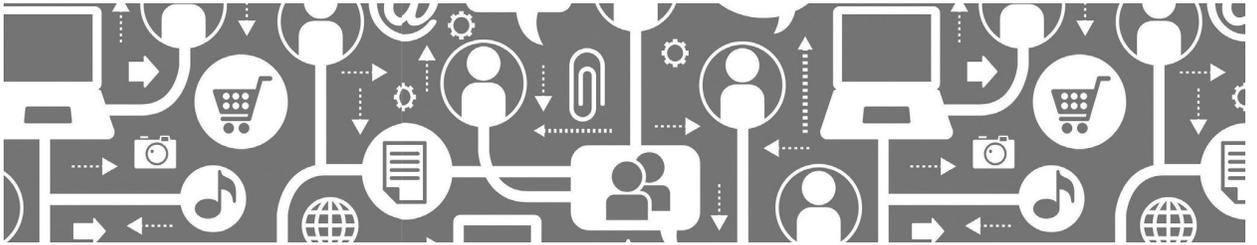


# The SAGE Handbook of Social Media Research Methods



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scholarship. Firstly, a new journal *Social Media + Society* was launched in April 2015 dedicated solely to the publication of original work in the field. This is in addition to numerous other journals that have social media as a key focus of scholarship such as *Big Data and Society*, *Social Media and Society*, *Information, Communication & Society*, *New Media and Society* and the *Journal of Computer-Mediated Communication*. Secondly, the relevance of social media in everyday life continues to grow and this relevance is further increased by the move by citizens toward adopting mobile devices (e.g., smartphones, phablets, and tablets) that provide flexible, on-the-go capabilities to access information from social media apps, as well as to contribute text, images, commentary and opinion. Finally, new data collection, data analysis and data visualization tools as well as web and mobile applications continue to be developed and existing ones are constantly updated and refined. These represent a new toolkit for scholars to embark on social media projects that allow for the integration of multiple data sources on a large scale. Hence, *The SAGE Handbook of Social Media Research Methods* represents an important step towards sharing the novel methodologies, tools and techniques specifically geared toward taking full advantage of the unique characteristics of social media data.

The amount, scale and scope of social media data have created a need for methodological innovations that are uniquely suited to examine social media data. This is not only restricted to big data analysis of a quantitative vein, which has perhaps received the most media and scholarly attention, but also to new approaches in qualitative methodology (Salmons, Chapter 12, this volume), from small stories in narrative analysis (Georgakopoulou, Chapter 17, this volume), to close reading (Stewart, Chapter 16, this volume), to thick data description (Latzko-Toth, Bonneau and Millete, Chapter 13, this volume), to methodologies that examine

non-verbal data such as images, representations and sound (Rasmussen Pennington, Chapter 15, this volume). Furthermore, the linking of data at different scales is a major challenge in social media data requiring approaches that are qualitatively different from existing methods, often combining image, text and interactions across time and contexts. Perhaps we can assert that we are observing what Kuhn (1970) described as ‘anomalies’ which lead toward new paradigms in science, after all, as we will discuss in more detail below, social media scholarship does require novel approaches and new ways of looking at social phenomena. As a result it also requires scholars to develop new skills in order to harvest, analyze and most importantly, interpret research findings and place them in context.

*The SAGE Handbook of Social Media Research Methods* is the first book to cover not only the entire research process in social media scholarship from question formulation to data analysis to the interpretation of research findings, but also to include designated chapters on how data collection, analysis, presentation and interpretation takes place on specific social media platforms such as Twitter (Murthy, Chapter 33, this volume), Facebook (Vitak, Chapter 37, this volume), Weibo (Hu, Qiao and Fu, Chapter 35, this volume), VKontakte (Gruzd and O’Bright, Chapter 38, this volume) and Instagram (Laestadius, Chapter 38, this volume). It provides a step-by-step guide to overcoming the challenges inherent in the nature of research projects that deal with ‘big and broad data’ and the need to add context to this data to help with result interpretation. To help those interested in acquiring the skills needed to complete a social media project, the chapters provide examples and case studies of a wide range of approaches to illustrate how to implement these with real data. The chapters are detailed and allow scholars who are unfamiliar with specific approaches or techniques to quickly

grasp the strengths, limitations and key considerations. The aim of the Handbook is for scholars to have a reference volume that will allow them to apply and tailor the various methodologies to their own research questions. The Handbook will be the single most comprehensive resource for any scholar or graduate student embarking on a social media project.

Four key highlights of the Handbook include:

- 1 Exploring the foundations for social media research including the development of interdisciplinary teams (McCay-Peet & Quan-Haase, Chapter 2, this volume), ethical considerations (Beninger, Chapter 5, this volume) and the wider impact of 'big data' on the social sciences (Kitchin, Chapter 3, this volume).
- 2 Demonstrating how both established and new qualitative and quantitative methods can be applied to social media data (Hand, Chapter 14, this volume).
- 3 Navigating what tools are available to help researchers with social media data collection, analysis, and representation (e.g., visual, sound, video and textual) and how they can be used (Rasmussen Pennington, Chapter 15, this volume; Vitak, Chapter 37, this volume; Zeller, Chapter 23, this volume).
- 4 Evaluating the characteristics and applications of different social media platforms for academic research purposes (Gruzd and O'Bright, Chapter 38, this volume; Laestadius, Chapter 34, this volume; Vitak, Chapter 37, this volume; Hu, Qiao & Fu, Chapter 35, this volume).

This introductory chapter seeks to place the volume in the wider context of the big data revolution through further defining what social media is and what it means to develop a 'social media methodology'. We then move on to explore what makes social media research so different to traditional social scientific endeavour in terms of the generic non-platform specific characteristics of the data. Having identified the difficulties and frustrations of using social media data, we conclude with how the contributions in this book have

established an accessible foundation for social scientific enquiry in this area.

## **SOCIAL MEDIA FOR SOCIAL RESEARCH?**

While some scholars have studied social phenomena on social media as a separate sphere from 'real life', we argue that these applications need to be viewed as integrated into and as an integral part of society at large. It is myopic to think that social media data emerge in a vacuum. Interactions and engagement on social media are often directly linked, or even result from, events taking place outside of it. Moreover, they are produced within a specific historical, social, political, and economic context. Thus, social media scholarship needs to take this context into account in any study of social media. This perspective is critical as it directly influences a study's research design and interpretation of findings. Often additional information, in the form of maps, historical events, newspaper articles, demographic information or political upheavals, need to be included to provide additional context that can aid in the interpretation of research findings.

Following the interest in the role social media played in the 2011 London Riots, the 2012 Barak Obama presidential campaign, the 2014 Ukraine political crises, the recent announcement in the UK of a multimillion pound government-funded data science institute, and the increasing disenfranchisement of social science data at the expense of privately owned transactional datasets (Savage and Burrows 2007, Hong and Nadler 2012), the social science community has become increasingly interested in non-traditional approaches to research design and data collection. The massive and unprecedented generation of 'big and broad data' necessitates the development of novel and innovative approaches to make sense of the social world through social media data, which in itself is

often de-contextualized and ‘data light’ with regards to the demographic staples of social scientific analysis (Sloan et al. 2013, 2015; Sloan, Chapter 7, this volume). Social media data also presents challenges with data preparation not seen to this scale in past data sets. The identification and handling of outliers is not new to scholars. In purely quantitative approaches, outliers are often eliminated as they introduce undesired ‘noise’ and can bias analytical findings, for example, in multivariate regression analysis. Qualitative data has handled outliers very differently, focusing on anomalies in data sets and integrating them in the interpretation of findings (Bradley, 1993). Social media data confronts several new types of noise and it remains unclear as yet as to how to integrate them into the analysis and interpretation of findings (Yang, Chen, Nevin and Quan-Haase, Chapter 6). For instance, misinformation can either be deceitful or accidental, depending on the individual’s motivation (Rubin, Chapter 21, this volume). Either way, scholars need to be aware of these extraneous factors and handle data analysis and interpretation accordingly. This Handbook provides an overview of the cutting-edge developments in this field that establish how to tackle these problems and overcome unique challenges, thus enabling more researchers to study the digital world through developments in methodology at the nexus of the social and computer sciences and digital humanities.

## DEFINING SOCIAL MEDIA

The global proliferation of social media is unprecedented both in growth of take-up and content production.<sup>1</sup> Duggan, M. (2015) shows that in 2015, as much as 72% of American online adults used Facebook, 31% Pinterest, 28% Instagram, 25% LinkedIn, and 23% Twitter. Most young people are constantly updating their Facebook status, retweeting messages and uploading

pictures to Instagram. Zephoria reports that as of June 2015, Facebook had 1.49 billion monthly active users: every 60 seconds these users provide 293,000 status updates, post 510 comments, and upload 136,000 photos (Zephoria, 2015). The amount of data generated and stored every minute is unprecedented. In short, social media usage has become a daily practice for many. For scholars, this revolution in communication provides both opportunities and challenges. The sheer amount of digitized user-generated content is a potentially rich source of information about the social world including interactions, attitudes, opinions and virtual reactions to real-world events. Yet the computational and analytical challenges are significant – how to process the vast amount of data, how to filter noise, how to democratize access to social media data for the wider social science community, how to understand online behaviour, and how to apply traditional social scientific concepts of sampling and inference, and coding and interpretation to understand the relationship between online communities and the wider population.

One key challenge is providing a definition for what social media is. Chapter 2, co-authored by McCay-Peet and Quan-Haase (this volume), provides a review of how scholars have approached this conceptual challenge and discusses what key elements are constant across various definitions. Creighton et al. (2013) get at the heart of the problem by stating that social media is closely linked to digital technology in general, making it difficult to articulate where the boundaries lie between various applications, tools and sites. This results from the heavy emphasis on social features in many applications, be it mobile, Internet-based or other platforms. Moreover, most web sites provide capabilities to seamlessly interact with social media further blurring the boundaries. It is also increasingly difficult to distinguish social media from digital technology in general (Creighton et al. 2013) because of the social elements that are now embedded in

everything from smartphone applications to wearable technologies.

What distinguishes social media from traditional media such as print and radio and from other new media such as web sites and podcasts? Hogan and Quan-Haase (2010) suggest that a definition of social media needs to specifically focus on what is unique about the applications and tools that are included and Bruns (2015) points out that the uniqueness of social media is its focus on connecting: ‘All media are social, but only a particular subset of all media are fundamentally defined by their sociality, and thus distinguished (for example) from the mainstream media of print, radio, and television’ (2015: 1). For the purpose of *The SAGE Handbook of Social Media Research Methods* we propose to include applications that have the following three characteristics:

- 1 Have the capability to support user-generated content in forms such as images, text, videos and statuses (such as geolocation check ins) (Blackshaw 2006, Gruzd et al. 2012, Kaplan and Haenlein 2010, Xiang and Gretzel 2010).
- 2 Provide a means for users to connect with one another (through follows or likes on Twitter, friendship connections on Facebook, or checking in with Foursquare) (Correa, Hinsley, and de Zúñiga 2010).
- 3 Support various means for members to engage with one another in the form of collaboration, community building, participation, sharing, linking and other means (Bruns 2015, Otieno and Matoke 2014).

Once these three elements come together, a medium can be described as falling under the rubric of social media.

## **THE METHODOLOGICAL CHALLENGES WE MUST RESPOND TO**

Using social media data for social scientific analysis requires a reorientation of how we think about data and its relationship with the

social world. The data exists and proliferates whether it is observed or not, it is not created solely for the purpose of research – in this sense its role in academic work could be labelled as incidental, yet that cannot detract from its importance in recording and shedding light on a whole range of social phenomena including attitudes, intentions, identity, networks, opinions, locations and representations. Of course, the incidental nature of the data is not entirely new to the social sciences (observational studies and ethnography as examples), but social media data inherently creates specific challenges that we must tackle head on. The challenges are not discipline-specific and can most poetically be presented as the 6 Vs: volume, variety, velocity, veracity, virtue and value (Williams et al. 2016).

Volume refers to the sheer amount of data being produced on social media platforms. BIS (2013) estimates that around 90% of the world’s data was created in two years prior to 2013 and Twitter reports the creation of 500 million tweets a day (Twitter, 2015) with around 15 million Twitter users in the UK alone (Rose, 2014). Collecting and storing this data raises significant challenges (Mayr and Weller, Chapter 8, this volume; Voss, Lvov and Thomson, Chapter 11, this volume) and sorting the useful data from the noise can take time and skill.

Variety is related to the multimodal nature of the data including text (Angus, Chapter 31, this volume; Georgakopoulou, Chapter 17, this volume; Thelwall, Chapter 32, this volume), images (Hand, Chapter 14, this volume; Laestadius, Chapter 34, this volume), videos, geospatial check ins (Buchel & Rasmussen Pennington, Chapter 18, this volume; Williams and Chorley, Chapter 36, this volume; Reips and Garaizar, Chapter 27, this volume) and audio. Also relevant is the ability of social media platforms to often facilitate multiple data types. This means that the ‘big data’ problem is not an issue solely for quantitative studies and the chapters in this edition demonstrate the huge potential

for analysis of many data types using social media including mixed methods studies (Hochman, Chapter 22, this volume).

Velocity refers to both the speed at which social media data is generated and how quickly users respond to real world events. The speed of data generation poses some very particular problems for data collection that need computational solutions rather than manual recording, such as the use of Application Program Interfaces (APIs) (Brown, et al., Chapter 9, this volume; Hegelich, Chapter 28, this volume). This is a particular problem for the social science community because of the paucity of computing and coding knowledge amongst researchers and in response we have covered the topic in this book from several angles. The speed of response to events creates a different set of problems around researchers reacting quickly enough to commence data collection when an event occurs and understanding the role of fine-grained temporality with ‘locomotive’ data (Jamieson and Boase, Chapter 24, this volume).

Veracity is primarily concerned with the accuracy, reliability and quality of the data. Social media data are often lacking important information that we would normally collect as standard in social research, most notably the demographic characteristics of the respondent and/or content producer. The development of demographic proxies (Sloan, Chapter 7, this volume) is key to understanding who is represented on social media, thus enabling further conversations around sampling and populations. Concerns around how (and if) social media data reflects real world events can be addressed through data linkage and augmentation with existing curated and administrative data sources (Zeller, Chapter 23, this volume), although we must still deal with the question of how the self is presented and to what extent the online identity of a user is crafted (Yang, Quan-Haase, Nevin and Chen, Chapter 6, this volume).

Virtue means ethics. Current ethical guidelines for social research are not fit for purpose when applied to social media data and much work has been done internationally to coordinate a response from the social science community on what such an ethical framework may look like (the ‘New Social Media, New Social Science’ #NSMNSS scholarly network has been particularly active in this area and practical guidelines are starting to emerge (see Townsend and Wallace 2016) which provide pragmatic advice to researchers). To complicate matters further, general ethical principles such as participant anonymity are at odds with the legal terms and conditions of data use for some platforms. Twitter will not allow tweets to be presented without usernames). This, in turn, has implications for protecting participants from harm when presenting data that may be incendiary (such as tweets containing hate speech). A starting point for the development of an ethical framework for social media is to understand how participants feel about their data being used for research (Beninger, Chapter 5, this volume).

Value is an assessment of how social media data increases our understanding of the social world by opening hitherto unavailable avenues of research and/or augmenting existing work through access to new data (McCay-Peet and Quan-Haase, Chapter 2, this volume). Certainly there are questions to be asked about how new ‘big data’ really is and what role theory can play within the data deluge (Kitchin, Chapter 3, this volume), but perhaps an unexpected outcome of the challenge this data has thrown at us has been an increase in interdisciplinary work across the social and computing sciences as well as the humanities from which all sides have benefitted (Quan-Haase and McCay-Peet, Chapter 4, this volume).

In response to these challenges a range of tools have been identified or developed that account for the complex characteristics of social media data. Popular and free analytical packages such as ‘R’ enable users to collect

Twitter data (Janetzko, Chapter 10, this volume) and analyze it in a variety of ways, whilst other tools provide more bespoke functionality in the areas of Natural Language Processing (NLP) and language analysis (Bontcheva, Chapter 29, this volume; Rubin, Chapter 21, this volume; Thelwall, Chapter 32, this volume) and social network analysis (Ghajar-Khosravi and Chignell, Chapter 19, this volume; Gruzd, Mai and Kampen, Chapter 30, this volume). Importantly, the development of graphical interface platforms, such as COSMOS, have democratized access by lowering the level of technical knowledge required to ascertain, process, filter and explore social media data (Morgan, Chapter 26, this volume).

## CONCLUSION

The introductory chapter highlights and discusses many of the challenges encountered in studies of social media ranging from practical decisions that influence the research design (i.e., timeline of data collection, what hashtags to follow and what tools to use to collect data) to more philosophical questions around the ethical treatment of human subjects. These challenges also emerge from the complexity of social media data and we discussed the 6 Vs as a means of summarizing the key characteristics (volume, variety, velocity, veracity, virtue and value) that any social media project needs to come to terms with and the tools that facilitate working with this data. The contributions to this Handbook demonstrate that the academic community has responded with gusto to these challenges with over 40 experts from around the world from a plethora of disciplines and a variety of methodological viewpoints coming together in one place for the first time. The Handbook covers not only the entire research process for social media research, from question formulation to the interpretation of research findings, but it also presents numerous examples and case studies of various approaches to showcase how to

implement various techniques with real data. The chapters provide methodological detail and allow scholars who are unfamiliar with the domain to quickly grasp the strengths, limitations and key considerations of this type of data with the aim of:

- Encouraging skill development: An easy to follow, step-by-step approach encourages scholars to immerse themselves in new techniques and thereby widen their methodological toolkit.
- Showcasing tool use: Many of the chapters rely on tools developed specifically for either the collection, analysis or visualization of social media data. Both pros and cons of various tools are discussed and the possibilities for analysis presented via case studies and examples.
- Covering of the entire research process: Scholars are encouraged to think about the entire research process from study design to interpretations of data. This provides a uniquely holistic perspective of social media research.
- Promoting ethical considerations: The chapters highlight how the person, the self, cannot be separated from the data trace in particular types of studies. This necessitates novel approaches to research ethics and the treatment of both big data and small data.
- Demonstrating data harvesting and cleaning practices and techniques: Social media data has particular characteristics and these need to be taken into account when harvesting data either for large quantitative analysis or analysis at a small scale. Also misinformation, deception and trolling practices can influence data interpretation and need to be considered seriously as part of the data set.
- Highlighting multi-method and multi-data approaches: The use of multiple methods of data collection, analysis, visualization and interpretation are critical for developing distinct understandings of social media practice and social phenomena. Triangulating data and also analyzing social media data in conjunction with other data sources can provide a fuller picture of social phenomena.

To tackle the challenges of social media research we must embrace an interdisciplinary approach (Quan-Haase and McCay-Peet, Chapter 4, this volume), drawing on methodological traditions from across and

outside of the social sciences, computer sciences and humanities. It is our sincere hope that this edition widens the pool of researchers who feel confident and competent when working with social media data and that the methodological discussions spread and grow because, as Bob Dylan almost said, these methods they are a changin'.

## NOTE

- 1 As McCay-Peet and Quan-Haase (Chapter 2, this volume) report between 2009 and 2014 there are almost twice as many references in Scholar's Portal (<http://www.scholarsportal.info>) in peer-reviewed articles to the term 'social media' in comparison to 'social networking sites (SNSs)'. In recent years, usage of both terms has increased exponentially, the trend suggests that social media is more 'social media' than 'social networking site (SNS)'.

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