Introduction

Twitter arguably became one of the most important communication arenas in daily political life of many. Initially conceived as a website to share personal status updates, it has now more than 335 million users globally sharing an average of 500 million tweets per day.[1] One distinct characteristic of this social network platform is the presence of not only individuals but also private and public institutions and organisations. Virtually every legislator, political party and candidate in developed democracies has an active Twitter account. Irrespective of their offline identities, they all presumably interact within the same linguistic and symbolic framework. This plethora of data allows social scientist to test variety of questions. Social science research done on twitter is diverse both methodologically as well as theoretically. In the following section, we will provide a brief summary of the research.

Twitter Studies

Most of twitter research is empirical and not easily amenable to conventional theories of the field. Nonetheless, two branches of political science – communication and political behaviour research – have provided ample of testable hypotheses to the emerging field. Major topics that have been covered in the area can be situated within (1) elections and policy analysis fields. Specifically, research within this umbrella focuses on topics such as agenda setting, framing, electoral campaigns as well as policy diffusion.

In reviewing the available literature on the use of Twitter in politics, it becomes quickly apparent that most research is data centered and focuses on the description of empirical evidence. Only a minority of studies tries to situate their findings explicitly in the context of larger theoretical discussions. Still, some of the most popular theories of communication research and political science have been used by researchers to analyse the political uses of Twitter. In theoretical discourses on the use of Twitter in politics (Table 2) and Methods in research on the use of Twitter in politics (Table 3), I list studies that situate their findings in the context of specific theories or methods. The theories in the tables are grouped according to the scientific fields they emerged from–communication research and political theory–and their focus–be it on the identification of psychological effects or the use of specific methods. It is important to note that I only included studies in this table which explicitly referred to the theories and approaches listed. There is an argument to be made that many of the studies, examining the use of Twitter in politics, contribute with their findings implicitly to some of

[1] Source: https://www.statista.com/statistics/282087/number-of-monthly-active-twitter-users/

these theoretical discourses. Still, for the sake of clarity, in this section, I only discuss studies that explicitly anchored their findings in the respective theoretical discussions.

I will first look at research that situates itself in the context of communication research. Researchers use concepts dealing with the agenda setting and agenda building processes of media coverage, the framing of messages referring to political candidates and the selective exposure of audience members to opinions concurring with their own.

The sources of the media agenda have been a focus of communication research for long (Reese, 1991; Shoemaker and Reese, 2014). With regard to Twitter's use in politics, researchers examine the way how Twitter messages might influence the media agenda. The studies included in this review that explicitly referred to agenda setting research showed that journalists increasingly incorporate Twitter messages by politicians and sometimes also those of other users in their coverage of political topics, be it as topic of a story, sources for quotes or as background information on ongoing stories (Broersma and Graham, 2012; Parmelee, 2013; Wallsten, 2014).

Framing refers to different ways information can be presented and the potentially varying effects on the recipient based on these different presentations (Chong and Druckman, 2007; Iyengar and Kinder, 1987). Studies using this concept examined which words were used in messages commenting on election day on the two candidates in the 2012 American Presidential election and showed that on that day most messages contained no partisan framing (Groshek and Al-Rawi, 2013). Another study showed that messages by politicians containing personalized information led to different effects in political learning of recipients when compared to depersonalized messages (Lee and Oh, 2012).

One of the oldest theories of communication research is selective exposure, the tendency of people to expose themselves to information in accordance with opinions already held by them. Media environments that allow audiences a lot of choice seem to foster this tendency (Frey, 1986; Prior, 2007). This theory is one of the building blocks of communication research and has received a lot of attention in the context of news gathering on the internet, as this seems to be the media environment with the largest opportunities to choose different sources of information yet (Garrett, 2009; Scheufele and Nisbet, 2013; Tewksbury and Rittberg, 2012). In this theoretical context, researchers have discussed the tendency of Twitter users to follow accounts of politicians belonging to parties they support and generally to use social networking services to find information in accordance with their political views (Gainous and Wagner, 2014; Parmelee and Bichard, 2012).

Contributions to a number of political theories can also be found in the literature on the political uses of Twitter. These include political deliberation, normalizing or transformative aspects of Twitter for the political system, political polarization and social capital.

The role of the internet as an arena fostering or hindering deliberative discourses on politics has been discussed in many studies and for many stages of the internet's technological development (Chadwick, 2006; Neuman, Bimber and Hindman, 2011; Wilhelm, 2000). Some researchers have analyzed the interactions of politicians and the public on Twitter from this perspective. These studies analyzed whether politicians interacted with normal users on Twitter. Since these interactions were very rare the authors tend to conclude that Twitter is a tool not used by politicians for deliberative discourses (Kim and Park, 2012; Thimm, Einspänner and Dang-Anh, 2012).

Early discussion on the effect of the internet focused on the question whether the internet would lead to a transformation of politics–with new political actors rising to power, enabled through new opportunities of information distribution, political coordination and new communication practices–or if the internet would become a normalized information environment, where the same political actors would dominate the political sphere on- and offline and follow the same communication practices onand offline (Davis, 1999; Margolis and Resnick, 2000; Neuman, 1991; Schweitzer, 2011). Various studies have analyzed if prominence for political actors in the traditional political environment would also lead to prominence on Twitter (Jürgens and Jungherr, 2011, 2014; Klinger, 2013) and if politicians used similar communication practices on Twitter as they did offline (Bode, Lassen, Kim, Shah, Fowler, Ridout and Franz, 2011; Mirer and Bode, 2013). These studies tend to show that in most countries the actors who are powerful offline tend also to dominate the political discourse on Twitter. A notable exception hereto is Germany where the Pirate Party, a party with no seats in the national parliament, is by far the most dominating party online. With regard to communication practices, the findings are more mixed. There, it appears as if political actors do not radically break with their communication practices online but adopt them somewhat for Twitter.

Especially in the USA, political scientists are discussing whether the political process has become more polarized over time. Researchers cite a number of reasons that might lead to an increasingly polarized electorate: polarizing cues from political elites, an increasingly atomized social structures might lead to people predominantly interacting with other people like them and a media environment with dedicated channels for partisan coverage (Fiorina and Abrams, 2008; Prior, 2013). Most studies addressing political polarization on Twitter map the

interactions of political vocal Twitter users and try to determine whether users tend to interact more strongly with users who share their political conviction. These studies are in the tradition of similar approaches in which researchers mapped linking practices between political blogs and found that political blogs tended to link to others sharing the same partisan convictions (Adamic and Glance, 2005). The evidence with regard to Twitter appears to be mixed. While there is evidence that users in the USA do indeed tend to retweet pre-dominantly messages of users who appear to share their political convictions users also tend to interact through @messages across partisan lines (Conover et al., 2011; Hanna et al., 2013; Mustafaraj and Metaxas, 2010; Smith et al., 2014). It will be interesting to see if these findings hold also for other political contexts. Also, it is not at all clear if these findings–true for specific interactions of users on a specific online service–do indeed speak to the polarization debate as understood in political science.

Political uses of Twitter have also been discussed in the context of social capital as understood by Robert Putnam. The basic idea being that social networks between people enable and foster political engagement (Putnam, 2000). Although this concept and its use in political science has been disputed (Jackman and Miller, 1998; Woolcock, 2010), it has proven popular with researchers focusing on the power of the internet to foster civic and political engagement (Rainie and Wellman, 2012). Following the same logic–digital tools enable new and meaningful interactions between people which in turn might lead to civic or political participation–some researchers expect Twitter to have similar effects (Gainous and Wagner, 2014).

Another set of studies addressed the use of Twitter from a psychological perspective. The focus of these studies are the motives that lead people to interact with politicians online. In this, they connect with the Uses & Gratification approach to media use (Rubin, 2009) and recent work on psychological mechanisms in the emergence of public opinion and political cognition (Lodge and Taber, 2013; Zaller, 1992). Also, studies focus on the effects exposure to tweets has on audiences with regard to political learning and the evaluation of political candidates and issues (Dimitrova et al., 2014; Gainous and Wagner, 2014; Hong, 2013; Lee and Jang, 2013; Lee and Oh, 2012; Lee and Shin, 2012; Parmelee and Bichard, 2012; Vaccari et al., 2013).

While the studies discussed above share the theoretical discussion they address in their research, there are also studies that approach the use of Twitter in politics with shared methods using rich data collected on Twitter to perform quantitative analyses. Two popular approaches are network

analysis and automated sentiment analysis. Studies using these approaches are listed in Methods in research on the use of Twitter in politics (Table 3).

In studies interested in the analysis of social networks, the use of Twitter conventions–such as following and follower relationships and interactions between users through @messages, @mentions or retweets–are used to construct a social network in which users form nodes and their interactions edges. Studies, using social network analysis usually focus on questions of who interacts with whom, be it political actors or the public (Ausserhofer and Maireder, 2013; Bode, Hanna, Sayre, Yang and Shah, 2011; Boutet, Kim and Yoneki, 2013; Bruns and Burgess, 2011; Bruns and Highfield, 2013; Burgess and Bruns, 2012; Conover et al., 2012, 2011; Feller et al., 2011; Groshek and Al-Rawi, 2013; Hanna et al., 2011, 2013; Jürgens and Jungherr, 2011, 2014; Jürgens, Jungherr and Schoen, 2011; Kim and Park, 2012; Larsson and Moe, 2012; Lin, Keegan, Margolin and Lazer, 2013; Maireder and Ausserhofer, 2013; Mascaro and Goggins, 2012; Mustafaraj and Metaxas, 2010; Mustafaraj et al., 2011; Plotkowiak and Stanoevska-Slabeva, 2013; Shamma, Kennedy and Churchill, 2009).

Studies using automated sentiment analysis also use textual data provided by Twitter. They use various approaches to identify the sentiment expressed in the messages by users. Researchers have focused on the sentiment expressed in messages referring to specific political candidates or interactions by specific users (Dang-Xuan et al., 2013; Diakopoulos and Shamma, 2010; Lin, Margolin, Keegan and Lazer, 2013; Mitchell and Hitlin, 2013; Plotkowiak and Stanoevska Slabeva, 2013; Rosenstiel and Jurkowitz, 2011; Stieglitz and Dang-Xuan, 2012).

Research Designs

Grouping the studies included in this review by their research design results in four categories: studies using surveys, conducting experiments, interviews, descriptive case studies and digital trace data. Research approaches to political uses of Twitter: Part 1 (Table 4) and research approaches to political uses of Twitter: Part 2 (Table 5) list the studies according to their use of one of the research designs listed above.

Some studies used surveys to determine aspects of political uses of Twitter, be it for assessments of how many people were using Twitter politically (Rainie et al., 2012; Smith and Rainie, 2010) or be it for the identification of characteristic variables showing a statistical relationship with political Twitter use (Bekafigo and McBride, 2013; Dimitrova et al., 2014; Gainous and

Wagner, 2014; Parmelee and Bichard, 2012; Vaccari et al., 2013). Studies based on surveys allow researchers to compare their findings on political Twitter use with established research on political participation, such as the civic-voluntarism model (Rainie et al., 2012; Verba, Schlozman and Brady, 1995). This potentially allows the identification of elements that political Twitter use shares with the use of other technologies for political participation and elements that are solely characteristic for the political use of Twitter. Still, surveys face specific challenges with regard to Twitter. As Twitter is still used by only a minority of people in any country, a true sample of a population would have to include a large number of respondents to allow for any meaningful discussion of political uses of Twitter. Up until now, there is only a limited number of studies that have large enough samples to allow for such a discussion (Gainous and Wagner, 2014; Smith and Brenner, 2012). Studies sometimes try to address this issue by selecting Twitter users based on their use of political hashtags or their decision to follow political actors. Once identified, the researchers invite this politically active population through Twitter messages to participate in a survey (Parmelee and Bichard, 2012; Vaccari et al., 2013). While this might give some indication on who political active users on Twitter are, this practice is heavily dependent on self-selection of the respondents and might thus lead to biased results.

A growing number of studies are using controlled experiments to measure effects on recipients following the exposure to Twitter feeds containing political information (Lee, 2013; Lee and Jang, 2013; Lee and Oh, 2012; Lee and Shin, 2012). Early research shows the considerable potential that lies in using experiments to identify mechanisms that political uses of Twitter share with political uses of other media. These research designs also allow to situate Twitter in the context of political psychology.

Most studies included in this review used digital trace data in some way, shape or form. Digital trace data document the activities of users on digital services. They document each interaction of the users with the service. Digital trace data are found data. Analyses based on this data type are thus in clear contrast to research in which data was explicitly collected to measure and control for specific phenomena–such as surveys or experiments (Howison, Wiggins and Crowston, 2011). Be it simply the manual transcription of the number of messages and followers of politicians' Twitter account (Golbeck, Grimes and Rogers, 2010; Peterson, 2012) or the extensive collection of data through Twitter's API (Ausserhofer and Maireder, 2013; Lin, Keegan, Margolin and Lazer, 2013; Mustafaraj and Metaxas, 2010), digital trace data of human

behavior mediated through Twitter has been at the centre of most research on the political uses of Twitter. In principle, every interaction of users with Twitter is documented and, within limits of their specific API access, accessible for researchers. This opens up interesting potentials for researchers interested in the use of digital tools, the effects of exposure to certain types of messages and the flow of information through networks constructed through manifest interactions between Twitter users. Twitter offers access to a data type that is representative for data collected by other online services like Google or Facebook. In contrast to these services, Twitter allows researchers comparable comprehensive access to its data. Thus, research using digital trace data on political behaviour on Twitter might not only speak to Twitter, but also offer potentials for the development of general methods for research with digital trace data on other services documenting an ever increasing share of political activity (Howison, Wiggins and Crowston, 2011; Jungherr and Jürgens, 2013; Lazer et al., 2009).