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Abstract

Among the many so-called microblogging services that allow their users to describe their current status in short posts, Twitter is probably among the most popular and well known. Since its launch in 2006, Twitter use has evolved and is increasingly used in a variety of contexts. This article utilizes emerging online tools and presents a rationale for data collection and analysis of Twitter users. The suggested approach is exemplified with a case study: Twitter use during the 2010 Swedish election. Although many of the initial hopes for e-democracy appear to have gone largely unfulfilled, the successful employment of the internet during the 2008 US presidential campaign has again raised voices claiming that the internet, and particularly social media applications like Twitter, provides interesting opportunities for online campaigning and deliberation. Besides providing an overarching analysis of how Twitter use was fashioned during the 2010 Swedish election campaign, this study identifies different user types based on how high-end users utilized the Twitter service. By suggesting a novel approach to the study of microblogging and by identifying user types, this study contributes to the burgeoning field of microblog research and gives specific insights into the practice of civic microblogging.

Keywords

microblogging, political campaigning, social media, Sweden, Twitter

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Introduction

More often than not, the introduction of a new communication technology triggers hopes of its democratic impact. As with the internet itself, blogging and microblogging alike have been heralded for their potential for increasing political participation among previously unengaged citizens (e.g. Castells, 2007: 255). Although many initial hopes for e-democracy (Chadwick, 2008; Hilbert, 2009) have gone mostly unfulfilled, the successful employment of the internet during the 2008 Obama US presidential campaign yet again raised voices claiming that so-called social media applications, microblogging services included, provide new opportunities for online campaigning and electorate engagement (Smith, 2009). As such, there is a pertinent need for empirical studies to examine if and how such services contribute to a broadening of participation in public debate, and to what extent it merely serves as yet another arena for already established societal actors. Indeed, previous research has suggested that studies look into microblog use that goes beyond the characterization of 'interesting novelty' (Honeycutt and Herring, 2009: 10), and Twitter, given its popularity and status, appears to be an ideal candidate for such studies (Jansen et al., 2009: 2173).

Such an aim – to study participation in political debate on Twitter – poses methodological challenges. How can we grasp and make sense of the sudden outbursts of seemingly abundant messages in a seemingly ever-more fragmented debate – constituting something akin to 'ephemeral communicative spaces' (Christensen and Christensen, 2008)? This article proposes an approach to studying microblogging as an arena for public political communication. The approach utilizes the potential of online media and net-based computer software to allow for comprehensive collection of data and metadata of large amounts of the actual public debate. As such, the approach facilitates longitudinal, quantitative analyses utilizing statistical methods as well as social network analysis.

To illustrate the approach, the article presents findings from a study on Twitter use during the 2010 Swedish general election campaign. As an established democracy with high levels of freedom of speech, high numbers of internet use and ICT penetration (Carlsson and Facht, 2010) as well as high election turnout, the Swedish political context represents a noteworthy case. It seems reasonable to assume that the Swedish election campaign would provide favorable conditions for the employment of a novel internet tool such as Twitter. Data was collected using the YourTwrapperKeeper application. In total, 99,832 tweets dealing with the election are analyzed, focusing on the various high-end users in the Swedish political Twittersphere, and the networks that appear between these users.

By utilizing social network analyses of a large dataset collected with the aid of emerging online applications, the study contributes to the development of the methodological toolbox for research. In so doing, the article presents findings on Twitter use before, during and after the height of the Swedish election campaign, thereby providing novel insights into practices of civic microblogging.

Background

Twitter is often understood as a derivative or miniature version of the regular blog – i.e. a microblog, consisting of 'short comments usually delivered to a network of associates'

(Jansen et al., 2009: 2170). By sending short messages – tweets – of up to 140 characters each, Twitter users share these updates to a network of followers. Compared to similar services, the act of following another Twitter user is not automatically reciprocal. A user can follow any number of other users, although the user being followed does not necessarily have to follow back.

As with communication apparatuses throughout history (e.g. Winston, 1998), Twitter has been utilized beyond the intended uses. For example, users accommodate alternative forms of use by annotating their tweets with different characters in order to signify a specific form of communication. To allow for conversations, the @ sign is used as a marker of addressivity. For example, posting a message including @USERNAME indicates that the message is intended for or somehow relevant to a specific user. Retweets (RT) refer to the practice of resending a tweet posted by another user. Following the basic typology suggested by Kwak et al. (2010), a tweet can be classified as a Singleton (a statement from a specific user, no @ sign present); a Mention or a Reply (@ sign followed by a user ID) or a Retweet, as mentioned earlier (marked with RT). Tweets can also include hashtags, where the # character is used in conjunction with a word or phrase in order to connect the tweet to a particular theme. This use of the # sign allows users to search the Twittersphere for specific topics of interest and to follow threads of discussion related to those topics.

Based on the suggested similarities between blogging and microblogging, the following section outlines the growth of blogging in general, and political blogging in particular. Following this, we present a review of the research that has been performed looking into the diverse uses of Twitter.

Political blogging

Blogging has received an ample amount of attention, both in various media outlets (Jones and Himelboim, 2010) as well as among academics (Larsson and Hrastinski, 2011). Remembering that ‘technology is often viewed as a key driver of change in the electoral arena’ (Gibson et al., 2008: 15), researchers have scrutinized the connections between new media and politics throughout history, focusing on print publications in Eighteenth-Century America (Warner, 1990) or internet search engines (Halavais, 2009), to mention two temporal extremes, as well as media systems as a whole (e.g. Baker, 2002; Page, 1996). Thus, the extent to which researchers have focused on the political aspects of blogging should come as no surprise (Kerbel and Bloom, 2005; Sweetser Trammell, 2007). Use of blogs for political purposes has been studied from the point of view of the citizen (looking to discuss political matters with peers), as well as from the point of view of the elected official (looking to connect with the electorate).

First, politically interested citizens who enter the blogosphere have been labeled ‘technoactivists’ in search of outlets for ‘democratic self-expression and networking’ (Kahn and Kellner, 2004). Blog use has been found to be an important predictor of online political engagement (Gil De Zuniga et al., 2009), and reasons for blogging appear to go beyond more intrinsic motivations. In their survey of top US political bloggers, Ekdale et al. (2010) found that extrinsic motivations for blogging (i.e. providing alternatives to mainstream media outlets or to influence public opinion) were among the top reasons for

maintaining a political blog. However, this does not mean that blogs automatically remove every obstacle to political participation. In his study on the potential for blogs to foster democratic discourse in the US context, for instance, Davis concluded that blogs and similar online applications could be problematic as public discussion forums since they were marred by problems like 'exclusion of others, flaming [and] a great deal of anonymity' (Davis, 2005: 119).

Second, political parties and their candidates have also entered the blogosphere to 'engage with supporters and the wider public' (Gibson et al., 2008: 19). Although there are indications that such activities have indeed fostered new channels for politicians to connect with an increasingly jaded electorate, many political actors appear to struggle with their presence on the internet (Vaccari, 2008b: 75), experiencing difficulty in adapting to the new medium. Perhaps due to the 'tradeoff between information control and interactive engagement' (Druckman et al., 2007: 428), studies have found that political actors are careful when venturing online, limiting the options for voter co-creation and interaction and making more use of traditional, informing features (Larsson, 2011; Vaccari, 2008a, 2008c). As such, the majority of online action by political actors has been likened to an 'electronic brochure' (Jackson and Lilleker, 2009), indicating that little adaptation to the online format have taken place.

Although studies have found politicians to apparently mainly use blogs as 'campaign gimmicks' (Lilleker and Malagón, 2010: 26), hopes are still held high regarding the use of online services for political purposes (Vaccari, 2008a). Recently, such hopes have been transferred to microblogging services like Twitter.

Twitter

While a number of more or less distinctive uses of Twitter have been reported, such as the case of an American student jailed in Egypt who used the service to signal distress, or the messages sent regarding the US Airways plane that crashed into the Hudson river (Arceneaux and Weiss, 2010; Kwak et al., 2010), academic research on Twitter use is at a very early stage. Studies have largely focused on describing various everyday uses of the service. For example, Marwick and boyd (2010) analyzed the various audience management techniques employed by Twitter users, while Java et al. (2007) identified four general categories of Twitter use: daily chatter, i.e. posts regarding daily events and thoughts; conversations using the @ character; sharing information where URLs are distributed via the posts; and reporting news, where 'users report latest news or comment about current events' (2007). Similarly, Honeycutt and Herring (2009) employed a grounded theory approach on their sample of tweets and found 12 distinct categories of tweets: about addressee, announce/advertise, exhort, information for others, information for self, metacommentary, media use, opinion, other's experience, self experience, solicit information and other. Although more finely grained, these 12 categories roughly correspond to the previous four, indicating reliability in the results of previous research.

Besides studying the uses of Twitter in a variety of everyday contexts, researchers have identified a variety of professional Twitter uses (Grace et al., 2010). Given the focus of the study presented here, the next section discusses the different varieties of political Twitter use that have been identified by researchers.

Political Twitter use

Researchers have studied political Twitter use focusing on either parliamentary or non-parliamentary uses of the service. The majority of existing studies of parliamentary uses of Twitter deal with US conditions. For example, Golbeck et al. (2010) analyzed the contents of over 6000 tweets from Members of the US Congress. The analysis showed that the members tweeted primarily to disseminate information, often providing URLs to news articles about themselves or to their blog posts. These modes of usage seemingly correspond with the Sharing information and Reporting news categories reported by Java et al. (2007). Congress people also reported on their daily activities, although these updates did not provide insights into the political process, nor did they improve transparency. Golbeck et al. label these tweets 'vehicles for self-promotion' (2010: 1620), indicating a mode of use more akin to one-way, top-down communication than of actually engaging with the citizenry. While microblogging in general has evolved towards becoming 'more conversational and collaborative' (Honeycutt and Herring, 2009: 10), Golbeck et al. (2010) found such use to be limited among the politicians. Similarly, while the practices of retweeting and hashtagging appear to be widespread among general Twitter users, the researchers found only 5 retweets and 344 tweets with hashtags in their sample. These conservative patterns of use could be a result of forced or semi-adoption of the Twitter platform, an unwillingness to participate in the practice of twittering or perhaps simply a lack of knowledge regarding the different possibilities for use that are available (Golbeck et al., 2010). While these studies provide valuable insights into a specific part of the Twittersphere, they are by default limited to give a biased, partial impression. A focus on non-parliamentary uses adds to this impression.

As for non-parliamentary uses, the notion of Twitter revolutions in totalitarian countries has been introduced, although the exact contents and effects of these uprisings are heavily disputed. For example, Gaffney studied Twitter use during the 2009 Iran elections by tracking the use of the #IranElection hashtag. Although Twitter helped protesters in Iran and around the world in organizing their efforts, the author claims that 'it is difficult to say with any certainty what the role of Twitter was' (Gaffney, 2010). Evgeny Morozov (2009, 2011) is not as coy in his criticisms of what he claims is the hyperbole surrounding Twitter use during the Iran election. Following Morozov, the Iranian Twitter revolution is 'a myth, dreamed up and advanced by cyber-utopian Western commentators' (2009: 11). It's all media hype, the product of a global *Twitterati* with little or no insight into the actual protests and processes that went down in Teheran. While studies of Twitter use in political hotbeds like Iran yield important information on political microblogging, to further our understanding, more politically stable contexts should be placed under scrutiny as well. Tumasjan et al. (2010) studied tweets related to the 2009 German federal election. While their focus was on Twitter content as a reflection of the offline political landscape, they also note that 'while Twitter is used as a forum for political deliberation, this forum is dominated by a small number of heavy users' (Tumasjan et al., 2010: 4, see also Bruns, 2010). Still, their approach, which relies on content analysis, does not allow for more detailed discussion of these users' behavior.

The methodological setup presented here aims to catch a broader spectrum of Twitter use during an intense period of political campaigning, guided by the pertinent

question of to what extent and how a service such as Twitter impact on participation in public debate. For this purpose, we employ a broad approach, encompassing both non-parliamentary and parliamentary Twitter users. By utilizing novel methodological tools to study Twitter users in a stable democratic context, the approach should provide the research community with new insights regarding online political activity. Next, the method section explains the rationale for data collection and analysis.

Method

As stated earlier, microblogging can be described as a diminutive version of blogging. As the latter of these internet forms has received some attention in scholarly work, our suggested approach draws on a line of studies on blogs and blogging, often referred to as hyperlink network analysis. Such studies are based on social network analysis, defining a node as a website representing a social actor, and the relationship between two nodes as expressed by hyperlinks. Through comprehensive mappings of links, the aim of such studies is to describe networks through measurements of density, centralization, the relation positioning of nodes, and their specific interconnections. We suggest transferring such an approach to Twitter. Such a move entails some basic advantages compared to studies of the blogosphere. While an attempt to map connections between blogs and bloggers depends on crawls across a wide range of domains and technical setups, leading to substantial challenges for data collection (see Moe, 2011 for discussion), Twitter activity takes place within one domain, with a common Application Program Interface (API). Moreover, while the actual meanings of a mention or retweet still need interpretation, such forms of communication are, arguably, more reliable as data for analysis than hyperlinks on blogs automatically collected by crawler software (e.g. Bruns et al., 2010).

Our employment of social network analysis is not without precedents. However, when such an approach has been used thus far, as for instance by Kwak et al. (2010), efforts tend to be directed at the entire Twittersphere, providing somewhat abstract and general descriptions. This study provides an analysis of a specific subset of that same online sphere, focusing on one set of use, namely political communication. Delimiting the analysis in this way enables us to provide a more detailed account regarding Twitter user types in a specific case. The aim is to move beyond descriptive statistics and study interaction between users, shedding light not only on the volume and forms of use, but also on who these users are and how they relate (or not) to each other.

For these purposes, data collection can be performed by means of a scrape or crawl. A range of technical solutions can be utilized for this purpose. In our instance, we opted for the YourTwrapperKeeper application (TwrapperKeeper, 2010). YourTwrapperKeeper is a free, publicly available online tool that is installed on a user's server. It allows for downloading and archiving tweets according to a variety of criteria. Specifically, YourTwrapperKeeper produces downloadable CSV-files, consisting of extensive lists featuring various information regarding the archived tweets: the message text, user name and id of the sender, user id of the recipient (if message is a reply), language code, client used to send tweet, geographical code, and the time the tweet was created. Analyses can then be performed using statistical software (SPSS) and the open source graph

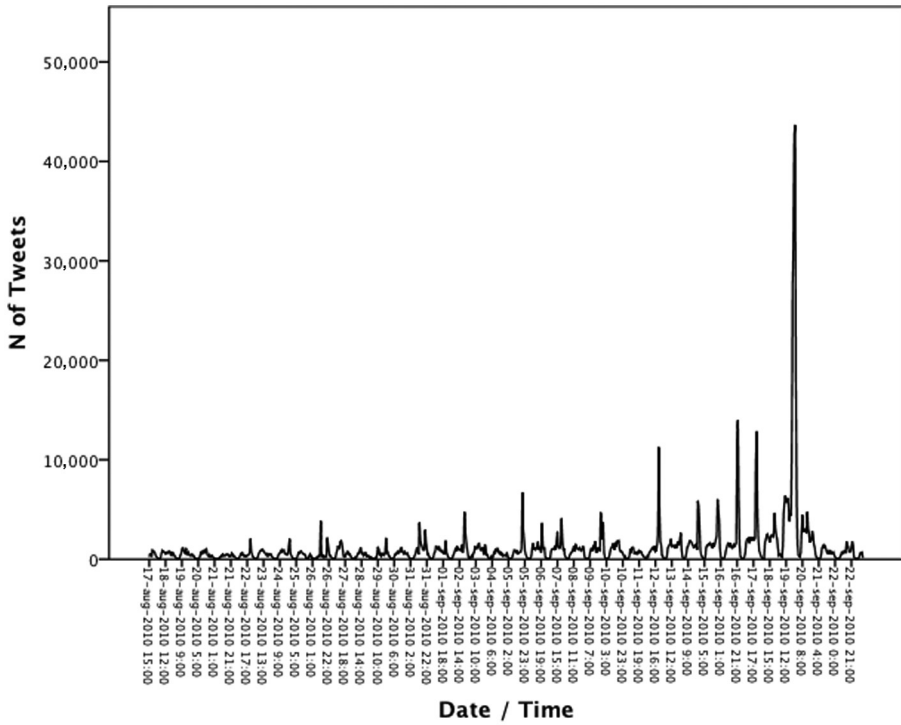


Figure 1. Longitudinal distribution of tweets.

visualization manipulation software Gephi (available at <http://gephi.org/>). In what follows, we illustrate the approach with a case – the 2010 Swedish election campaign.

The case of the 2010 Swedish election campaign

As noted by Golbeck et al. (2010: 1618), the congressional calendar has an obvious impact on the activities of elected officials – and, should they be Twitter users, on the contents of their tweets. With the 2010 Swedish Election Day set to Sunday, September 19th, data collection was employed in order to capture the Twitter activity concerning the election one month beforehand. Archiving via YourTwrapperKeeper began on August 17th. In order to catch some of the post-election Twitter activity, data collection was aborted on September 22nd, four days after the election. In the weeks of political campaigning leading up to August 17th, the hashtag #val2010 (Swedish for #election2010) emerged as the most commonly used hashtag indicating content relevant to the upcoming election. Following Gaffney (2010), the tagging system employed by Twitter users allows the researcher to quickly identify transmissions of interest. As such, the delimitation for this study to focus on the #val2010 tag seemed to be a feasible approach to data collection.

In order to provide an overview of the total sample used in the study at hand, Figure 1 provides a timeline illustrating the distribution of tweets throughout the examined period of August 17th to September 22nd.

Table 1. Distribution of tweets by type.

Type of tweet	N	%
Singleton	60,088	60.2
@	6964	7
RT	32,780	32.8
Total	99,832	100

The timeline is characterized by a number of spikes, indicating an increase in the frequency of tweets sent at those particular times. These spikes grow visibly larger as election day (September 19th) draws closer, with the largest increase of tweets appearing on Election Day itself. Perhaps not very surprisingly, the spikes visible in Figure 1 can largely be explained by offline events influencing Twitter activity. Besides election day, which sees the largest spike featuring about 50 per cent of the total number of archived tweets, significant spikes occur in conjunction with televised political debates, statements made by key politicians or offline political meetings or rallies. Further overview of the activity under scrutiny is provided in Table 1, which shows the distribution of the total sample by type of messages (either singleton, @ or RT as discussed earlier). Singletons are most common ($N = 60,088$, 60.2 per cent), followed by RT ($N = 32,780$, 32.8 per cent) and directed messages (@; $N = 6964$, 7 per cent). As such, the majority of tweets sent were non-directed messages.

While Figure 1 and Table 1 provides us with an overview of the data, they do not reveal more specified information regarding Twitter use during the examined time period. With the distinction between singletons, mentions/replies and retweets in mind, the data were analyzed in order to find users who distinguished themselves according to this categorization of tweets. An examination of how Twitter contributes to a broadening of public debate, and to what extent it merely serves as yet another arena for already established societal actors requires a focus on high-end users. While this inevitably leaves out the denizens of the #val2010 Twittersphere, it allows for careful scrutiny of who the most active users are, and how they approach the capabilities of microblogging services like Twitter. By focusing our analysis on these high-end users, we provide a framework for interpretation of the different user categories evident from the collected data.

Table 2 shows how the highest ranking user stands out with more than three times as many singletons ($N = 1932$) sent than number two on the list ($N = 618$). Furthermore, the table provides identifying information about the users. The Twitter pages of all identified users were visited in order to determine occupational status of the user, and to see whether or not the user appeared to be using the service under an assumed name or not. Politicians from different camps and levels are represented: Annika Beijbom (Twitter ID AnnikaBeijbom), the third most active user, is a parliamentary candidate for the Liberal party (Folkpartiet). The remaining politicians on the list are both Conservatives (Moderaterna), all below the top level of their party. A second group identified in table 2 consists of political bloggers and journalists – users who to some extent could be

Table 2. Ten most active singleton tweeters.

Twitter ID	N	Political affiliation	Comments
all_insane	1932		Anonymous, political-satirical content
blogfia	618		Political blogger
AnnikaBeijbom	616	Fp (Liberals)	National Parliamentary candidate
Nemokrati	550		Anonymous, author under assumed name
Pihlblad	544		Journalist
juditburda	392	M (Conservatives)	Local Parliamentary candidate
vpressfeldt	352		University student
MuzafferUnsal	345	M (Conservatives)	Part-time politician
mickep2	312		Journalist
skogskant	312		Anonymous

considered to be established voices in the Swedish public debate. The remaining users identified in Table 2 are difficult to describe in any greater detail since they hide their identities and do not state any affiliation, political preference, or other information disclosure regarding themselves and their activities. Three users are anonymous, including the top-ranking ‘all_insane.’ This Twitter ID is a pun with a political edge aimed at the conservative coalition (collectively labeled Alliansen [the Alliance]). The two other anonymous users are Skogskant and Nemokrati, the latter of which claims to be an author using Twitter under an assumed name.

While descriptive statistics like the ones presented above provide a starting point for analysis, they do not reveal much about the relationships between the different high-end users identified in the data. As mentioned earlier, Twitter can be used to communicate by means of @ messages, as well as to redistribute messages sent by others through the practice of retweeting. In order to analyze these uses we employ social network analysis. First, in order to assess the conversational potential of Twitter, the reciprocity of mention/reply networks (i.e. tweets directed towards specific users by means of the @ character) are taken into account. Utilizing the Gephi software package (Bastian et al., 2009), Figure 2 provides a network analysis of the top @ networks.

The figure features a number of nodes, each representing a particular Twitter user. The color of the nodes represents the outdegree of each user – the darker the color, the more @ messages the specific user sent. Node size is dependent on indegree – the larger the node, the more messages were directed towards the specific user. Straight lines between nodes specify unidirectional communication, while curved lines indicate reciprocity in exchanges of messages.

The graphical representation presented in Figure 2 allows us to sort the identified high-end users into broad categories of senders (characterized by darker, smaller nodes), receivers (lighter, larger nodes) and sender-receivers (darker, larger nodes). The main users for each of these categories are shown in Table 3.

Where Senders are more active in communicating their views to other, specified users, they are not reciprocal in their use of the replies function – a tendency that is

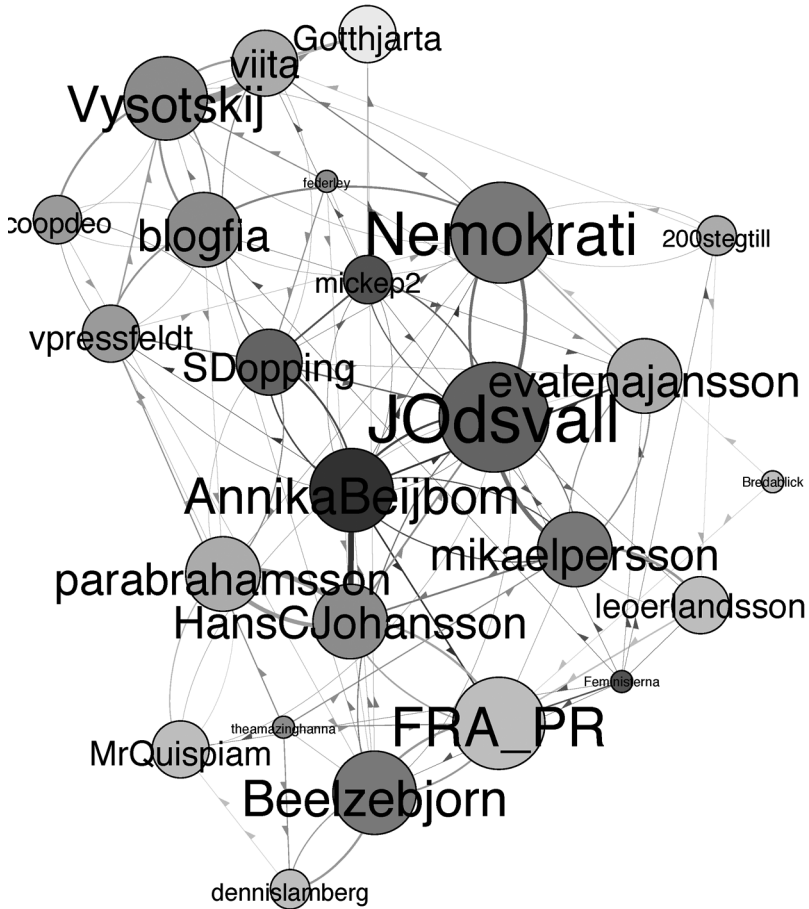


Figure 2. Top @ networks. Degree range: 40 >, graph constructed using the Force Atlas layout in Gephi.

Table 3. Categorizations of top @ users.

User category	Examples of identified users
Senders	Feministerna (Politician, Feminist party), federley (Politician, Centre party) theamazinghanna (IT professional)
Receivers	mrquispian, leogerlandsson (Politicians, Pirate party), evalenajansson (Politician, Social democrats), FRA_PR (Anonymous, political-satirical content), parabrahamsson (IT professional), Gotthjarta (Anonymous)
Sender-receivers	hanscjoansson, Beelzebjoern (Politicians, Pirate party), AnnikaBeijbom (Politician, Liberals), Jodsvall (Politician, Liberals), Vysotskij (Left-wing political blogger), blogfia (Non-partisan political blogger), mickep2, Sdopping (journalists), Nemokrati (Anonymous)

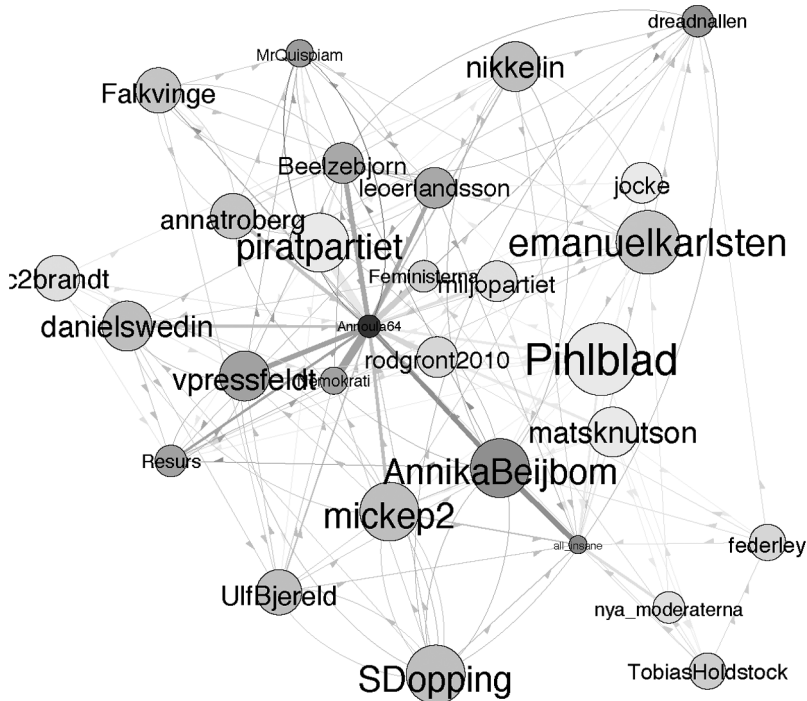


Figure 3. Top RT networks. Degree range: 40 >, graph constructed using the Force Atlas layout in Gephi.

reversed for users categorized as Receivers. These latter users tend to receive many directed messages, but are not as active in sending messages of their own. Finally, the Sender-receiver can be characterized as a more well-rounded Twitter user with regards to exchanging messages with others. Users in this category tend to be more versatile in their use of the @ character, in that they demonstrate higher levels of sending as well as receiving messages. Such categorizations allow for assessment of different user strategies. For instance, the map (Figure 2) depicts the liberal politician Annika Beijbom as a central node in the network and as a clear Sender-receiver.

Through retweets, a singleton can be redistributed in several steps, leading to a disseminating mode of communication. Studies have demonstrated that retweeting is effective also to distribute messages from users with few followers (Kwak et al., 2010). It follows that retweet activity is crucial as a measure of whose views are made important on Twitter. Again using Gephi, Figure 3 provides a network map of RT activity, identifying the high-end users in this regard. Much like in Figure 2, each node in Figure 3 represents a user. The darker the color of the node, the more active the user is at retweeting the messages of others. Users who are often retweeted are identified by larger node sizes. Line styles are interpreted in the same manner as in Figure 2. Applying similar principles as for Figure 2, three distinct user groups can be identified in Figure 3. First, retweeters

Table 4. Categorizations of top RT users.

User category	Examples of identified users
Retweeters	Annoula64, MrQuispam (Politicians, Pirate party), dreadnallen (Politician, Feminist party), all_insane (Anonymous, political-satirical content), Nemokrati (Anonymous)
Elites	piratpartiet (Official Twitter, Pirate party), miljopartiet (Official Twitter, Green party), nya_moderaterna (Official Twitter, Conservatives), rodgront2010 (Official Twitter, Red–Green parties coalition), federley (Politician, Centre party), TobiasHoldstock (Press secretary for Conservatives), Pihlblad (Journalist) jocke (IT professional)
Networkers	AnnikaBeijbom (Politician, Liberals), beelzebjorn, falkvinge, annatroberg leoerlandsson (Politicians, Pirate party), vpressfeldt (Student), SDopping, emanuelkarlsten, danielswedin (Journalists), nikkelin (IT professional), UlfBjereld (Professor)

are represented by smaller, darker nodes, indicating high activity with regards to disseminating the messages of other users. Second, larger, lighter coloured nodes – indicating popularity in the network – represent elites as their messages tend to be frequently retweeted. Finally, users classified as networkers are distinguished by their tendency to retweet and to be retweeted. As such, their corresponding nodes tend to be larger and darker. Table 4 provides examples of the categorizations for each of the three identified user types.

While the findings show clear examples of Retweeters and Elites, the majority of nodes in Figure 3 can be characterized as relatively larger and darker – the characteristics of the more reciprocally oriented Networker user type. Because of the relative frequency with which their tweets are retweeted by other users, and because they also tend to retweet messages originally posted by others, networkers not only enjoy significant standing in the network – they also contribute to the standings of others. For the category of Elites, the user Pihlblad emerges as one of the largest, lightest nodes in Figure 2. Pihlblad is often retweeted but does not retweet to the same extent – a behavior resulting in Elite network status. An opposite behavioral pattern is distinguishable for the category of Retweeters in general and the user Annoula64 in particular. With perhaps the smallest, darkest node in the graph, this user displays a pattern of use characterized by high levels of retweeting the messages of others, while not being retweeted herself.

In sum, the results presented above indicate that core users of the #val2010 hashtag employed quite diverse uses and engaged in different varieties of network connections with each other. Moreover, it becomes apparent from the data presented here that many of the highly active users can be said to at least potentially enjoy privileged positions in their respective professional capacities of journalists, politicians, etc.

Discussion

The overall temporal distribution of activity found in the case study signals a relationship between Twitter and mainstream media: spikes of activity in tweeting about the

2010 Swedish election can be linked to either televised debates, or the media coverage of offline events such as political rallies. Similar results were reported by Bruns (2010) in his study on Twitter use during the 2010 Australian election and by Shamma et al. (2010) in their study of Twitter use during televised US political debates. As such, Twitter activity appears to be largely dependent on other mediated events – a micro-blogging trend that manifests itself not only in the Swedish, but also in the Australian and US political contexts.

In purely quantitative terms, Twitter contributes to a broadening of public debate: it constitutes a novel arena for mediated public communication, and the sheer number of tweets – close to 100,000 in the present sample on the Swedish election – testifies to its use. The important question, though, is to what extent Twitter merely serves as another arena for already established societal actors, or rather facilitates a new distribution among public speakers, allowing new voices or perspectives to be heard.

The first important observation from the list of high-end users concerns the significance of their volume of activity: while many from the total sample of users contributed tweets about the election, only a minority did so to any large degree. In terms of volume, high-end users constitute a substantial part of the activity.

Second, looking at the identity of this minority, the findings indicate that Twitter indeed serves as a new outlet for speakers already belonging to an elite, or at least affiliated with prominent positions in mainstream media or political life in general. The majority of high-end users are politicians or established journalists and bloggers. This main impression should not, however, lead us to ignore the presence of other actors in the part of the Twittersphere studied here. The most conspicuous group consists of anonymous users. While not ruling out the possibility that these accounts – like ‘all_insane,’ Nemokrati and skogskant – may represent established actors, it does signal the potential for outsiders and less conventional voices to speak up via Twitter. Of course, the very fact that one can build a profile and make an impact in public political discussion under pseudonyms is a rather novel phenomenon – that seems to set online media apart from traditional mass media channels. The ways in which anonymous users interact with and relate to other users, and to what extent their communication gets into wider distribution is a clear topic for further scrutiny.

A third observation concerns Twitter as an arena for discussion. Overall, this function seems to be employed first and foremost for disseminating and not for dialogue: merely 7 per cent of the messages in the sample were replies. This distribution largely follows the findings of previous research (Honeycutt and Herring, 2009; Kwak et al., 2010; Tumasjan et al., 2010), and indicates that Twitter is used mainly for sending undirected messages, with its potential for conversation and dissemination employed at a much smaller rate. Yet, if we look closer at how modes of use such as conversations and retweeting played out among the top users, a more complex impression emerges. For the @ network, the category of sender-receiver is arguably the largest one – indicating that many of the top users took a more reciprocal approach to Twitter as conversational tool. For the RT network, the category of networker appeared to be most common, indicating an equal stance towards retweeting and being retweeted among the top users. While the category of elites is dominated by the official Twitter accounts of a variety of major Swedish political actors, other, minor political actors (like non-parliamentary parties

[Pirate party, Feminist party], political bloggers, etc.) appear more active in both networks. These findings indicate the potential of the Twitter platform as a means of outreach for such minor, partly marginalized actors. In sum, while major political parties and actors appear to have a hard time adapting to the reciprocal nature of @ and RT practices using Twitter, these means of conversation and networking appear to play some part in the use of minor political actors as identified in this study.

Finally, and perhaps most importantly, Twitter remains a marginal activity. While 19 per cent of US adult internet users also use Twitter (Fox et al., 2009), the numbers are substantially lower elsewhere. A German survey found 3 per cent of adults to be Twitter users (Busemann and Gscheidle, 2010), and Norwegian statistics show 6 per cent are users of the service (Arnesen and Solheim, 2010). In Sweden, the estimated number of Twitter users varies between 1 per cent and 8 per cent of internet users – a clear minority in the population (Brynnolf, 2011; Najafian, 2010). In a recently completed panel study on the use of various forms of social media in the period leading up to the same election under study here, Dimitrova et al. (2011) found that only around 1 per cent of the respondents in their representative sample used Twitter to follow politicians or political actors on a weekly basis.

Taken together, our findings indicate that Twitter falls somewhat short of the expectations held by those most optimistic on behalf of the democratic and disruptive potential of new web tools.

The present case study cannot make claims as to whether or not the documented Twitter use had any effect on the outcome of the election. From the results presented here, we can provide anecdotal-at-best evidence suggesting that the effect of Twitter use, if there was one, must be considered minimal. Consider for example a high-end user like Annika Beijbom (user name AnnikaBeijbom as identified above). While the analyses showed Beijbom to be a highly active user of Twitter, her efforts regarding online campaigning in this regard apparently did not help her secure a seat in the Swedish parliament. Similarly, while members of the Pirate Party were among the most active Twitter users in our data (with the official party Twitter account present, as well as party affiliated users like hanscjhansson, Beelzebhorn, falkvinge, annatroberg and leorlandsson), they did not succeed in gaining parliament representation once the ballots were counted. Obviously, Twitter use cannot serve as a lone variable for predicting political success – the processes at work here are far more complex. Future research should take the intricacies of these matters into account. For example, before we can make any claim on the possible effect of Twitter use, we must improve the methods for ascertaining how many internet users are also users of Twitter. Similarly, the degree to which Twitter users post messages needs to be assessed, accounting for active as well as inactive accounts. Future research in the context studied here should approach the daunting task of assessing the degree to which use of Twitter and other social media applications have effects on voter mindsets and in shaping the electoral process. Such research efforts will be of importance as scholars continue to try and make sense of these ongoing developments of public debate.

When we study Twitter users, we study advanced internet users and their patterns of dissemination and interaction. Nonetheless, by studying these high-end users or early adopters might enable us to get a glimpse of how use of Twitter and similar services

might be shaped in the future – and to what extent and how marginalized political voices can make themselves heard on a wider scale.

Conclusion

Twitter research is at a very early stage. One interesting sign of its immaturity is the conceptual relegation of its use as a subcategory, or derivative, of blogging, as micro-blogging. There clearly are similarities between the two, with our references to blog hyperlink analysis illustrating one such link on the level of research. However, the differences between blogs and Twitter are also substantial, not least from the perspective of the reader. A blog is traditionally defined as a frequently updated website consisting of chronologically dated entries presented in reverse order (e.g. Bruns and Jacobs, 2006). While reverse chronology might still describe the reading of tweets, many differences are also apparent. As a stream of messages from a multitude of sources, often related and tagged according to specific themes or subjects and not necessarily presented on a webpage, Twitter shows a number of differences when compared to blogs. This observation points to the need to acknowledge not only the autonomous qualities and features of Twitter, but also to the need for rethinking our definitions of blogs in light of Twitter, alongside the uptake of RSS and related feed applications.

While previous research efforts have mostly tried to categorize the content of tweets, or provide large-scale metrics derived from general Twitter API data, the study presented here provides a different approach to the field of Twitter research. We have suggested a novel way of collecting and analyzing Twitter data, contributing to the development of online methodological tools for the study of new media. To illustrate the value of such an approach, we have applied our suggested rationale on a specific case, providing insights into the activities of high-end Twitter users during an election campaign.

While Java et al. (2007) as well as Honeycutt and Herring (2009) proposed detailed categorizations of Twitter content, the analysis presented here suggests broader categories of Twitter users for @ messaging (Senders, Receivers, and Sender-receivers) and retweeting (Retweeters, Elites, Networkers), respectively. It is our belief that the user categories identified here could be of interest to similar, future research endeavors. For further research into online political activity, the validity of these user types could be tested in other socio-geographical contexts. It should also be of relevance to see if the roles of users identified in the different categories in this study emerge also in other contexts. Specifically, it should be of interest to see if established politicians take on the role of senders regardless of electoral environment, and if non-parliamentary actors (such as the Pirate party in this study) tend to appear as networkers also outside of the context under scrutiny here. Moving beyond political Twitter use, the categories presented here could be of use also in other thematic contexts. While the approach to studying Twitter presented here has some clear merits, it is not without its limitations. In the following, these limitations are assessed in combination with further ideas for future research efforts.

A first set of limitations has to do with hashtags. As studies have showed, in Twitter communication, hashtags are dynamic entities, and often contested (Hickman, 2010). Hashtag identification can be difficult – especially pertaining to a specific topic and as

the discussion unfolds. In our illustrative case study, although val2010 remained stable and dominant throughout the period of study in the present case, it is safe to assume that the data did not cover all relevant tweets. Some messages used other hashtags, misspelled them, or left them out altogether. Even those who used the val2010 tag when composing, a singleton, say, criticizing a political candidate on a televised debate, might not employ the tag for a subsequent reply message that results from the original singleton. However, even though the use of a specific hashtag will entail biases, the resulting data set does, compared to other instances of off- and online mediated communication, provide a basis for a comprehensive analysis.

A second limitation has to do with context. While an analysis of Twitter use can yield detailed insights into the practices of public communication on one specific online arena, the ramifications of the findings should, in the next step, be made subject to comparisons. This could entail comparison with Twitter use in other social settings, or comparison with other forms of online communication – say blogging, or discussion forums – in the same setting. Such comparisons would enable a better understanding of the weight and impact of the patterns of use as identified in this study. A broader scope applied to new contexts will help further this developing research area.

The approach suggested here focuses on structural aspects of Twitter use. Through our analysis, we map out the basis for different Twitter user types. Although the work presented here provides the research community with a point of departure for further inquiry into these matters, it does not, however, take the step into qualitative research efforts. While such in-depth analysis is arguably beyond the scope for the focus of this particular article, more qualitative ways of approaching data like these could be feasible for future research efforts. For example, individual Twitter users of high interest (perhaps identified through an analysis similar to the one presented above) and their patterns of use could be studied. Another interesting aspect might be to focus on retweeted messages. While an analysis such as the one presented here provides an overview on who is retweeting who, the contents of these messages, as well as Twitter messages in general, are of obvious interest. By taking the next step and moving beyond the structural, overarching analytical approach employed here, future research will be able to provide interested scholars with a deeper understanding of the practices of Twitter use.

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