind the cause 100 percent!!!*"). Toward the end of the riots, the focus of supportive tweets shifted towards praise of communication and positive comments about GMP's use of Twitter (e.g., "*I'm so impressed by the attitude of @gmpolice in relation to SN. They've used the positive aspects of Twitter to enormous benefit for all*"). A similar observation can be made for critical tweets: the increase of critical messages was not due to a critique of actions on the ground, but due to negative comments about GMP's use of Twitter (e.g., "*I think @gmpolice should stop bragging about the number of arrests they've made & remember that these are people's lives. It's not a sport*"; cp. Figure 5 bottom). More generally, citizens' tweets contained a much higher number of comments about GMP's Twitter use compared to messages sent to or about MET (avg. 26.6% of tweets per day vs 4.7%, respectively).

One explanation to this different pattern lies in the differences in styles used by the two police forces (Denef et al., 2013): MET used a more formal approach, while GMP preferred an informal style. This more informal approach split opinions of citizens: some found the approach

refreshing (e.g., "*@gmpolice think it's fantastic that you are engaging with the public like this. Shows the human side of policing*") and others found it inappropriate for a police force (e.g., "*Detached and professional' is want I want to see from a police twitter account - upholding the law, not expressing an opinion @gmpolice*"). These different views led also to discussion amongst citizens about the proper use of Twitter by police forces during riots.

GMP's informal style was also the reason behind the high volume of messages on August 13th as well as the shift in content from crisis related to Twitter related tweets (Figures 5 and 6). On this day GMP sent the following tweet: "*Mum-of-two, not involved in disorder, jailed for FIVE months for accepting shorts looted from shop. There are no excuses*". Although the 'mum-of-two' tweet was only one of many informal tweets by GMP (e.g., commenting on offenders' sentences or threating (potential) looters; "*Captured lots of criminals on CCTV - we will identify you and we will be coming for you*"), this specific tweet was seen by many citizens as offensive and caused intense negative reactions. The ensuing barrage of critique as well as subsequent arguments amongst citizens to accuse or excuse the GMP-tweet saw the volume of tweets rise from 135 on the previous day to 1,901 on August 13th. Thus, for some time considerable space was taken up on a discussion about GMP's Twitter account, instead of communicating about the riots or supporting police in their duties on the street (cp. Figure 6 left).

Interestingly enough, the spike in messages was not only due to a high volume of Twitter related tweets (praising, criticizing or commenting on GMP's use of Twitter); instead, tweets across all categories increased to a nearly equal measure (cp. Figure 6 right side). The discussion around the tweet thus seemed to have caused a rise in citizens' interest around the functioning of GMP more generally. However, only a day later, the volume of citizens' tweets had decreased to a

similar level as prior to August 13th, demonstrating how fast citizens' attention shifted away from the incident.

Other aspects in citizens' communications showed a similar pattern as observations made in the MET case. As with tweets directed at MET, citizens' crisis related tweets during the initial days of the riots focused primarily on requesting performance (cp. Figure 5; e.g., "*@gmpolice we want to see more crooks arrested*") and to a lesser extent on requesting information (e.g., "*@gmpolice thanks I just like to know if its peaceful in my area these riots make me nervous if you know what I mean*"). Towards the end of the crisis, citizens' focus became again broader also questioning justice of activities and competence of the police force, praising their activities or starting to write about non-riot related issues.

Figure 5: Topics of citizens' tweets over the course of the riots (% of tweets per day): GMP police

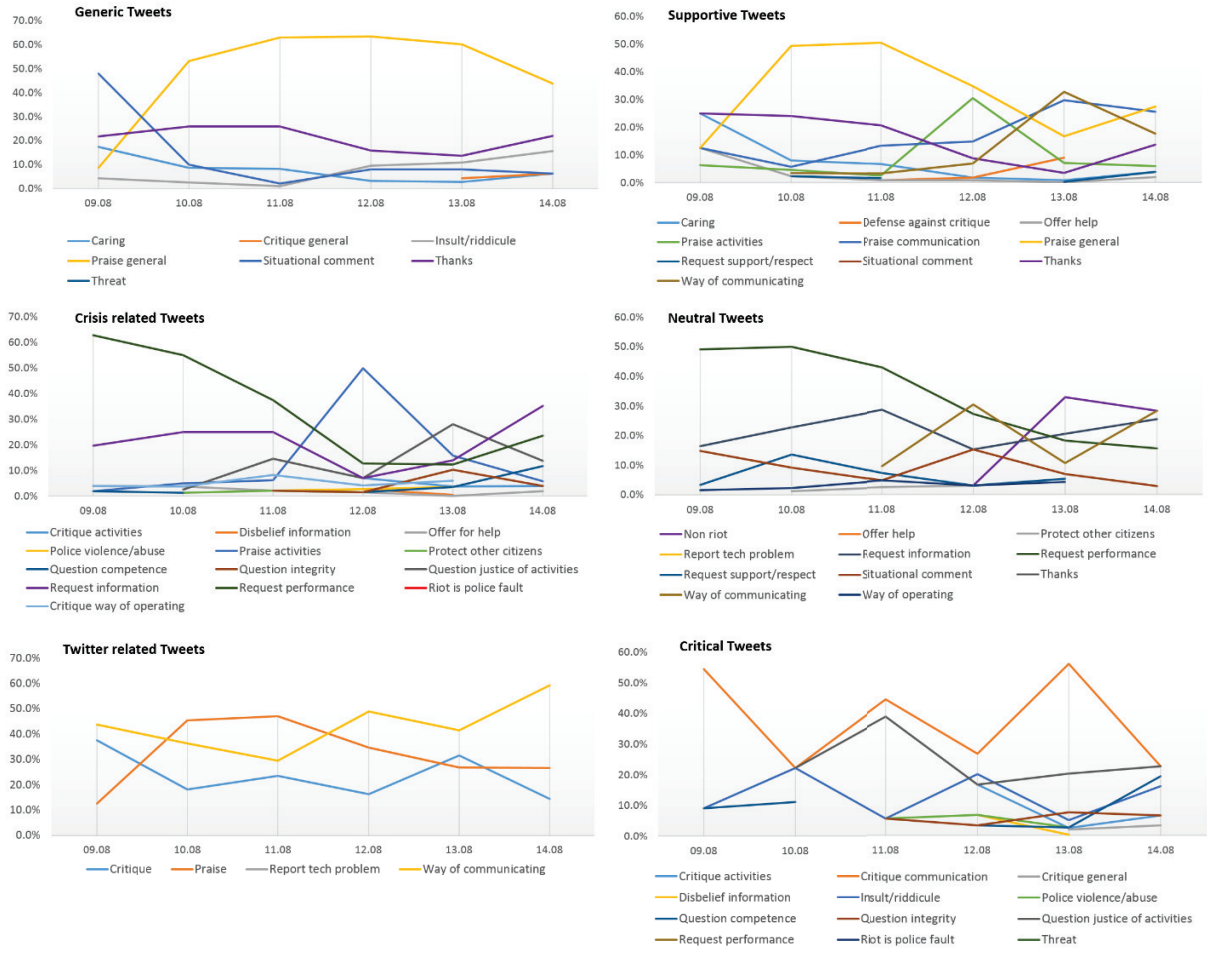
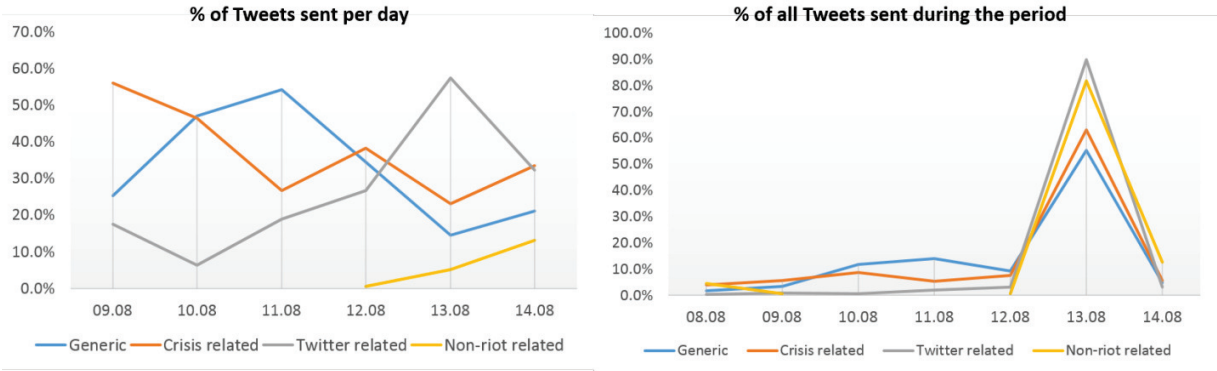


Figure 6: Changes in content of citizen tweets over the course of the riots: GMP police



5. DISCUSSION

Our study aimed to shed light on changes in citizens' communication in terms of sentiment and content over the duration of a crisis. Analyzing citizens' tweets directed at or speaking about two disparate police forces during the 2011 UK riots, we found considerable similarities in the development of sentiments and content across the two cases from their onset to the final days of the riots. Taken together, our observations across both cases suggest that citizens' concerns seem to follow a 'general logic' with shifts in the type of topics citizens find relevant and pay attention to throughout the duration of crisis events. Further, we found that citizens actively engaged with police forces about their way of handling the crisis, but also addressed broader issues on the perceived justice of actions as well as their overall competence and integrity. These critical voices were most visible in the very early stage and the last phase of the riots.

Early and late stages of a crises can thus be seen as especially vulnerable times for police forces, in which citizens aim to make sense about the crisis and the role of police in the events: at the beginning, in terms of framing the crises as the organization's fault; in the final stages by critically reviewing the effectiveness and ethics of actions and communications. These observations add a dynamic perspective to existing crisis communication models. Prevalent models, such as Image Repair Theory (Benoit, 1995, 1997) and Situational Crisis Communication Theory (Coombs, 2009). tend not to theorize potential changes in the emotions and needs of crisis audiences. Our study suggests that content and sentiments of communications change in systematic ways over the duration of a crisis event, which will require adaptation of organizations' reactions and crisis communication strategies.

The need for a more dynamics view is also borne out by a second important observation from our study: the strong fragmentation of voices into nearly equal parts supportive, neutral and critical messages at the end of the crisis period in both cases, and for MET also at the beginning

of the riots. This fragmentation emphasizes the plurality of opinions and concerns in crisis publics (Webster & Ksiazek, 2012) and supports the existence of a rhetorical arena in which crisis communication emanates from a multitude of groups (Frandsen & Johansen, forthcoming; Coombs & Holladay, 2014). Their often contradictory opinions and concerns need to be addressed in a competent manner. Instead of choosing one singular response strategy such as denial, mortification or bolstering (Benoit, 1995; Coombs, 2009), our study indicates that organizations need agility to address the plurality of audiences present on social media and the subsequent multitude of concerns and attitudes voiced at the same time. Organizations thus require agility in their crisis communication strategies over time as well as across audiences.

A third important observation was the episode around the 'mum-of-two' tweet by GMP. This incident dramatically changed the communication pattern and content of citizen tweets. Using Grebe's (2013) terms, GMP in this instance failed to meet the expectations of the public of what was deemed to be an appropriate response message. This episode can be seen as a short social media crisis (Coombs, 2014; Coombs & Holladay, 2012; Veil et al., 2011) in the sense that it is an event that can harm the organization and arises in or is amplified by social media (Coombs, 2014). This social media crisis led into a "double crisis" (Johansen & Frandsen, 2007), in which the original crisis (the riots) was – during one day – superposed by a communication crisis that showed a negative reaction to GMP's use of Twitter. The resulting reactions made the public 'forget' what the original crisis was about and instead focus on GMP's communication efforts and messages. This incident illustrates the volatile nature of crisis communication on Twitter as well as potential challenges of a rather informal communication style during evolving crises, but also possibilities for recovering from such blunders.

Yet, despite the explosive initial reactions, citizens' attention quickly shifted away again from the tweet incident. We believe that this was due to two main reasons: firstly, GMP conducted damage control by apologizing and asking for feedback on their communication style. According to Benoit's Image Repair Theory (1995, 1997), GMP used a 'mortification' strategy, while under Coombs's Situational Crisis Communication Theory (2009), they used an 'apology' to rebuild their crisis response. In both cases, the organization takes full responsibility of the incident and asks for forgiveness, just as GMP did. These efforts at repairs were received positively by many, who lauded GMP for admitting a fault and their willingness to learn. The strategy to apologize and openly admit the fault seemed to have been instrumental in calming negative opinions and creating a positive view which made attacks by others unreasonable. Our observations support previous findings on the use of apologies, such as Schultz et al. (2011)'s, who concluded that people are more likely to pass along or react to messages when they are angry about an incident, and that apology and sympathy should therefore lead to less negative feelings. The GMP case can serve as demonstration that a proactive and engaging, informal approach can work well in shaping perceptions of police and their actions, but also showcases its dangers.

Secondly, citizens increasingly started defending GMP against critique of others. The events around the tweet thus also demonstrate that citizens can be important allies in the image repair of organizations. A considerable group of citizens played an active role in co-shaping and co-creating positive narratives about both police forces. Neither Image Repair Theory nor Situational Crisis Communication Theory have recognized the role of citizens in supporting embattled organizations in their efforts to manage their image during and in the aftermath of crisis events. We think that here lays considerable potential in extending and refining our

understanding of organizational crisis communication and in harnessing citizens in the creation or repair of organizational legitimacy during and after crises.

5. CONCLUSIONS

The main objective of this article was to shed light on how citizens use Twitter over the course of a crisis event in relation to first responders such as police forces leading to new insights for the planning and implementation of effective and adaptive crisis communication. Our study contributes to the literature on crisis communication by expanding the application of both Benoit's Image Repair Theory and Coombs's Situational Crisis Communication Theory in two specific ways. By examining citizens' communication with and about police forces on Twitter we add citizens' social media use as an important factor in (co-)shaping organizational image and legitimacy that both theories should more often take into account. Our study moreover illustrates how citizens employ social media in the sense-making process throughout a crisis and how this sense-making and thus the focal concerns shift across the duration of the events. Given the reactive nature of Image Repair Theory and Situational Crisis Communication Theory communication strategies, our study contributes to these theories by adding a dynamic perspective of likely content and sentiment shifts over time. In addition, our study shows that, given the fragmentation of citizens' opinions and concerns, organizations need to handle crisis communication strategies flexibly to simultaneously address a variety of (possible) publics. Together these insights can be utilized by police forces to help determine the appropriate organizational responses that facilitate coping across various stages of a crisis.

5.1. Practical implications

Our study offers very practical lessons to first responders such as police for a more strategic social media communication approach during crises. Firstly, police forces need to competently manage the natural fragmentation of their audiences on social media. On the one hand, they should aim to amplify the positive and supportive voices to enhance and strengthen online support by citizens (e.g., reacting to such messages by thanking the senders). On the other hand, the more critical voices can provide important learning and feedback moments for police forces. Keeping track of the sentiments as well as the content of citizen tweets throughout an event can help reacting quickly to misconceptions (e.g., by quickly providing rationales for actions perceived as unjustified) or guide changes in the style, frequency and content of communications (e.g., frequency of updates on arrests or localized information on number of officers on the ground).

Critical voices, especially in the sense-making phase in the aftermath of a crises, can further provide crucial information about (potential) trust issues and threats to the perceived standing and legitimacy of police forces longer term. As Terp Søland (2016) pointed out, crises can threaten both the image and reputation of an organization. Our study illustrates that such threats go hand in hand with the possibility to be perceived as an effective crisis responder and that such fragmentations of opinions may be most likely in the early and later stages of a crisis. We therefore propose that reactive strategies, which are the most prevalent strategies in both Benoit's and Coomb's crisis communication models, should be accompanied by a more proactive bolstering posture, intended to build a positive connection between police forces and citizens (Coombs, 2014).

During the height of the riots, the fragmentation of opinions nearly disappeared. In these middle days, the primary concern of citizens in both cases was police performance on the ground; that is,

seeing whether and how police forces handled the crises in concrete ways (number of arrests, type of actions taken, presence or absence in certain areas, transparency of communications about actions, etc.). For police forces this means that communications in these middle days should be based on a bolstering strategy that "reminds" citizens about the organization's good work and that, therefore, strongly focuses on showcasing performance and concrete actions, assuaging the need of citizens to see police act (Coombs, 2014). At this point, an active Twitter presence can thus be seen as parallel to showing an active presence on the streets (i.e., indicating the need for a double focus on 'boots and tweets').

The choice of a flexible crisis communication strategy is key to do this successfully. Our results show that, in making that choice, context and the circumstances surrounding a crisis episode matter (Bell, 2010; Coombs 2009). Thus, for MET, the strategy of information resulted in less negative crisis reactions (Coombs & Holladay, 2009), while for GMP, and as a result of the social media crisis, an image restoring strategy focused on admitting responsibility and asking for forgiveness proved more suitable (Coombs, 2009; Benoit, 1997; Benoit, 1995). Nevertheless, due to the fragmentation of audiences, combining different strategies and, therefore, addressing the concerns and expectations of several publics, seems to be the most powerful option, particularly when that combination includes both reactive/defensive strategies and proactive ones.

Due to its dynamics in terms of sentiments and content, analyzing citizens' interaction on social media during crises further offers a tool for police forces to improve the choice and consequent impact of crisis communication strategies. Given the ambiguous nature of opinions in the late stages and aftermath of a crisis, as shown in both our cases, the monitoring of social media during post-crisis stages seems especially important. An active presence can contribute to

citizens' sense-making, that is, the attempt to retrospectively create an understanding of what has occurred and how to evaluate the role of police forces during the events. Police forces should thus refrain from scaling down their social media presence too early to avoid threats to their legitimacy in the longer term.

5.2. Limitations and future research

Our study also has several limitations. We exclusively focused on Twitter during a situation of spreading civil unrest. This is a very different situation than, for instance, crises due to environmental disasters or terrorist attacks. Hence, in how far our observations also hold for other forms of crises and other social media platforms are questions that require further attention. Also, future studies need to clarify in how far disparities in online reactions translate into different offline behaviors as well as their impact on subsequent crises, a research question that could be addressed using the Social Amplification of Risk Framework (SARF) (Kasperson et al., 1988; Renn et al., 1992). Moreover, it is likely that demographic, societal or local subgroups will react differently to crisis communication strategies. It was (at least with the tools in our reach) not possible to gather the demographics of Twitter users. Here lays considerable potential for more focused enquiries within and across subgroups and therefore for further understanding the fragmentation of audiences during unfolding crisis events. Finally, the two police forces started on different levels on Twitter, GMP having been considerably more active than MET even before the riots. In how far such differences affect citizen reactions during crisis remains another research question.

Still, there are important lessons to be learned from detailed analyses of Twitter messages, as such public narratives provide a direct window into reactions of citizens on the web. As our observations demonstrate, Twitter can be a fast-paced feedback loop for crises responders such

as police during developing crises, not only about their actions on the ground, but also about their communicative approach – especially if the organization is willing to be transparent and to enter into direct communication with the (online) public. On the other hand, our study also demonstrates the possible pitfalls and challenges of taking this route. To make an informed decision, crisis responders need to be aware of these respective benefits and challenges of disparate communication strategies and the multitude of voices organizations will encounter during crisis events.

REFERENCES

Allen, D. K., Karanasios, S. & A. Norman (2014). Information sharing and interoperability: The case of major incident management. *European Journal of Information Systems, 23*(4), 418–432.

Baker, S. (2012). Policing the riots: New social media as recruitment, resistance, and surveillance. In D. Briggs (Ed.), *The English Riots of 2011. A summer of discontent* (pp. 169-190), Hook: Waterside Press Ltd.

Bell, L. (2010). Crisis communication: The praxis of response. *The Review of Communication, 10*(2), 142-155.

Benoit, W. L. (2015). *Accounts, excuses, and apologies: Image repair theory and research*. Albany: State University of New York Press.

Benoit, W. L. (1997). Image repair discourse and crisis communication. *Public Relations Review, 23*(2), 177-186.

Benoit, W. L. (1995). *Accounts, excuses and apologies: A theory of image repair strategies*. Albany: State University of New York Press.

Briggs, D. (2012). Introduction. In D. Briggs (Ed.), *The English riots of 2011. A summer of discontent* (pp. 9-25), Hook: Waterside Press Ltd.

Brummette, J. & Fussell Siso, H. (2015). "Using Twitter as a means of coping with emotions and uncontrollable crises". *Public Relations Review, 41*(1), 89-96.

Cassa, C., Chunara R., Mandl K. & Brownstein J. (2013). Twitter as a sentinel in emergency situations: Lessons from the Boston marathon explosions. *PLOS Currents Disasters,* Jul 2, Edition 1, doi: 10.1371/currents.dis.ad70cd1c8bc585e9470046cde334ee4b.

Coombs, W. T. (2014). *Ongoing crisis communication: planning, managing, and responding* (4th ed.). Thousand Oaks: CA: Sage Publications.

Coombs, W. T. (2009). *Ongoing crisis communication: Planning, managing, and responding* (3rd ed.). Thousand Oaks, CA: SAGE Publications.

Coombs, W. T. & Holladay, S. J. (2014). How publics react to crisis communication efforts. Comparing crisis response reactions across sub-arenas. *Journal of Communication Management, 18*(1), 40-57.

Coombs, W.T. & Holladay, S.J. (2012). The paracrisis: The challenges created by publicly managing crisis prevention. *Public Relations Review, 38*(3), 408-415.

Coombs, W. T. & Holladay, S. J. (2009). Further explorations of post-crisis communication: Effects of media and response strategies on perceptions and intentions. *Public Relations Review, 35*(1), 1–6.

Coombs, W.T. & Holladay, S.J. (2006). Halo or reputational capital: reputation and crisis management. *Journal of Communication Management, 10*(2), 123-137

Crump, J. (2011). What are the police doing on twitter? Social media, the police and the public. *Policy & Internet 3*(4), 1-27.

Currie, D. (2009). *Special report: Expert round table on social media and risk communication during times of crisis- Strategic challenges and opportunities*. Washington DC: American Public Health Association.

Denef, S., Bayerl, P.S. & Kaptein, N. (2013). Social media and the police - Practices of British police forces during the August 2011 riots. Paper presented at the SIGCHI Conference on Human Factors in Computing Systems. Paris, April 27th-May 2nd.

Fischer, D., Fischbach, K, & Possega, O. (2016). Communication barriers in crisis management: A literature review. Paper presented at the 24th European Conference on Information Systems. Istanbul, June 12th-15th.

Frandsen, F. & Johansen, W. (in press). “Reconceptualizing crisis communication: Developing a multi-vocal approach”. *Public Relations Review*.

Gaspar, R., Pedro, C., Panagiotopoulos, P., Seibt, B. (2016). “Beyond positive or negative: Qualitative sentiment analysis of social media reactions to unexpected stressful events”. *Computers in Human Behavior, 56*, 179-191.

Grebe, S. K. (2013). Things can get worse: How mismanagement of a crisis response strategy can cause a secondary or double crisis: The example of the AWB corporate scandal. *Corporate Communications: An International Journal, 18*(1), 70-86

Hughes, A. L. & L. Palen (2012). The evolving role of the public information officer: An examination of social media in emergency management”. *Journal of Homeland Security & Emergency Management, 9*(1):1–20.

Hughes, A.L., St. Denis, L., Palen, L. & Anderson, K.M. (2014). Online public communications by police & fire services during the 2012 Hurricane Sandy. Paper presented at the 32nd Annual ACM Conference on Human Factors in Computing Systems. Toronto, April 26th-May 1st.

Johansen, W. & Frandsen, F. (2007). *Krisekommunikation: når virksomhedens image og omdømme er truet*. Frederiksberg: Forlaget Samfundslitteratur.

Kasperson, R. E., Renn, O; Slovic, P., Brown, H. S., Emel, J., Goble, R., Kasperson, J. X. & Ratick, S. (1988). “The social amplification of risk: A conceptual framework.” *Risk Analysis,* 8 (2), 177–187.

Kreps, G. A. (1984). Sociological inquiry and disaster research. *Annual Review of Sociology, 10*, 309-330.

Krippendorff, K. (2013). *Content analysis. An introduction to its methodology*. Thousand Oaks, CA: Sage Publications.

Lee, Y., Seo, Y., Nam, H., Hwang, G. & Sung, M. (2012). Influence of media types on acceptance of crisis communication strategies. *Journal of Public Relations Research*, *16*(1), 35-77.

Lettieri, E., Masella, C. & Radaelli, G. (2009). Disaster management: Findings from a systematic review. *Disaster Prevention and Management, 18*(2), 117-136.

Li, J., Vishwanath, A. & Rao, H. (2014). Retweeting the Fukushima nuclear radiation disaster. *Communications of the ACM 57*(1), 78-85.

Lillqvist, E. & Salminen, L. (2014). Facing Facebook impression management strategies in company–consumer interactions. *Journal of Business and Technical Communication*, *28*(1), 3-30.

Liu, B. F., Austin, L. & Jin, Y. (2011). How public respond to crisis communication strategies: The interplay of information form and source. *Public Relations Review, 37*(4), 345-353.

Mergel, I. (2014). *Social media practices in local emergency management results from central New York*. Syracuse, NY: Institute of National Security and Counterterrorism – Moynihan Institute of Global Affairs.

Mulder, F., Ferguson, J., Groeneweg, P., Boersma, K. & Wolbers, J. (2016). Questioning big data: Crowdsourcing crisis data towards an inclusive humanitarian response. *Big Data & Society*, online in advance, 1-13.

Meijer, A. (2010). Cocreating safety. Using new media to engage citizens in the production of safety. Paper presented at the European Group for Public Administration (EGPA) Conference. Toulouse, September 2nd-4th.

Meijer, A. & Theans, M. (2013). Social media strategies: Understanding the differences between North American police departments. *Government Information Quarterly, 30*(4), 343-350.

Nelson, A., Sigal, I. & Zambrano, D. (2010). *Media, information systems, and communities: Lessons from Haiti*. London: Communicating with Disaster Affected Communities (CDAC) and Knight Foundation. Available online at: https://kf-site-production.s3.amazonaws.com/publications/pdfs/000/000/005/original/KF_Haiti_Report_English.pdf.

Ott, L. & Theunissen, P. (2015). Reputations at risk: Engagement during social media crises. *Public Relations Review, 41*(1)*,* 97-102.

Palen, L., Vieweg, S., Liu, S. B. & Hughes, A. L. (2009). "Crisis in a networked world: Features of computer-mediated communication". *Social Science Computer Review, 27*(4), 467-480.

Panagiotopoulos, P., Bigdeli, A.Z. & Sams. S. (2014). Citizen–government collaboration on social media: The case of Twitter in the 2011 riots in England. *Government Information Quarterly, 31*(3), 349–357.

Panagiotopoulos, P., Barnett, J., Bigdeli, A. Z. & Sams, S. (2016). "Social media in emergency management: Twitter as a tool for communicating risks to the public". *Technological Forecasting and Social Change, 111*, 86-96.

Pang, N. & Ng, J. (2016). Twittering the Little India riot: Audience responses, information behaviour and the use of emotive cues. *Computers in Human Behavior, 54*,

Renn, O., Burns, W. J., Kasperson, J. X., Kasperson, R. E. & Slovic, P. (1992). "The social amplification of risk: Theoretical foundations and empirical applications." *Journal of Social Issues, 48* (4), 137–160.

Rosenthal, U., Charles, M.T. & 't Hart, P. (1989). *Coping with crises: The management of disasters, riots and terrorism*. Springfield: Charles C. Thomas Publisher.

Schultz, F., Utz, S. & Goritz, A. (2011). Is the medium the message? Perceptions of and reactions to crisis communication via twitter, blogs and traditional media. *Public Relations Review*, 37(1), 20-27.

Sellnow, T. & Seeger, M. (2013). *Theorizing crisis communication*. Hoboken, NJ: Wiley-Blackwell.

Shih, P. C., Han, K. & Carroll, J. M. (2015). Using social multimedia content to inform emergency planning of recurring and cyclical events in local communities. *Homeland Security & Emergency Management, 12*(3), 627-652.

Simon, T., Goldberg, A. & Adini, B. (2015). Socializing in emergencies - A review of the use of social media in emergency situations. *International Journal of Information Management, 35*(5), 609-619.

Skriver Jensen, K. (2014). *Crisis communication on social media*. Unpublished master thesis. Aalborg: Aalborg University.

Starbird, K., Maddock, J., Orand, M., Achterman, P. & Mason, R.M. (2014). Rumors, false flags, and digital vigilantes: Misinformation on Twitter after the 2013 Boston marathon bombing. Paper presented at the iConference 2014. Berlin, March 4th-7th.

Stewart, M. C. & Gail Wilson, B. (2016). "The dynamic role of social media during Hurricane #Sandy". *Computers in Human Behavior, 54*(C), 639-646.

Tapia, A., LaLone, N. & Kim, H.-W. (2014). Run amok: Group crowd participation in identifying the bomb and bomber from the Boston marathon bombing. *Paper presented at the 11th International ISCRAM Conference*. University Park, PA, May 18th.

Takahashia, B., Tandoc Jr, E.C. & Carmichael, C. (2015). Communicating on Twitter during a disaster: An analysis of tweets during Typhoon Haiyan in the Philippines. *Computers in Human Behavior, 50*, 392-398.

Terp Søland, A. (2016). *Managing social media crises: The effects of communication form and communication strategy*. Unpublished master thesis. Copenhagen: Copenhagen Business School.

UK Cabinet Office (2012). *Smart tips for category 1 responders using social media in emergency management.* March 2012. Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/85946/Using-social-media-in-emergencies-smart-tips.pdf.

Van Gorp, A., Pogrebnyakov, N. and E. A. Maldonado (2015). Just keep tweeting: Emergency responder's social media use before and during emergencies. *Paper presented at the 23rd European Conference on Information Systems*. Münster, May 26th-29th.

Veil, S., Buehner, T. & Palenchar, M. A. (2011). Work-in-process literature review: Incorporating social media in risk and crisis communication. *Journal of Contingencies and Crisis Management, 19*(2), 110-122.

Webster, J.G. & Ksiazek, T.B. (2012). "The dynamics of audience fragmentation: public attention in an age of digital media". *Journal of Communication, 62*(1), 39-56.

Wendling, C., Radisch, J. & Jacobzone, S. (2013). *The use of social media in risk and crisis communication*. OECD Working Papers on Public Governance, no. 25. Available online at: http://www.oecd-ilibrary.org/governance/the-use-of-social-media-in-risk-and-crisis-communication_5k3v01fskp9s-en.

Wukich, C. (2015). Social media use in emergency management. *Journal of Emergency Management 13*(4), 281-294.

Wukich, C. & Mergel, I. (2015). Closing the citizen-government communication gap: Content, audience, and network analysis of government tweets. *Homeland Security and Emergency Management, 12*(3), 707-735.

Yates, D. & Paquette, S. (2011). Emergency knowledge management and social media technologies of the 2010 Haitian earthquake. A case study. *International Journal of Information Management 31*(1), 6-11.

Yin, T. (2009). *Case study research. Design and methods*. Thousand Oaks, CA: Sage Publications.

Figure 1. Change of sentiments in citizen Tweets over the course of the riots: MET police

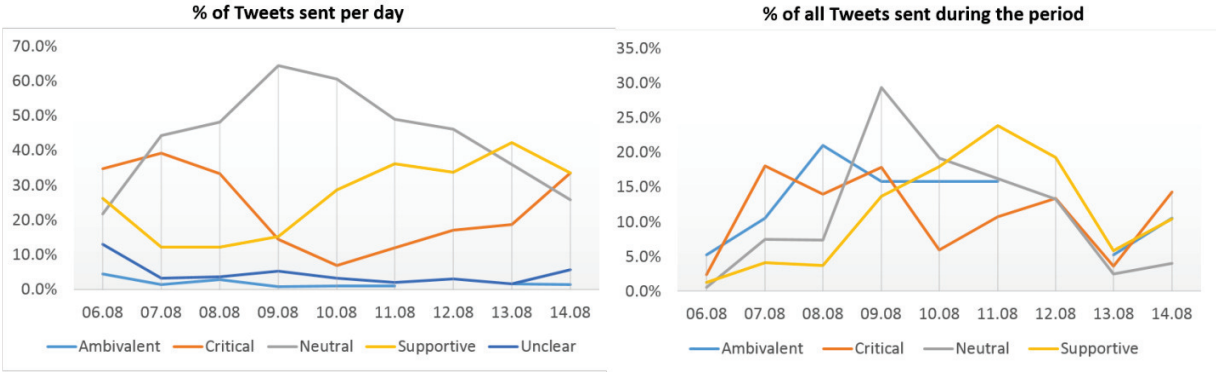


Figure 2. Topics of citizens' Tweets over the course of the riots (% of Tweets per day): MET police

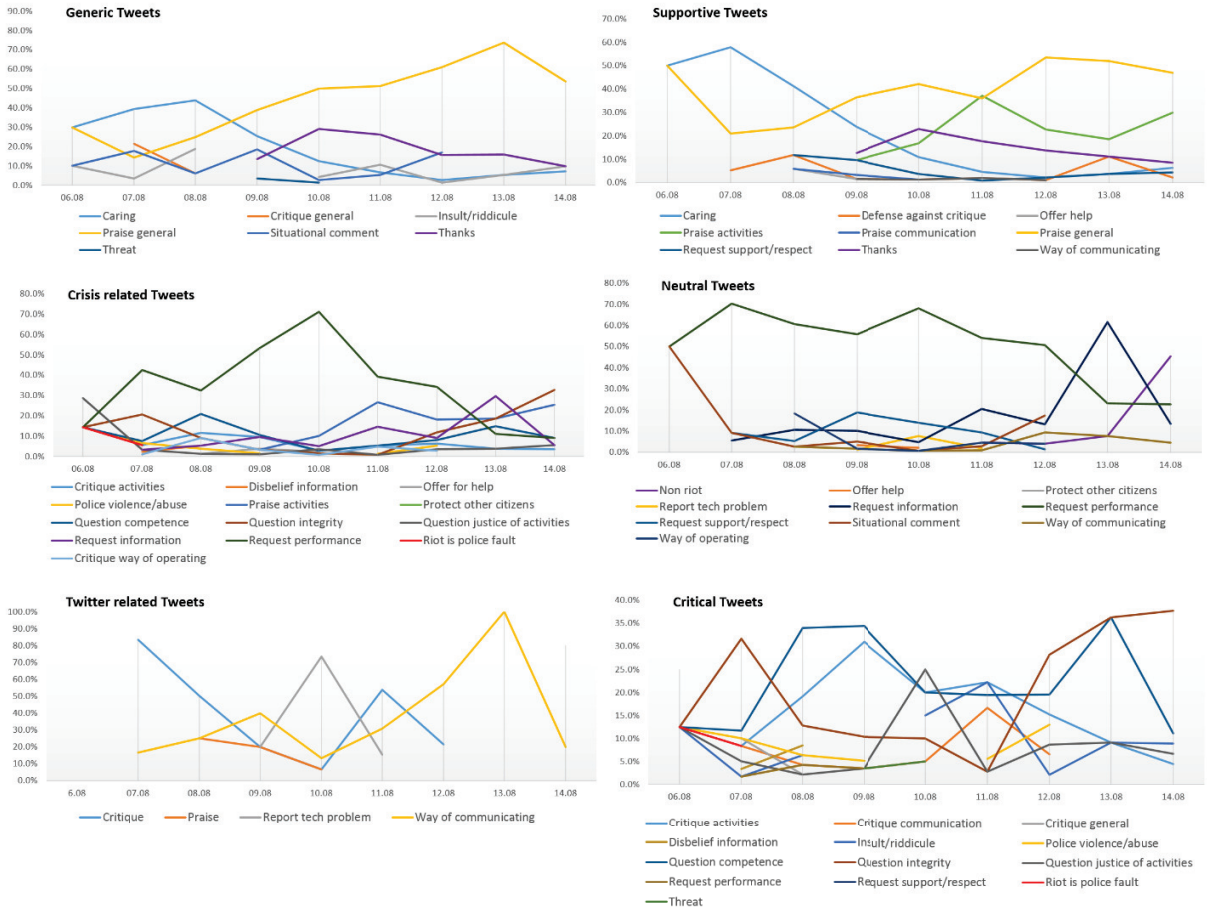


Figure 3. Changes in content of citizen Tweets over the course of the riots: MET police

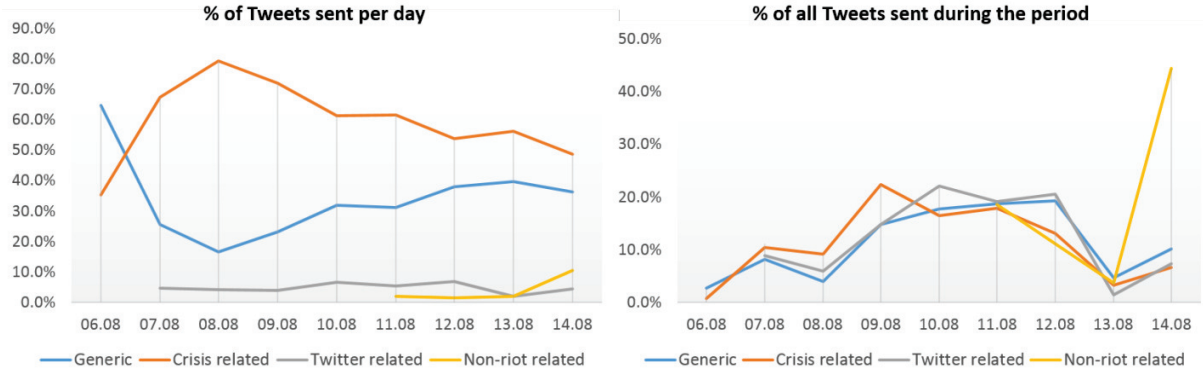


Figure 4. Change of sentiments in citizen Tweets over the course of the riots: GMP police

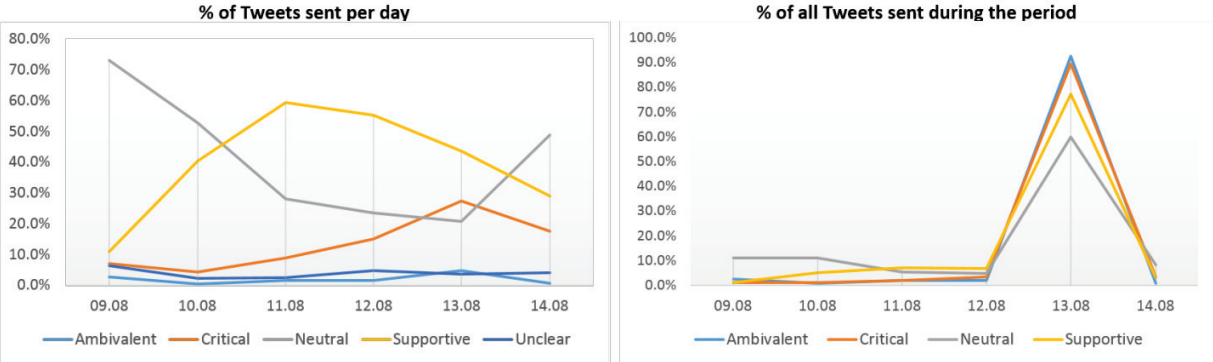


Figure 5: Topics of citizens' Tweets over the course of the riots (% of Tweets per day): GMP police

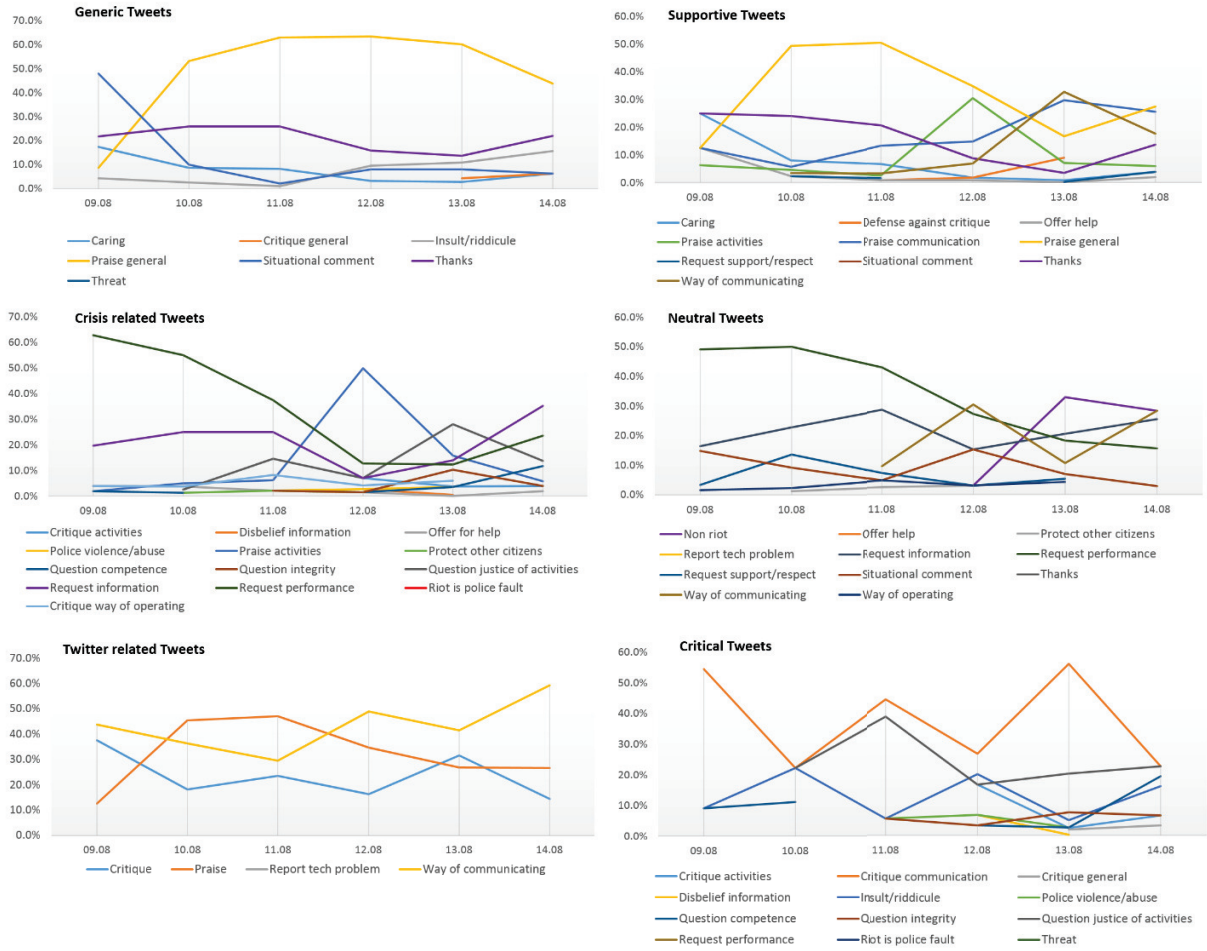


Figure 6: Changes in content of citizen Tweets over the course of the riots: GMP police

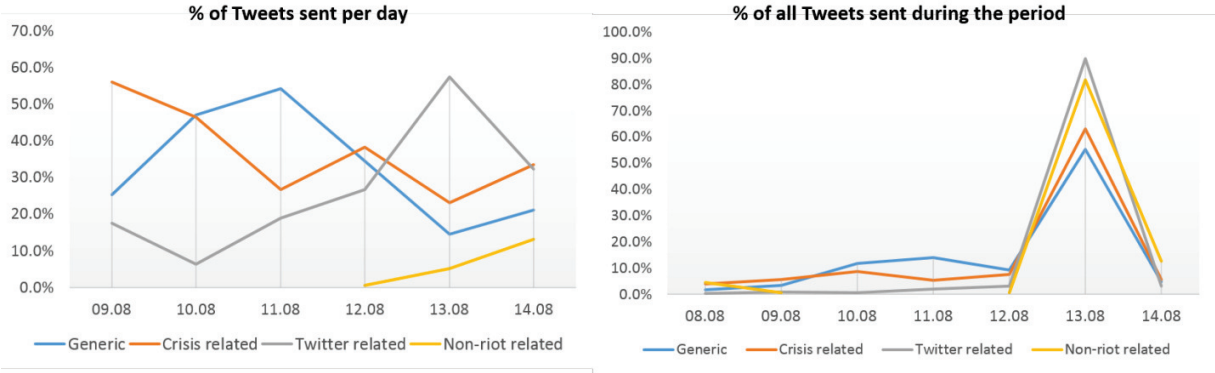


Table 1: Crises types by level of responsibility (source: Coombs, 2014: 150)

Victim cluster: Very little attribution of responsibility
Natural disasters
Rumors
Workplace violence
Malevolence
Accidental cluster: Low attribution of responsibility
Challenges
Technical-error accidents
Technical error-product harm
Preventable cluster: Strong attribution of responsibility
Human-error accidents
Human error-product harm
Organizational misdeeds

Table 2. Topics identified in citizen tweets

THEME 1: GENERAL COMMENTS	
Topics	**Example**
1. General praise	@gmpolice keep up the amazing work, bad guys never win!!!! :-)
2. General critique	@[name] @gmpolice Sad to say but policemen ARE like that.
3. Caring	@metpolice bring in the army, you guys need some backup out there, you shouldn't have to fight this war on your own!! #bringinthearmy
4. Thanks	I think we all owe @gmpolice & @metpoliceuk a HUGE thank you this week.
5. Insult/ridicule	@gmpolice arrest yourselves.
6. Threat	Hey, @metpoliceuk bribes u took 4 global phone hacking make u a criminal organization, you will be closed #Anonymous
7. Riot is police fault	@[name] @[name] @metpoliceuk no i think you'll find it's the police who've been inciting disorder
8. Situational comments	@gmpolice I'd really hoped as the city of manchester, we could have risen above such vile and pathetic behaviour.
9. Force-comparison	I think the Met have a lot to learn from forces like @gmpolice
THEME 2: COMMENTS ON POLICE ACTIVITIES	
10. Praise of activities	@metpoliceuk hurrah! Well done. X
11. Critique of activities	@[name] @gmpolice seems heavy handed, contradicts policy http://t.co/cPCmvvX
12. Way of operating	@metpoliceuk There clearly are not enough police officers, fire engines to restore order, Order a curfew #londonriots #ukriots
13. Request for information	@gmpolice How is King Street? Any further damage?
14. Offer to help	@gmpolice anything we can do to help? #manchesterriots
15. Request for performance	@metpolice I don't care about exact number of arrests - put a stop to this NOW please. From a taxpayer #hackney
16. Disbelief information	@[name]: RT @metpoliceuk: Police have not requested a #mediablackout and are continuing to provide updates < Liars
17. Question integrity	[name] (2) Which raises the question whether @gmpolice accept the principle of the presumption of innocence.
18. Question justice/activities	@gmpolice Yes, he probably did something truly heinous. Like littering.
19. Police violence/abuse	And yet try standing in the street to make a valid political point and @metpoliceuk will come down on you like a ton of bricks. #ukriots
20. Question competence	@gmpolice just hashtag it 'EducatedGuess'
21. Protection of co-citizens	@[name] @[name] @[name] @gmpolice [name] had nothing to do with the looting he was on his way home from blackpool

Table 2 (continued).

THEME 3: COMMENTS ON TWITTER COMMUNICATION BY POLICE	
22. Way of communication	@gmpolice use tweeters initials to sign off. Then we get the change of tone x Jo
23. Praise of communication	Amazing use of tech RT:@metpoliceuk: Help us identify London troublemakers on our Flickr pages http://t.co/v7nk7Fz
24. Critique of communication	@gmpolice Give the swashbuckling a rest.
25. Information on IT issues	@metpoliceuk link not working :-(
THEME 4: COMMENTS DIRECTED AT OTHER CITIZENS	
26. Information exchange amongst citizen	@[name] @gmpolice << what did they say mate?
27. Request to support/respect police	Please help the @gmpolice any way you can to bring the criminals to justice #riots
28. Defense against critique	So @metpoliceuk shoot a dangerous criminal with a gun and its their fault??? I think not... #tottenham
THEME 5: NON-RIOT RELATED	
29. Non-riot	Fill in the @gmpolice survey about how they police football matches and you could win tickets to see England at Wembley http://bit.ly/pSldjJ
REST CATEGORY	
(Unclear)	@gmpolice It clearly was!

WHAT DO CITIZENS COMMUNICATE ABOUT DURING CRISES? ANALYZING TWITTER USE DURING THE 2011 UK RIOTS

Mila Gascó holds a MBA and a Ph. D. in public policy evaluation (Award Enric Prat de la Riba granted to the best Ph. D. thesis on public management and administration, given by the Escola d'Administració Pública de Catalunya in Barcelona, Spain). Nowadays, she is the Associate Research Director of the Center of Technology in Government as well as a Research Associate Professor at the Rockefeller College of Public Affairs and Policy, both at the University at Albany – SUNY. Before joining SUNY, Dr. Gascó served as a senior researcher at the ESADE's Institute of Governance and Public Management and the Institute of Innovation and Knowledge Management, in Spain. Previous to that, she was a senior analyst at the International Institute on Governance of Catalonia and a professor in the Rovira Virgili University the Pompeu Fabra University.

Mila Gascó has a lot of consulting experience on the information and knowledge society as well. In this respect, she has worked for a wide variety of organizations such as the United Nations Development Program, the Mayor's Office in Valencia (Venezuela), the Spanish Agency for International Development Cooperation, the City Council and the Provincial Council of Barcelona, the International Institute for Democracy and Electoral Assistance, the Latin American Centre on Management for Development (for whom she co-developed the Ibero-American Interoperability Framework), the World E-Governments Organization of Cities and Local Governments (she was the leading judge for the WeGo Awards), the Inter-American Development Bank, or Google.

Her areas of research are mainly related to ICT adoption by the public sector and, among other, they include electronic and open government, e-governance public sector innovation, smart cities, and public policy evaluation.

Petra Saskia Bayerl is Associate Professor of Technology and Organizational Behavior and Co-Director of the Centre of Excellence in Public Safety Management (CESAM) at Rotterdam School of Management, Erasmus University, the Netherlands. She holds master degrees in psychology, linguistics and organizational dynamics from universities in Germany and the USA and a Ph.D. from Technical University in Delft, Netherlands. Her research interests lay at the intersection of human-computer interaction, organizational communication and organizational change with a special focus on the impact of technological innovations and public safety. Her research has been published in journals such as *MIS Quarterly*, *Communications of the ACM*, *New Media and Society* and *Journal of Organizational Behavior* as well as international conferences in psychology, management, computational linguistics and computer sciences. Her most recent books include "*Application of Big Data for National Security*", "*Open Source Intelligence Investigation*" and "*Community Policing in a European Perspective*".

Sebastian Denef is CEO and Co-Founder at OWN.space, a Berlin-based startup focused on building software for collaboration between knowledge workers and digital agents. Sebastian is also a research fellow at Fraunhofer, studying Human-Computer Interaction in complex social configurations. As a visiting scholar at Innopolis University he teaches Human-Computer Interaction Design. Sebastian holds a PhD degree in Industrial Design from Technical University Delft and a degree in Media System Design from University of Applied Science Darmstadt.

Babak Akhgar is Professor of Informatics and Director of CENTRIC (Centre of excellence in terrorism, resilience, intelligence and organised crime research). Babak has more than 120 referred publications on security, OSINT, counter terrorism and cybercrime. He is principal investigator and technical lead in several multimillion Euros international security initiatives.

Babak Akhgar is technical coordinator of two major EU security projects on Dark web (identification of terrorist generated content) and Cyber Crime and Cyber Terrorism policy and research agenda development. Prof Akhgar latest books are titled "*Cyber Crime and Cyber Terrorism*", "*Application of Big Data for National Security*" and "*Open Source Intelligence Investigation*". In addition to his scholarly activities; Prof Akhgar is Advisory board member of West Yorkshire Police Independent Advisory Group for Cyber Crime, board member of the European Organisation for Security, member of Europol external advisory board on data protection and member of SAS UK academic board.