Information Occupation:
Using Information Science to Explore Occupy Wall Street

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Abstract

Global social movements like the Arab Spring and Occupy Wall Street were unprecedented in their use of social media as an organizing tool and communication technique. To further explore the roles of mobile technologies in the Occupy Wall Street movement, we present an analysis of information diffusion on Twitter as well as describe the relationship between mobility, technology, and spatial practices over a nine-month period. We perform a network visualization and analysis of Twitter data sets as well as utilize ethnographic methods to collect data across several spaces. This paper describes Occupy Wall Street's practices and describes a model to analyze current and future social movements.

Keywords: network visualization, social computing, social informatics, social movements, technological mediation

Introduction

Social movements during the past decade have taken advantage of ubiquitous computing and social media, facilitating mobility and the flexibility to organize actions and create and share digital content. The same technologies provide researchers with rich insight into these worlds. Understanding Occupy Wall Street, then, requires analyzing protestor practices in a variety of spaces by employing different methods. Citizen journalists, by means of social, mobile media, had a critical role in the Arab Spring uprisings (Tufekci & Wilson, 2012; Wilson & Dunn, 2011), and we find similar implications for OWS. We examine online OWS practices using network and time-series visualizations and analysis of Twitter data, then examine the on-site practices[1] of OWS protestors. Ultimately, we argue that technological mediation (Brewer & Dourish, 2008) gives rise to, and provides researchers new insight into, social movement practices.

Twitter Data Collection Methods

We collected tweets from a list of hypothesized influential tweeters (HITs), including 17 activists/citizen journalists and 5 journalists selected based on their Twitter behavior and OWS involvement. Our HITs' usernames were used as search terms, allowing us to gather HIT tweets and retweets, as well as retweets and mentions of HITs authored by other users. We also archived tweets using designated hashtags for each of two actions[2]. Data was collected periodically throughout the day on April 1 (March to Commemorate the Brooklyn Bridge Action) and May 1 2012 (General Strike)[3]. Our April 1 data set includes 1,077 unique users and 1,609 retweets, and our May 1 data set includes 14,372 unique users

[1] By practices, we borrow Aronoff and Kubik's definition of "how people act in their social worlds."
[2] Because #A1 and #mayday are common terms, this undoubtedly introduced some extraneous tweets into our data set.
[3] Because The Archivist tool only allows the user to collect the most recent 1800 tweets for each search term, some tweets were not collected due to the high volume of Twitter activity.

Acknowledgements: This project was created as part of the i3 Inclusion Institute, University of Pittsburgh. Special thanks to our inspiring i3 leadership and advisory team: Kip Currier, Ph.D., Michael Depew, Courtney Loder, and Joe Sanchez, Ph.D. Thanks also to our teammates Mavis Gyamera and Guadalupe Soto, and to Colleen Jankovic, Ph.D., for proofreading and editing help.

Haimson, O.L., & Cartagena, J. (2013). Information occupation: Using information science to explore Occupy Wall Street. *iConference 2013 Proceedings* (pp. 733-737). doi:10.9776/13353

and 42,919 retweets. After collecting the tweets, we scraped the text files and created a from/to matrix based on retweets.

Network Visualization and Analysis

Our network visualization and analysis suggests that a Twitter user can be influential and central in a network if she is (1) an information router and/or (2) an information source, and that the two are not mutually exclusive[4].

A comparatively large number of arrows point toward some HITs (Figure 1), designating them information routers, and away from others, making them information sources. Our results support Lotan et al.'s findings from the Egypt and Tunisian uprisings that journalists are more likely to be information sources, while activists are information sources *and* information routers (Lotan et al., 2011). We were surprised to find that certain tweeters (e.g., @YourAnonNews) were central information sources in our network, though less clearly related to OWS on the ground or on Twitter. Our network analysis gives insight into what it means to be an influential tweeter, and how information about a social movement can most effectively be spread – by garnering the support of information sources, whose tweets can reach a wide audience, and by employing the help of information routers to further disseminate information.

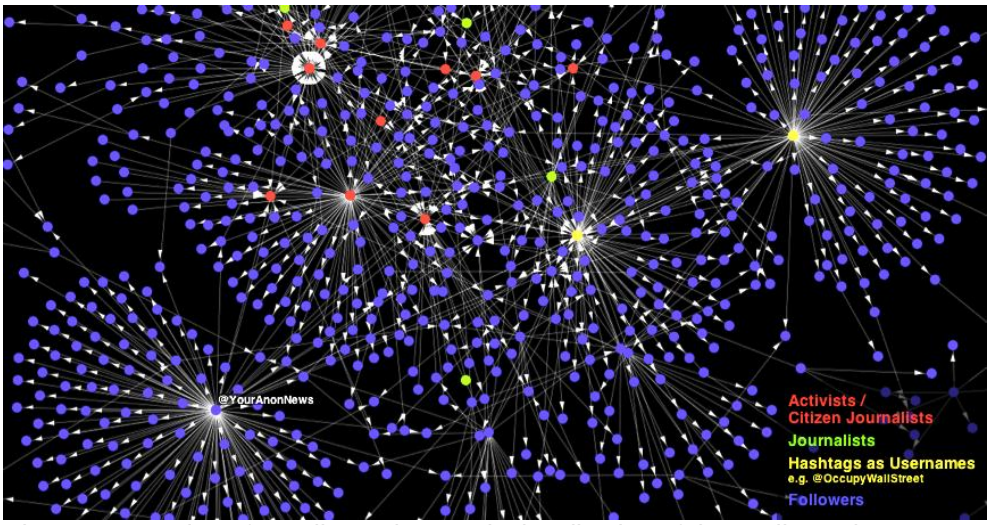

Figure 1. A portion of our directed network visualization of the April 1 action.

On the Streets and in the Tweets

Combining Twitter volume with observations from on-site research, we find that Twitter activity occurs most often just before and after an action, and subsides during the most active times of on-site protest. We display the number of tweets during the April 1 and May 1 actions alongside the number of people present at each protest (Figure 2). Peaks in Twitter activity occurred both as the action gained momentum, and as the action drew to a close, suggesting that activists use social media to spread information about social movements during these times. Because relatively little Twitter activity occurred during the time the action was most populated, an effective protest strategy may be to employ a team whose primary role is to spread information via social media, using strategized live-tweeting for instance, during the most active times of an action.

[4] The terms "information router" and "information source" come from Lotan et al., 2011.

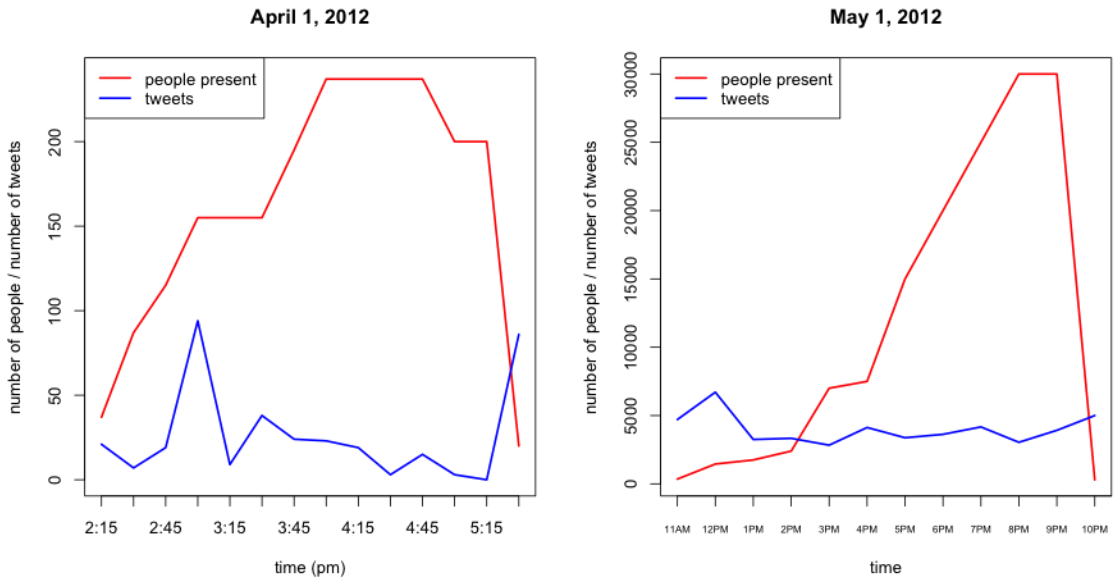

Figure 2. Amount of people at OWS actions as compared with related tweets.

Occupy Wall Street's Information Ecosystem

New technologies, technological practices, and forms of mobility give everyday spaces structure and meaning (Brewer & Dourish, 2008). As OWS's networks flourished, new demonstration locations were selected, and confrontations with the NYPD occurred, protestors adjusted their practices, helping preserve existing meanings while also giving rise to new ones. We briefly discuss the semiotics of OWS, then describe the relationship between protestor practices and the role of mobile devices in different spaces and under separate, ecological conditions.

Technological Mediation and Social Practices

OWS's nonverbal communication developed because a large number of individuals were confronted with, and found ways to negotiate, the same institutional hurdles (Swidler, 1995). N.Y. state law prohibits the use of megaphones without permits, so communication within Zuccotti Park[5] occurred within the constraints of existing encoded social structures (Brewer & Dourish, 2008). In response, nonverbal gestures were created (Figure 3).

[5] Zuccotti Park is located in lower Manhattan, New York City where OWS protestors camped and lived from September 17 until November 15, 2011. It was renamed Liberty Square during its occupation.

Figure 3. Occupy hand gestures. Images are from Occupy Design and are licensed under a Creative Commons Attribution-ShareAlike 3.0 Unported License.

Initially used during Zuccotti Park's nightly General Assemblies[6], facilitators encouraged their use. As the movement grew in numbers and new spaces emerged[7], these gestures manifested themselves independent of 'physicality' or 'virtuality.' Conversational quips in local cafés and digital content on the NYCGA website were uptwinkled[8] by protestors. What once seemed reserved as a function of decision-making was now used to communicate in different ways and strengthened interpersonal relationships and a sense of shared space, practice, resources, and identity (Baym, 2010).

Mobile Devices, Varied Roles

Changes in spatial locations, whether on the Brooklyn Bridge or the NYCGA website, did not alter the signs and social layers (Benyon-Davis, 2007) shared by OWS protestors. Rather, the demonstration's patterns of movement and action in space were shaped, and shaped by, their cultural logics (Brewer & Dourish, 2008). We describe how technological mediation allowed OWS to encounter and appropriate Zuccotti Park in different ways and how new mobile practices transformed this space as a site of action (Brewer & Dourish, 2008).

Zuccotti Park does not provide Wi-Fi access, however, the Free Network Foundation (FNF) provided protestors with Freedom Towers[9] that created a decentralized, mesh network. Similarly, OWS supporters enabled Wi-Fi tethering on their devices, providing additional Internet access. Protestors and citizen journalists uploaded photographs or livestreamed videos to social media sites capturing group discussions, dances, and individual perspectives. We categorize these mobile and spatial practices under 'everyday conditions'[10].

Under conditions of duress, these practices change significantly. Network support and information dissemination continue, but rapid organization strategies emerge. This practice was observed during the NYPD raid on Zuccotti Park as tweets and texts were used to contact reporters and organize locations to meet. While helicopter spotlights tracked protestors and NYPD cruisers blocked city streets, protesters used Google Maps to navigate around lower Manhattan. Several hours later, hundreds of protestors and reporters assembled at Foley Square[11] to regroup and document the aftermath.

Discussion

Our approach illustrates how network visualization and ethnographic methods are useful when examining how information spreads and describing mobile technologies and the roles they play. As new social movements materialize, understanding the technologies and practices used to appropriate spaces and dominant media narratives will be important areas for future study. While our analysis concentrates on network analysis and technological mediation, similar lenses and methods can be used to perform content and frame analysis (Kitzinger, 2007), or to examine issues surrounding government surveillance of activist communities (Morozov, 2011; Soghoian, 2012).

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[6] General Assemblies were nightly meetings where decisions were made ranging from fund allocations to revising proposals.
[7] These spaces include meeting and demonstration locations, Twitter, Facebook, the New York City General Assembly (NYCGA) social networking website, and tumblr.
[8] In addition to uptwinkles (see Figure 4 for description) observed in conversation at local cafés, this gesture was designed and integrated within the NYCGA's website design. It is the equivalent of a Facebook "like" and has a similar upvote/downvote rating function as Reddit.
[9] Freedom Towers are comprised of modems, routers, netbooks, and custom firmware and connected to Clear's 4G network.
[10] While this abstract highlights two Occupy Wall Street information ecosystem conditions, our poster describes four: everyday, duress, marches, and raid. Under each, we illustrate the devices present and how they are used.
[11] Foley Square is a park located a few city blocks from Zuccotti Park.

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