

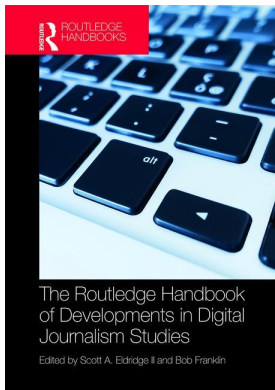
This article was downloaded by: 10.3.98.93

On: 17 Jan 2019

Access details: *subscription number*

Publisher: *Routledge*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: 5 Howick Place, London SW1P 1WG, UK



The Routledge Handbook of Developments in Digital Journalism Studies

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Hacks, Hackers, and the Expansive Boundaries of Journalism

Publication details

<https://www.routledgehandbooks.com/doi/10.4324/9781315270449-27>

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Published online on: 30 Aug 2018

How to cite :- Nikki Usher. 30 Aug 2018, *Hacks, Hackers, and the Expansive Boundaries of Journalism* from: The Routledge Handbook of Developments in Digital Journalism Studies Routledge

Accessed on: 17 Jan 2019

<https://www.routledgehandbooks.com/doi/10.4324/9781315270449-27>

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HACKS, HACKERS, AND THE EXPANSIVE BOUNDARIES OF JOURNALISM

Nikki Usher

The boundaries of journalism are increasingly blurred as new entrants from people to new forms of news expand the field. Of increasing importance to the future of journalism is the intersection between programming and journalism. Code is the backbone of every news website, but having staff who can program as part of editorial efforts has not only become more commonplace, but it is also absolutely critical for news organizations looking to do more sophisticated digital storytelling. But code is just one part of the larger story about this fusion between hacks (journalists) and hackers (coders). As journalism becomes increasingly quantified, thanks to the rise of data and tools that make it easier to understand this data, the importance of those who can computationally analyze these new sources of news have also become highly visible in many prominent newsrooms across the world.

The chapter begins with an examination of some of the complexities and opportunities afforded by the rise of these computationally minded journalists, collectively discussed here as ‘interactive journalists’ – an umbrella term that delineates this fusion of programming, data, and journalism from other points in journalism’s long entanglement with computation (Usher, 2016). However, given the 2016 Brexit and Trump votes, it’s worth probing whether the “master narrative” of interactive journalism may well be dead. If quantification and visualization were supposed to make information more visible and understandable, how did so many people – readers, journalists, politicians – make faulty predictions about electoral futures? Did the reification of the fusion of journalism and coding contribute to possible misinformation?

As interactive journalism came into the popular vernacular between 2009 and the present, interactive journalists took on an aura of superiority (or mastery) – their special knowledge of programming or data analysis or both made them relevant and important to the news industry. A *New York Magazine* article from 2009 on the *New York Times* interactive staff reflects the early exuberance surrounding interactive journalists with the subhead, “What are these renegade cybergeeks doing at *The New York Times*? Maybe saving it” (Nussbaum, 2009). Key figures in the movement were able to state the case for their superiority within the journalistic profession. Nate Silver, the FiveThirtyEight election-predicting wunderkind, began a site separate from *The New York Times*. In his manifesto, Silver (2014) argued that “one of the potential advantages of data journalism is that it generalizes better than traditional approaches, particularly as datasets increase in scale to become larger and more complex”. Moreover, in an era of big data, one of journalism’s preeminent challenges will be how to harness its potential for adding to public

knowledge. As issues from automation to algorithmic transparency become more prominent (Carlson, 2015; Dörr, 2016), journalism requiring computation and data analysis will take on additional relevance.

Given this potential, it's easy to see how interactive journalism might fall victim to overly high expectations and an undefined mission. Here, existing literature will be referenced to help provide a cohesive sense of what we know so far. However, scholarship is contested as far as even a basic historical trajectory of the field and simple definitional claims, making it hard to evaluate what has been accomplished by a heterogeneous subfield of journalists. Moreover, much of the literature takes the rise of programming in journalism as a normative good whereby quantification and information visualization leads in sum to better journalism and therefore better public knowledge.

CONTESTED HISTORY

In order to understand fully where interactive journalism fits into the profession as a whole, it's helpful to have some sense of its origins. This historical perspective provides insight into the subfield's lack of coherence. Some scholars and academics trace the origins of interactive journalism to some of the first news infographics. Others argue that interactive journalism has its antecedents in the move to make journalism more like social science, an approach amplified by computer-assisted reporters. However, it makes more sense to bridge these two origin stories with the argument that specific computation requirements were required in order to distinguish interactive journalism as a wholly new field (Usher, 2016).

Some scholars chart the beginning of infographics themselves as part of a need to better communicate scientific discovery and world events. Monmonier (1989), one of the most extensive chroniclers of mapping in journalism, argues that infographic-like images in the news might be traced to sixth-century block printing. Friendly¹ traces infographic history from the pre-seventeenth-century visualizations of planetary movements. Some *Guardian* journalists argue that they were doing data journalism from the very first day of publication in 1821, with a then-revolutionary tabular presentation of education statistics (Datablog, 2011).

Throughout the development of newspaper printing, advances in information visualization have largely been the result of war or major international events. The Titanic provided significant incentive for journalists across the world to visually depict the tale of the sinking ship for readers. World War II made *Time* and *Fortune* leaders in information visualization and encouraged experimentation elsewhere. Today, war, disaster, and politics continue to provide fertile ground for interactive development, with more data ever than before available for journalists to splice, dice, present, and even share with their audiences.

Anderson (2017) ties together the maturation of data analysis with the rise of data-visualization, arguing that journalism began to incorporate social science methods into journalism. The incorporation of interactives into newsrooms has not been a forward march of progress, with this "technologically specific work" inspiring discourses of contestation, aspirations, and normalization in the newsroom (Powers, 2012: 25).

But the history of infographics leaves out the computational aspect of interactive journalism. Cox (2000) argues that the 1952 UNIVAC computer's prediction of Eisenhower's success for CBS was a landmark in using data to help make journalism more precise. And it was that term, 'precision', that would inspire Detroit journalist Philip Meyer's approach to what would go on to be called computer-assisted reporting in its earliest iteration. Meyer (2002) advocated for bringing social science methods, including hypothesis testing, into journalism and using this approach

to make sense of data that was either collected from government agencies or compiled by news organizations. His early work led to significant recognition in the field.

However, specifically thinking about interactives as simply the most technically sophisticated version of computer-assisted reporting is incomplete. Significantly, web and mobile-enabled interactive visualizations can include myriad forms of storytelling that move beyond just maps, charts, graphs, and other displays of quantitative information. The birth of this new subfield really brings with it the ability to use programming in order to enhance not only the reporting experience but the user experience of engagement with web-enabled storytelling. The early '80s brought the arrival of tools like Microsoft Chart and hardware like the Macintosh; *USA Today* shook up journalism with its page design focused around colorful weather maps and personal finance graphics.

Toward the end of the 1980s, as computers became a more regular part of journalistic work processes, the potential for new forms of journalist work became clear to some early visionaries. Monmonier in 1989 offered a key prediction that proved to be true:

Electronic display makes possible map symbols that blink and move. . . . Video display technology and modern telecommunications offer the potential for linking highly dynamic cartographic display software with large geographic databases . . . should electronic news databases ever emerge as a mass-communications medium, dynamic news maps would become commonplace.

(Monmonier, 1989: 15–16)

At the time, studies about the rise of visual journalists in newsrooms suggested the inability of other professional journalists to see their value as journalists first rather than artists (Lowrey, 2002), revealing tensions about the incorporation of innovation that foreshadowed some of the issues seen in the integration of online journalism into traditional news but provides a point of contrast for the “master narrative” of interactive journalism.

But computers needed to get faster and the web had to become more technically sophisticated in order to enable the type of interactivity we take for granted today. Three factors – the rise of cloud computing, the rise of ‘social’ open-source, and programming advances such as AJAX and Flash set in motion new forms of storytelling as well as the need for new kinds of journalists. Cloud computing allowed newsrooms to take advantage of cheap, distributed servers so as to avoid having interactive projects clog up the newsroom’s mainframe. ‘Social’ open-source enabled programmers to better develop community ties in order to share and build upon each other’s code. Flash was easy enough for more seasoned infographic creators to move into the interactive realm and to begin thinking about the potential of this form of storytelling, while AJAX enabled basic functions like scrolling within a Google map or toggling over content without leaving the page.

By 1995, the web was at least fast enough that most home computer users could support some form of early multimedia. It’s at this point that we actually start to see the development of interactives that took graphics beyond still representations and made them into something tactile – something a user could actually engage with – a call-and response experience (Stromer-Galley, 2004). Notably, significant innovation in U.S. newsrooms came from the fringes – small newspapers rather than large ones. Young people who were excited by programming were getting their first jobs at small newspapers across the country – in coastal Florida, in Lawrence, Kansas, or in big-city metros like the *Atlanta Journal-Constitution* or *The Chicago Tribune*. Elsewhere, in Europe, large papers often led key advances; *El Pais* in Spain, the *Times* of London, and the *Daily Telegraph* (UK) were early leaders.

THE BIRTH OF THE 'HACKER JOURNALIST'

A few key constitutive moments help mark the later acceleration in the 2000s and 2010s that we have seen in the field and the celebration of the journo-techie as a 'master' of the newsroom: the mythology of Adrian Holovaty, the institutionalization of interactive journalism within the industry, and the bridge-building between journalists and programmers exemplified by Hacks/Hackers and other extra-industry-spanning collaborations.

In the early 2000s, Holovaty, a University of Missouri-trained programmer, led a team of young journalists who could program at the *Lawrence Journal-World*. The work in Lawrence encouraged an industry-wide obsession with finding journalists who had a 'start-up' mentality, programmer 'cool' as well as chops, and editorial knowhow. Holovaty, now no longer involved in journalism, was one of the first to combine data with interactive visualization: a crime map using Chicago crime stats and the 'new' Google Maps open API (at the time, this was called a 'mash up'). His blog was also a starting point for the flourishing community – he posted job ads and outlined a variety of manifestos; with others he also guest wrote entries and added extensive commentary about their experimentation in the burgeoning subfield. Holovaty's presence on the journalism industry conference circuit was unavoidable for almost 10 years; many articles written about him also reflect the industry fetishizing of his skills, with news executives expressing both awe and the need for these journalists.

Institutionalization quickly followed. One of the first signs that the news industry at large was seeing the form's potential was the 2008 introduction of Knight-backed scholarships at Northwestern University's Medill School for Journalism for programmers to learn about journalism. Other programs fusing computer science and journalism or substantial opportunities for credit emerging at leading journalism schools such as Columbia, Stanford, and the University of Missouri – opportunities that are now increasingly standard at universities across the world. Major newspapers like the *New York Times* and the *Wall Street Journal*, watching a *Washington Post* newsroom effort led by Holovaty, scrambled to institutionalize teams with dedicated staff. In 2010, international attention to the WikiLeaks cables and the MP scandals in the UK underscored the significance of interactive journalism in storytelling (Howard, 2014). At this point, since 2010, other newsrooms across the globe have developed either specific teams or emphasized bringing on journalists with new expertise in programming into existing teams, though large newsrooms have the ability to pay for and to attract top talent that smaller newsrooms often struggle to retain.

Further signs of institutionalization can be reflected in organizational growth and institutional recognition. The National Institute for Computer-Assisted Reporting, or NICAR, began adding more programming-specific bootcamps that delved beyond Excel manipulation to include data scraping as well as the creation of both front-end and back-end development. NICAR is an international conference with strong U.S. ties, but regional European-based conferences have also emerged, such as NODA, the Nordic data journalism conference, begun in 2013, and DataHarvest: The European Investigative Journalism Conference, begun in 2012. The *New York Times*' 2012 interactive "Snow Fall: The Avalanche at Tunnel Creek" helped both solidify and popularize the potential of interactive journalism. The project won a Pulitzer and garnered record traffic to the site from new visitors to the *New York Times*; in following years, interactives were consistently among the newspaper's top traffic-getters, setting a precedent for further investment in this form of journalism and its practitioners not just at the *Times* but within the industry.

However, the development that really captured the attention of many hoping that programming might be a way to help save journalism was the creation of Hacks/Hackers, a grassroots effort that attempts to bridge gaps between the journalism community and the programming community. Primary among these efforts was the journalist-created Hacks/Hackers organization

in 2009 – a loosely coordinated group that aims to bring together “hacks” – the journalists, and “hackers” – the programmers – in order to begin a fusion between skill sets and cultures (Lewis and Usher, 2014). At its height in 2014, the grassroots movement had about 75 international chapters on four continents and an estimated membership of 23,000; today it boasts just over 50 chapters on three continents (Lewis and Usher, 2014). However, this group has had mixed success in encouraging the fusion of techies and journalists. In some cases, the groups were unable to attract any technology experts other than those already working in journalism. In other cases, the groups diverged from the original journalistic purpose and instead served as a convening point for a variety of information and knowledge-management fields such as civic tech and citizen science. Newsrooms have had internal and externally focused hackathons to drive innovation, taking cues from the Hacks/Hackers group’s role as a conveyor and culture-bridger for technologists and journalists.

Major tech companies are invested in developing journalism’s technical chops. Knight and Mozilla began a major international partnership in 2011 that featured a worldwide contest for programming aficionados – the five winners were awarded with a one-year fellowship in one of five international news organizations, no previous journalism experience necessary. This partnership led to Open News and its online community, Source, which aims at connecting “a network of developers, designers, journalists, and editors to collaborate on open technologies and processes within journalism” and now has its own conference, SRCCON: the Open News Source conference.

In 2015, Google launched “Google News Lab”, which provides support for fellowships for programmer journalists, organizes a contest for interactive journalism, offers training material (particularly around Google trends), and supports various news innovation projects, such as First Draft, the citizen journalism verification effort. As part of pressure from European newspaper publishers, Google has also provided about \$164 million to help simulate news innovation from start-ups to business models to interactive journalism. Facebook has recently launched additional partnerships with journalists, though not around programming. However, questions remain about the incentives of large technology companies to provide support for journalism when their business models are a huge factor in the economic disruption of journalism. Nonetheless, the maturation of the fusion of programming, data analysis, digital storytelling, and visualization in newsrooms can be told through a variety of historical perspectives, but much needed is a focus on the development and integration of new programming technology in the service of editorial content.

WHO ARE THESE PEOPLE?

As the divergent potential for tracing interactive journalism’s history might indicate, defining the field with some coherence has been difficult – with some scholars wondering whether it even makes sense to have a clear definition. Are these practitioners ‘computer-assisted reporters’, ‘hacker journalists’, ‘data journalists’, ‘programmer journalists’, ‘developers’, ‘designers’, ‘news nerds’, ‘computational journalists’, or something else (like ‘interactive journalists’)? Are they doing ‘hacker journalism’, ‘computational journalism’, ‘data journalism’, ‘multimedia storytelling’, or ‘interactive storytelling’? (see also Coddington, this volume, Chapter 17). Definitions matter, though of course they are situated within the cultural context of the journalism being conducted and need to reflect how the journalists themselves articulate their backgrounds and self-definition. Furthermore, definitions also have normative dimensions and, in turn, reflect how these journalists bring to bear a particular cognitive framework for understanding and creating journalism. And finally, being able to define and delineate makes critique and feedback easier.

Powers (2012) argues that a multiplicity of discourses emerges; as journalists technologically innovate, they define their work in ways that designate both novel technologies and alignment with journalism. However, this is uneven, as this can be framed as disruptive, continuous, or opportunistic. Within the broad umbrella of the subfield, computational journalism and computer-assisted reporting have fairly established definitions. However, the terms 'data journalist', 'programmer journalist', and 'hacker journalist' are much blurrier. Computational journalism has its origins in 2006: Georgia Tech computer scientist Ifran Essa and his then-doctoral student, Nicholas Diakopolous, coined the term as a way to think about how algorithms might solve journalistic problems. The term is now often used to discuss how computers can be used to aid journalism in the creation of tools that might help data analysis and assist journalists in investigative work via algorithms, data, and social science methods (Flew et al., 2012; Hamilton and Turner, 2009). Drawing from engineering and computer science, computational journalism is increasingly associated with a move toward "algorithmic accountability", whereby journalists are encouraged to try to reverse-engineer algorithms, either computationally or through more systematic, albeit anecdotal reporting efforts (such as comparing prices online by ZIP codes) (Diakopolous, 2014).

Computer-assisted reporting is also connected to computing power to help to do investigative work, particularly through the application of social science methods. Computer-assisted reporters may build databases, but generally, they are not building stand-alone tools that might scale and aid the rest of the industry, nor are they working on sophisticated algorithmic programming in the service of news. Rather, CAR reporters might be thought of as experts in data-gathering (particularly via freedom of information act requests) and statistics (Coddington, 2015). Parasie and Dagiral (2013) found that CAR reporters were focused on statistics and anecdotes to be used for reporting. CAR reflects a temporal orientation prior to today's 'big data' world and interactive web technology and recalls data exploration that was focused more on internal newsroom use and includes only minimal emphasis on the presentation and exploration of that data for users. Bounegru (2012) argues that CAR is primarily focused on investigative reporting, while data journalism is not only more integrated into new forms of storytelling but also reflects an approach to journalism that prioritizes openness, community-building, shared resources, and learning. Overall, all journalists are now 'computer-assisted reporters' because they all use computers.

'Data journalism', though, is a particularly messy term. Academics who have studied data journalists across Norway, Sweden, Belgium, Germany, the US, and the UK find some coherence when thinking about skills, practices, and newsroom integration. Particularly within Europe, data journalism appears to be the predominant professional self-description. Holovaty is credited with coining the term by many journalists, and a number of 'data journalism' handbooks (Bradshaw, 2013) and conferences use the moniker.

But the definitions break down, in part because the field incorporates a subgroup of journalists who can have varying backgrounds (such as in technical or non-journalist fields) and varying skill sets (some might be ace programmers, while others might only focus on data acquisition), an unpredictable pathway to the profession. Royal (2012) found that *Times* interactive journalists come from a variety of journalism and non-journalism backgrounds, described themselves by a variety of titles, and had a variety of expertise and duties within the newsroom. Fink and Anderson (2015) also find a variety of skills within data journalists, who have different backgrounds, expertise, and goals. Weber and Rall (2013) argue that interactive journalists are comprised of programmers, journalists, and statisticians. Some consider what mastery of skills is required in defining the field (Karlsen and Stavelin, 2014; Parasie and Dagiral, 2013). Smit et al. (2014) focus on journalists whose work consists of "information visualization", a term they argue refers to "all mental models of data" (p. 345), ultimately concluding that there is no perfect convergence

of backgrounds working in this field. Howard (2014), drawing from interviews with dozens of journalists working at the intersection of data and programming, suggests that data journalism can be thought of as “gathering, cleaning, organizing, analyzing, visualizing, and publishing data to support the creation of acts of journalism” (p. 4). Appelgren and Nygren (2014) define data journalism as a combination of data analysis, programming, and visualization.

However, others resist the demarcation. De Maeyer et al. (2015) argue for a discursive view of the term given the variety of identities and backgrounds data journalists in French-speaking Belgium possess. The scholars conclude that lack of coherence makes it difficult for these journalists to have a shared interpretive community. They find there is a divergence in attitudes toward data – as to whether the data is “ordinary” or doable by one person and within the normal temporal patterns of newswork, or whether the data is “thorough” or requiring the “collective mobilization of a range of skills (journalism, computer science, statistics, graphic design)” (p. 441). Trédan (2014) argues that there is no perfect way nor any actual definition that articulates a coherent set of practical mastery. Along this line of thinking, Fink and Anderson (2015) have proposed thinking about data journalism as an “assemblage” – or suggest that it is defined by the fluidity of material, cultural, and practice-based understandings.

One strategy has been to look for epistemological differences as ways to delineate the group. Coddington (2015) maps these divisions around openness, epistemology, vision of public, and the professional orientation of journalists (for a helpful break down see p. 337). Parasić (2014) suggests that programming journalism offers an epistemological challenge to traditional journalism because it pushes journalistic work toward hypothesis and data-driven research rather than news that relies on normative assumptions. In Germany (Weinacht and Spiller, 2014), note that while data journalism is difficult to define, the scholars find both practical and epistemological differences that differentiate these journalists: different skill sets and a tendency to view the audience as able to assist in developing new trends and ideas. However, scholars in Norway share this finding; Karlsen and Stavelin (2014) found that despite different skill sets, there were many epistemological similarities between the professional norms of data journalists and traditional journalists.

But ‘data journalism’ is fundamentally unsatisfying even across a multi-level analysis of individuals, organizations, and institutions. Data journalism restricts the definition of interactive web-storytelling to a narrow focus on numeracy – but the story of interactive journalism is more than just journalists dealing with ‘big data’. Parasić and Darigal (2013) and Karlsen and Stavelin (2014) are among the few to use the term “programmer journalists” to define their research participants, but their programmers focus on making data transparent for users – thus data journalism is at the core of their practices. Even teaching data journalism is difficult because of the lack of a coherent definition – promoting educators to ask how legal training for data acquisition, ethical considerations, or experience working with data via computational tools can fit together (Hewett, 2013, 2016).

Many journalists working in this space do not work with data at all – and in fact, may be coding in the service of an editorial project that has little to do with the visualization of quantitative information. Many of the technologists new to newsrooms are not data analysts, nor do they wish to be; similarly, many of the journalists working in this area are more interested in using programming to building novel solutions for storytelling that move far beyond structured data. Interactive quizzes and interactive storytelling that provides an immersive journalism experience replete with multimedia elements, newsgames, and beyond reflect a diversity in subject matter and in content that is not represented by ‘data journalism’ and, moreover, fails to be reflected in scholarship that tends to focus on more serious forms of quantitative storytelling, particularly investigative journalism as conducted through data analysis. As a result, what is really different about this subfield is the ability to create news applications that layer interactive features around data and storytelling in ways that prompt engagement from the user. Thus, in my comprehensive

study of the field, found in *Interactive Journalism: Hackers, Data, and Code*, I think more broadly about the convergence of hacks and hackers through what they create: “a visual presentation of storytelling through code for multilayers, tactile user control for the purpose of news and storytelling” (Usher, 2016: 20). If the field can only be categorized discursively, while scholarly inquiry is well-suited to explore the ‘assemblage’, if there is no center and no common set of practices, critique is more difficult – and critique is warranted at this point.

A reassessment

However, a reassessment is necessary surrounding the excitement and interest in interactive journalism from the field and from scholarship. As noted, the field embraces interactive journalism as a savior – a ‘master narrative’ that includes two forms of mastery: masters over big data comprehension and the certainty of knowledge provided via quantification and as masters within the newsroom: individuals who have skills others do not. Much of the scholarship has indeed focused on what tech culture can bring to journalism as an epistemological offering: from transparency to a reliance on open-source data to a fundamental openness that engages in user-directed inquiry to narrative (Lewis and Usher, 2013, 2014, 2016; Usher, 2016).

But it’s time to think about the problems that data journalism/interactive journalism presents to knowledge acquisition. That’s not to say that scholars haven’t pushed back entirely on interactive journalism: they have studied convergence difficulties within the newsroom, for example. But there’s a strong normative element to this work: that interactive journalists should be incorporated into the newsroom, and moreover, journalism should be more open, more data-driven, and more engaged with the user. Perhaps those assumptions are ones worth putting on hold.

The first key point is that interactive journalists are, for the most part, not statisticians. They know a lot, they’re self-trained, but in only the rarest instances are these journalists formally trained in regression, logarithmic, and multivariate analysis, and beyond. To understand patterns in data, all the machine learning and visualization in the world can’t help if journalists lack fundamental data comprehension skills. Ample evidence exists from the NICAR email list of journalists struggling with basic statistical questions; if categorizing variables is difficult, moving beyond descriptive statistics to understand the modeling of a dataset is simply not possible. When these problems with quantification are then visualized, real issues emerge, because the visualizations themselves are incomplete stories that belie the complexities of the numbers they represent. To some degree, this has always been a problem with visualizations, but in this case, newsrooms are often asking journalists to work with data and present it to audiences when journalists lack the ability to “investigate” or “interview the data” (Willis, 2011).

These forms of storytelling matter to the public’s understanding of data: Silver’s NowCast and the *New York Times*’ Upshot interactives provided predictive data, neatly visualized, which did not reflect issues with uncertainty in polling and failed to communicate to users quantitative, data-based reasons why their candidate might fluctuate each day in her chance of winning. We know now that presenting people with all the data can be harmful – consider the effect of WikiLeaks’ data dump of documents on right-wing conspiracy nuts. The documents enabled speculation about a child pornography ring with connections to Hillary Clinton being run out of a pizza restaurant’s basement in Washington, DC. ‘Pizzagate’ caused a mentally imbalanced man to walk into the restaurant and start shooting with an assault rifle. Other data interactives can prompt less serious mistakes in judgment: ProPublica’s Dollars for Docs invites users to see if their doctor accepts money from drug companies. This may prompt people to make judgments about doctors being in the pockets of drug companies and choose to disregard medical advice or simply not to go to a ‘corrupt’ doctor – my doctor and even my father appear on this database, but neither’s acceptance of funds reflects anything dubious or even slightly questionable (an honorarium for

an invited lecture and the acceptance of a nominal amount then spent on treating staff to lunch). If data is not contextualized – whether it is quantitative like Dollars for Docs or qualitative like WikiLeaks and Pizzagate – audiences can't make good judgments. The problem is even worse when the information is rendered in visually pleasing but reductionist visualizations.

Another issue that is emerging is whether journalists are creating interactives that have the intention of being storytelling vehicles or clickbait, or somewhere in the middle. The economic incentives to create content that promotes extensive engagement on a site are real. Some of the journalism that tells interactive stories don't have advertising, though, either because the UX is intended to be so immersive so that it is not interrupted or because advertising is hard to integrate within the interactive experience. Other interactives are simply clickbait – albeit well-produced clickbait. These are interactives that do not have significant public civic information but are intended for entertainment: an interactive on the Westminster Dog Show, an interactive Oscar Ballot, listicles of tourist destinations, and beyond. The worst offenders are interactive quizzes – and publications from the *New York Times* to the BBC to *Slate* make use of them. The *New York Times* dialect quiz was a top traffic getter, while *Slate's* news quiz of the week has consistently been a traffic driver for years. Newsgames have for the most part been civic in orientation, but at what point will these games end up as “snack food” content? There is no problem with entertainment journalism; however, the incentive to create more clickbait interactives is present, many are clickbait, and they do return traffic. Perhaps the emphasis on interactives and their overproduction may lead to more presentation and quantification errors (FiveThirtyEight is a leading example in this case).

The ‘master narrative’ of interactive journalism has another problem – one that should have been taken into account by the scholarship thus far but has not. The coinage of ‘the master narrative of interactive journalism’ also brings to bear a development in journalism that is profoundly gendered – masters connotes male mastery. All of the studies that attempt to classify the emerging subfield by skills, geographical orientation, backgrounds, epistemologies, and beyond fail to actually address what might be the elephant in the room, so to speak: distinct imbalances in gender and other forms of diversity. NICAR, an association that prides itself on inclusivity, had a speaker list that was two-thirds male. The structural disadvantages that women face in being successful in STEM education and later in STEM fields are now also a barrier that will affect the future of the news industry. If interactive journalism can still save the industry, or be one critical force, will those doing this work be mostly male? This is a conversation that needs to happen among scholars and within the industry but has seldom been a focal point.

Finally, the ‘master narrative’ is also fundamentally problematic because of questions endemic to cosmopolitanism, globalization, and partisanship. Though there are some indications of interactive journalism happening in hyperlocal newsrooms (Radcliffe, 2013), Fink and Anderson (2015) rightfully point out that small newsrooms do not have the ability to foster cultures of data journalism. Keeping a skilled interactive journalist is hard for a world-class newsroom that can pay top dollar and near impossible for a small one that can't do so and lacks the branding to motivate an interactive journalist to take a pay cut. Though some tools are democratizing interactive journalism, such as basic chart builders and Google fusion software, interactive storytelling stands to be a more robust path for reader engagement at news organizations that already have better prospects in the digital ecosystem.

Moreover, the rise of partisan media also threatens the future of interactive journalism's reach. Partisan news organizations on both sides are manipulating data to enhance political claims; poor data visualization from the wrong organizations can lead to serious implications (consider Trump's retweet of a neo-Nazi's rendering of false crime statistics) (Hogan, 2015). In other instances, the move away from “facts” to news organizations that choose “ideology” over “objectivity” (Hemmer, 2016) suggests that the people who may benefit the most from interactive

journalism may not ever see it: those who most need rigorous interactive storytelling to bring them to places unlike where they live and those who could benefit from data visualization about hot-button issues may never see any of it. Interactive journalism holds promise, but it requires significant critique moving forward.

Further reading

Scholarship on this subject continues to emerge. For a more comprehensive account of the rise of interactive journalism, its incorporation into contemporary newsrooms, and the normative paradigm it advances, consider Usher (2016)'s book on the subject, *Interactive Journalism: Hackers, Data, and Code*, so far the only book-length treatment of the subject. Other related work on the ideology of interactive journalism includes Lewis and Usher (2013) on open-source values in journalism, Anderson's (2013) effort to create a sociology of computational journalism, and Parasić's (2014) discussions of the epistemological tensions of interactive journalism. For work outside the newsroom, consider Lewis and Usher's (2014, 2016) look at the global network of Hacks/Hackers and the formation of the Knight Mozilla News Technology Partnership, now called Open News. Howard's (2014) work provides a cataloging of interviews from dozens of the US and UK's top interactive journalists. Additional work by Broussard (2016) considers the take-up of big data practices as code sharing and applied research methods. But before starting along any line of research involving interactive journalism, Meyer's (2002) *Precision Journalism* should be examined as a classic that sets into motion the long line of scholarship and the incorporation of interactives into practice.

Note

- 1 www.datavis.ca/milestones/

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