UNDERSTANDING 'FAKE NEWS': A BIBLIOGRAPHIC PERSPECTIVE

Andrew Park, Matteo Montecchi, Cai 'Mitsu' Feng, Kirk Plangger, and Leyland Pitt

Abstract

False information that appears similar to trustworthy media content, or what is commonly referred to as 'fake news', is pervasive in both traditional and digital strategic communication channels. This paper presents a comprehensive bibliographic analysis of published academic articles related to 'fake news' and the related concepts of truthiness, post-factuality, and deepfakes. Using the Web of Science database and VOSViewer software, papers published on these topics were extracted and analysed to identify and visualise key trends, influential authors, and journals focusing on these topics. Articles in our dataset tend to cite authors, papers, and journals that are also within the dataset, suggesting that the conversation surrounding 'fake news' is still relatively centralised. Based on our findings, this paper develops a conceptual 'fake news' framework—derived from variations of the intention to deceive and/or harm—classifying 'fake news' into four subtypes: mis-information, dis-information, mal-information, and non-information. We conclude that most existing studies of 'fake news' investigate mis-information and dis-information, thus we suggest further study of mal-information and non-information. This paper helps scholars, practitioners, and global policy makers who wish to understand the current state of the academic conversation related to 'fake news', and to determine important areas for further research.

Keywords—*'fake news', deepfakes, truthiness, post-fact, bibliometric analysis, misinformation, disinformation, mal-information, non-information, strategic communication, strategic communications*

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Enter the Age of 'Fake News'

The practice of strategically disseminating and publishing false information has a long history in politics, international relations, and warfare, and can have extremely negative consequences for individuals and for society.[1] This has been especially true during the global COVID-19 pandemic, with not only politicians and pundits creating and spreading 'fake news', but also journalists and other trusted information sources.[2] Furthermore, 'fake news' on COVID-19 is also spreading like wildfire through invitation-only discussion forums on social media platforms,[3] with potentially more dangerous consequences. While broadcast media are subject to some degree of public scrutiny, falsehoods spread through private and relatively closed networks can be magnified further, and given

1 Leonie Haiden, 'Tell Me Lies, Tell Me Sweet Little Lies', in Jente Althuis and Leonie Haiden (eds.) *Fake news: A Roadmap* (Riga: Latvia: NATO Strategic Communications Centre of Excellence, 2018); Chelsea McManus and Celeste Michaud, 'Never Mind the Buzzwords: Defining Fake News and Fake Truth', *Fake News: A Roadmap.*
2 Rasmus Kleis Nielsen, Richard Fletcher, Nic Newman, J. Scott Brennen, and Philip N. Howard, 'Navigating the "Infodemic": How People in Six Countries Access and Rate News and Information about Coronavirus', Misinformation, Science, and Media (2020): 2020–04. [Accessed 15 May 2020]; J. Scott Brennen, Felix Simon, Philip N. Howard, and Rasmus Kleis Nielsen, 'Types, Sources, and Claims of COVID-19 Misinformation', Reuters Institute 7 (2020). [Accessed 15 May 2020]
3 Mark Scott, 'Facebook's Private Groups are Abuzz with Coronavirus Fake News', *Politico*, 30 March 2020. [Accessed 15 May 2020]

credence by echo-chambers in discussion groups.[4] Thus, in a broader context, strategic communications researchers and practitioners require an in-depth understanding of the potential threats and risks and of any other opportunities that arise from 'fake news' phenomena.

The rise of 'fake news' has brought these practices to the forefront not only of academic, business, and political discourses, but also of public, social media, and mass media debates.[5] Although 'fake news' is loosely defined in the academic literature as 'false news intended to mislead audiences', the 2016 US presidential election shifted the usage of the term, that is, to call any statement 'fake news' now also serves to dismiss information one disagrees with for the purpose of closing down debate.[6] Therefore, the modern practice of 'fake news' can be both strategically useful to, and also an impediment to, persuasive communications. This paper explores academic literature on 'fake news' to derive insights for future strategic communications research and practice.

Undoubtedly, early humans strategically communicated inaccurate and untruthful information to each other by signs or spoken words. The term 'fake news' or 'false news' as it was called in the past has identifiable origins in the seventeenth century, as individual actors in the English Civil War exploited the press to disseminate their preferred political viewpoints and to shape public opinion.[7] In the early twentieth century, the silent movie era icon Stan Laurel's catastrophic marriages and heavy drinking attracted vast media attention, although much of what was reported was untrue. His biographer John Connolly notes, 'He [Laurel] wonders how many acres of newsprint have been filled by words he has not said, forming an entire alternative history of his life in which nothing has meaning or substance unless it forms the punch line to a gag'.[8] Print media and radio accelerated the spread of false news in the first half of the twentieth century, and television expanded the trend in the latter half. However, it was the advent of the internet as we know it today, in the mid-1990s, and the emergence of social media in the early twenty-first century that have really put the generation and dissemination of 'fake news' into overdrive.[9]

4 Kelly R. Garrett, 'Echo Chambers Online?: Politically Motivated Selective Exposure Among Internet News Users', *Journal of Computer-Mediated Communication* 14, N° 2 (2009): 265–85; Andrei Boutyline and Robb Willer, 'The Social Structure of Political Echo Chambers: Variation in Ideological Homophily in Online Networks', *Political Psychology* 38, N° 3 (2017): 551–69.
5 Plangger, Kirk, and Leyland Pitt, 'Brands and Brand Management Under Threat in an Age of Fake News', *Journal of Product & Brand Management*, 29, N° 2 (2020): 141–43.
6 McManus and Michaud, 'Never Mind the Buzzwords'.
7 Ibid.
8 Connolly, John, He (London: Hodder & Stoughton, 2017), p. 89.
9 McManus and Michaud, 'Never Mind the Buzzwords'.

The 'fake news' phenomenon reached a fever pitch around the time of the 2016 US presidential election, when both Republicans and Democrats questioned the veracity of stories denigrating the opposition.[10] Because of its key role in recent political discourse and the implications for influencing global policy decisions, 'fake news' has attracted much attention from scholars, and a growing host of journals have begun serving the community of researchers interested in this phenomenon. Strategic communications researchers and practitioners need to further understand how the conversation surrounding 'fake news' is evolving, and how its practice is changing, not only in the mass media but in other strategic domains such as digital communication channels. [11]

As the academic literature on 'fake news' is scattered among many different fields, a comprehensive mapping of this literature is needed to establish what has been written and what further questions are still to be investigated. As Jane Webster and Richard T. Watson posit, new theoretical and conceptual contributions need to be based on reviews and syntheses of extant thought in the literature, both for mature topics and also for emerging issues.[12] This paper provides a review and synthesis of the 'fake news' literature to develop concise insights for future strategic communications research and practice. Specifically, we seek answers to the following questions:

- How has the amount of research on 'fake news' evolved over time?
- What are the key terms associated with 'fake news' in the literature?
- Who are the most prominent researchers and what links do they have to each other?
- Which journals and universities are the most prolific and influential in their publication of 'fake news' research?

10 Hunt Allcott and Matthew Gentzkow, 'Social Media and Fake News in the 2016 Election', *Journal of Economic Perspectives* 31, N° 2 (2017): 211–36.
11 David MJ. Lazer, Matthew A. Baum, Yochai Benkler, Adam J. Berinsky, Kelly M. Greenhill, Filippo Menczer, Miriam J. Metzger, Brendan Nyhan, Gordon Pennycook, David Rothschild, Michael Schudson, Steven A. Sloman, Cass R. Sunstein, Emily A. Thorson, Duncan J. Watts, Jonathan L. Zittrain, 'The Science of Fake News', *Science* 359, N° 6380 (2018): 1094–96; Haiden, 'Tell Me Lies; Plangger and Pitt, 'Brands and Brand Management'.
12 Jane Webster and Richard T. Watson, 'Analyzing the Past to Prepare for the Future: Writing a Literature Review', *MIS Quarterly* (2002): xiii–xxiii.

One way of providing an overview map is through bibliographic analysis that can indicate trends in academic publication activity and trace relationships among authors, topics, and journals. Bibliographic reviews of the work published in specialist journals give guidance to the authors, readers, reviewers, and editors of these journals about where and how a conversation is taking place. Bibliographic reviews can be mapped to show the outlets from which these conversations originate and enable the identification of under- or over-researched topics and subtopics. A map of emerging topics can allow scholars to identify conceptual issues[13] and to uncover interesting and important areas that require further investigation.[14]

To date, no such bibliographic reviews have been published on 'fake news', nor on the related topics of truthiness, deepfakes, or post-factuality. As these topics are central to future research initiatives, we suggest that this gap presents an opportunity. From a strategic communications management perspective, bibliographic analysis can serve to indicate which authors and journals are most influential and provide the most insightful and up-to-date thought leadership and empirical studies that advance the research on 'fake news'.

This paper first discusses four relevant key terms we have used to direct our literature searches—'fake news', 'truthiness', 'post-fact', and 'deepfake'. Then, we present visualisations of the bibliometric network of research conducted on 'fake news' using VOSViewer software. We then use the findings to propose a conceptual framework that deconstructs 'fake news' in two dimensions, namely, the intention to deceive and the intention to harm, and also provide four typologies of 'fake news': disinformation, misinformation, mal-information and non-information. The paper concludes with implications for strategic communications researchers and practitioners.

13 Sebastian K. Boell and Dubravka Cecez-Kecmanovic, 'On Being "Systematic" in Literature Reviews', in *Formulating Research Methods for Information Systems* (London: Palgrave Macmillan, 2015), p. 48–78; Mary M. Crossan and Marina Apaydin, 'A Multidimensional framework of Organizational Innovation: A Systematic Review of the Literature', *Journal of Management Studies* 47, N° 6 (2010): 1154–91; Dhruv Grewal, Nancy Puccinelli, and Kent B. Monroe, 'Meta-analysis: Integrating Accumulated Knowledge', *Journal of the Academy of Marketing Science* 46, N° 1 (2018): 9–30; Maria Sarmento and Cláudia Simões, 'The Evolving Role of Trade Fairs in Business: A Systematic Literature Review and a Research Agenda', *Industrial Marketing Management* 73 (2018): 154–70.
14 Christine Köhler, Murali K. Mantrala, Sönke Albers, and Vamsi K. Kanuri, 'A Meta-analysis of Marketing Communication Carryover Effects', *Journal of Marketing Research* 54, N° 6 (2017): 990–1008; Marko Kohtamäki, Rodrigo Rabetino, and Kristian Möller, 'Alliance Capabilities: A Systematic Review and Future Research Directions,' *Industrial Marketing Management* 68 (2018): 188–201.

'Fake news', 'Truthiness', 'Post-Fact', and 'Deepfakes'

Based on existing definitions,[15] this paper defines 'fake news' as fabricated or false information that is disseminated through public media channels, including print, broadcast, and online. Furthermore, 'fake news' is not political satire (i.e. factual information presented in a news report format that bends the objective truth),[16] news parody (i.e. non-factual information presented in a news report format),[17] nor 'native' advertising (i.e. advertising presented as informational content).[18] Tracking where 126,000 news stories originated and how they were shared by three million Twitter users, Soroush Vosoughi, Deb Roy, and Sinan Aral report that such content spreads much further, faster, more deeply and more broadly than real or true news content.[19] One potential reason for this is that 'fake news' is often more novel and sensational; hence, it is more 'compelling' and triggers a more powerful emotional response.[20] Specifically, 'fake news' evokes fear, disgust, and surprise, whereas real news evokes sorrow, joy, and anticipation.[21] Moving beyond the term 'fake news', academics write about the related terms of 'truthiness' and 'post-fact', as well as the emerging topic of 'deepfakes'.

First, truthiness refers to circumstances in which the validity of something is based on how it 'feels', regardless of objective, verifiable facts.[22] On 17 October 2015, the term was first coined by the American comedian Stephen Colbert on his television show the Colbert Report. When truthiness is evoked, 'the world is as you wish it'.[23] A simple example of this would be the anti-vaccination lobby, who deny the wisdom of vaccination against serious infectious diseases despite overwhelming evidence that vaccination solves major health problems on a

15 Lazer et al., 'The Science of Fake News; McManus and Michaud, 'Never Mind the Buzzwords'.
16 McManus and Michaud, 'Never Mind the Buzzwords'; Lindsay H. Hoffman and Dannagal G. Young, 'Satire, Punch Lines, and the Nightly News: Untangling Media Effects on Political Participation', *Communication Research Reports* 28, N° 2 (2011): 159–68; Jana Laura Egelhofer and Sophie Lecheler, 'Fake news as a Two-dimensional Phenomenon: A Framework and Research Agenda', *Annals of the International Communication Association* 43, N° 2 (2019): 97–116.
17 Egelhofer and Lecheler, 'Fake news as a Two-Dimensional Phenomenon'; Jr, Edson C. Tandoc, Zheng Wei Lim, and Richard Ling, 'Defining Fake News: A Typology of Scholarly Definitions', *Digital Journalism* 6, N° 2 (2018): 137–53.
18 Colin Campbell and Lawrence J. Marks, 'Good Native Advertising Isn't a Secret', *Business Horizons* 58, N° 6 (2015): 599–606; Colin Campbell and Nathaniel J. Evans, 'The Role of a Companion Banner and Sponsorship Transparency in Recognizing and Evaluating Article-style Native Advertising', *Journal of Interactive Marketing* 43 (2018): 17–32.
19 Soroush Vosoughi, Deb Roy, and Sinan Aral, 'The Spread of True and False News Online', Science 359, N° 6380 (2018): 1146–51.
20 Vosoughi et al., 'The Spread of True and False News Online'; Paul Ekman, 'An Argument for Basic Emotions', *Cognition & Emotion* 6, N° 3–4 (1992): 169–200.
21 Vosoughi et al., 'The Spread of True and False News Online'.
22 Pierre R. Berthon and Leyland F. Pitt, 'Brands, Truthiness and Post-Fact: Managing Brands in a Post-rational World', *Journal of Macromarketing* 38, N° 2 (2018): 218–27.
23 Berthon and Pitt, 'Brands, Truthiness and Post-fact', p. 218.

global scale. For example, at the time of writing, the Pacific nation of Samoa is facing a major measles crisis that has resulted in a number of deaths, and the declaration of a state of emergency. Measles inoculation rates in Samoa declined by around 50% between 2016 and 2018. [24]

Second, Pierre R. Berthon and Leyland F. Pitt use the term 'post-fact' rather than the more common term 'post-truth', to differentiate it effectively from truthiness. They define 'post-fact' as taking a position that ignores facts. An example was President Trump's advisor Kellyanne Conway who used the term 'alternative facts' during a 'Meet the Press' interview in January 2017, in which she defended Press Secretary Sean Spicer's false statement about the attendance numbers at Trump's presidential inauguration. Asked by a journalist, Chuck Todd, to explain why Spicer 'utter[ed] a provable falsehood', her clarification was that he was merely stating 'alternative facts'. Todd's response was that 'alternative facts are not facts, they are falsehoods'.[25]

Finally, the term 'deepfake' refers to the technological capability to create audio and video of real people saying and doing things they never said or did.[26] These range from the merely amusing—videos on YouTube in which comic actor Jim Carrey appears in Jack Nicholson's famous role in *The Shining;* to the more potentially troubling—Barack Obama insulting Donald Trump in a fabricated video with soundtrack; to the truly awful and offensive—the transposition of Indian journalist Rana Ayyub's face onto the body of an adult movie actress with catastrophic reputational consequences. Deepfakes have the potential to cause immense damage. First, people tend not to doubt what they see and hear in video, and this makes deepfakes credible. Second, people tend to believe what they want to believe, and this is true for both ends of the political spectrum. Trump supporters might believe that Obama would say offensive things about their leader, and Obama supporters might believe that Trump deserves to have such things said about him and admire that their hero has the moral fortitude to say these things. The potential for conflict is significant. Third, as the Ayyub example illustrates, terrible damage can be done to the

24 Kwai, Isabella, 'Samoa Closes Schools as Measles Epidemic Kills at Least 16', *The New York Times*, 18 November 2019. [Accessed 15 May 2020]
25 Berthon and Pitt, 'Brands, Truthiness and Post-fact'.
26 Danielle K. Citron and Robert Chesney, 'Deep Fakes: A Looming Crisis for National Security, Democracy and Privacy?', *Lawfare* (2018). [Accessed 15 May 2020]; Bobby Chesney and Danielle Citron, 'Deep Fakes: A Looming Challenge for Privacy, Democracy, and National Security', *California Law Review* 107 (2019): 1753. [Accessed 15 May 2020]; Kietzmann, Jan, Linda W. Lee, Ian P. McCarthy, and Tim C. Kietzmann, 'Deepfakes: Trick or Treat?', *Business Horizons* 63, N° 2 (2020): 135–46.

reputation and personal life of an innocent person. Fourth, deepfakes might have the potential to spark international conflict in an unprecedented way. A leader does not actually have to say anything threatening to spur controversy that can lead to a violent confrontation or even a combat situation. All that is required is that a sufficient number of people on one side simply believe that the opposing leader said what the images and sound in the deepfake video suggest.

Searching the Literature

Key Terms, Sample and Data Source

The keywords 'fake news', 'post-truth', 'post-fact', 'truthiness', 'deep fakes/deepfakes' were used to perform a search of relevant scholarly contributions. The data source included documents indexed in the Web of Science database. This initial search resulted in 1119 documents, which were further filtered to include only academic articles [editorials, book reviews, and commentaries were excluded]. This refined search led to a final sample of 479 academic articles indexed in the database in the last twenty years.

The first paper related to our search terms was published in 2001, however, the number of papers published on these topics per year never exceeded six until 2017. In that year sixty-one papers were published—a dramatic increase. In 2018, there were 188 papers. By the end of the third quarter of 2019, 243 papers had already been published.

The top ten most cited papers returned by Web of Science related to one or more of the search terms as shown in Table 1 below. The two most cited papers are the article 'Social Media and 'fake news' in the 2016 Election' by Hunt Allcott and Matthew Gentzkow published in *Journal of Economic Perspectives* in 2017,[27] followed by Geoffrey Baym's 'The Daily Show: Discursive Integration and the Reinvention of Political Journalism' published in *Political Communication* in 2005.[28] The outlets within which discourse on 'fake news' is taking place are diverse, with no journals being duplicated for the top ten most cited papers. *Digital Journalism*, *Perspectives on Psychological Science*, and the *Journal of Applied Research in Memory and Cognition* round out the journals with the top five most cited papers.

27 Allcott and Gentzkow, 'Social Media and Fake News in the 2016 Election'.
28 Geoffrey Baym, 'The Daily Show: Discursive Integration and the Reinvention of Political Journalism', *Political Communication* 22, N° 3 (2005): 259–76.

Paper	Citations
Allcott, H., & Gentzkow, M. 'Social Media and Fake News in the 2016 Election', *Journal of Economic Perspectives* 31, N° 2 (2017): 211–36.	309
Baym, G., 'The Daily Show: Discursive Integration and the Reinvention of Political Journalism', *Political Communication* 22, N° 3 (2005): 259–76.	204
Tandoc Jr, E. C., Lim, Z. W., & Ling, R., 'Defining "Fake News": A Typology of Scholarly Definitions' *Digital Journalism* 6, N° 2 (2018): 137–53.	83
Narvaez, D., 'Moral Complexity: The Fatal Attraction of Truthiness and the Importance of Mature Moral Functioning', *Perspectives on Psychological Science* 5, N° 2 (2010): 163–81.	80
Lewandowsky, S., Ecker, U. K., & Cook, J., 'Beyond Misinformation: Understanding and Coping with the "Post-truth" Era', *Journal of Applied Research in Memory and Cognition* 6, N° 4 (2017): 353–69.	73
Abdel-Basset, M., & Mohamed, M., 'The Role of Single Valued Neutrosophic Sets and Rough Sets in Smart City: Imperfect and Incomplete Information Systems' *Measurement* 124 (2018): 47–55.	47
Khaldarova, I., & Pantti, M., 'Fake News: The Narrative Battle Over the Ukrainian Conflict', *Journalism Practice* 10, N° 7 (2016): 891–901.	37
Mihailidis, P., & Viotty, S., 'Spreadable Spectacle in Digital Culture: Civic Expression, Fake News, and the Role of Media Literacies in "Post-fact" Society', *American Behavioral Scientist* 61, N° 4 (2017): 441–54.	36
Speed, E., & Mannion, R., 'The Rise of Post-truth Populism in Pluralist Liberal Democracies: Challenges for Health Policy', *International Journal of Health Policy and Management* 6, N° 5 (2017): 249.	32
Newman, E. J., Garry, M., Bernstein, D. M., Kantner, J., & Lindsay, D. S., 'Nonprobative Photographs (or Words) Inflate Truthiness', *Psychonomic Bulletin & Review* 19, N° 5 (2012): 969–74.	31

Table 1. Ten most cited papers using the search terms in Web of Science as of October 2019

Bibliographic Analysis

The list of papers returned by Web of Science was analysed using VOSViewer, a bibliographic analysis software developed at the University of Leiden, Netherlands.[29] While there are other methods available to conduct such analysis (e.g. SciMAT, Bibliometrix), the VOSViewer software is freely available to researchers and easily constructs powerful, visual maps that can aid interpretation and insight into diverse literatures. Furthermore, we chose VOSViewer over other popular mapping techniques such as Multi-Dimensional Scaling (MDS), as it tends to provide a more accurate representation of the raw bibliometric dataset. MDS suffers from a bias towards network nodes that are located in the centre of a bibliometric map, whereas VOSViewer gives equal importance to nodes regardless of their positions.[30] Moreover, there has been a growing number of recent VOSViewer-based bibliographic studies analysing the scholarly discussion taking place in a variety of other domains, including organisational communication and creativity,[31] public health and infections,[32] big data applications,[33] and safety culture.[34] We draw on the best practices and techniques used in these studies to optimise the visualisation of the data and our analyses.

The VOSViewer algorithm uses distance-based prioritisation of bibliographic metrics, meaning that the shorter the distance between two entities (e.g. authors, cited journals) on a network map, the more closely related they are to each other. Conversely, entities that are further away from each other on the VOSViewer map are less closely related. VOSViewer also uses different colours for each cluster on its maps, which makes network nodes more easily distinguishable. Where two nodes are directly linked to each other, VOSViewer will connect them with a visible line.

29 Nees Jan Van Eck and Ludo Waltman, 'Software Survey: VOSViewer, a Computer Program for Bibliometric Mapping', *Scientometrics* 84, N° 2 (2010): 523–38.
30 Nees Jan Van Eck, Ludo Waltman, Rommert Dekker and Jan van den Berg, 'A Comparison of Two Techniques for Bibliometric Mapping: Multidimensional Scaling and VOS', *Journal of the American Society for Information Science and Technology* 61, N° 12 (2010): 2405–16.
31 Smaliukienė, Rasa, and Antanas Survilas, 'Relationship Between Organizational Communication and Creativity: How it Advances in Rigid Structures?', *Creativity Studies* 11, N° 1 (2018): 230–43.
32 Erwin Krauskopf, 'A Bibliometric Analysis of the Journal of Infection and Public Health: 2008–2016', *Journal of Infection and Public Health* 11, N° 2 (2018): 224–29.
33 Seung-Pyo Jun, Hyoung Sun Yoo, and San Choi, 'Ten Years of Research Change Using Google Trends: From the Perspective of Big Data Utilizations and Applications', *Technological Forecasting and Social Change* 130 (2018): 69–87.
34 Karolien Van Nunen, Jie Li, Genserik Reniers and Koen Ponnet, 'Bibliometric Analysis of Safety Culture Research', *Safety Science* 108 (2018): 248–58.

DOI 10.30966/2018.RIGA.8.4.

The process of data collection from Web of Science and the visualisation of bibliographic networks using VOSViewer allows for a robust analysis of publishing activity. Not only are we able to identify the conversations taking place, we are also able to determine the impact of the authors, institutions, and countries writing about these topics.

We conducted several types of analyses on the body of research using VOSViewer:

- Co-authorship analysis: the greater the number of co-authored papers, the higher the relatedness of authors, institutions, and countries
- Co-occurrence analysis: the greater the number of documents in which two keywords occur together, the higher the relatedness of these keywords
- Citation analysis: the greater the number of times authors, journals, and papers cite each other, the higher the relatedness of these items
- Co-citation analysis: the greater the number of times authors, journals, and papers are cited together, the higher the relatedness of these items

The results from these analyses are presented and discussed in the next section.

Results and Analysis

In this section, we present the results of the VOSViewer analysis of the literature related to the search terms. The literature shows little occurrence of these 'fake news' terms before the 2016 American presidential election (see Figure 1). After this event, sharp spikes in the use of the search terms begin to appear, which suggests the proliferation of discourse related to 'fake news'. We consider authors, author networks, and overall trends in research regarding these topics, and categorise the journals in which they are published in terms of their impact. We also analyse other keywords that appear concurrently with our search terms.

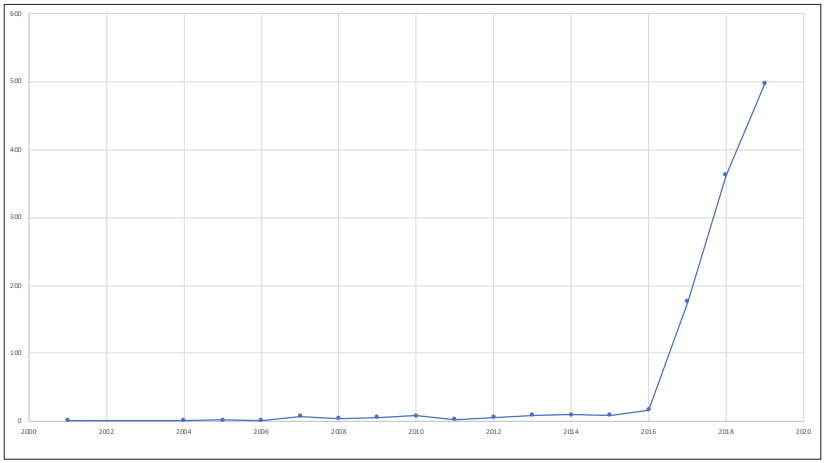

Figure 1. Number of documents feature search terms related only to 'fake news' published – 2001 to October 2019

Co-authorship analysis

In total, 1,023 authors were involved in writing the 479 articles that comprised the Web of Science results related to 'fake news', 'truthiness', 'post-fact', and 'deepfakes'. To produce a more meaningful map of co-authorship, we set the minimum number of papers published by an author to three, and nine authors met this threshold. We choose these thresholds drawing on other bibliographic studies that typically use cut-offs of up to ten authors (or papers or citations), to improve the visualisation of large datasets.[35] The resulting map of co-authorship for these nine authors is shown in Figure 2. There are two distinct networks of authors who write on this topic, the most prominent of which is a network between psychologists Daniel Bernstein (Department of Psychology, Kwantlen Polytechnic University, Canada), Maryanne Garry (School of Psychology, University of Waikato, New Zealand), Steve Lindsay (Department of Psychology, University of Victoria, Canada), and Eryn Newman (School of Psychology, Australian National University, Australia).

35 David E. Polley, 'Visualizing the Topical Coverage of an Institutional Repository with VOSViewer', *Data Visualization: A Guide to Visual Storytelling for Libraries* 111 (2016); Chunlei Ye, 'Bibliometrical Analysis of International Big Data Research: Based on Citespace andVOSViewer', in 2018 14th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD), 927–32. IEEE, 2018; Syed Hamad Hassan Shah, Shen Lei, Muhammad Ali, Dmitrii Doronin, and Syed Talib Hussain, 'Prosumption: Bibliometric Analysis Using HistCite and VOSViewer', *Kybernetes* (2019): 1020–45.

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Figure 2. Map of co-authorship (Generated by VOSviewer)

There are 559 universities from around the world that have researchers publishing work related to 'fake news'. Again, we set the minimum number of documents published per institution to five, and eleven institutions met this threshold. There is one large cluster of universities that co-publishes—Harvard University, the University of Sydney, Deakin University, Nanyang Technological University, and the University of Oxford.

This indicates significant international collaboration on 'fake news' research. Table 2 lists the top six countries by number of papers published on 'fake news', and includes the total number of citations per paper that each of these countries has received in Web of Science journals. Scholars from the USA, England, and Australia account for the greatest number of papers, whereas scholars from the USA, England, and Canada account for the greatest number of citations per paper.

Country	Documents	Citations	Citations Per Paper
USA	212	1400	6.60
England	52	216	4.15
Australia	37	130	3.51
Canada	36	128	3.56
Germany	25	78	3.12
Spain	22	26	1.18

Table 2. Top published countries by number of papers as of October 2019

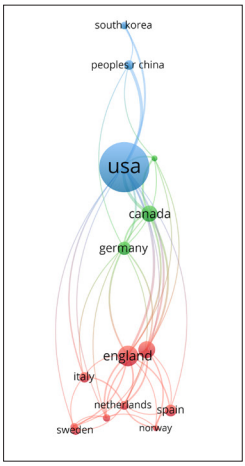

Figure 3. Map of co-authoring countries (Generated by VOSviewer)

As can be seen from Figure 3 there is one major cluster of countries whose scholars work togerther on research related to 'fake news'. We used a cut-off of seven documents published per country and out of sixty-five countries included in our sample, sixteen met this threshold. It should be noted that the size of the nodes represents the number of documents published by that country, for example, the USA is the largest node as it is the country with the greatest number of published papers in our sample. This cluster, when analysed further, comprises three smaller networks of countries who work together. The most prominent network consists of scholars from the USA, China, and South Korea. The large network at the bottom in red consists of countries such as Australia, England and Spain. The intermediary green network consisting of Germany, Canada, and New Zealand links the top and bottom networks.

Co-occurrence Analysis

Co-occurrence analysis involves assessing the number of documents in which two terms or words are found together. VOSViewer aggregates co-occurrences of both author keywords and all other keywords, showing their frequency and relatedness. It does not count common functional words such as pronouns, articles, and prepositions. For this analysis, we employed a threshold of ten documents in which a keyword had to appear for it to be included; this resulted in thirty-three keywords. Table 3 lists the ten most commonly occurring keywords that appeared in our sample of 479 papers from the Web of Science database. The top five most common keywords ranked by number of occurrences are 'fake news', 'social media', 'misinformation', 'media', and 'information'.

There are four major keyword clusters concerning media, audience reactions, communication, and conceptual lenses that appear in our literature sample. Figure 4 maps these clusters in terms of how individual words co-occur, and also depicts the links between keywords and clusters. First, the terms other than 'fake news' are media-related and shown in green—'misinformation', 'disinformation', 'propaganda', 'continued influence', 'information literacy', and 'media literacy'.

DOI 10.30966/2018.RIGA.8.4.

Keyword	Number of Occurrencesw
'Fake News'	225
Social Media	95
Misinformation	68
Media	59
Information	33
Policies	29
Internet	28
Disinformation	28
Journalism	28
News	25

Table 3. Most commonly occurring keywords as of Oct. 2019

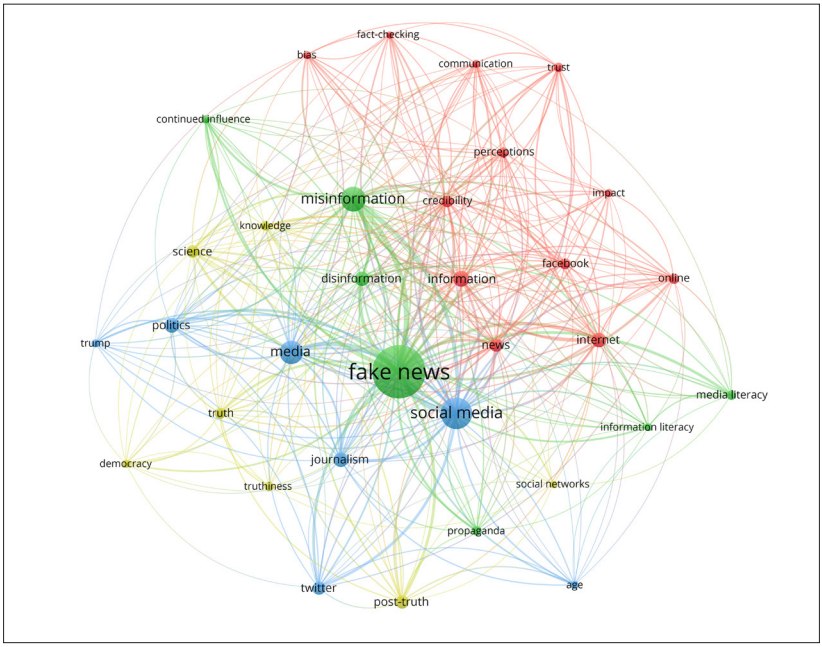

Figure 4. Map of co-occurrence of keywords (Created by VOSviewer)

DOI 10.30966/2018.RIGA.8.4.

Second, the keywords that are shown in red describe audience reactions including psychological attributes—'perceptions', 'trust', 'bias', and 'credibility'—and behaviours —'fact-checking' and 'communication'. Third, the terms, other than 'post-truth' and 'truthiness', that are shown in blue, illustrate elements of communication practice—'politics', 'journalism', 'media', and 'social media'. Fourth, the terms that are shown in yellow describe conceptual lenses—'social networks', 'science', 'truth', 'democracy', and 'knowledge'.

Furthermore, authors supply keywords to publishers that they perceive best describe their research. Using VOSViewer, we conducted an analysis of author-supplied keywords and again used ten documents as the threshold to limit our map to the most frequently-appearing terms. This resulted in fifteen keywords (see Figure 5). Once again, 'fake news', 'post-truth' and 'truthiness' appear, as they were contained in our search terms; however, 'deepfakes' does not, most likely because this is a relatively new term. Other terms appear to mirror the results described in the last paragraph.

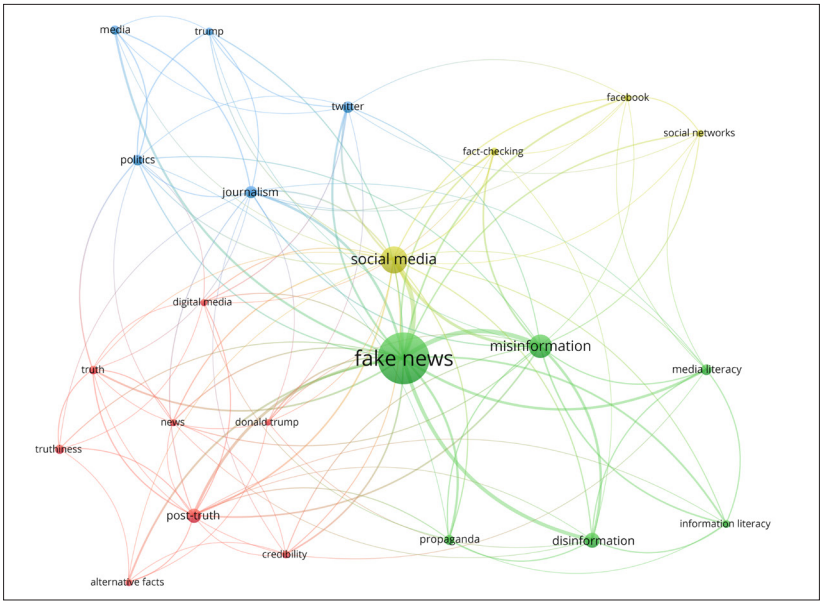

Figure 5. Map of co-occurrence of author keywords (Created by VOSviewer)

Citation Analysis

Citation analysis is based on the relatedness of items, such as authors and journals, where relatedness is determined by the number of times they cite each other. The citation analysis also includes sources outside the database that appear in the papers in our dataset. Our first citation analysis was concerned with the papers in the sample: Which papers in the field of 'fake news' cite each other? We required that a paper be cited at least fifteen times. Twenty-eight papers met this threshold; however, only fifteen of these papers cited other papers included in our dataset. Figure 6 reveals a noteworthy observation: Geoffrey Baym's paper, published in 2015, about the Daily Show[36] is the key paper that links the entire network; it makes a connection between other significant articles such as Hunt Allcott's 2107[37] paper about the US presidential election, as well as Irina Khaldarova's and Mervi Pantti's 2016 paper about Ukraine.[38]

The second citation analysis was concerned with cited journals; a journal had to be cited at least five times to be included in the map. Thirteen journals met this criterion and of these, twelve formed a network in which one or more journals cited each other at least once.

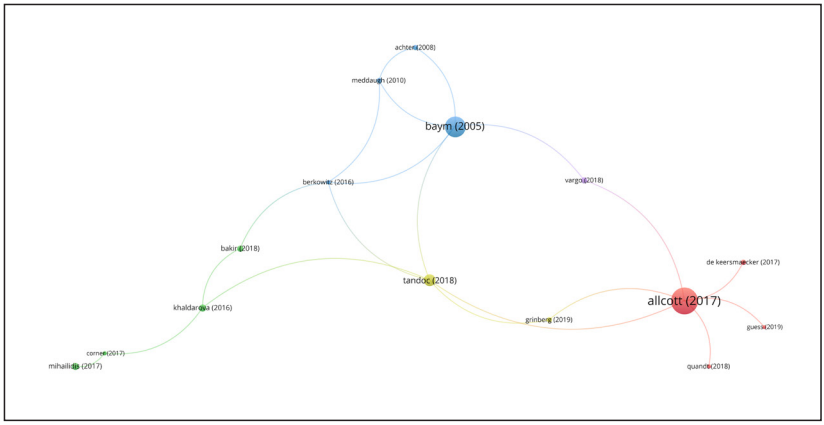

Figure 6. Map of citations by paper (Created by VOSviewer)

36 Baym, 'The Daily Show'.
37 Allcott and Gentzkow, 'Social Media and Fake News in the 2016 Election'.
38 Irina Khaldarova and Mervi Pantti, 'Fake News: The Narrative Battle over the Ukrainian Conflict', *Journalism Practice* 10, N° 7 (2016): 891–901.

This network map is shown in Figure 7 below, demonstrating that two main clusters of journals cite each other. The two clusters on the left (red and green) are the dominant clusters; they include journals such as *American Behavioral Scientist*, *International Journal of Communication*, and *Digital Journalism*. Another smaller network exists on the periphery (blue), and includes *Journalism Practice* and *Journal of American Folklore*. *Digital Journalism* is one of several publications that link these two networks.

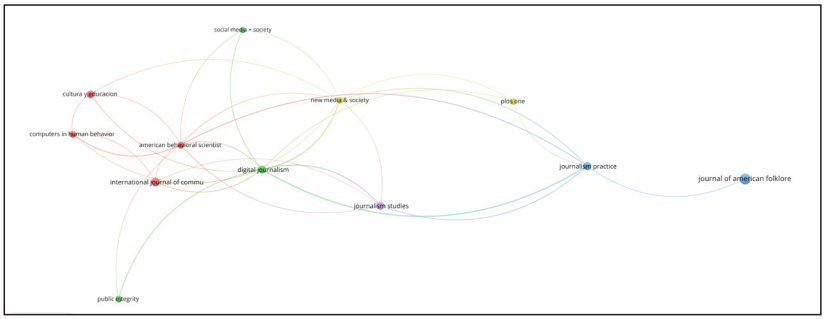

Figure 7. Map of citations by journal (Created by VOSviewer)

Finally, we explored citation networks of authors based on how often they cite each other. We required a minimum of fifty citations per author but did not place any constraints on the minimum number of documents each author published. Thirteen authors met this criterion. Nine of these authors comprised a meaningful citation network, which is shown in Figure 8 below. Edson C. Tandoc Jr at Nanyang Technological University in Singapore is a prominent author who serves as a key link between other clusters that include scholars such as Hunt Allcott, Richard Ling, Geoffrey Baym, John Cool, and Ullrich K. H. Ecker.

Co-citation Analysis

Co-citation analysis explores how closely items such as authors, journals, and papers are cited together. This type of analysis provides insight into the degree to which they have shaped and influenced the academic conversations about our field of interest. The co-citation analysis is not restricted to items occurring in the sample. We began the co-citation analysis by looking at all the references cited in the 479 papers in our dataset. We constrained our network map by requiring that a reference be cited at least twenty times; ten references met this criterion.

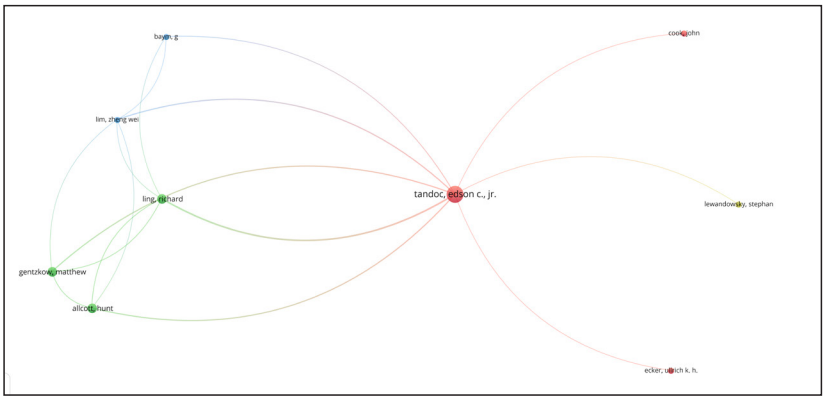

Figure 8. Map of citations by author (Created by VOSviewer)

The top three most cited papers were Allcott (2017),[39] Vosoughi et al. (2018),[40] and Tandoc et al. (2018).[41] The other papers that comprise the 10 most influential references are shown in Figure 9. They appear to be uniformly linked, with no single node being disproportionately influential in terms of number of citations, perhaps with the exception of Allcott (2017).[42] All linkage distances between nodes are relatively equal.

We then conducted the same co-citation analysis on all journals cited in our dataset, identifying 11,433 different sources (journals and other publication outlets). Again, to filter the result, we set a threshold of fifty citations per journal, which reduced the total number of eligible sources in our network map to twenty-nine. Some of the most highly cited academic journals in the resultant sample include (number of citations in parentheses): *Science* (174), *Journal of Communication* (165), *Digital Journalism* (148), *New Media & Society* (127), and *PLOS One* (115). The network map of journals is provided in Figure 10. There is a large cluster of non-academic publishing outlets to the right, in green, made up mostly of newspaper sources such as *The Guardian* and *The New York Times*.

39 Allcott and Gentzkow, 'Social Media and Fake News in the 2016 Election'.
40 Vosoughi et al., 'The Spread of True and False News Online'.
41 Tandoc et al., 'Defining Fake News: A Typology of Scholarly Definitions'.
42 Allcott and Gentzkow.

DOI 10.30966/2018.RIGA.8.4.

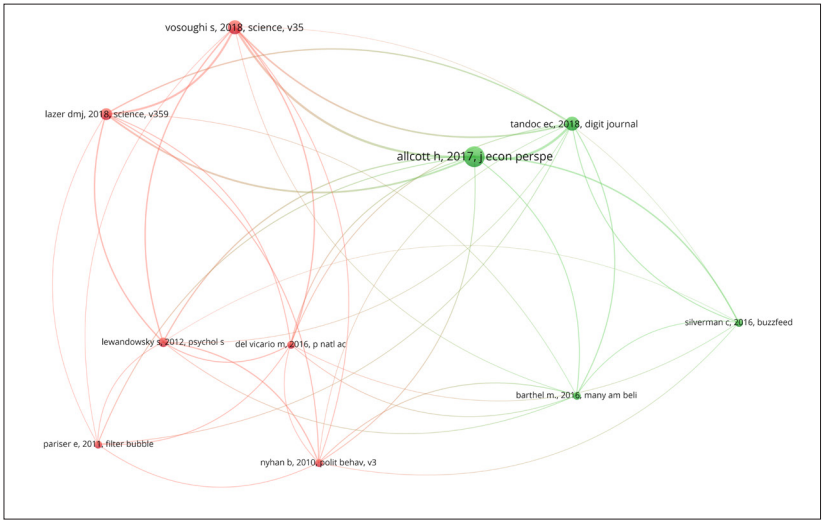

Figure 9. Map of co-citations by reference (Created by VOSviewer)

The other two major clusters on the left, in blue and red, are comprised primarily of academic journals, which include the aforementioned highly cited journals as well as other sources such as *Journal of Economic Perspectives*, *American Behavioral Scientist*, *Computers in Human Behavior*, *American Journal of Political Science and Information*, and *Communication & Society*.

We concluded our co-citation study by analysing all authors cited in the 479 papers. This analysis revealed 14,211 total citations. We set a threshold of 30 citations per author, which resulted in fifteen authors being eligible for our co-citation network map. The top five most cited authors were Hunt Allcott (111 citations), Craig Silverman (89), Edson C. Tandoc Jr (72), Stephan Lewandowsky (69) and Soroush Vosoughi (67). It is interesting to note that many of the same authors continue to appear in the various bibliographic analyses we have conducted so far. This suggests that, in this relatively young field of research related to 'fake news', article output seems to revolve around a small set of scholars, though this is likely to expand as the topic continues to gain in reach and prominence. The co-citation network map of authors is shown in Figure 11. Craig Silverman, Hunt Allcott, and Soroush Vosoughi are firmly in the centre, linking tangentially co-cited authors such as Cass R. Sunstein and Lucas Graves.

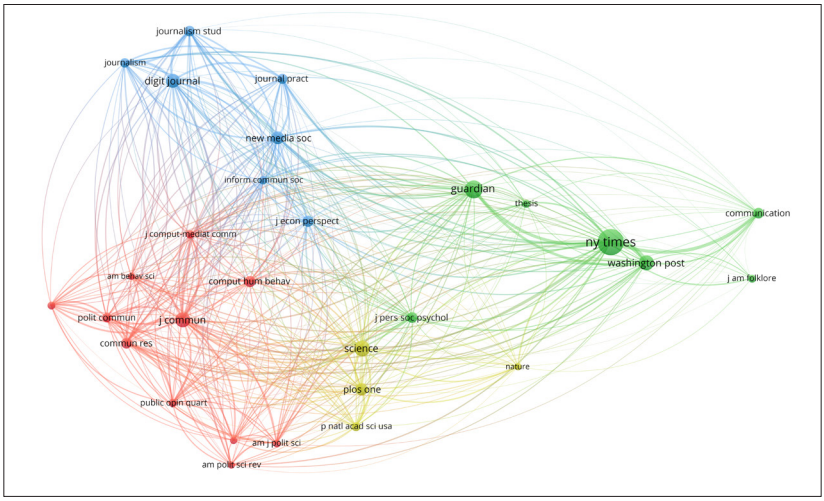

Figure 10. Map of co-citations by source (Created by VOSviewer)

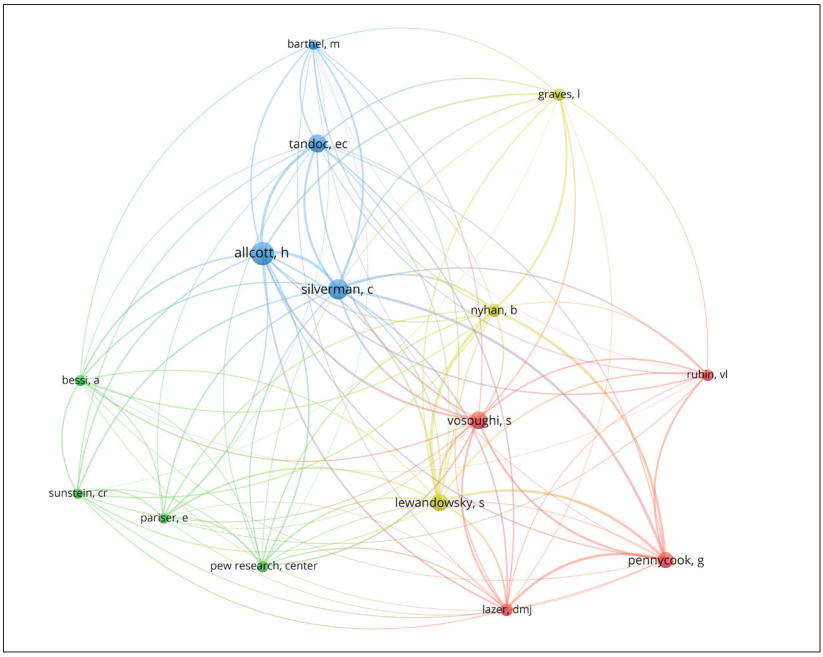

Figure 11. Map of co-citations by author (Created by VOSviewer)

General Discussion

This paper explores and maps the current state of research on 'fake news', 'truthiness', 'post-fact', and 'deepfakes' using a bibliographic mapping software called VOSViewer. Our dataset consisted of articles on these topics that appear in journals indexed on the Web of Science database. The VOSViewer software allows for analysis and insights that would be very difficult or impractical to obtain using other literature content analysis tools or by manually coding the papers. The number of papers published on these themes has increased substantially since 2017, which is not surprising given the topical nature of this area of study. In general, the results suggest that the conversation on 'fake news' is largely dominated by a select group of authors, several of whom are prolific in that they have successfully published large numbers of articles, and by several others who are influential as evidenced by how often they are cited.

Scholars from the USA, England, Australia, and Canada produce the highest volume of articles related to 'fake news', and their articles also receive the greatest number of citations. The USA is disproportionately represented in this select group. With respect to the universities whose scholars write on this topic, a strong cluster of institutions including Harvard University and the University of Sydney tend to co-author papers. When we expand our citation analyses to include authors and journals not included in our dataset, we still see that authors from our sample are among the most influential—Geoffrey Baym (Klein College of Media and Communication, Temple University, USA) and Hunt Allcott (Department of Economics, New York University, USA). Although possibly prejudiced by our English-only publication sample, this suggests that the academic conversation on 'fake news' is still relatively emergent and a group of core authors publish and are cited disproportionately on the subject.

The Faces of 'Fake News': Implications for Future Research

The bibliometric analysis presented in this paper identifies significant research interest in 'fake news' across several social science disciplines, specifically concerning mis-information and dis-information. However, outside of this mis- or dis-information dichotomy, a broad concept of 'fake news' needs to include other falsehood-creating practices that strategic communicators face, including mal-information and non-information. Our analysis revealed that these latter two falsehood practices have been subjected to limited critical scrutiny in the existing literature. Thus, in order to fully appreciate the complexity of

'fake news' phenomena, we must first understand the conceptual foundations of the construct.

We deconstruct 'fake news' into two dimensions that describe the intention to deceive and the intention to harm. The 'intention to deceive' is defined by the motivation to change or reinforce audiences' affective, behavioural, and cognitive responses by creating content that promotes falsehoods and non-factual information to achieve political, ideological, financial, or other goals.[43] However, not all 'fake news' content has the intent to deceive as some content (also) has an intent to harm. 'Fake news' content that has the 'intention to harm' either the audience or the subject of the content may be driven by competitive, political, ideological, or other differences.[44]

Using these two dimensions and insights gleaned from the 'fake news' literature, we propose a practical conceptual framework to describe four different types of 'fake news' practices—the practices of mis-information, dis-information, mal-information, and non-information (see Figure 12). When 'fake news' has a low intention to harm and to deceive, this content is 'mis-information'—inaccurate, false information that is the result of honest mistakes or of negligence.[45]

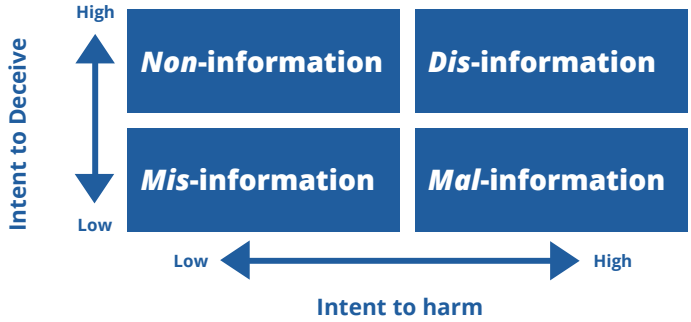

Figure 12. The faces of 'fake news'

43 Lazer et al., 'The Science of Fake News'; Jeannette Paschen, 'Investigating the Emotional Appeal of Fake News Using Artificial Intelligence and Human Contributions', *Journal of Product & Brand Management* (2019): 223–33; Andrew Flostrand, Leyland Pitt, and Jan Kietzmann, 'Fake News and Brand Management: A Delphi Study of Impact, Vulnerability and Mitigation', *Journal of Product & Brand Management* (2019): 246–54.
44 Flostrand et al., 'Fake news and Brand Management'; Anouk De Regt, Matteo Montecchi, and Sarah Lord Ferguson, 'A False Image of Health: How Fake News and Pseudo-facts Spread in the Health and Beauty Industry', *Journal of Product & Brand Management* (2019): 168–79; Michail Vafeiadis, Denise S. Bortree, Christen Buckley, Pratiti Diddi and Anli Xiao, 'Refuting Fake News' on Social Media: Nonprofits, Crisis Response Strategies and Issue Involvement', *Journal of Product & Brand Management* 29, N° 2 (2019): 209–22.
45 Justin Hendrix, and David Carroll, 'Confronting a Nightmare for Democracy: Personal Data, Personalized Media and Weaponized Propaganda', *Medium*, 4 May 2017. [Accessed 15 May 2020]; Claire Wardle and Hossein Derakhshan, *Information Disorder: Toward an Interdisciplinary Framework for Research and Policy Making*, Council of Europe Report 27 (2017). [Accessed 15 May 2020]; McManus and Michaud, 'Never Mind the Buzzwords'.

For example, during recent terror events in London and France, some social media users created and shared unconfirmed rumours about the identity of the perpetrators and their motives without the intention to harm or deceive.

Where there is an intention to harm but not to deceive, 'fake news' content is classified as 'mal-information'—reality-based information used to inflict harm on a person, organisation, country, or another group.[46] Consider for instance the actions of anti-Hillary groups during the last US presidential elections. Hilary Clinton was the subject of several leaks involving the mismanagement of classified information during her time as Secretary of State. While the actual content of the news was factually correct, the timing and circumstances of the release indicated an attempt to undermine her credibility and her suitability for presidential candidacy.

Where the intention to deceive is high and the intention to harm is also high, 'fake news' content can be called 'dis-information'—the manipulation of information that purposefully aims to mislead and misinform.[47] A falsified article that appeared on the now closed WTOE5 News, and was shared more than 960,000 times, stated that the Pope had endorsed Donald Trump's candidacy for US president.[48]

Finally, where there is a high intention to deceive but a low intention to cause harm, 'fake news' can be classified as 'non-information'—irrelevant information that obfuscates, hides or covers real or true information sought by audiences.[49] For example, consider a government agency that needs to legally reveal an uncomfortable truth in a public report. That agency could practice non-information by inserting irrelevant detail into the report to mislead or cover-up uncomfortable real or true findings or information.

While academics have researched 'fake news' broadly with a specific interest in dis-information and mis-information, as the co-occurrence analysis indicates, other key aspects of 'fake news' are less prominent, including mal-information, non-information, and deepfake techniques. These faces of 'fake news' are

46 Ibid.
47 Ibid.
48 Penny Marshall, 'What is Fake News, What Are the Worst Examples and Why Does It Matter?', *Independent TeleVision* (ITV) Service, 18 February 2019. [Accessed 15 May 2020]
49 Yiquan Gu and Tobias Wenzel, 'Strategic Obfuscation and Consumer Protection Policy', *The Journal of Industrial Economics* 62, N° 4 (2014): 632–60; Axel Gelfert, 'Fake News: A Definition', *Informal Logic* 38, N° 1 (2018): 84–117; Ian P. McCarthy, David Hannaha, Leyland F. Pitt, and Jane M. McCarthy, 'Confronting Indifference Toward Truth: Dealing with Workplace Bullshit', *Business Horizons* (2020): 253–63.

critically important, both for strategic communications professionals and for public policy officials who wish to develop fully a broad understanding of 'fake news' and the practice of creating or publicly spreading falsehoods. For example, the literature offers little insight into the motivations to create or the consequences of mal- or non-information. Thus, we propose promising areas of future research interest in Table 4 under the four clusters identified by the keyword analysis.

Research theme	Related questions for future research
Mal-information	
Expressions of 'fake news'	● Using research on mis-information and dis-information, how to effectively and efficiently identify mal-information in the media?
	● How to develop media literacy programmes to combat the threats of mal-information directed towards vulnerable audiences?
Audience reactions	● What behaviours protect against the threat of mal-information?
	● What are the psychological consequences of sharing mal-information accidentally?
Conceptual lenses	● How can the intent to harm be incorporated into existing theories and conceptual frameworks?
Communication practice	● What regulations or ethical practice rules should be developed to control mal-information?
Non-information	
Expressions of 'fake news'	● How are non-information practices correlated with other 'fake news' practices?
Audience reactions	● How can audiences cope with non-information strategies and detect honest information?

Conceptual lenses	• How can understandings of deception intentions help conceptualise the impact on target audiences and other stakeholders?
Communication practice	• To what extent can interventions prevent non-information practices from interfering with strategic communications objectives?
'Deepfakes'	
Expressions of 'fake news'	• How does the rise of highly convincing audio-visual 'deepfake' techniques impact the different faces of 'fake news'?
	• What is the role of other methods of creating 'fake news' when deepfakes can create near perfect falsehoods?
Audience reactions	• How will audiences react when 'fake news' content is pervasive and indiscriminate from real news?
	• What is the role of media relationships when content can be synthetically produced using 'deepfake' techniques?
Conceptual lenses	• What are the implications of artificial intelligence technology that enables 'fake news' production and sharing?
Communication practice	• How can communication professionals mitigate and anticipate the effects of 'fake news' utilising 'deepfake' techniques?

Table 4: Future 'Fake News' Research Directions for Strategic Communications

Conclusions

The results of the bibliometric analysis indicate where academic research on 'fake news' takes place, as well as which authors or groups of authors are influential and important to reference when conducting new studies on 'fake news'. Furthermore, for strategic communications researchers, the findings above provide a clear map of not just the evolution of this emerging field, but also of the most important topics that have been subjected to peer-reviewed critical scrutiny.

As with most research, this paper has limitations. We have relied primarily on the Web of Science database to produce the raw bibliographic data that served as the input for our VOSViewer analyses. Any errors with respect to publication volumes, citation volumes and potential misattributions of authorship could have resulted in occasionally flawed results, particularly when such a large volume of data from 479 papers was used in the VOSViewer analysis. We did spot-check many data points for accuracy and did not find any errors; however, this heavy reliance on the Web of Science database should be considered when reviewing the results. It should also be noted that there are many credible journals that are not included in the Web of Science service, and these were, by definition, not used in our analysis. Furthermore, follow-up studies that use different indices, include more languages or utilise other search terms could provide additional insight into the evolution of 'fake news' concepts that could be added to and compared with the findings reported above.

If the trends identified in this literature review persist, 'fake news' and the related terms will continue to be important issues in a wide range of academic disciplines, including politics and international relations, journalism and communications, business and management, and the social sciences in general. It will be interesting to see how the academic conversation on 'fake news' evolves over time. A fundamental prerequisite for any research effort on such a dynamic and evolving topic is a map of the extant literature. Strategic communications scholars, practitioners, and policy makers can benefit from this bibliographic review as it speaks to the direction in which the conversation surrounding this topic is headed. Authors, reviewers, and journal editors alike can benefit from the map that a bibliographic review provides in thinking about their future work, the value of that work, and the tangents that journals might follow.

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