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Published online: 14 Dec 2012.

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TWITTER AS A REPORTING TOOL FOR BREAKING NEWS
Journalists tweeting the 2011 UK riots

Farida Vis

This study focuses on journalists Paul Lewis (The Guardian) *and Ravi Somaiya* (The New York Times)*, the most frequently mentioned national and international journalists on Twitter during the 2011 UK summer riots. Both actively tweeted throughout the four-day riot period and this article highlights how they used Twitter as a reporting tool. It discusses a series of Twitter conventions in detail, including the use of links, the taking and sharing of images, the sharing of mainstream media content and the use of hashtags. The article offers an in-depth overview of methods for studying Twitter, reflecting critically on commonly used data collection strategies, offering possible alternatives as well as highlighting the possibilities for combining different methodological approaches. Finally, the article makes a series of suggestions for further research into the use of Twitter by professional journalists.*

KEYWORDS   breaking news; crisis communication; social media; Twitter; UK riots

Introduction

The 2011 August riots, which involved four days of the worst violence and destruction in UK recent history (*The Guardian* 2011), lend themselves well to the analysis of crisis communication on Twitter. Moreover, they allow for an in-depth analysis of how the platform was used by mainstream media journalists, an important emerging area of research and the focus of this study.

Various studies have started to address the role of the media in the riots, not least because of the ways in which social media in particular was blamed for having caused them (*The Guardian* 2011). In the absence of a government inquiry into the riots, *Guardian* journalist and "Special Projects Editor" Paul Lewis, who had actively tweeted the riots, set up the "Reading the Riots" project (http://www.guardian.co.uk/uk/series/reading-the-riots) to examine their causes. This ground breaking collaboration between *The Guardian* newspaper and the London School of Economics replicates an earlier study that brought together journalists and social scientists, led by journalist Philip Meyer in the aftermath of the Detroit riots of 1967. Part of the project, in which the present author was involved, focused on analysing the role of social media, especially Twitter, through the study of the 2.6 million tweets sent during the four days of the riots, which were donated by Twitter. This study examined the role and spread of rumours on Twitter (Guardian Interactive Team et al. 2011) and whether the platform was used for incitement for which little evidence was found (Richards and Lewis 2011).

The present study focuses on journalists, Paul Lewis (*The Guardian*) and Ravi Somaiya (*The New York Times*), the most frequently mentioned national and international journalists across 2.6 million tweets (Evans and Vis 2011). Both actively tweeted the riots. This study thus adds to existing research, offering additional analytical approaches for studying crisis communication on Twitter as well as deepening understanding of how individual journalists use it. It concludes by suggesting new strategies for research in this rapidly developing area.

Overview of the Literature

Crisis Communication Before and After Twitter

Since its launch in 2006, Twitter has attracted significant research interest because of the openness of the platform, easy access to data and the insight such data offer in better understanding a range of communication practices, from interpersonal, everyday communication, to the ways in which Twitter plays a role in breaking news situations, thus increasingly attracting the attention of journalism scholars. In March 2012, six years after its launch, Twitter announced it has 140 million active users, with 340 million tweets sent every day (Twitter 2012).

During different crisis events, from popular uprisings, to the aftermath of natural disasters, information infrastructures may be affected, shut down altogether and traditional media outlets may have considerable difficulties in getting to locations and verifying information. Verification of information is one of the cornerstones of journalism.

With the deluge of information that social media can produce, information verification is a real challenge and social media content, especially images, are treated with particular caution for use in news (Lyon 2012). Newsrooms have started developing sophisticated mechanisms through which the authenticity of social media images can be verified, such as the BBC Verification Hub (Turner 2012). Additionally, new news organizations like Storyful offer further services to help with such verification (Little 2012). In breaking news situations, user-generated content can be overwhelming for news organizations to deal with especially if they have no reporters on the ground. Thus Bruno (2011, 8) has pointed to a so-called "Twitter Effect", where Twitter provides "live coverage without any reporters on the ground, by simply newsgathering user-generated content available online". During the UK riots, *The Guardian* itself aimed to encourage the delivery of more accurate user-generated content, specifically on Twitter, by highlighting "nine ways to use Twitter responsibly" (Hamilton 2011). These tips included: "Unless you can see it happening, don't tweet it"; "If you see rumours [on Twitter], question them directly"; "Get verification"; "If you see something you know isn't true, try to correct it"; "Follow people you trust to be accurate."

If we temporarily cast our minds back to a time before Twitter, we can see a continuation in the types of communication highlighted during earlier events. For those on the ground in the aftermath of Hurricane Katrina in 2005 (see Vis 2009), the collapse of communication networks meant that coordinating a response was severely hampered. Local media provided a vital resource for those able to connect to the internet, creating online spaces where people could find information and connect with one another.

Moving again to the contemporary moment, the role of Twitter in crisis situations such as the Arab Spring, Christchurch earthquake, Queensland floods and Japanese earthquake, tsunami and nuclear disaster, as well as the UK riots have not only highlighted Twitter as an important platform for breaking news (see e.g. Murthy 2011 and Bruns et al. 2012 for useful overviews), but also pointed to the importance of key agents such as the emergency services who are able to share important information in real time, for example through "hashtags" allowing for the labelling and easy location of tweets.

Ambient Journalism and Twitter

Known for its real-time, short 140 character updates, Twitter creates an environment of constantly fragmented updates, an "awareness system" (Hermida 2012), which users curate through streams based on who they follow. Hermida (2010) and Bruns (2010) have both characterized this fragmented environment containing streams of information from professional journalists and non-professionals "ambient journalism". Hermida (2012, 2) further posits: "As ambient journalism, Twitter provides a mix of news, information and comments, usually connected to current reality, but without an established order." This structure thus expands the number of different agents potentially involved in the production of journalistic products, most notably news. The role and potential of Twitter for journalism is therefore a rapidly growing area of research.

Broadly speaking, studies so far have concentrated on the way new social media technologies, including Twitter, are reshaping journalism, affecting news production and online consumption (Bruns and Highfield 2012; Newman 2011; Newman, Dutton, and Blank 2012), on the one hand, while other studies have specifically looked at how journalists themselves have adapted to social media. These latter studies often focus on the use of Twitter as part of their everyday journalistic routines within a recognized set of journalistic norms. So far, they have noted general trends most frequently through analysis of the Twitter accounts of large groups of often "elite" journalists (Holcomb, Gross, and Mitchell 2011), alongside more narrowly focused studies that have highlighted specific types of journalists and their Twitter use, such as foreign correspondents (Cozma and Chen 2012), or examined gender differences between Twitter-using journalists (Lasorsa 2012). What these studies have largely found is that Twitter was generally not used as a reporting tool but more frequently used to promote content from the journalists' own news organization, sending users back to their the main website. Finally, other studies have interviewed individual journalists about their use, often through early adoption of the platform (Newman 2011). Media profiles further highlight individual journalist's Twitter prowess and innovative use like NPR's Andy Carvin (Kiss 2011). A new study by Hermida, Lewis, and Zamith (2012) offers further insight into how Carvin's use of sources differed from those of the mainstream media during his Twitter coverage of the Arab Spring, thus pointing to the possible emergence of new journalistic conventions on Twitter.

Methods for studying Twitter are still developing and have become a topic for research in their own right. Bruns and Burgess (2012) provide a timely overview of the

types of methods and approaches for journalism researchers. These include tracking developments (tweets, hashtags) over time, identifying key users and mentions/themes as well as conducting network analysis. Moreover, highlighting a range of key data collection strategies, Bruns and Liang (2012) offer an overview of state-of-the-art software for large-scale quantitative approaches. The methods discussed here thus build on these methodological developments through two exploratory case studies but also introduce additional approaches for more in-depth analysis of smaller data sets, showing the possibilities of combining a number of approaches allowing for further insight. At the same time, it reflects on the limits of these methods and data collection strategies and where possible seeks to offer solutions. The next section explains the methods used in this study in full. Overall, this exploratory study focuses on how these journalists used Twitter, analysing a range of Twitter conventions along with the content of their tweets.

Methods

The Guardian/Twitter database of 2.6 million tweets, uploaded by 700,000 individual users, was collected from the Twitter "firehose" (full archive of tweets, sold through licensed third parties) by *The Guardian* and Twitter through a seed list of 160 riot-related hashtags (#ukriots, #tottenham, #tottenhamriots, etc.) as well as others identified through this initial list. The database therefore only contains tweets that included a hashtag and although this is an obvious limitation and raises issues over the representativeness of the sample (Omand, Bartlett, and Miller 2012), this is currently a widely adopted approach to collecting topic-specific Twitter data. Consequently, this unique Twitter riot data set is to date, so far as the author is aware, the most complete collection on the UK riots and richer than those relying on only a handful of hashtags. Not identifying enough salient hashtags is a secondary limitation of such collection approaches. The limitations of these collection strategies and how to overcome them are discussed below. Part of the current study thus relies on *The Guardian*/Twitter database, specifically on the number of mentions individual Twitter accounts received with the top 1000 released through *The Guardian Data Blog* (Evans and Vis 2011) and thus freely available for further inspection.

In order to minimize and largely overcome the identified data collection problems, a second strategy was employed to collect all tweets sent by the two journalists included for analysis. Aside from the pay-for firehose data, Twitter gives free access to its platform through a series of APIs (application programming interface, mainly aimed at third-party developers) including the REST API, which allows for the retrieval of up to 3200 tweets in the past from a single account. As neither journalist included in this study had tweeted enough to put the riot period beyond the reach of the REST API, all tweets sent from the evening of 6 August (after 21:00 pm) until midday on 10 August were collected through Snapbird (which runs on the REST API, http://snapbird.org/). This second collection of tweets included 441 for Paul Lewis and 290 for Ravi Somaiya and thus contained *all* tweets sent during this period irrespective of whether they included a hashtag.

The code frames used for analysing these data were partly based on those developed in previous studies, partly on additional inductive code building. It is hoped they

will be of use to those interested in studying breaking news on Twitter as well as more general studies of the platform and its use by journalists.

Actor Types

The top 1000 Twitter accounts released on *The Guardian Data Blog* was based on all possible mentions and thus included original tweets, retweets, mentions and @replies highlighting a single account. This can consequently say little about how these accounts were engaged with, though still gives a useful indication, once coded, of the types of accounts that were frequently mentioned, highlighting ones for further analysis. An earlier investigation into this data devised a code frame (Vis 2012), extending those developed by Gilad Lotan et al. (2011) for studying information flows during the Tunisian and Egyptian uprisings, in order to identify 20 different account types that had tweeted the riots. Most salient for the current study are the following: (1) mainstream media; (2) only online media (news); (3) non-news mainstream media; (4) journalists; (5) journalists (online media); (7) bloggers; and (12) riot accounts. Concentrating on the 200 most mentioned Twitter accounts, two coders (including the author) separately coded all 200 accounts. Where disagreement arose a third coder made a final decision, thus ensuring 100 per cent intercoder agreement. For more details on the development of this actor type code frame, the full frame and coding manual and an account of the difficulties with such coding, see Vis (2012).

Tweet Types

For the second data set, the 731 tweets sent by Paul Lewis and Ravi Somaiya, five different Twitter functions were coded: original content, mentions, manual retweets (RTs), automated RTs and @replies. It was important to distinguish between two different forms of retweeting: namely when a tweet had been copied and pasted, possibly slightly altered with additional text typically added before or after the content (boyd, Golder, and Lotan 2010). It was felt that this was markedly different from the automated retweeting, which is achieved by pressing a button reproducing the tweet without alterations. Computer-assisted coding can struggle with identifying automated tweets, as the lack of the "RT" identifier makes them difficult to trace and an algorithm able to identify identical content across a Twitter corpus would have to be employed. As the current journalist tweet corpus was small and the identification of these different retweeting behaviours seen as analytically useful, manual coding was possible, thus making the identification of these two forms of retweeting possible and straightforward. Mentions refer here to the highlighting of another Twitter account, through the use of "@" followed by the account name (e.g. @paullewis) but are different from the @reply, which can be considered a direct form of address and seen as more conversational. "Original content" simply highlights tweets that contain no mentions or @replies and are also not retweets. For each tweet up to four links (URLs) and up to four hashtags were recorded. The links were then coded further, as described below. Online tool ReCal (Freelon 2010) was used to establish intercoder reliability. For the tweet types, which only offered five different options, 10 per cent of the tweets were recoded for

each journalist (29 for Ravi Somaiya and 44 for Paul Lewis). Both had an intercoder agreement of 100 per cent and Scott's pi of 1.

Linksharing

Links were coded to highlight the type of content they shared by identifying them as: (1) image-sharing platform; (2) video-sharing platform; (3) mainstream media—riot stories; (4) mainstream media—other; (5) blogs and local news; (6) official accounts (e.g. government, police); (7) broken link; (8) other. Additional attention was then paid to the images from code (1), and these were further coded to highlight that the images were (1) the journalist's own; (2) another journalist's; (3) another Twitter user's; (4) not a still image; (5) not relevant (not riots related). Finally, news stories linking back to their own news organisation were examined in more detail, specifically Live Blogging at *The Guardian*.

Tweet Content

In order to get a better sense of how Twitter was used as a reporting tool, a code frame was devised for coding the content of the journalists' tweets. In part this was conducted by further development of frames used in previous studies (Bruns et al. 2012; Cozma and Chen 2012; Holcomb, Gross, and Mitchell 2011; Lasorsa 2012; Lasorsa, Lewis, and Holton 2012) as well as through additional inductive code building and testing. The content frame coded tweets according to the following categories: (1) reporting—eyewitness (first-hand accounts of the scene by the journalist); (2) reporting—eyewitness quotes (quoting other sources at the scene); (3) reporting—other (including reports from individual journalists, members of the public and official sources such as the government and police); (4) requests—verification (specifically in relation to rumours); (5) requests—story information (leads, tips, help with writing up material); (6) request—other information; (7) statement—plans (about where the journalist was headed); (8) statement—general; (9) news organization—own; (10) news organization—other; (11) news organization—both; (12) personal opinion/reaction; (13) thanking people; (14) other.

For the tweet content 15 per cent of the tweets were second coded. For Paul Lewis, 66 tweets were recoded and an 87.9 per cent intercoder agreement was established, corresponding with Scott's pi of 0.813. For Ravi Somaiya, 44 tweets were recoded with an intercoder agreement of 95.5 per cent and Scott's pi of 0.83, both of which are above the minimum reliability threshold of 0.70.

Limitations

Aside from the limitations already identified with the original database of 2.6 million tweets, it is worth mentioning two additional limitations. First, as this study is exploratory in nature it only includes two journalists for more in-depth analysis, which is a modest sample. Moreover, both are at "elite" news organizations and have been

identified through frequent mentions in the original riots corpus, which may not accurately reflect their ranking in tweeting the riots overall (specifically in the case of Ravi Somaiya). Secondly, this study can say nothing about their regular Twitter use outside of this small and highly unusual four-day breaking news window. Both these concerns should be taken up in additional research.

Findings

Actor Types

If we look at the 200 most mentioned accounts, the focus of the write up on *The Guardian Data Blog* (though all top 1000 accounts were released), it is clear that within this expected "top" of the tail of 1000 most mentioned out of 700,000 accounts, there is a distinct second tail, highlighting that only a handful of accounts were mentioned more than 10,000 times. Within this small number of very frequently mentioned accounts, Paul Lewis is in second place with 30,031 mentions, the only mainstream media journalist to make the top ten. Although not the focus of the present study, Mustafaraj et al. (2011) usefully remind us of the "vocal" minority (top of the tail), compared with the relatively "silent" majority (in the long tail) and any reading of data showing such a clear distribution is wise to keep this in mind.

Taken together, these top 200 accounts received 567,430 aggregate mentions. What is clear from Figure 1 is that a significant number of these mentions are related to mainstream media. Those accounts coded "mainstream media" received 125,768 mentions or 22.2 per cent of all top 200 accounts. If we add to this those accounts coded as "mainstream media journalist" (79,043 mentions, 14 per cent), "only online news media" (13,303 mentions, 2.3 per cent) and "online media journalists" (4607
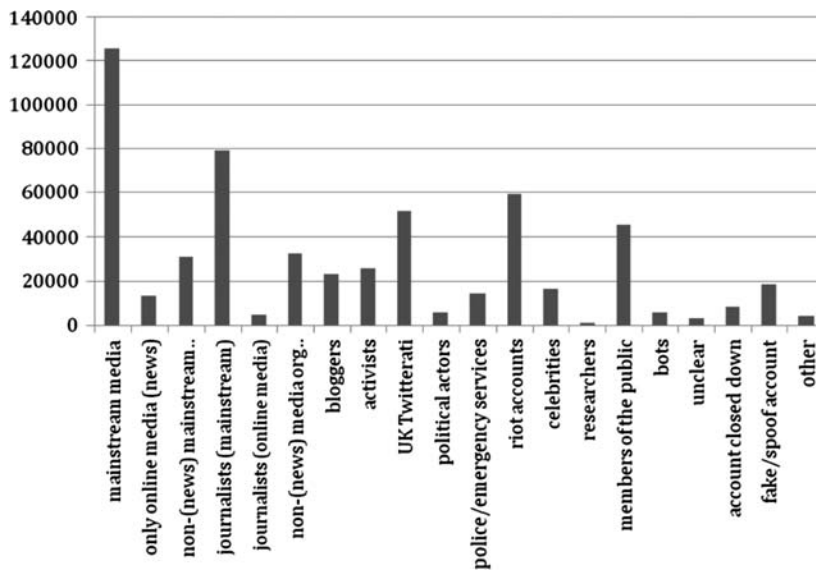

FIGURE 1
Top 200 Twitter accounts tweeting the riots

TABLE 1
Top 50 most mentioned Twitter accounts

Ranking	Twitter handle	Number of mentions	Code
1	@riotcleanup	40,960	Riot accounts
2	**@paullewis**	**30,031**	**Journalists (mainstream)**
3	@piersmorgan	20,412	UK Twitterati
4	@bbcnews	18,836	Mainstream media
5	@itv_news	15,177	Mainstream media
6	@bbcbreaking	13,476	Mainstream media
7	@guardian	11,513	Mainstream media
8	@lawcol888	9290	Members of the public
9	@simonpegg	9240	UK Twitterati
10	@gmpolice	8904	Police/emergency services
11	@channel4news	7228	Mainstream media
12	@artistsmakers	7033	Non(news)-media organization employees
13	@lord_voldemort7	6697	Fake/spoof accounts
14	@skynews	6151	Mainstream media
15	@ruwaydamustafah	6146	Activist
16	@manchesterriots	6096	Riot accounts
17	@twitpic	6024	Non(news)-mainstream media organizations
18	@fieldproducer	6004	Journalists (mainstream)
19	@recruitmentjob1	5962	Bot
20	@_snape_	5939	Fake/spoof accounts
21	@policeuk	5671	Only online media (news)
22	@mattkmoore	5645	Journalists (mainstream)
23	@queen_uk	5527	Fake/spoof accounts
24	@johnprescott	5093	UK Twitterati
25	@stevemavis75	5081	Members of the public
26	@uk_blackberry	4826	Non(news)-mainstream media organizations
27	@benschofield	4692	Journalists (mainstream)
28	@itvcentral	4215	Mainstream media
29	@fleetstreetfox	3732	Blogger
30	@timeoutlondon	3580	Non(news)-mainstream media organizations
31	@idrioters	3533	Riot accounts
32	@metpoliceuk	3532	Police/emergency services
33	@the_multiman	3524	Non(news)-mainstream media organizations
34	**@ravisomaiya**	**3484**	**Journalists (mainstream)**
35	@heardinlondon	3465	Members of the public
36	@time	3438	Mainstream media
37	@ajenglish	3335	Mainstream media
38	@telegraphnews	3270	Mainstream media
39	@angrybritain	3169	Blogger
40	@rioferdy5	3163	UK Twitterati
41	@andybelluk	3143	Members of the public
42	@example	3137	Celebrity
43	@buttonsmagoolio	3017	Account now closed down
44	@sampepper	2970	Blogger
45	@thomascooksport	2843	Non(news)-mainstream media organizations
46	@daraobriain	2827	Celebrity

TABLE 1 (*Continued*)

Ranking	Twitter handle	Number of mentions	Code
47	@lbc973	2820	Mainstream media
48	@telegraph	2794	Mainstream media
49	@londontonight	2774	Mainstream media
50	@londonriots2011	2764	Riot accounts

mentions, 0.8 per cent), then news media accounts are mentioned nearly 40 per cent of the time (39.3 per cent), highlighting that Twitter was a source of news in its own right, but also actively used for spreading mainstream media content as well as providing rich source material for the mainstream media, and individual journalists in particular as we will see below.

Although Wu et al. (2011) studied the sharing of URLs on Twitter, their finding that "roughly 50% of URLs consumed are generated by just 20k elite users", highlighting that "the media produces the most information" lends useful insight to the current findings. Specifically, their comment that "the total number of URLs retweeted by bloggers (465k) is vastly outweighed by the number of retweeted by ordinary users (46M); thus is spite of much greater activity, their overall impact is still relatively small." Related to such mentions it is therefore important to bear in mind the work done by the long tail. Most of the 700,000 individual accounts included will remain invisible, Mustafaraj et al.'s (2011) "silent majority", yet their work is clear in the number of mentions received by those accounts in the top of the tail.

Another category worth highlighting, due to their curatorial practices, are the "riots accounts". These accounts were specifically set up to tweet the riots, provide information or, in the case of "riotcleanup", encourage cleaning activities in the aftermath of the riots. Although they are not mentioned as frequently as some of the other actor types discussed above (59,193 mentions, 10.4 per cent), the @riotcleanup account is the most mentioned account in the whole data set and had a significant reach as well as high newsworthiness during a short period of time (see Table 1 for the 50 most mentioned accounts).

Finally, the three individual accounts ranked 13 (@lord_voldemort7), 20 (@_snape_) and 23 (@queen_uk) are all spoof accounts (with a distinct UK flavour) and worth highlighting. Such fake/spoof accounts are popular on Twitter and can evidently pop up even when studying serious news like the riots. It is thus important to develop code frames that can accommodate and identify such known Twitter behaviour, part of the fabric of the platform, and interpret them as such.

Concentrating on the most mentioned journalist at a UK news organization (Paul Lewis, ranked 2), as well as the top-mentioned journalist at a non-UK news organization (Ravi Somaiya, ranked 34), Muck Rack (www.muckrack.com) a tool for checking Twitter rankings of individual journalists within their news organization (Lasorsa 2012), listed Paul Lewis, at the time of writing (October 2012), as the 11th highest-ranking *Guardian* journalist on Twitter. It included 285 *Guardian* journalists and described Paul Lewis as a "Special Projects Editor" with 51,294 followers and 5426 tweets. Ravi Somaiya is ranked 82nd among 296 *New York Times* journalists, listed as a "Journalist" with 8861 followers and 6280 tweets. Finally, www.whendidyoujointwitter.com shows that Paul Lewis joined

Twitter on March 30 2009 and Ravi Somayia on 14 November 2009. The findings for the content analysis in the next section detail how they used Twitter to tweet the riots.

Finding from the Content Analysis

Tweets Over Time

Figure 2 shows the tweeting frequencies of both journalists (Paul Lewis in dark grey and Ravi Somaiya in light) across the four days and nights of the riots and four periods of tweeting activity can clearly be identified.

On the first night Paul Lewis starts tweeting at 9:04 pm when, in response to another Twitter user who claims there is "rioting" in Tottenham, he asked: "Linked to the police shooting?" Twenty minutes later he tweets: "I'm heading to Tottenham riot. Advice anyone?" and at 1:29 am declares: "Anyone still on the scene at #tottenham riot? Home now—reading Twitter stream—and tempted to go back." Twenty minutes later he heads out again, finally cycling home at 3:16 am. Although Ravi Somaiya decides to head out later, a few hours after the disturbances started, at 11:48 pm (in response to a tweet from BBC reporter Rick Majitha), he stays out uninterrupted until around 5:00 am, sending his final tweet at 6:33 am announcing an early morning appearance on the BBC. Figure 3 shows that both journalists tweeted most on the third night/day, when both reported from various locations, including Hackney and Enfield. On the fourth night/day Paul Lewis tweets significantly more, in large part because he and a colleague (Mustafa Khalili) travel to cover other riot-affected locations outside London, most notably Gloucester and Birmingham.

Tweet Types

Across the four nights/days (Figure 4), standardized for comparison, it is clear that Paul Lewis' tweets are most often original tweets (312 tweets, 71 per cent) compared with Ravi Somaiya's (133 tweets, 46 per cent). The content of these will be examined in more detail in the final section, highlighting how this facilitated reporting. In total, 8 per cent of Paul Lewis' tweets are retweets, either manual RTs (six tweets, 1 per cent)
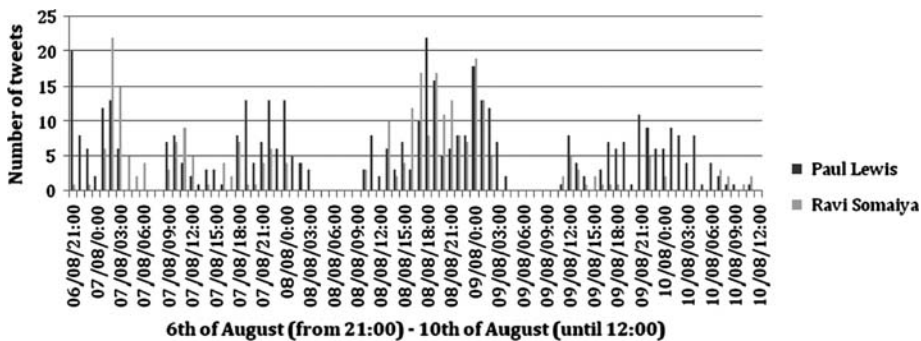

FIGURE 2
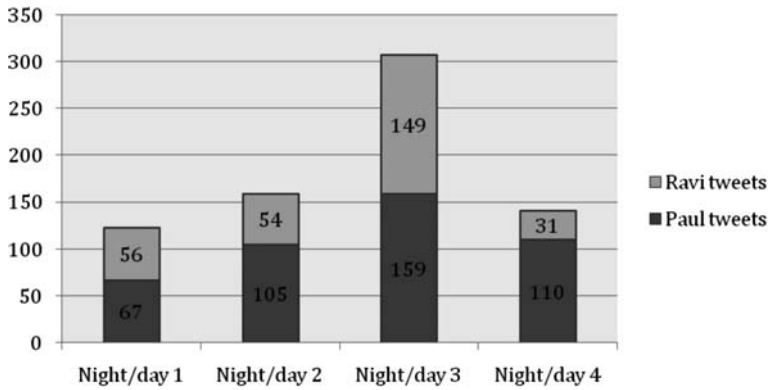Total tweeting activity over four nights/days

FIGURE 3
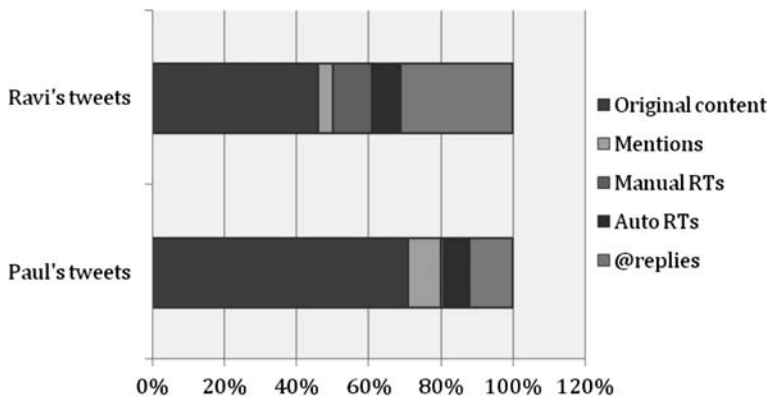Number of tweets sent by each journalist over four night/days

FIGURE 4
Total percentages of tweets per type per journalist

or automated retweets (31 tweets, 7 per cent). Closer inspection shows that the majority of these (22 tweets, 71 per cent) either came from official mainstream media organization accounts or from other tweeting journalists. On the other hand, Ravi Somaiya retweets more often manually (31 tweets, 11 per cent) than automatically (25 tweets, 8 per cent). Overall, 20 per cent of his tweeting constitutes retweeting, more than double that of Paul Lewis' tweets.

Paul Lewis uses 54 @replies (12 per cent), whilst Ravi Somaiya dedicates more than a third of his tweets (89 tweets, 31 per cent) to @replies, suggesting on the surface that he is more "conversational" than Lewis. Additional analysis of the tweet content will illuminate further what this meant in terms of using Twitter as a reporting tool and what this high level of @replies indicates. Paul Lewis mentions other Twitter accounts in 38 tweets (9 per cent) and Ravi Somaiya does this in only 12 tweets (4 per cent).

Finally, if we examine this Twitter behaviour per individual night/day period (Figures 5 and 6), it is clear that Paul Lewis' Twitter behaviour is fairly consistent throughout the period, but that Ravi Somaiya's is not. His large drop in original content
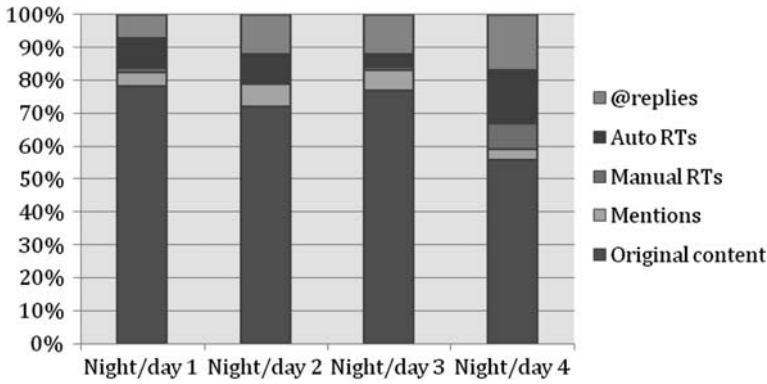
FIGURE 5
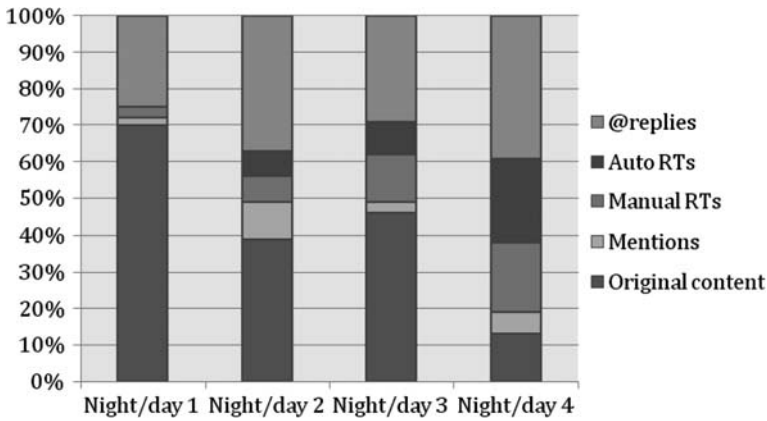Total percentages of tweets per type per night/day—Paul Lewis

FIGURE 6
Total percentages of tweets per type per night/day—Ravi Somaiya

on night/day four can be explained by the fact that there remains little rioting in London where he is based while Paul Lewis continues his live reporting elsewhere, thus assuring a high level of original tweets.

Examining tweet behaviour over the full time period shows a useful pattern, but examining each night/day period individually reveals in more detail how their use of Twitter either stayed relatively stable or indeed changed quite significantly. The next sections discuss additional Twitter conventions in more detail, namely the use of links, specifically the taking and sharing of images, the ways in which they shared mainstream media content and made use of hashtags in their tweets. The final section of these findings looks at how Twitter was used as a reporting tool by examining the content of the tweets in more detail.

Use of links. Paul Lewis shared 111 links in his tweets of which 59 were images (53.2 per cent), five were videos or live streams (4.5 per cent), 43 were links to mainstream media riot-related stories (38.7 per cent), one to a Blog (0.9 per cent), one to an official source (0.9 per cent) and finally two links were broken (1.8 per cent). Ravi

Somaiya shared 70 links in his tweets of which 42 were images (60 per cent), 15 were links to mainstream media riot-related stories (21.4 per cent), three were to Blogs (4.3 per cent), one to an official source (1.4 per cent), six links were broken (8.6 per cent) and three were unrelated (4.3 per cent).

Images. Of the 59 images Paul Lewis shared, most, 44 images (75 per cent), were uploaded by himself through his Yfrog account. Five images (8 per cent) were uploads from other journalists, including two from Ravi Somaiya, seven images (12 per cent) were uploaded by other Twitter users not identified as journalists and three (5 per cent) were not relevant. Of the 42 images Ravi Somaiya shared, similar to Paul Lewis, most images (28, 67 per cent) he uploaded himself. Five images (12 per cent) came from other journalists, including one from Paul Lewis, four images (9 per cent) came from other Twitter users and five (12 per cent) were not relevant.

Mainstream media sharing. Of the 43 links that Paul Lewis shared, most (38) pointed back to *The Guardian*. Of these links, 18 were to different *Guardian* Blogs of which most (16) were to five different riot Live Blogs (the full archive of these is here: http://www.guardian.co.uk/uk/series/london-riots-live). During the riot period under examination *The Guardian* produced a total of six Live Blogs, so only one Blog is left out in these links. Tweets highlighting these links are repeated a number of times as the Blogs are updated. As this group of Live Blogs are specifically related to the riots and have their own online section, they could be considered both as "News" or "Series/Subject" following the scheme developed for the study of *Guardian* Live Blogs by Thurman and Walters (2013, in this issue). Whilst that study found that on "average, a Live Blog runs for 360 minutes, has a total of 40 updates, and a total word count of 4,031", the current study, perhaps unsurprising given the nature of the event, finds that the five Live Blogs Paul Lewis highlights run for 642 minutes on average, have a total of 92 updates and are around 10,500 words each. Some have gaps of a few hours between them, whilst for others the gaps are less that 20 minutes in terms of covering the event, with one Blog coming to an end highlighting the immanent start of the next Blog elsewhere, providing a link for easy discovery. The early Blogs in particular use a lot of Paul Lewis' material, including series of tweets, links to tweet collections, longer sections of written text, links to other stories he has written as well as some of the images he took himself and uploaded via Twitter. Moreover, readers are encouraged to follow @paullewis on Twitter for further updates. Of the 15 mainstream media links Ravi Somaiya shared, six were to content in the main online sections of *The New York Times*, to five different stories in total, for which he has a byline for three, thus mainly highlighting his own work. He also points to one (*The New York Times*) *LedeBlog*, which he has co-written with another *Times* reporter and which has a similar feel to *The Guardian* Live Blogs. Eight links point to other main news organizations, including four linking to *Guardian* content including one of the Live Blogs from 9 August.

Use of hashtags. Of Paul Lewis's 441 tweets, 343 contained at least one hashtag (78 per cent), highlighting that nearly a quarter of his tweets did not. He uses a wide range of words in his hashtagging, 41 individual ones with the following most prominent: #enfield (66); #hackney (49); #ukriots (43); #londonriots (41); #tottenham (34). A considerable number of his hashtagged tweets (89 tweets, 26 per cent) contained at least two hashtags, typically this would combine the specific location "#enfield" he was reporting from alongside a more generic one like "#ukriots", thus ensuring visibility across two hashtag communities (Bruns and Highfield 2012). Of Ravi's 290 tweets, 170

contained at least one hashtag (59 per cent), which is far fewer than Paul's and shows that over 40 per cent of his riot tweets did not contain a hashtag, thus making them less visible if searching for news updates through hashtags. He also uses a smaller range of hashtags, 24 in total, of which the five most prominent are: #hackney (55); #tottenham (32); #tottenhamriot (23); #londonriots (21); #woodgreen (12). Again they are predominantly location based alongside a range of "riot"-themed ones.

The simple Wordle visualizations (Figures 7 and 8) highlight more clearly these differences in both range as well as frequency of use as gauged against the total number of hashtags used. Wordle is case sensitive and so in the case of Paul Lewis, "Tottenham" and "tottenham" are shown as separate, though they were not treated as separate in the totals reported above.

Tweet Content

The findings for the tweet content, shown in Table 2, highlight strong similarities, in using Twitter for eyewitness reporting, as well as marked differences, most notably in using Twitter to source information and voice opinions.

Reporting. Both journalists used Twitter to report, in Paul Lewis' case 204 tweets (46.3 per cent) in total. Ravi Somaiya sent 142 "reporting" tweets (49 per cent), both journalists predominantly tweeting their own eyewitness accounts, highlighting their at-the-scene presence. For example, early in the morning on the first night Paul Lewis tweets: "Building in north Tottenham ablaze. Young men in masks won't let me get closer. #riothttp://yfrog.com/h2345xaj" (2:27 am, 7 August), and similarly Ravi: "Police have now massed -- dozens in riot gear. But not sure how they will break through firewall to rioters (and me!) behind. #tottenhamriot" (2:32 am, 7 August). To a lesser extent they also incorporated quotes from eyewitnesses, including chants ("Feds, Feds" and "London's burning!") alongside a variety of responses from rioters, rioted, bystanders and the police.

FIGURE 7
Hashtags used—Paul Lewis

FIGURE 8
Hashtags used—Ravi Somaiya

TABLE 2
Content of tweets according to category (%)

	Paul Lewis (N = 441)	Ravi Somaiya (N = 290)
Reporting—eyewitness	30.00	32.80
Reporting—eyewitness quotes	6.10	3.80
Reporting—other	10.20	12.40
Request—verification	2.90	0.00
Request—story information	13.20	0.70
Request—other	2.50	0.30
Statement—plans	3.60	2.10
Statement—general	3.60	1.40
News organization—own	9.10	2.10
News organization—other	6.80	7.90
News organization—both	0.20	0.00
Opinion/reaction	5.20	22.40
Thanks	3.20	6.90
Other	3.40	7.20
Total	100	100

Requests. Paul Lewis sent 82 tweets (18.6 per cent) that contained a request compared to Ravi Somaiya's three (1 per cent). Concentrating here on Paul Lewis, most of his requests concerned information about possible leads: "Searching for *reliable* accounts of alleged police mistreatment of 16-year-old girl at protest that allegedly

sparked #tottenham #riot" (9:28 am, 7 August), seeking additional information as he was writing: "I'm writing a piece reconstructing #tottenham riot. Anyone see a record of what precise time BBC pulled out its journos?" (2:52 pm, 7 August) as well as requests to get in touch if people knew of further planned rioting: "Seeing BBM messages about #londonriots? Please share to help Guardian's coverage. Name: 'Paul'. PIN number is 22416EC #londonriots" (5:03 pm, 8 August). Additionally, Paul Lewis also used Twitter to seek verification (13 tweets, 2.90 per cent), typically retweeting someone, adding "Confirmation?" or "Is this true?" before the retweeted content, which he, elsewhere, has described as "crowdsourcing the news" (Lewis 2011).

Statements. Statements typically highlighted plans to go to a certain location, Paul Lewis: "Consensus is that we should head to #Enfield—going there now" (5:40 pm, 9 August), often containing additional information, Ravi Somaiya: "Heading to #Enfield, to join @paullewis, reports of looting, violence, riot police with dogs. Also rumours of unrest in Brixton" (8:40 pm, 7 August). More general statements, "I am writing" or "heading home now", offered insights about what was going on and what the journalists were up to. Overall, 32 of Paul Lewis' tweets (7.2 per cent) and 10 (3.5 per cent) of Ravi Somaiya's were statements.

News organizations. Both journalists made references to their own as well as other news organizations. Of Paul Lewis' 71 tweets (16.1 per cent), most referred back to *The Guardian*, most frequently highlighting stories he had filed, Live Blogging he was involved in, links to these, as well as pointing to the coverage of other *Guardian* journalists. Where he highlighted other news outlets, most of the time this was to highlight his own appearances (mainly on the BBC). Ravi Somaiya mainly highlighted other news outlets with only six tweets (2.1 per cent) pointing to his own compared to 23 tweets (7.9 per cent) to news organizations other than *The New York Times*, but similar to Paul Lewis, these included his own appearances on these. This dominant linking to other news organizations is not common according to recent studies (see e.g. Holcomb, Gross, and Mitchell 2011 for an overview of American journalists on Twitter).

Opinion/reaction. This category shows a marked difference between the two journalists with Ravi Somaiya tweeting his opinion or reaction across 65 tweets (22.4 per cent) compared to Paul Lewis' 23 (5.2 per cent). Ravi's tweeting included meta-comments on his own role as a journalist using Twitter: "Aware there is real danger of media driving story, btw. So will no longer be tweeting my movements in advance" (4:41 pm, 8 August) as well as highlighting wider political issues through the tweets of others: "Judging by tweets I'm seeing, it's going to prove a little awkward for David Cameron that he was at a $15,000-per-week villa in Tuscany" (10:51 pm, 8 August). Equally Paul used creative ways to comment through the use of well-known cultural references: "Anyone who has seen Spike Lee's 'Do The Right Thing' will be welcoming the cold rain over #Tottenham" (2:04 pm, 7 August). Overall, reactions were frequently given in response to another Twitter user (@reply).

Discussion

This ambitious exploratory study into journalists' Twitter use during the UK riots has highlighted the need to better understand such online journalistic practices. It has reported on a number of useful collection strategies for Twitter data, pointing to

possible pitfalls and offering solutions. Moreover, it has shown the insights that can be gleaned from a relatively small data set which was obtained without the need to rely on extensive computational intervention.

This study has shown that journalists Paul Lewis and Ravi Somaiya made extensive use of Twitter during the riots and, through their early adoption of the platform, were well placed to do so, attracting significant numbers of followers to their Twitter feed during the riots. Through an analysis of different Twitter conventions and content analysis of their tweets, it is clear that Twitter became an effective reporting tool. Fraser Nelson (2011) highlighted the value of their Twitter reporting at the time:

> They behaved like instinctive reporters: picked up (on the news or, more likely, on Twitter) that a riot was underway, then went out and reported it. And they did so with pictures and observations that were well-judged and informative, never hysterical or futile. The presence of a TV camera, with the bright lights, have a certain effect on a crowd—so the blogger with his mobile is better able to take and broadcast truer images of what's going on. The broadcasters were playing catch-up with Twitter. All you needed was a mobile, to find out—anywhere in the world—what was going on in Tottenham. Likewise the reaction.

In their use of Twitter as a rich source for story leads and material, and this is particularly the case with Paul Lewis, these emerging journalistic practices highlight journalism as a process flowing and developing between tweets, Live Blogs, other online content and print. It speaks of a more fluid and open relationship between professional journalists and what Bruns and Highfield (2012) have recently again referred to as "random acts of journalism", remobilising Lasica's (2003) earlier articulation, which highlights those instances where citizens may (unknowingly) contribute to the creation of journalistic content without necessarily labelling themselves as citizen journalist or "doing journalism". The Editor of *The Guardian*, Alan Rusbridger, highlights the value of opening up journalism: "If you can open your site up, and allow other voices in, you can get something that's more engaged, more involved—and actually, I think, journalistically better" (2010, quoted in Newman, Dutton, and Blank 2012).

Studying breaking news on Twitter and early adopters in these situations is important as it can highlight the emergence of new journalistic conventions, which a focus on established journalistic norms alone may fail to identify. Unlike the j-bloggers Singer (2005) highlighted as having "normalized" their blogging practices to fit in with accepted and established journalist norms, studying journalists' active and prolific Twitter use during crisis and breaking news situations can highlight the importance of unexpected and *ad hoc* practices.

Paul Lewis and Ravi Somaiya's uses of their own (often very low quality) images is something that they had not really done previously as part of their Twitter use and have not subsequently taken further. It thus seemed to serve a specific purpose at the time, providing their audiences with highly valuable, trusted visual material combined with their "eyewitness" report tweets. This highlights something not well understood or addressed within the current literature and that is the journalist as citizen, bearing witness. They negotiated dangerous situations, made themselves less visible as journalists enabling the taking of pictures on small and discrete camera phones.

Moreover, the ease with which Ravi Somaiya in particular included his opinion in tweets also highlights the watering down of an established journalistic norm, possibly

giving rise to a new hybrid norm on Twitter. The specificities of the platform and the transparency it gives to journalistic practices, which Thurman and Waters note (2013, in this issue) audiences value in relation to Live Blogging, is an important development. In their study of Andy Carvin's Twitter use during the Arab Spring, Hermida, Lewis, and Zamith (2012) note a similar phenomenon, as do Papacharissi and de Fatima Oliveira (2012) in their work on Twitter reporting of the Arab Spring.

Studying the Twitter use of these two journalists exclusively during a breaking news situation does not extend into a clear understanding of their everyday use of the platform in their day-to-day journalism. Studies often either focus on everyday Twitter use or pay attention to elite early highly active users during breaking news and crisis situations. While both are extremely valuable in understanding better the increasingly wide adoption and use of Twitter by journalists, it is important to combine these approaches to get a still clearer picture. Further work should also consider the value of more longitudinal approaches as well as those that aim to more substantially map use across a whole country, including both national and regional press, and broadcasters, establishing different typologies of Twitter use. Moreover, international comparisons are needed (which this study only hints at), most notably to extend the scope of such work beyond English and also beyond Twitter itself instead of artificially treating it as a bounded space. Rather, Twitter should be seen as part of a complex ecosystem in which journalism takes place. Although this current study has only briefly hinted at the relationship between the use of Twitter and Live Blogging, further work could expand fruitfully on this as well as give additional consideration to understudied practices such as the *ad hoc* image production and sharing, including an analysis of the images themselves, *witnessing* practices that both journalists engaged in. Additionally, how these emerging Twitter practices can be situated more broadly within a profession undergoing important changes and where identifying who is a journalist is becoming perhaps less clear.

REFERENCES

Boyd, Danah, Scott Golder, and Gilad Lotan. 2010. "Tweet, Tweet, Retweet: Conversational Aspects of Retweeting on Twitter". In Paper presented at the *43rd Hawaii International Conference Systems Sciences (HICSS)*. IEEE: Kauai, HI, January 6.

Bruno, Nicola. 2011. *Tweet First, Verify Later? How Real-time Information Is Changing the Coverage of Worldwide Crisis Events*. Oxford: Reuters Institute for the Study of Journalism, University of Oxford. http://reutersinstitute.politics.ox.ac.uk/fileadmin/documents/Publications/fellows__papers/2010-2011/tweet_first_verify_later.pdf.

Bruns, Axel. 2010. "Oblique Strategies for Ambient Journalism." *M/C Journal* 13 (2). http://journal.media-culture.org.au/index.php/mcjournal/article/viewArticle/230.

Bruns, Axel, and Jean Burgess. 2012. "Researching News Discussion on Twitter: New Methodologies." *Journalism Studies* 13 (5–6): 801–14. doi:10.1080/1461670X.2012.664428.

Bruns, Axel, Jean Burgess, Kate Crawford, and Frances Shaw. 2012. *#qldfloods and @QPSMedia: Crisis Communication on Twitter in the 2011 South East Queensland Floods*. Brisbane: ARC Centre of Excellence for Creative Industries and Innovation.

Bruns, Axel, and Tim Highfield. 2012. "Blogs, Twitter, and Breaking News: The Produsage of Citizen Journalism." In *Produsing Theory in a Digital World: The Intersection of Audiences and Production in Contemporary Theory*, edited by Rebecca Ann Lind, 15–32. New York: Peter Lang.

Bruns, Axel, and Yuxian Eugene Liang. 2012. "Tools and Methods for Capturing Twitter Data during Natural Disasters." *First Monday* 17 (4), April 2. http://firstmonday.org/htbin/cgi-wrap/bin/ojs/index.php/fm/article/view/3937/3193.

Cozma, Raluca, and Kuan-Ju Chen. 2012. "What's in a Tweet? Foreign Correspondents' Use of Social Media." *Journalism Practice* 7 (1): 33–46. doi:10.1080/17512786.2012.683340.

Evans, Lisa, and Farida Vis. 2011. "200 Most Influential Twitter Users during the Riots: Are You on the List?" *The Guardian Data Blog*, December 8. http://www.guardian.co.uk/news/datablog/2011/dec/08/riot-twitter-top-200.

Freelon, Deen G. 2010. "ReCal: Intercoder Reliability Calculation as a Web Service." *International Journal of Internet Science* 5 (1): 20–33. http://www.ijis.net/ijis5_1/ijis5_1_freelon.pdf.

Guardian Interactive Team, Rob Procter, Farida Vis, and Alex Voss. 2011. "How Rumours Spread on Twitter." *The Guardian*, December 7. http://www.guardian.co.uk/uk/interactive/2011/dec/07/london-riots-twitter.

Hamilton, Mary. 2011. "UK Riots: Nine Ways to Use Twitter Responsibly." *Guardian News Blog*, August 10. http://www.guardian.co.uk/technology/blog/2011/aug/10/uk-riots-responsible-use-of-twitter.

Hermida, Alfred. 2010. "Twittering the News: The Emergence of Ambient Journalism." *Journalism Practice* 4 (3): 297–308. doi:10.1080/17512781003640703.

Hermida, Alfred. 2012. "Tweets and Truth: Journalism as a Discipline of Collaborative Verification." *Journalism Practice* 6 (5–6): 659–68. doi:10.1080/17512786.2012.667269.

Hermida, Alfred, Seth C. Lewis, and Rodrigo Zamith. 2012. "Sourcing the Arab Spring: A Case Study of Andy Carvin's Sources During the Tunisian and Egyptian Revolutions". Paper presented at the International Symposium on Online Journalism, Austin, TX, April 20–21.

Holcomb, Jess, Kim Gross, and Amy Mitchell. 2011. *How Mainstream Media Outlets Use Twitter: Content Analysis Shows Evolving Relationship*. The Project for Excellence in Journalism, Pew Research Center. http://www.journalism.org/node/27311.

Kiss, Jemima. 2011. "Andy Carvin: The Man Who Tweets Revolutions. NPS's Media Strategist Has Become a Leading Player in the Breaking News Business." *The Guardian*, September 4. http://www.guardian.co.uk/media/2011/sep/04/andy-carvin-tweets-revolutions.

Lasica, Joseph D. 2003. "Random Acts of Journalism: Beyond 'Is It or Isn't It Journalism?' How Blogs and Journalism Need Each Other." *New Media Musings Blog*, March 12. http://www.newmediamusings.com/2003/03/random_acts_of_.html.

Lasorsa, Dominic. 2012. "Transparency and Other Journalistic Norms on Twitter: The Role of Gender." *Journalism Studies* 13 (3): 402–17. doi:10.1080/1461670X.2012.657909.

Lasorsa, Dominic L., Seth C. Lewis, and Avery E. Holton. 2011. "Normalizing Twitter: Journalism Practice in an Emerging Communication Space." *Journalism Studies* 13 (1): 19–36. doi:10.1080/1461670X.2011.571825.

Lewis, Paul. 2011. "Crowdsourcing the News." *TEDxThessaloniki talk*, April. http://www.ted.com/talks/paul_lewis_crowdsourcing_the_news.html.

Little, Mark. 2012. "Finding the Wisdom in the Crowd: Storyful Helps News Organizations Verify Social Media." *Nieman Reports* 66 (2): 14–17. http://www.nieman.harvard.edu/reports/article/102766/Finding-the-Wisdom-in-the-Crowd.aspx.

Lotan, Gilad, Erhardt Graeff, Mike Ananny, Devin Gaffney, Ian Pearce, and danah boyd. 2011. "The Revolutions Were Tweeted: Information Flows During the 2011 Tunisian and Egyptian Revolutions". *International Journal of Communication* (5): 1375–405.

Lyon, Santiago. 2012. "Detecting the Truth in Photos: How a News Service Verifies Images and Videos." *Nieman Reports* 66 (2): 7–9. http://www.nieman.harvard.edu/reports/article/102763/Detecting-the-Truth-in-Photos.aspx.

Murthy, Dhiraj. 2011. "Twitter: Microphone for the Masses?" *Media, Culture and Society* 33 (5): 779–89. doi:10.1177/0163443711404744.

Mustafaraj, Eni, Samantha Finn, Carolyn Whitlock, and Panagiotis T. Metaxas. 2011. "Vocal Minority versus Silent Majority: Discovering the Opinions of the Long Tail". Paper presented at the IEEE SocialCom Conference, Boston, October 9–11.

Nelson, Fraser. 2011. "Twitter Had the Riots Covered." *The Spectator*, August 7. http://blogs.spectator.co.uk/coffeehouse/2011/08/twitter-had-the-riot-covered.

Newman, Nic. 2011. *Mainstream Media and the Distribution of News in the Age of Social Discovery: How Social Media Are Changing the Production, Distribution and Discovery of News and Further Disrupting the Business Models of Mainstream Media Companies*. Oxford: Reuters Institute for the Study of Journalism Report, University of Oxford, September. http://ora.ox.ac.uk/objects/uuid:94164da6-9150-4938-8996-badfdef6b507/datastreams/ATTACHMENT01.

Newman, Nic, William H. Dutton, and Grant Blank. 2012. "Social Media in the Changing Ecology of News: The Fourth and Fifth Estates in Britain." *International Journal of Internet Science* 7 (1): 6–22. http://www.ijis.net/ijis7_1/ijis7_1_newman_et_al.pdf.

Omand, David, Jamie Bartlett, and Carl Miller. 2012. "*#intelligence: A Balance between Security and Privacy Online Must Be Struck*…" London: DEMOS. http://www.demos.co.uk/publications/intelligence.

Papacharissi, Zizi, and Maria de Fatima Oliveira. 2012. "Affective News and Networked Publics: The Rhythms of News Storytelling on #Egypt." *Journal of Communication* 62 (2): 266–82. doi:10.1111/j.1460-2466.2012.01630.x.

Richards, Jonathan, and Paul Lewis. 2011. "How Twitter Was Used to Spread—and Knock Down—Rumours during the Riots." *The Guardian*, December 7. http://www.guardian.co.uk/uk/2011/dec/07/how-twitter-spread-rumours-riots.

Singer, Jane B. 2005. "The Political J-blogger: 'Normalizing' a New Media Form to Fit Old Norms and Practices." *Journalism* 6 (2): 173–98. doi:10.1177/1464884905051009.

The Guardian. 2011. "Reading the Riots: Investigating England's Summer of Disorder." http://www.guardian.co.uk/uk/interactive/2011/dec/14/reading-the-riots-investigating-england-s-summer-of-disorder-full-report.

Thurman, Neil, and Anna Walters. 2013. "Live Blogging—Digital Journalism's Pivotal Platform? A Case Study of the Production, Consumption, and Form of Live Blogs at Guardian.co.uk". *Digital Journalism* 1 (1). doi:10.1080/21670811.2012.714935.

Turner, David. 2012. "Inside the BBC's Verification Hub: Technology and Human Intervention Are Key." *Nieman Reports* 66 (2): 10–13. http://www.nieman.harvard.edu/reports/article/102764/Inside-the-BBCs-Verification-Hub.aspx.

Twitter. 2012. "Twitter Turns Six." *Twitter Blog*, March 21. http://blog.twitter.com/2012/03/twitter-turns-six.html.

Vis, Farida. 2009. "Wikinews Reporting of Hurricane Katrina." In *Citizen Journalism: Global Perspectives*, edited by Stuart Allan and Einar Thorsen, 65–74. New York: Peter Lang.

Vis, Farida. 2012. "Reading the Riots on Twitter: Who Tweeted the Riots?" *Researching Social MediaBlog*, January 24. http://researchingsocialmedia.org/2012/01/24/reading-the-riots-on-twitter-who-tweeted-the-riots/.

Wu, Shaomei, Jake Hofman, Winter A. Mason, and Duncan Watts. 2011. "Who Says What to Whom on Twitter". In *Proceedings of the 20th International Conference on World Wide Web*. AMC, 2010.

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