

Policy Insight Through Social and Online Media: A Systematic Mapping of Qualitative Passive Citizensourcing Studies

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This systematic mapping study examines how and why researchers conduct qualitative studies of online citizen commentary on public policy matters, and identifies procedural commonalities and differences. Findings indicate that researchers typically: choose online comments to help understand public discussion and salient attitudes to important policy matters; believe online citizen commentary can give insights into community attitudes because it is unsolicited and relatively anonymous and unconstrained; believe anonymity is the main disadvantage because it can be difficult to ascertain who is commenting or which groups are represented; justify their choice of source data sites by preferring those with ready access to a large readership or large numbers of comments; manually

'copy and paste' online comments from one or more sites, mostly news media websites; use thematic analysis to identify emergent attitudes and influences; and either omit discussion of ethical issues or assert that because the data is freely accessible to the public, it is open to use without ethics permission. Recommendations include: more specificity in research areas and questions; greater use of multiple and diverse source types; less use of frequency and description in analysis and more use of theory and complex analysis; and integration of ethical considerations into research design.

Keywords: Systematic mapping, Qualitative Research, Online comments, Citizensourcing, Public policy, Social media

As governments strive to arrive at well-supported policy decisions, there is an increasing imperative that citizens' values, concerns and interests should inform these decisions (Marino & Presti, 2018). Expert insights and technical advice are central to good policy development; however, government policy-makers are unlikely to feel confident adopting policies based solely on expert recommendations if they appear to be out of touch with citizen thinking (Charalabidis, Euripidis, Androutsopoulou, Karkaletsis, & Triantafyllou, 2014; Simmons & Mehmet,

2018; Tengku Izhar, 2018). Head (2013) understands this shift from the centralised ‘creed of expertise’ towards local knowledge as recognising the “contestability of policy advice in a pluralistic world of public debate” (p. 398).

Driving this shift in policy-relevant localised knowledge is the way citizens now routinely express themselves online through different platforms such as Facebook and Reddit, on websites of traditional and other news outlets, and on myriad forums enabling their posts, comments and displays (Bossetta, 2018; Walker, King, & Hartman, 2018; Waterloo, Baumgartner, Peter, & Valkenburg, 2017). To better understand citizen thinking, governments and those attempting to influence policy are increasingly attending to citizen-generated content made available through digital platforms (Natow, 2019; Panagiotopoulos, Bowen, & Brooker, 2017; Taeihagh, 2017). There are two main means by which policy-makers can utilise these sources: through active solicitation processes such as policy co-design and government established platforms; and, through passive processes commonly known as *citizensourcing* (Charalabidis et al., 2014). Passive citizensourcing differs to the active examples in important ways, most notably in its focus on unsolicited online citizen thinking. Citizensourcing has the potential to include more, and previously unheard, voices in policy development (Panagiotopoulos et al., 2017). However, the data come in many forms of display and context, and to date there are no guidelines for its identification, capture and qualitative interpretation.

Ghermandi and Sinclair (2019) argue that the field of citizensourcing – and in particular, *passive citizensourcing*, which focuses on upload of unsolicited information, commentary and opinions – is under-examined. Despite the relative novelty of the field, there are two distinct approaches to coding and analysing data: automated and manual. Automated approaches often use quantitative methods and focus on using either machine learning tools or linguistics software to determine sentiment and the different perspectives held by citizens (Androutsopoulou, Charalabidis, & Loukis, 2018; Grover, Kar, Dwivedi, & Janssen, 2019). These approaches are often used to investigate larger data sets with a very specific set of project objectives (Burnap et al., 2015; Pang & Lee, 2008; Tengku Izhar, 2018). Manual approaches tend to use qualitative methods to focus not on broader patterns but on the variety of ideas, perspectives and reasoning held by citizens (Mehmet, D'Alessandro, Pawsey, & Nayeem, 2018). Kozinets (2019) argues that

the immersion gained by manual qualitative approaches provides researchers with important insight into the contextual factors impacting lived experiences, rather than reducing citizen thinking to polarities of positive or negative. The detail required for confidence in policy decision-making and communication to a range of stakeholders generally requires greater nuanced insight than is available purely or predominately through automated approaches (Mehmet et al., 2018).

The rapid uptake of research using digital data to inform policy warrants systematic review of approaches that can help to guide the evolution of appropriately credible and feasible practices designed to improve policy decisions (Ghermandi & Sinclair, 2019). A small number of systematic reviews have been conducted. For instance, Ghermandi and Sinclair (2019) explored passive citizensourcing of social media in environmental research, Franco, Tursunbayeva, and Pagliari (2016) and Tursunbayeva, Franco, and Pagliari (2017) explored e-government in public health, and Wongkoblap, Vadillo, and Curcin (2017) investigated mental health disorders to assist in health policy formation.

The aim of the study described in this article was to systematically map previous research that used qualitative techniques with passively sourced online citizen commentary to better understand public policy across diverse domains (e.g., health, environment, economics). This study focused on qualitative manual approaches, as distinct from automated citizensourcing approaches, due to the disparity in research focus, and the under-researched nature of qualitative approaches.

The study recorded and reviewed commonalities and differences in methodological procedures, claims related to the approach, and advantages and limitations. The next section will focus on the material used in the systematic mapping study and provide a detailed explanation of the method.

Method

Systematic mapping or scoping studies (SMS) provide a way of reviewing literature pertaining to a specific concept in order to better understand and synthesise scholarly production associated with the concept (Guajardo Leal, Navarro-Corona, & Valenzuela González, 2019). Importantly, published research not only present findings, but also indirectly represent activity related to the findings (Cooper, 2016). The aim of SMS, then,

is not the synthesis of findings from the studies under review, but their categorisation within an inductively developed framework (O'Cathain, Thomas, Drabble, Rudolph, & Hewison, 2013). Petersen, Vakkalanka, and Kuzniarz (2015) argue that SMS must demonstrate two features related to scope and outcome: (1) SMS should aim for a good sample, rather than all possible studies on the topic; and (2) SMS should result in “an inventory of papers on the topic area, mapped to a classification” (p. 2).

Research Questions

Systematic mapping studies are directed by questions that allow findings to be categorised across commonalities and differences. SMS connect reviewed studies and divide them into sub-questions to aid data extraction and analysis (Petersen et al., 2015). This current study used two research questions with complementary sub-questions to aid data extraction from the reviewed journal articles:

RQ1: How do researchers conceptualise the advantages and disadvantages of the use of online citizen commentary as data in policy research?

1.1 What are the reported justifications for using this research approach?

1.2 What advantages have the researchers claimed for using this research approach? (e.g., cost, time)

1.3 What disadvantages have the researchers claimed for using this research approach? (e.g., representativeness, ethics)

RQ2: What are the procedural commonalities and differences in approaches taken to using online citizen commentary as data in policy research?

2.1 What (broad) policy area is the study located in? (e.g., health, environment, education)

2.2 What terminology have the studies used to describe their data? (e.g., online comments, social media posts)

2.3 What sources have the studies used to collect data?

2.4 How have the studies identified and justified their data source(s)?

2.5 How have the studies discussed or dealt with issues of ethics?

2.6 What method(s) have the studies used to collect (extract) their data?

2.7 What method(s) have the studies used to analyse their data?

Search Strategy

It was not within the scope of this study to conduct a census review of the field of citizensourcing. Instead, the aim of the search was to capture a representative cross-disciplinary sample of journal articles that qualitatively analysed passively sourced online citizen commentary. The diversity of research disciplines of interest meant that literature searching could not be limited to specific specialised journals or databases. The search strategy had to rely on the use of broad and inclusive key search terms across journal databases and disciplinary areas. With these considerations in mind, this study cannot claim to be an exhaustive account of all studies that address the research aim. Rather, the study represents a sufficiently diverse and numerous cross-section of qualitative studies of online citizen thinking about important policy matters.

Keywords and Search Terms

The following key search terms were used to identify journal articles that have used community sentiment expressed online: “Online comments” AND “reader comments” AND “talkbacks” AND “posted comments” AND “online public responses” AND “social media comments” AND “social media posts” AND “online posts” AND “sentiment” AND “online attitudes” AND “social media attitudes”.

These search terms were developed through conversations with active researchers in the field of digital media and policy, as well as prior experience of the topic from time spent researching this methodological domain. Further, some search terms were included as a result of knowledge of geo-specific terms used in this field (e.g., ‘talkbacks’ is a common term in Israeli scholarship) (Kaplan & Prato, 2016; Mandelzis, Bernstein, & Ringel, 2017). The five databases used to run the keywords and search terms were Scopus, Web of Science, SAGE Journals, ProQuest and EBSCO Academic Search Complete.

Inclusion/Exclusion and Quality Assurance Criteria

The researchers first excluded studies based on titles and abstracts, followed by full-text readings. Application of the inclusion and exclusion criteria was first conducted by the second and third authors, progressing to a collaborative coding approach (Saldana, 2016) where all

three authors reached consensus on the inclusion or exclusion of studies. Disputed studies resulted in an additional review and discussion, with a majority vote dictating inclusion/exclusion. The inclusion criteria included:

- Used online citizen commentary as main data source;
- Online citizen commentary was unsolicited for the purposes of the study being conducted;
- Study included a fully manual qualitative analysis (did not exclude mixed method studies or studies using descriptive statistics to support qualitative analysis); and
- Study was published after 2006.

The exclusion criteria included:

- No explicit or implicit suggestion of how research findings related to or could inform design, implementation, communication or evaluation of public (government/public authority) policy;
- Methods of analysis and reporting were fully quantitative;
- Study was focused on automation;
- Study was not accessible in full-text;
- Books and grey literature;
- Study was not in English;
- Study presented non-peer reviewed material; and
- Study focused on crisis management or response.

Figure 1 shows the number of studies included and excluded as criteria were applied in the selection process. Full-text reading of the remaining studies led to further exclusion, as it became apparent that studies fell outside the scope of the research focus. This resulted in 26 studies. Backward snowball sampling (Jalali & Wohlin, 2012) was then conducted, this involved searching the reference lists of the identified articles to ensure relevant articles had not been overlooked. This process resulted in an additional 10 studies being added (final overall sample $N=36$). All 10 new studies identified in the backward snowball sampling repeated the inclusion/exclusion process. As a result, all 10 were included in the scoping study. Studies included in the systematic mapping study are noted in Appendix A.

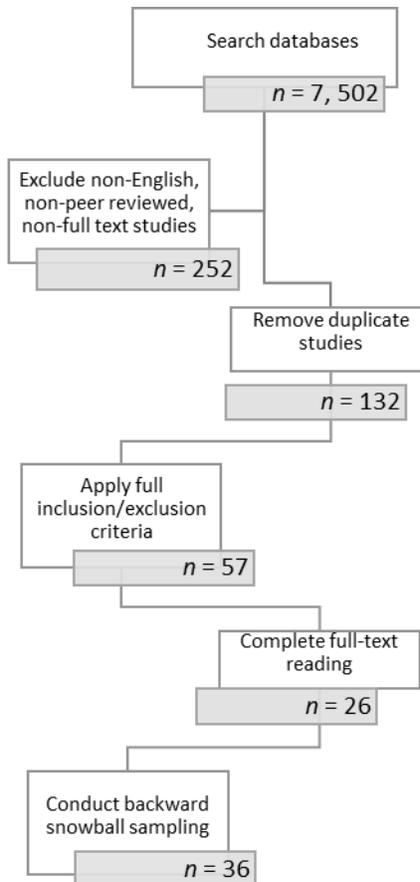


Figure 1. Study selection process including journal article totals. Then describe the content of the figure briefly without repeating the content in the manuscript. The figure should aid in the understanding of the data.

Data Extraction

Templier and Paré (2018) advise that “the data extraction plan must determine what data or information shall be extracted in order to provide clear answers to the initial research questions” (pp. 512–514). As a result, a systematic data extraction template (Table 2) was developed and applied.

Table 1
Systematic data extraction template used in the study

Data Category	Research Sub-question	Research Question
Justification for using research approach	What justifications were provided for using this research approach in light of the study's objectives and focus? (This category does not include broader claims of advantages for using this research approach, but rather why it was considered relevant/appropriate given the context of the study.)	1
Terminology used to describe data	What terms were used to describe the data in the study? (e.g., 'online comments', 'citizen perspectives')	2
Reported advantages/disadvantages of research approach	Did the study report specific advantages or disadvantages related to the use of this research approach? If so, what are these reported advantages/disadvantages?	1
Data source(s) used	What data source(s) were used in the study? (e.g., online news websites, Facebook, Instagram, etc.)	2
Justification of data source(s) used	Did the study provide justifications for the use of said data source(s)? If so, what justifications were provided?	2
Ethics	Did the study report on any ethical considerations specific to this research approach? Did the study require or receive ethics approval from their relevant institution(s)?	2
Method of data extraction advantages/disadvantages	Did the study report on the method of data extraction used? If so, what was the method used? Did the study claim specific advantages or disadvantages related to the use of their data collection/extraction method? If so, what are these reported advantages/disadvantages?	2

Analysis and Classification

As suggested by O'Cathain et al. (2013), data extraction categories used in this study were developed inductively while reviewing selected studies. The authors do not claim these categories to be an exhaustive list of relationships between reviewed studies, but rather those that were inductively identified as most pertinent to how the studies approached the process of using unsolicited social and online media data to understand public discussions of policy matters.

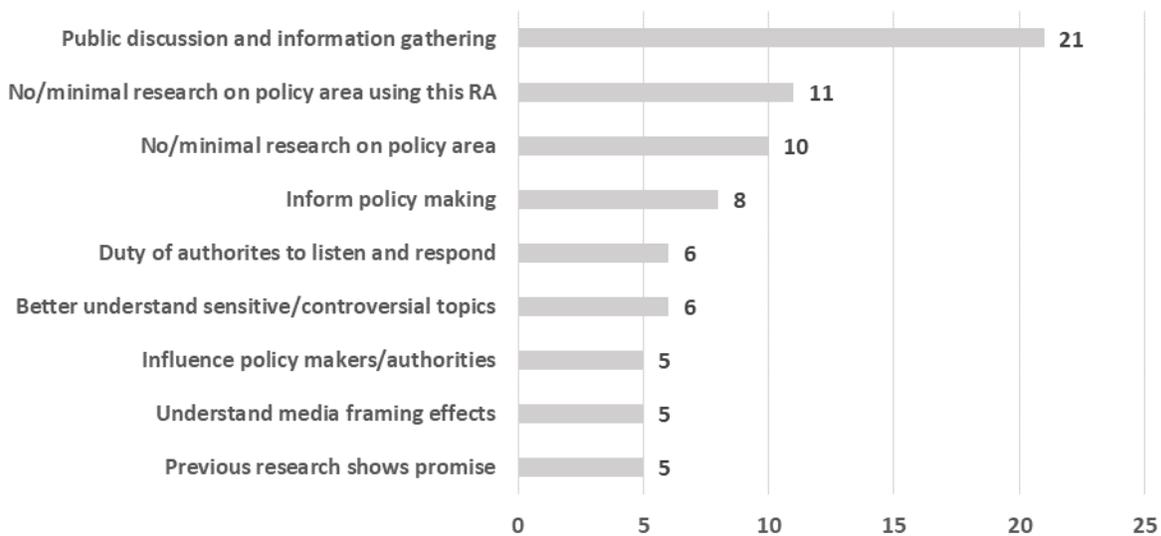
The data extracted for each category were tabulated in an Excel spreadsheet by the leader researcher and visually illustrated (where appropriate). A sample of texts from each category were then selected and reviewed by two other co-researchers to ensure intercoder reliability. Some of the data extraction categories lent themselves to simple frequency representation (e.g., country of research), while others required qualitative description (e.g., justification for using research approach). Analysis was not based on the authors' 'interpretation', but rather on what the studies' authors themselves claimed to be the relative advantages in using their approach. This gives insight into the various ways researchers position their approaches, and the benefit(s) they claim.

RESULTS

This section maps the results of the final review sample of 36 journal articles that met the study's criteria. A clear majority of the studies were conducted in health-related policy areas ($n = 26$). These included policy topics such as smoking, psychiatric treatment, obesity, vaccinations and breastfeeding. Environmental policy ($n = 5$) was the next most common topic, covering climate change, marine animal management and water use. After education policy ($n = 2$), all other policy areas had one study each (transport, science and crime). The most frequently reported countries of research were the United States ($n = 9$), the United Kingdom ($n = 6$), Canada ($n = 5$), Australia ($n = 4$) and Israel ($n = 2$). China, Ireland, The Netherlands, New Zealand and Romania all had one study each. Two studies did not specify a country (unspecified), while three reported that their study used sources from multiple countries (e.g., The Washington Post AND The BBC).

Justification for qualitative citizensourcing

Studies provided numerous and diverse justifications for using qualitative citizensourcing, often providing multiple justifications concurrently. Figure 2 provides a complete overview. The most common justification ($n = 21$) was that social and online media were considered increasingly important sites of public discussion and information gathering on important policy matters (coded as ‘public discussion and information gathering’). A number of studies also justified the use of this research approach by noting that little or no research had been conducted on their policy area broadly ($n = 10$), or using this research approach specifically ($n = 11$).



*Figure 2. Justification provided by reviewed studies for using qualitative citizensourcing. *RA is research approach*

Other common justifications provided were that citizen discussions on social and online media might help inform aspects of policy making (e.g., communication, design, implementation, consultation) ($n = 8$); that public authorities and policymakers have a duty to listen to and understand public perceptions and thinking ($n = 6$); and that social and online media provide a useful site to research potentially sensitive or controversial topics ($n = 6$). In summary, the justifications show that public discussions in digital media are considered important. They are noticed by, and influence, decisions of public authorities and policymakers. Further, the discussions aid understanding of the effects of media framing on public discussion of policy issues.

Terminology used to describe data

There were 52 unique terms used across the reviewed studies in reference to data that were collected from social and online media platforms. All studies used a minimum of two terms, while two studies used a total of six terms each. The five most common terms applied to data were “comments” ($n = 28$), “online comments” ($n = 15$), “reader comments” ($n = 9$), “public perceptions” ($n = 6$) and “public opinions” ($n = 5$).

Reported advantages of research approach

Most of the advantages reported by the reviewed studies referred to features of the data/comments and characteristics of the source and sample, and asserted that the large numbers of comments give honest and open insight into community attitudes because they are unsolicited, often anonymous, and from diverse voices that may not otherwise be heard. Many studies reported more than one advantage, with an average of three per study. Only six of the 36 studies did not report any advantages. The most common advantage reported was that data (comments) gathered from social and online media could be characterised as ‘real-time’ and ‘spontaneous’ insight into public opinion and reactions to policy-related matters ($n = 12$). A number of studies ($n = 11$) considered the research approach to be advantaged by the anonymity often provided to commenters by social and online media platforms. This anonymity is believed to liberate individuals from social constraints, resulting in more forthright and genuine expressions of opinion and, some specified, a reduction in social desirability bias in the collected data ($n = 7$). The third most commonly reported advantage was that the research approach enabled insight into public understanding and perspectives on policy matters ($n = 10$).

Other notable advantages included the ability to track trends in public understanding and perspectives on policy matters ($n = 7$); and that the data (comments) were unsolicited for the purposes of research, and hence voluntarily contributed by members of the public ($n = 6$). Six studies also claimed that the approach was advantaged in matters of cost and timeliness when compared to other research methods such as surveys, focus groups or interviews. These advantages, as well as others cited by five studies or fewer, are represented in Figure 3.

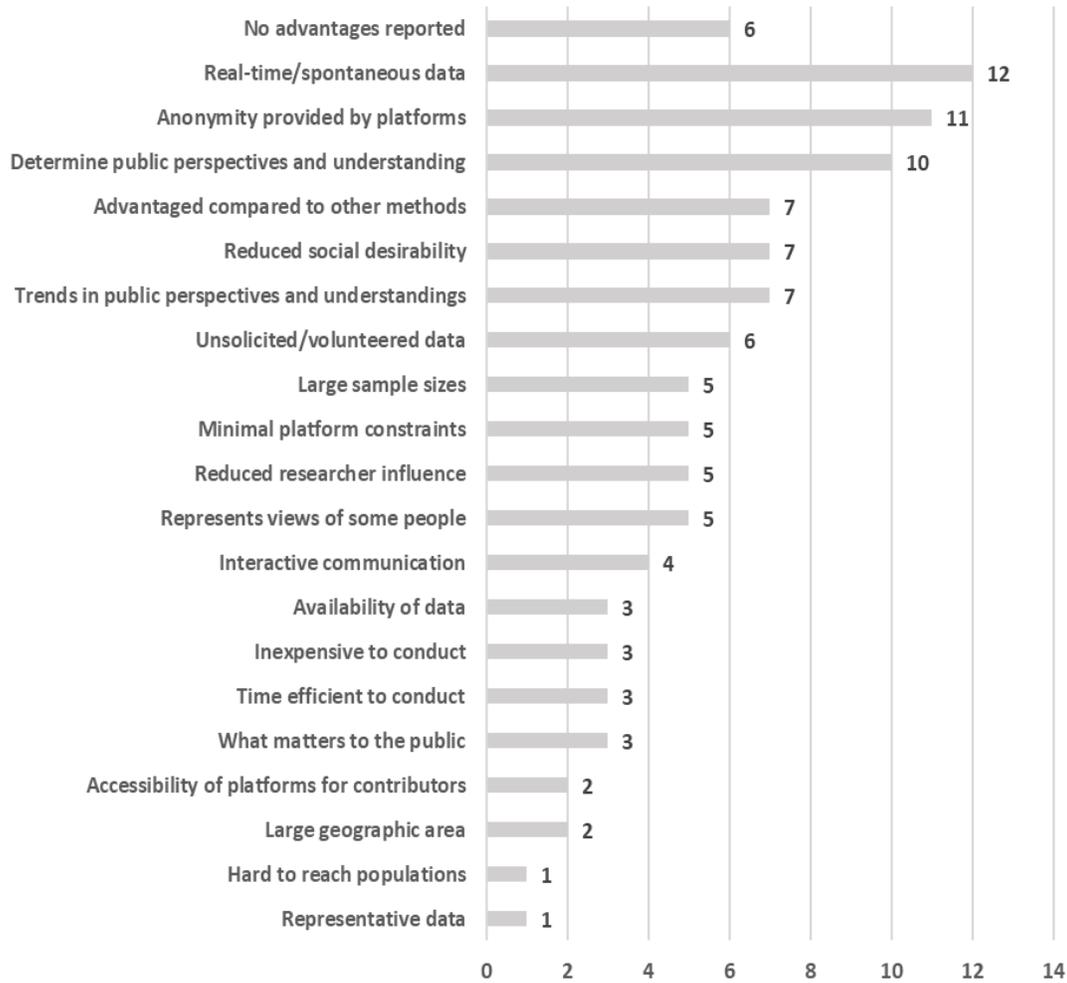


Figure 3. Reported advantages of crowdsourcing across the reviewed studies

Reported disadvantages of research approach

There were 12 disadvantages reported across the reviewed studies, most deriving from the anonymity and lack of accountability of online commenters. One third of the studies ($n = 12$), however, did not report any disadvantages. The most commonly cited disadvantage was the inability to determine the representativeness of the people providing the comments. This was due in part to the limited availability of demographic information about the sample population from social and online media platforms ($n = 14$). The second most commonly cited disadvantage ($n = 9$) was the perception that contributions to online discussions often came from members of the public who are most negative, opinionated or in disagreement with what is being discussed. More than one study referred to the profile of contributors as typically ‘blindly opinionated’.

Two other reported disadvantages both related to the anonymity often provided by social and online media platforms. The first was a perceived relationship between anonymity and the aforementioned inability to gather demographic data about the sample population ($n = 7$). The other theme concerned a link between commenter anonymity and the civility of online discussions ($n = 8$); authors believed that anonymity can lead to increased levels of hostility and aggressive forms of communication. All reported disadvantages, including those cited by five or fewer studies, are presented in Figure 4.

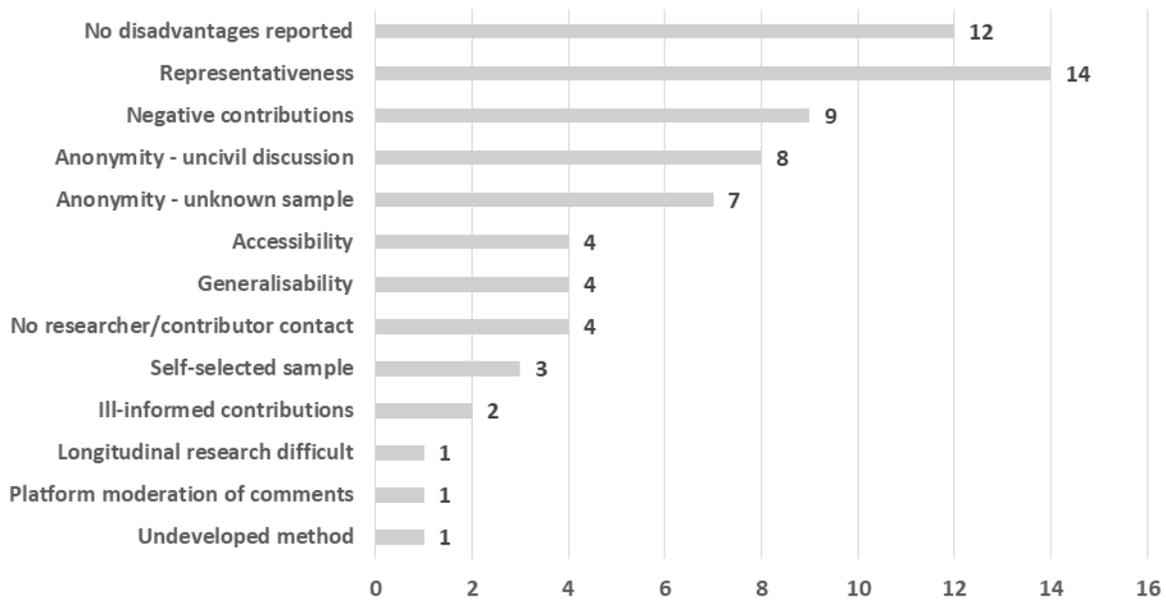


Figure 4. Reported disadvantages of crowdsourcing across the reviewed studies

Data sources

The most common data source type was online news websites ($n = 28$), followed by discussion forums ($n = 5$), Facebook comments ($n = 4$), online magazine websites ($n = 4$) and blogs ($n = 3$). Interestingly, Reddit, Myspace and Twitter were noted only once each. Just eight of 36 studies gathered data from a single source, while 28 studies used multiple sources of data (e.g., The New York Times AND The Washington Post). If we consider online news and online magazine websites as representing the same data source ‘type’, then the majority of studies ($n = 30$) gathered data from a single data source type, such as online news websites. Only six studies gathered data from multiple source types, for example, online news websites as well as Facebook.

Most studies that gave justifications for selecting their data sources referred to a large readership or numbers of comments. Nine of the 36 studies did not provide any justification for their choice of data sources. One study claimed to have collected a fully comprehensive sample of all possible sources for their topic. The most common justification given was the volume of readership numbers for the chosen news websites or social media pages ($n = 14$), with many referring to readership/circulation numbers for their choice source(s). One study explains, for example, “we chose a British tabloid newspaper, Daily Mail, because it is one of the three biggest selling newspapers in Britain (which are The Sun, the Daily Mail and the Daily Mirror)” (Jaspal, Nerlich, & Koteyko, 2012, p. 388).

The next most common justification was the number of comments or commenters on a given news article or social media post ($n = 6$). This justification was premised on the belief that more comments or commenters reflected a higher level of public engagement and hence indicated the relative importance of the article or post. The demographic spread of a source’s readership was the third most common justification ($n = 5$). When employing this justification studies often referenced census or survey data to support claims of demographic diversity. All justifications for the use of specific data sources, including those that were cited by fewer than four studies, are noted in Figure 5.

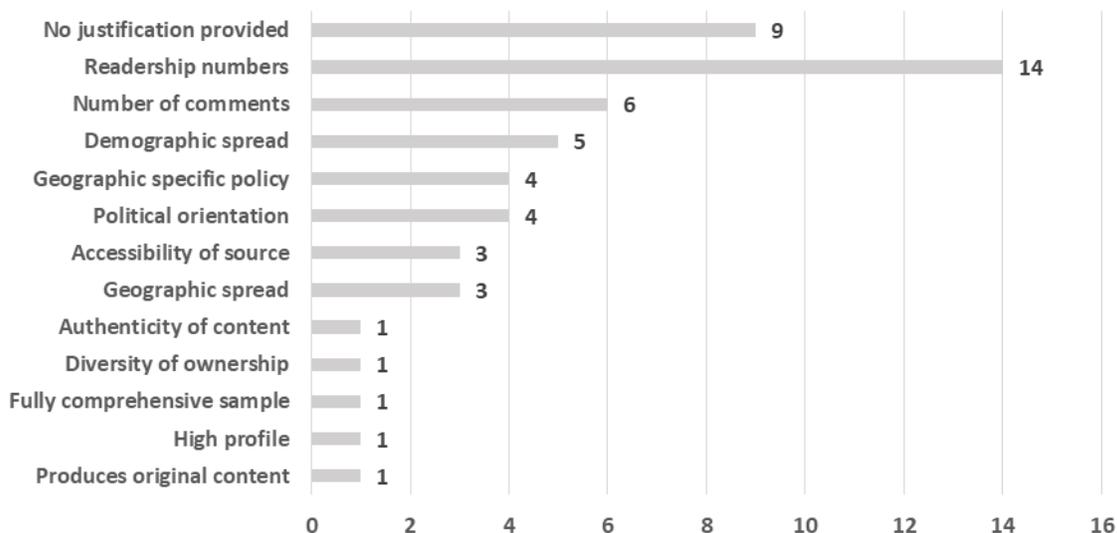


Figure 5. Justifications in reviewed studies for selecting their data source(s)

Ethics

Ten studies reported that they had received full ethics approval from their respective institution review board. Six claimed that no ethics approval was required for this form of research, based on their (the researchers') judgement ($n = 3$) or the judgement of their institution review board ($n = 3$). Five studies reported that their approach to research ethics was informed by established guidelines, including Kozinets' netnographic research, the British Psychological Society, and the Association of Internet Researchers. Fourteen studies did not mention ethics approval, nor ethical concepts or considerations of any kind, representing over one third of all studies. A number of important ethical themes that were discussed throughout the reviewed studies are detailed below.

The most common ethics discussion related to researchers' assertions that comments posted to social and online media platforms were considered to be in the public domain ($n = 14$). These studies often claimed that commenters should assume their contributions would be read by others if the place of commenting was publicly viewable. Moreover, a number of these studies argued that contributors to online discussions should have no reasonable expectation of privacy, and hence their contributions were admissible as research data. The next most common ethical discussion centred on the use of aliases or pseudonyms when quoting directly from comment data ($n = 6$). Most of these studies agreed that the use of pseudonyms enabled the researchers to ensure the anonymity of commenters, and therefore make the tracing of comments back to individuals more difficult. Ethical considerations cited by five or fewer studies included:

- the importance of maintaining the anonymity of commenters;
- whether it was possible or necessary to gain informed consent from contributors to discussions on social and online media platforms;
- whether this form of research should be considered to involve human subjects;
- the inability to contact commenters after research had concluded;
- whether comments should be paraphrased to ensure anonymity of commenters or if paraphrasing distorted an accurate reflection of online discussion;
- the level of potential risk or harm to contributors if their comments were used in research; and

- whether it was possible or necessary to acquire permission from the sites (sources) used for data collection.

Methods of data collection

More than two thirds (26 of 36) of the reviewed studies did not provide any information about how they collected or extracted their data from the sources they had outlined. A number of these studies referred to the use of qualitative data analysis software such as NVivo ($n = 9$), but did not discuss how data was extracted and then transferred to such software, or how NVivo was used to help them code said data given it is tool, rather than a method of analysis itself. Among the studies that did report method of data collection, the majority used a manual ‘copy and paste’ method ($n = 5$) whereby data (comments) were copied from the original site and pasted into an Excel or Word document. Other studies described a process of storing comments as a separate electronic file ($n = 2$), with one study even reporting that they had printed out all comments in their data set.

Only two studies reported the use of more advanced data extraction software, one of which was purposefully designed for the study (Keelan, Pavri, Balakrishnan, & Wilson, 2010), while the other was the program R Package Social Lab (Mehmet et al., 2018). These latter two studies were the only studies to claim advantages for their chosen data collection methods. Keelan et al. (2010) suggested that their purpose-built program enabled them to maintain the original look and form of the data they collected. Mehmet et al. (2018) reported that use of R Package Social Lab was advantaged by its ability to gather posts, accompanying comments and replies. None of the studies reported any disadvantages to their method of data collection.

Methods of data analysis

Thirteen methods of analysis were employed across the 36 reviewed studies, with methods often reported as exhibiting specific advantages and disadvantages when analysing online citizen commentary. Thematic analysis was by far the most commonly used method of data analysis ($n = 23$), considered to be advantaged by its ability to flexibly identify and compare important themes within large data sets, offering a quick and

resource-efficient method to explore attitudes expressed online. It was considered as disadvantaged, however, by the possible distorting influences of researcher interpretation and the risk of forcing data into themes, resulting in a loss of nuanced understanding. Descriptive statistics followed closely behind ($n = 10$), and was often used in combination with thematic analysis. Basic content analysis was the next most common ($n = 6$), thought to be most useful when quantifying whether a significant number of comments could be categorised into certain content codes, and therefore determine their effectiveness in understanding citizen thinking. It was thought to be disadvantaged by its often restrictive approach to assigning content codes and its inability to deal with the varied ways individuals communicate online. Critical discourse analysis ($n = 3$) was advantaged by its ability to provide insight into how reality is constructed by individuals and groups online through talk and text. This insight into the construction of shared reality through language was considered vital in developing an understanding of how people describe social phenomena. All methods of analysis, including those that recorded two or fewer mentions, can be reviewed in Figure 6. Interestingly, more complex methods, such as appraisal and rhetoric analysis, were less common – this may be due to the infancy or the exploratory nature of the research into a new field.

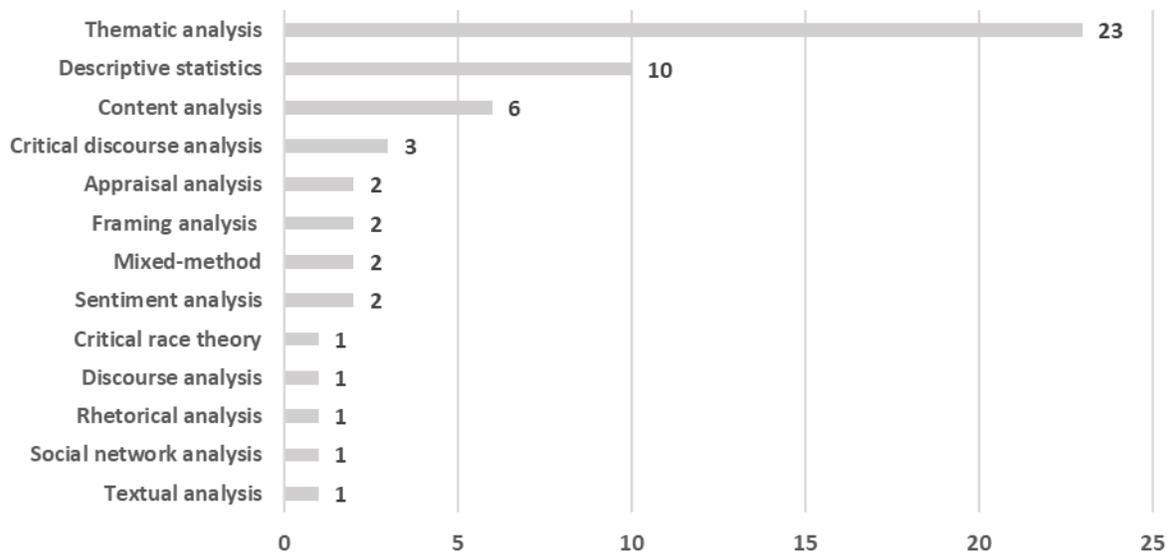


Figure 6. Methods of analysis employed by reviewed studies

DISCUSSION

This systematic mapping study provides a guide to previous identification, capture and interpretation of online citizen commentary in public policy matters. The use of digital comments and opinions to aid policy formation and communication about policy is growing. As a result of our research, we can now describe a typical qualitative, online, passively citizen-sourced research project as follows:

- Researchers choose online comments to help understand public discussion and salient attitudes to important policy matters;
- Researchers believe online comments can give honest and open insight into community attitudes because they are unsolicited and relatively anonymous and unconstrained;
- The downside of anonymity is that you cannot be sure who is commenting or which populations and interest groups are represented;
- Most often researchers manually ‘copy and paste’ online comments from one or more sites, mostly news media websites;
- Choice of site is mostly justified by ready access to a large readership or large numbers of comments;
- Thematic analysis of the data is most often used to identify emergent attitudes and influences; and
- A majority of researchers either omit discussion of ethical issues or assert that because the data is freely accessible to the public, it is open to use without special ethics permission.

Online comments provide an expanding source of insight into citizens’ policy understanding and preferences. However, there are challenges and considerations that need to be incorporated into future application. This systematic mapping study has helped to map the research processes used, the ethical considerations, and the reported advantages and disadvantages of such research. The study offers five areas that require critical reflection to ensure qualitative passive citizensourcing continues to develop as a viable approach to assisting with policy formation and communication.

1. Immersion helps align the scope of the study and data selected for analysis

A strength of qualitative citizensourcing research is that it assists in deepening understanding of citizens' attitudes, reasoning and worldviews, and communicating the lived experiences of citizens impacted by the policy under study. Qualitative research often reveals insights unknown to the researcher prior to commencement of a study (Herrmann, 2007). Due to the almost boundless potential sources and possible data, Kozinets (2019) recommends extensive immersion into the domain being investigated prior to decisions about the research scope and any collection of data. This approach helps researchers become sensitised to datasets and can assist in determining appropriate data for use in the study. It enables researchers to match the size and composition of the dataset to the purpose and resources of the study.

2. Move beyond single source types to diverse source types and sources, to give a more rounded understanding of policy opinion

Research has demonstrated that the digital architectures of online spaces can enable, constrain, promote and discourage certain communicative and social behaviours (Bossetta, 2018; Waterloo et al., 2017). Platform design features such as user anonymity, character limits and supported modes of communication (e.g., written text, images or video) influence the way that platform users will communicate and interact. Research on important public policy matters is, therefore, unlikely to gain comprehensive insight if data (i.e., citizen commentary) is gathered exclusively from single source types, a limitation not addressed by any of the reviewed studies. Citizen commentary may be polarised, aggressive or bipartisan on one platform due to its architectural design (e.g., Twitter); the opposite might be found on another source type (e.g., blogs). If researchers are purposefully limited in the scope of data sources, they should reflect openly on how the choice of particular platforms may influence the resulting insights.

3. Extend beyond descriptive or frequency reporting towards nuanced approaches that provide richer insights

The structuring and interpreting of unsolicited attitudes and lived experiences in ways that deliver deeper and credible insights is highly prized by policy decision makers. Over-reliance on descriptive statistics and content analyses limits interpretation to the readily measurable and is constraining. As qualitative citizensourcing research increases in sophistication and moves towards comprehensively understanding online discussions, researchers will need to move towards more critical and complex approaches to extract not just explicit meanings but implicit meanings as well. The analytic methods available to researchers for this purpose will ultimately be governed by their research focus, however certain approaches, such as critical discourse analysis, appraisal theory, and multimodal analysis, are particularly well-suited to uncovering implicit meanings in text, and identifying communicative techniques deployed by online media platforms users (REFS).

4. *Quality assurance of data collection and analysis*

The importance of transparency in the process of data extraction and analysis needs to be better recognised if findings are to be sufficiently credible for policy contributions. Many studies did not detail how data was collected or put into place processes that ensured that the robustness of analyses could be accountable. The data extraction process should be thoroughly detailed, as it has methodological and ethical implications. An important consideration may be to include someone within the research team with a lived experience of the policy, or invite them to help interpret findings – a practice known as member checking (Carlson, 2010). Terms, phrases and utterances in social media can be interpreted in a variety of ways (Kozinets, 2019). By member checking with someone from ‘that world’ during the analysis process, researchers can better guarantee the accuracy of analysis and quality of reporting.

5. *Ensure ethical considerations are integrated into the research process*

Transparency and respect are essential in the research process. That many studies did not acknowledge that online comments needed ethical considerations is

troubling. Researchers need to adhere to their own institutional and national guidelines. Further, this study recommends that future researchers should consider the use of established guidelines (e.g., from the British Psychological Society, and the Association of Internet Researchers). It is also important to consider the ethical implications of data extraction to ensure items such as metadata or personal information are not collected.

Social media and, in particular, social networking sites have become commonplace in people's lives. This article focused on citizen thinking expressed as written comments; however, many people use multiple modes beyond written language such as images and videos. To better understand online citizen commentary more broadly, future researchers may need to develop techniques for interpreting beyond written language.

Social media provide unprecedented opportunities for those interested in better understanding community views on policy, and an increasing number argue that it behoves public authorities to attend to citizens who choose to express themselves online. Citizensourcing from online commentary is not a complete research solution; however, more robust and tailored approaches will enable better alignment of citizens' values, concerns and interests with regard to policy decisions and communication.

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Appendix A. Full Systematic Study References

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