

UNRAVELLING DATA JOURNALISM

A study of data journalism practice in British newsrooms

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The centrality of data in modern society has prompted a need to examine the increasingly powerful role of data brokers and their efforts to quantify the world. Practices and methods such as surveillance, biometrics, automation, data creeping, or profiling consumer behaviour, all offer opportunities and challenges to news reporting. Nonetheless, as most professional journalists display a degree of hesitancy towards numbers and computational literacy, there are only limited means to investigate the power dynamics underpinning data.

This article discusses the extent to which current data journalism practices in the UK employ databases and algorithms as a means of holding data organisations accountable. Drawing on semi-structured interviews with data journalists, data editors and news managers working for British mainstream media, the study looks at how data journalism operates within the news cycle of professional newsrooms in the UK. Additionally, it examines the innovations data journalism brings to storytelling, newsgathering, and the dissemination of news.

KEYWORDS data journalism; big data; data brokers; algorithms; power; materiality; performativity; reflexivity

Introduction

Modern society has witnessed the advent of an age of data superabundance. The scale of the data we have accumulated until now, and the speed needed to process it, have prompted a pressing necessity to understand the intricacies and the impact of data-driven technologies and practices in ordinary life, driving contemporary institutions into a race to harness the potential of *big data*.

As algorithms use data to make vital decisions about our lives in a domain free of public scrutiny, practices such as surveillance, biometrics, automation, consumer profiling, algorithmic predictability, and machine learning tend to agitate public opinion. Simultaneously, in a dynamic indistinguishable to the public eye, mediated discourses of innovation extol big data's messianic virtues as the cure to all societal illnesses, framing it as the ultimate panacea. Whilst reports on the marvels and failures of big data populate the mainstream news agenda, journalists debate whether to engage with governments and corporations in the construction of a reality increasingly modelled by informational data. As numeracy tends to be rather limited in professional newsrooms (Curtin and Scott, 2001), a growing demand for journalists able to investigate the power dynamics underpinning data is generally unfulfilled. Nonetheless, an emergent breed of data journalists, empowered by the methods and tools of data science, begins to display a remarkable understanding of the computing language and logics behind this datafication of

the world, making apparent a growing need to revise many of the traditional practices and philosophies of the news media establishment.

With all this in mind, this article discusses the extent to which current data journalism practices in the UK employ databases and algorithms to hold data organisations accountable. Additionally, through the prism of material, performative and reflexive frameworks, this research seeks to: 1) explain how data journalists operate within the news cycle of professional newsrooms in the UK; and 2) examine the innovations data journalism brings to storytelling, newsgathering, and the dissemination of news. Lastly, the article contributes to current debates on data power, and the materiality and professional practice of data journalism.

Materiality, performativity, reflexivity and power as explicative frameworks

This theoretical section seeks to briefly outline the four notions I used to analyse the idiosyncrasies of British data journalism practice and its ability to hold data organisations to account. In this respect, the notions of materiality, performativity and reflexivity serve as an explicative framework to understand how data as a material entity intermediates the professional practice and mindsets of data journalists. The article also draws on Foucauldian approaches to power relations and strategies to help explain the ways in which a burgeoning group of data brokers interact with the rest of society's institutions to negotiate power.

Materiality is not an alien concept to journalism studies, particularly since a current enthusiasm about Latour's Actor-Network Theory has stimulated a line of inquiry concerned with the materiality of data journalism artefacts (See Parasie 2015; De Maeyer et al. 2015). Research in this field focuses on the binary complementarity between actors (journalists) and actants (journalism technologies) facilitating the emergence of cybernetic hybrids capable of restructuring news labour (Turner 2005). More recent "object-oriented" approaches to journalism studies (Anderson and De Maeyer 2015; Neff 2015) shift their analytical focus from the human-nonhuman nexus to the social, material, and cultural contexts that shape a multiplicity of technology-driven spheres.

Here, I will employ Miller's distinction between a "vulgar theory of mere things as artefacts" and "a theory that claims to entirely transcend the dualism of subjects and objects" (2005, 3) to expand beyond a reductionist conceptualisation of data as *objective* evidence. By approaching data rather as a "body without organs" (Deleuze and Guattari 1987, 4) hence "something more than 'mere' matter: an excess, force, vitality, relationality, or difference that renders matter active, self-creative, productive, unpredictable" (Coole and Frost 2010, 9) I address a wealth of active automations powered by data which nowadays play a fundamental role in news production.

After determining how data is enacted by data journalists, I then look at the norms and discursive practices which enable data journalists to impose their constructed truths on the public (Broersma 2013). Broersma (2010, 17-18) remarks that journalism functions as a performative discourse that endeavours

to persuade the public of the truthfulness of its accounts, either by (re-)staging or retelling events and consequently attaching meaning to them, or by describing and producing phenomena at the same time. When it succeeds in persuading the public through the way it presents the news, journalism transforms an interpretation into a reality upon which citizens can act (17–18).

I will argue that the constant interplay between the elements that shape data journalists' performativity and the materiality of the data with which they interact, consequently mediates the reflexivity of these professionals. In this vein I define reflexivity "as a conscious and continuous attention to 'the way different kinds of linguistic, social, political and theoretical elements are woven together in the process of knowledge development, during which empirical material is constructed, interpreted and written'" (Guillaume 2002 citing Alvesson and Sköldbberg 2000, 5).

As data journalism finds its place within the vast spectrum of professional journalism practice, inevitably it has to interact with an emergent breed of power holders such as Facebook, Google, Wikimedia, IBM and General Electric, amongst other data conglomerates. In order to better understand the complexities of this interaction and its subsequent negotiation of power I resort to Foucault's ideas of power strategy as my conceptual point of departure. According to Foucault:

Every power relationship implies, at least *in potentia*, a strategy of struggle, in which the two forces are not superimposed, do not lose their specific nature, or do not finally become confused. Each constitutes for the other a kind of permanent limit, a point of possible reversal (Foucault 1982, 794).

Foucault observes that "between a relationship of power and a strategy of struggle there is a reciprocal appeal, a perpetual linking and a perpetual reversal" (Foucault 1982, 794). This means that power relations can cause a confrontation between data journalists; who want to expose wrongdoing within data corporations, and data brokers; who want to preserve corporate secrets to maintain their competitive advantage. The interaction between both adversaries can prompt mechanisms of power triggered by the influence that both exert on each other. This instability, remarks Foucault, provides a dual interpretation of the same event, from the perspective of either the struggle or the power relationships, generating dissimilar elements of meaning and types of intelligibility (Foucault 1982, 795).

Methodology

This qualitative research draws on 24 semi-structured interviews with key informants working for the Guardian, BBC, the Financial Times, Channel 4, the Trinity Mirror (ampp3d and regionals), the Times, CNN, Thomson Reuters, the Telegraph, STV, the Scotsman, the Herald, the detailtv, and the News Letter. Interviews were conducted face-to-face or via skype/landline between January 2014 and August 2015. Conversations focused on different aspects of the data news production process: How data journalists operate within the news cycle of

professional newsrooms in the UK; and what innovations data journalism brings to storytelling, newsgathering and the dissemination of news. The empirical data gathered was then categorised into four thematic domains, namely: 1) materials of the trade, 2) practices, 3) mind-sets and 4) power dynamics.

The number of British news organisations with the financial infrastructure required to appoint data journalists or set up data units was relatively small. Informants were selected following the principle of enculturation, defined by Spradley as “the natural process of learning a particular culture” (1979, 47). In this respect, informants with a high level of enculturation were selected from organisations performing data journalism within the mainstream UK media. Interviews were conducted with 12 data journalists or journalists working with data (coded as DJ₁ – DJ₁₂), eight data editors (coded as DE₁ – DE₈), two news managers (coded as NM₁ and NM₂), one programmer (coded as P₁) and one graphic designer (coded as GD₁). The geographic segmentation is as follows: 15 informants were based in London (five DJs, six DEs, two NMs, one P and one GD), one informant was based in Manchester (a DE), four informants were based in Scotland (four DJs), two informants were based in Northern Ireland (a DJ and a DE) and two informants were based in Wales (two DJs).

[De]constructing British data journalism

Epistemologically speaking, data journalism was defined by informants in terms of a constant interplay between two predominant paradigms. A portion of the informants suggested that data journalism refers to an ability to report through the articulation of quantifiable evidence (DE₄, DE₆) and its subsequent contextualisation through human testimony (DJ₄, DJ₇, DJ₈, DJ₉, DJ₁₂). Another portion of the informants remarked that data journalism, by means of a combination of journalistic and computing logics, sees beyond the structures of computerised information to unearth novel insights that are then packaged as a multi-layered, database-driven, informational experience. Informants unanimously agreed that the end is journalism—or telling stories—and data is the means to that end. The phrase “it's not data for data's sake” was frequently used to illustrate the significance of remaining anchored within the confines of journalism, and avoiding drifting away to the realm of computing science without a practical reason.

This epistemological diversification of data journalism's ethos materialises in the UK context as three predominant forms of data journalism practice that I will delineate next through the examination of their material, performative and reflexive dimensions.

Figures vs. databases: the materiality of data entities

From the testimonies of the informants, it became clear that the use of data by data journalists in the UK largely adheres to the rigid ethos of the Freedom of Information Act (FOIA) scheme. In this respect, the materiality of data obtained through FOI requests a) is mediated by ideals of alleged openness and transparency, b) is subject to the bureaucracy and politics of

public institutions (DE1, DJ4, DJ5, DJ7, DJ8, DJ12), c) covers themes circumscribed to public governance, health, education or crime, and d) is usable as long as it is provided in a machine-readable format (DJ7, DJ8). Despite being viewed by some of the informants as a powerful source for exclusives (DJ2, DJ4, DJ10, DJ12, DE1, DE4, DE5), the materiality of FOI-driven data provides a distinctive flavour to the reports of data journalists that generally restricts data-driven stories to the few topics outlined above, affecting not only the style of reporting but also the scope of the story (DJ4).

Notably, as web-scrapers and similar automations become normative elements of British data journalism (DE3, DE4, DE5, DJ2, DJ3, DJ11), data gathered through these techniques is infused with the flexible philosophy of computerised methods, fostering, as a result, problem-solving and creative ways of finding, compiling, and understanding unstructured informational data (DE5, DJ4). The adoption of such methods also provides a wider range of alternative sources of data, which allows data journalists to cover more diverse topics, thus overcoming the topical saturation of open/FOI data. In addition, this wider range of sources can help journalists to expose corporate wrongdoings, placing private institutions under similar degrees of scrutiny to those experienced by public power holders.

Within the rigidity and flexibility of both materialities, data mediated by FOI regimes is predominantly assumed to be a claimable material object (DJ2, DJ7) that functions as either an evidential input for stories (DE1, DE4, DE8, DJ3) or as a data-driven output, depending on the human agency of either journalists or experts to make the data understandable through proper contextualisation (DJ7, DJ12). Beyond the boundaries of object-oriented materiality, a number of informants rendered data as embodied entities capable of mediating their practices—web metrics informing editorial decision-making (DE5), for instance. Embodying embryonic forms of artificial intelligence, computerised algorithms are capable of agency, intentionality and decision-making, and act as companions during the news production process. Automations can also take the form of made-to-measure scripts or algorithms to process vast amounts of data at great speed (DE7, DJ4), scrape unstructured data, generate visualisations that aid the analysis process (DJ2, DJ10, DJ11), or to create datafied outputs, which challenge the very conventions of what is newsworthy (NM2, DE3, P1). Within smaller news outlets, data journalists have to resort to generic, third-party solutions limited by the universality of their user-interface design. This distinction between large and small news companies is primarily driven by a lack of advanced computational skills and a technological infrastructure that creates a gap between data journalists with the competences to query data in its own terrain, and data journalists who have to spend more time finding ready-made tools to fit their lines of inquiry.

These idiosyncratic aspects of data materiality clearly pervade the performativity and reflexivity of data journalists, mediating how they perceive themselves and their working procedures. In this sense, a portion of informants felt comfortable performing more elementary forms of data analysis to produce FOI-driven stories. Another portion felt the need to utilise techniques employed in computer science to provide structure to data obtained through

less conventional methods, such as web-scraping, thus escaping the constraints of open data regimes and the limited thematic flavour that the FOIA scheme granted their stories.

The shifting performativity of data journalism

Surfacing in a sphere where journalistic performativity is legitimised through the rigorous adoption of axiomatic conventions institutionalised almost a century ago, data journalism has had to adhere to these established norms in order to be acknowledged as a serious form of journalism by audiences and the news industry alike. Perhaps that is why informants referred to journalistic authority as a paramount principle shaping their performativity (NM1, DE6, DE7, DJ3, DJ5, DJ12). Concurrently, in an attempt to overcome the high levels of public mistrust that normative journalism suffers nowadays, data journalists have resorted to an additional set of discourses and conventions to legitimise their performativity in the public eye and persuade audiences of the veracity of their accounts.

In this respect, informants agreed that data journalists resort to the principle of numeric infallibility in providing quantifiable evidence in their stories, which is then reinforced by the rigour of statistical methods used during the news-production process (NM1, NM2, DE1, DJ2, DJ4, DJ5). Additionally, they adhere to the premise of computational neutrality by using technologies that arguably circumvent human bias and efficiently perform automated gathering, analysis and presentation of unstructured journalistic information.

Informants almost unanimously stressed the significance of data journalism's collaborative nature. The absence of certain advanced computational skills and/or the restricted access to certain information compelled some of the informants to embrace open-source ideals and seek internal or external collaboration in their efforts to, firstly, overcome these limitations, and secondly, to generate and explain phenomena simultaneously.

Data journalists tend to engage with audiences in collaborative crowdsourced projects by sharing datasets as part of their news outputs. Furthermore, as data journalism ideals impregnate the news culture of professional newsrooms, specialised correspondents seek to collaborate with data journalism units to provide soundness and robustness to their stories through the use of numeric evidence and rigorous scientific methods. An informant observed that some of the best stories they have produced were those where data journalists collaborated with specialised correspondents (NM1). Collaborative projects where data journalists, developers, statisticians and graphic designers interacted were deemed by informants as very effective; combining the expertise of various disciplines to produce ground-breaking news experiences (NM1, DE1, DE2, DE3, DE4, DE7, DJ1, DJ4, GD1, P1). Data journalists with rather limited technical competences and infrastructure, tend to collaborate with external programmers, civic initiatives, third-sector organisations and libraries, trusts or universities to generate stories.

As data journalists try to fit within the rigidly-established performativity of the professional newsrooms where they operate—simultaneously developing

their own individual performativity—their practices diversify into different forms of data journalism. In this sense, informants distinguished between daily, quick turnaround, generally-visualised, brief forms of data journalism (DE6, DJ3); extensive, thoroughly-researched, investigative forms of data journalism (DE2, DE7, DJ1, DJ4); and light, editorialised, entertaining, often-humorous, gamified forms of data journalism (DE3, DE4). In terms of approaches to data, exclusive stories sometimes emerged from data (NM1, NM2), whilst at other times data was used to fact-check allegedly objective information that was already in the public domain (DE3, DE4, DJ5). As for the work flow, data units could generate content commissioned by data editors, act as datafied internal news wires (NM2, DE5, D11) or, as mentioned before, collaborate with other beats or specialist reporters in co-authored longer projects (NM1, DJ3, DE6).

This increasingly common collaboration between data units and beat/specialist correspondents in datafied affairs has resulted in data journalists investing much of their time in training sessions, assistance or simply dealing with data-related issues that in many cases are outside their core remit (NM2, P1). In order to deal with their heavy workload, some data units have created basic automated tools for traditional journalists struggling with data that can assist them in the generation of simple data journalism outputs (NM1, DE1, P1), so that they can better allocate their time and efforts in more investigative, high-end projects.

Nose for news vs. computational cognition

In spite of the increasing relevance of computerised dynamics and their disruptive effect on the performativity of data journalists, journalistic reflexivity prevailed as essential. In this respect, a couple of informants at editorial level claimed that within the constraints of the newsroom cycle it was more feasible to train traditional journalists to become data-savvy and capable of writing scripts at a very basic level than to teach programmers a proficient level of journalism (DE4, DE7). Informants almost unanimously stressed that their primary goal was to tell journalistic stories and the varying degrees of technical experience they possessed served to achieve that goal (DJ1, DJ3, DE1, DE6, DE8).

Nonetheless, the testimonies of data journalists and editors with the highest proficiency in computing science inadvertently proved how heavily their reflexivity was pervaded by traces of computational thinking. These informants demonstrated a high degree of efficiency in overcoming the typical limitations of open/FOI data, displaying a remarkable capacity for problem-solving and an exceptional understanding of the functioning dynamics and the architecture of web technologies (DJ1, DJ2, DJ6, DE5, DE7).

Often referring to the improvement of the user experience, these data journalists approached data as a means to generate innovative ways to offer users a compelling news experience (NM1, DE4, GD1, DJ2, P1), as opposed to linear news stories following more conventional norms. Their mindset and approach evoked many of the well-established principles of user-interface or human-computer interaction design of computer science, thus disrupting normative forms of journalistic storytelling.

Some of the informants regarded computing skills and thinking as essential for contemporary data journalism, explaining that data literacy and basic notions of computing were required to work within their data units (DE1, DE2, DE3, DE4, DE7, DJ3). One of the informants observed that computing knowledge enabled him to work individually, maintaining control over projects at every stage of the process, hence reducing the appearance of errors, misrepresentations or misinterpretations (DJ2).

Although journalistic attitudes remain deeply ingrained within the reflexivity of data journalists, a clear merging with computational logics was noticeable. In fact, more than half of the informants declared that data literacy should be an essential skill for journalism in the near future (NM1, DE1, DE4, DE5, DE7, DJ4, DJ5, DJ7, DJ8, DJ10, DJ12).

The central-regional divide

Following the material, performative and reflexive analysis of the current state of affairs in data journalism in the UK, a closer examination of the testimonies of the informants suggested a set of noticeable discrepancies between central and regional British data journalism.

Central news organisations such as the Guardian, the Financial Times, the BBC or the Times are championing the development of cutting-edge data journalism as their executive boards recognise the added value of data journalism units (NM1, NM2, DE1, DE2, DE5, DE6, DE7, DE8). Meanwhile regional data journalism—with a few exceptions such as thedetail, the Trinity Mirror, and BBC Scotland—tends to be strongly limited by internal organisational and editorial pressures and by the scarce human and material resources. Despite having a devolved data policy, Scotland displayed a higher degree of editorial hesitancy towards data journalism, which was interpreted by most of the Scottish informants as a barrier to the definitive consolidation of data journalism in Scotland.

Data journalists working centrally tend to seek collaboration within the confines of their news organisations, generally with specialist reporters, in order to preserve the brand identity of their stories (NM1, DJ2). News organisations following this dynamic normally possess the required infrastructure and know-how to develop ambitious journalistic projects in-house. Smaller news organisations, operating on the periphery of the regions, equally pursue collaboration internally but tend to reach out for external collaboration in an effort to palliate the lack of technical skills or the scarcity of resources. Informants mentioned that they frequently collaborate with civic organisations and open source initiatives (such as Hacks/Hackers or scraperwiki) that seek to establish partnerships with developers; or seek advice from communities of programmers (DJ6, DJ7). Collaborations with libraries, trusts or foundations (DE5) were deemed fruitful when the datasets were collated, curated and maintained by these organisations in a pristine manner. Occasionally, some projects engaged in a partnership with third-sector organisations (DE8) or private companies (DE5) that contributed to the project by opening up their databases for journalistic scrutiny.

Amid claims of journalistic authority over computational proficiency, at least half of the regional data journalists felt limited by their inability to write software code, regarding this skill as a powerful enabling agent in data journalism. On many occasions, these informants expressed a degree of frustration when the generic third-party solutions they used for data processing or visualisation were not compatible with the software infrastructure of their news outlets or were not fit for certain projects they pursued.

The data editor is solidly established in central data journalism as a figure who not only has editorial autonomy over the content produced within the unit, but more importantly is a mediator between the rest of the newsroom and the editorial staff (DE₁, DE₂). The role varies in each news organisation, but they are largely responsible for negotiating the workload of their journalists—making sure they are not overwhelmed by requests from other desks. Data editors also organise and deliver training sessions on data journalism for conventional journalists within their newsrooms (DE₁, DE₂, DE₅, DE₇).

The challenges of holding data brokers accountable

Despite an initial thesis that described data journalists and data brokers as opposing forces; results suggest that before engaging in this struggle—if that even happens—data journalists tend to struggle with two internal forces. These two forces consist of a) a power relationship through which data journalism is acknowledged by fellow journalists as a serious form of journalism and not only a service or support unit (DE₁, DE₂, P₁), and b) a continuous power struggle with constantly-evolving data technologies, philosophies, logics and dynamics. Externally, they struggle against powerful corporations that are pioneers not only in the development of the technological platforms and architectures that data journalists are trying to understand or adapt to, but also in the establishment of the legal framework surrounding the business models developed by these datafied technologies and platforms.

Although data journalists are fully aware of the power dynamics driven by emergent data brokers (NM₁, DE₁), most of them feel that they can contribute to uncovering wrongdoing within these domains as long as they are collaborating with beat/specialist journalists traditionally commissioned to cover these areas: business, technology, and science. Beat reporters are perceived by the informants as the most suitable professionals to investigate the behaviour of news subjects, sources, and news events within the confines of data power arenas (NM₁, DJ₁, DJ₄, DE₂, DE₆, DE₇). As pointed out by an informant: “There is a difference between data being the story or the issue and data-driven journalism which can apply to whatever the subject matter” (DE₆). Similarly, another informant observed “You don’t want to conflate the Big Data world and the data journalism world because they are doing very different things” (DJ₃).

In this scenario, access to the corporate data held by data brokers does not depend on the advanced computational skills of data journalists, but on the will of insiders, whistleblowers, or leaks and similar traditional means (NM₁, DJ₂, DJ₄, DJ₅, DJ₁₀, DE₁, DE₇).

In spite of the growing expansion of open data schemes regulated by FOIA regimes, many data journalists have recognised that open data is too overly politicised to be used effectively for journalistic purposes, deeming the data scraped from websites or obtained through informants or similar conventional methods to be more appropriate (DJ2). In this sense data journalism seemingly works better as an alternative methodology or philosophy that adapts to journalistic themes or beats—be that sports, or investigative journalism—to provide both a robust backbone to stories, and tools to efficiently make use of web-based knowledge infrastructures.

Conclusions

This article has provided a panoptic overview of the current state of affairs in British data journalism. Through the examination of its material, performative and reflexive dimensions, data journalism is defined in terms of a constant interplay between two predominant paradigms: a) reporting through the articulation of quantifiable evidence and its subsequent contextualisation through human testimony; and b) a combination of journalistic and computing logics to see beyond the structures of computerised information and unearth novel insight that is then packaged as a multi-layered, database-driven, informational experience.

As the practice becomes more popular in the UK, data journalism units have been established in most of the newsrooms that comprised the sample. In cases where a data unit was not in operation, a minimum of one data journalist was appointed—or worked informally—to write data-driven journalism or to collaborate with other specialist correspondents in co-authored pieces. In this respect, data journalism practice is fully ingrained within the news cycles of the majority of the mainstream organisations studied, and has been approached strategically as a means to create sound, robust, transparent and collaborative news exclusives that offer a better and more interactive informational experience for the public. After a period of consolidation, data journalism practice in the UK has largely diversified into three forms of data journalism: a) a daily, quick turnaround, generally-visualised, brief form of data journalism; b) an extensive, thoroughly-researched, investigative form of data journalism; and c) a light, editorialised, entertaining, often-humorous, gamified form of data journalism.

Despite generalised claims in favour of journalistic authority over computing skills, data journalism has potentially disrupted an otherwise quite normative practice by gradually infusing the performativity and reflexivity of traditional journalists with traces of computational thinking. The clearest indication of this is the progressive replacement of linear storytelling by more interactive and engaging forms of informational user experience that offer multi-layered, multiplatform, gamified, database-linked dynamic content. This informational experience appears to be heavily mediated by the ontologies of user-interface design, user experience design (UXD) and human-computer interaction, which signals the pervasiveness of computational thinking in data journalists' reflexivity. The news production process has also been considerably transformed following the increasing prevalence of active embodiments of data,

such as algorithms, metrics, web-scrapers and other forms of automation or artificial intelligence that nowadays are part of professional newsrooms.

Data journalists have also innovated by institutionalising a whole new range of norms and conventions to both legitimise their practice, and overcome generalised public mistrust of journalism. In this respect, data journalism uses methods reinforced by values such as numeric infallibility, scientific rigour, computational neutrality, crowdsourced collaboration, intra- and extra-newsroom cooperation and hyperlocal empathy, to generate exclusives that are generally perceived as more accurate and transparent. Notably, because of the collaborative nature of this type of news reporting, data journalists' authority is not affected when members of the public challenge their data or when alternative angles to their stories are suggested by audiences. In fact, they embrace this kind of public engagement as a natural part of their news reporting.

As for the power dynamics driven by emergent data brokers, informants declared that those were subjects commonly covered by beats such as technology, business or even science. Data journalists did not see such topics as part of their core remit, and explained that they would collaborate in projects related to data power insofar as they included a database-related component they were responsible for, whilst the specialist correspondent reported on content-related issues. In spite of the informants' remarkable understanding and knowledge of issues related to the aforementioned power brokers, data journalists acknowledged their limitations as data experts when dealing with the inaccessibility of the data held by data corporations. In such instances, they preferred to uncover this type of data through traditional methods such as leaks or whistleblowers.

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