"Putting It Together, That's What Counts": Data Foam, a Snowball and Researcher Evaluation

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Open data, institutional data, personal data and social data can be gathered by a data broker, deemed to be adding value by creating unprecedented combinations. Some or all of the original data may not belong to the broker, but their control of data flows and ability to combine different sources takes the existing data points into something new that can be sold and resold. This new object may be seen as beneficial, where the data donor and/or society receives something in return, or what I call 'data foam', where the new product or service has little or no benefit to anyone other than the seller. This chapter explains the concept of data foam, using the specific example of the increasing use of metrics in researcher evaluation.

The concept of the surveillant assemblage (Haggerty and Ericson 2000) or data double (Poster 1990) is a familiar one. People are aware that their data are profitable to corporations, for marketing and insurance purposes, crime prevention and control and myriad other uses. The privacy intrusion is seen as acceptable, if they receive something in return (Gordon 2014). This is a part of the price we pay for cheaper and more personalised products and services, and has come into its own with the rise of 'freemium' apps for mobile devices and the seemingly almost

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compulsory engagement with platforms from Google and Facebook in order to engage with modern life. Our shadows are always with us.

There are so many data-related metaphors now: data flows, data journeys, data friction, data doubles, data ghosts. Why throw another into the fray? Why 'data foam'? Well, the various components of the 'assemblage' can be agitated again and again to produce a new and shallow layer of dubious value on top of the seemingly reasonable use of data in public statistics or as payment for products and services. This agitated ephemeral layer, this 'foam', is another product or service to be sold—not to solve a problem but to create a market or influence decision-making.

Is charging for value-added services really an unproblematic aspect of open data and 'leaky' data (social media, institutional/work data, phone data, CCTV, ANPR, data others put out there on our behalf) (Bates 2012)? Who benefits? Whose labour is not compensated or valued? Are platforms really the problem? Is the financialisation of open data, that should be publicly owned and not necessarily exploited for profit (Bates and Goodale 2017), and personal data, that should not be weaponised against a user (Lyon 2003; G.J.D. Smith 2016), the price we have to pay to live and work in the twenty-first century?

Once, my wallet was stolen in a large store in an out-of-town shopping centre. There were no witnesses and, according to the duty manager, the area of the store where I had been standing when it happened was not covered by CCTV—it was an open area with no shelves and therefore no chance of employees or shoplifters damaging or stealing stock or fittings. The security camera in 'public' areas does not exist to protect citizens, but to monitor employees and protect property. Workplace monitoring and productivity metrics are again not for the benefit of the surveilled. So combinations of these data sources, frothed up into something new, are used for decision-making that rarely benefits the data creator. It is exacerbating existing problems.

The new objects created from combining sources, this data 'foam' on top of the existing flows, can be used for monitoring, marketing, assessment and control. Cambridge Analytica's algorithms worked with their unique combinations of Facebook data to influence the outcomes of the UK EU referendum vote ('Brexit') and the 2016 US Presidential

election. Elsevier's 'basket of metrics' is used for researcher assessment, comparison and employment decisions. The call centre or warehouse performance dashboard and the Bradford Factor for measuring employee absenteeism are so old fashioned now that you can combine video tracking, social media and physical social interactions of employees and persuade them to do corporate wellness wearables such as Corporate Wellness 360, which offers corporate wellness packages where staff are provided with devices that generate 'smart data' and advanced analytics for employers.

Quantification in higher education made its biggest early strides on the student-facing side of the university, providing 'richer information' (Williamson 2016) to support 'learning and teaching' via learning analytics, recruitment and retention management and course and tutor evaluation (Hall 2016). It crept slowly into the work of the researcher, as the regular research evaluation exercises started to take hold in many countries, with academic tenure, promotion and recruitment committees also enjoying the 'evidence' provided by cold hard numbers (Besley and Peters 2009). The quality of research could suddenly be measured by the Impact Factor of the venue in which the outputs were published, the number of times they were cited, a star rating in the research excellence framework (REF), and the ability of the researcher to bring in grant funding against targets. The backlash against such crude measures (Gruber 2014; Anonymous Academic 2015) has only encouraged the spawning of yet more metrics, bringing in quantification of impact via social media data and other sources (Martín-Martín et al. 2016) and touting the value of Lambert's (2003) 'basket of metrics' for researcher assessment (Clements et al. 2016b).

Metrics are not merely 'neutral' statistics as all chapters in the current edited collection maintain. When multiple actors use a measurement, it becomes a visible artefact that can be compared with other artefacts—a material object that did not exist before (Pine and Liboiron 2015; Moore and Robinson 2016). The production and analysis of these artefacts is a profitable service, be it traditional bibliometrics, which serve disciplines such as the humanities very poorly (Thelwall and Delgado 2015; Stelmach and Von Wolff 2011), or the alternative article level metrics commercialised as Altmetrics (owned by Digital Science) and Plum

Analytics (Roemer and Borchardt 2015), which was acquired by Elsevier in February 2017.

The vast number of publications produced by researchers every year led to a call by some for the human evaluation panels of the REF to be replaced in part or in whole by metrics, and an extensive multi-stakeholder review led by James Wilsdon (Wilsdon et al. 2015) recommended that metrics be used responsibly and only to support qualitative decision-making, not replace it. This recommendation has been upheld by the recommendations of the recent Stern Review (Stern 2016), despite Elsevier lobbying the government for the tender to run the new metricised REF (Eve 2016), although it seems that the new teaching excellence framework (TEF) will rely heavily on metrics (Department for Business Innovation & Skills 2015, 2016).

CRIS (current research information systems) such as Pure and Symplectic are explicitly designed to be reporting tools as well as bibliographic management systems, including the generation and exposure of metrics and comparisons,. Institutional repositories (IRs) have also been used alongside or instead of CRIS in REF reporting and exporting data to funders for Researchfish (Clements et al. 2016b; Hinrichs et al. 2015). Researchers often feel uncomfortable with audit culture (Apple 2005; Sparkes 2007; Cahill and Irving 2015; Back 2016; Anonymous Academic 2015), and policymakers and managers are doing little to address this concern (Cruickshank 2016), while librarians continue to embed Altmetrics, bibliometrics and Snowball metrics into the research sharing infrastructures they control (Sonkkila 2015; Ward et al. 2015; Clements et al. 2016b). Academic SNS are also engaged with metrics, ResearchGate even devising its own version of the h-index, following interest in its proprietary ResearchGate Score (ResearchGate 2016; Kraker and Lex 2015).

Studies of academic identity often refer to the 'game' of academia, with the strive for 'excellence' and need to achieve highly on publishing and teaching metrics, as one where they do not understand the written rules, or they feel ill-prepared to play (Pereira 2015; Sparkes 2007; J. Smith 2010; Krause 2009; Levin and Montero Hernandez 2014; S. Ball 2000; Winn 2014),—even as they recognise their role in this game at various stages in their careers (S. Smith 2015; Watermeyer 2015;

White 2012; Barry et al. 2001; Zembylas 2007; S. Moore et al. 2016). This performative aspect to working life (J. Butler 1988) and academic identity (S. Ball 2000; Gendron 2008; Morrissey 2015; Musselin 2013), based on Goffman's ideas of social performance (Goffman 1956), adds additional pressure to the academic's experience of work and time that is not experienced by other higher education workers.

It could be argued that the constant drive for improvement in 'excellence' also moves away from learning about learning for the benefit of society and towards metrics, compliance and evidence for the benefit of third parties, where reporting is a proxy for actual improvement and consistency of approach is actively discouraged (Collini 2012). Collini is talking about teaching here, but the same could be said of research, in a move away from increasing the sum of human knowledge and understanding towards again metrics, compliance and reporting (S. Moore et al. 2017). Beer (2016a, b) argues that measurement 'produces uncertainty and competition'; it individualises people and stimulates intense affective responses. It is important not just to consider how the academic rat-race and the metrics associated with it affect the careers and working lives of researchers but also how they affect researchers' affect. In other words, measures are affective even when they are not effective, and how they make researchers feel is as an important a consideration as the behaviours they target.

If Zuboff (2015) is correct and the current logic of capital accumulation is 'surveillance capitalism', the biggest commercial players in academic publishing and research sharing are already involved in researcher monitoring or surveillance via the data journey (Bates et al. 2016) through the profiles, linkages, data intersections and metadata (Beer and Burrows 2013) managed and controlled via their products and services. The publishing giants provide a full range of these to researchers and libraries and institutions, including citation analysis products (Harzing and Alakangas 2016; D. Butler 2016), CRIS (Clements and McCutcheon 2014), researcher identification systems and analytics (Yu et al. 2016; Elsevier 2014; Ware and Mabe 2015), PDF and reference management services (Manoff 2015), research data management (European Union 2016) and other researcher tools such as profile services and research notebook software (Martín–Martín et al. 2016; Hoey

2015; Banks 2016; Boersma 2016; Nicholas et al. 2016; Cutler 2012; M.E. Smith 2016; Parker-Gibson 2015). The real threat may not be publisher control of research outputs, but of workflows and data flows, which are far more difficult for either researchers or librarians to ethically disrupt.

> What's wrong with a big for-profit company producing such metrics? What does it mean if Elsevier owns this data?…The data is not available to the people or institutions or disciplines it purports to measure. It cannot be contested, it cannot be re-analyzed, it cannot be investigated, it cannot be downloaded. It just has to be trusted. (Kelty 2016)

Elsevier are also part of the Snowball Metrics initiative (Green 2014; Wilsdon et al. 2015), used by some institutions in benchmarking university outcomes (Jump 2014), monitoring researcher productivity and informing academic recruitment decisions (Dresbeck 2015). In some cases, Snowball Metrics are linked directly to the CRIS (Clements et al. 2016b), and Elsevier have lobbied the UK government in the hope of becoming the preferred supplier of metrics for future research assessment exercises (Wilsdon et al. 2015; Eve 2016). The Elsevier product Scopus is already used for the Times Higher Education world university rankings, despite its poor reporting of research outputs other than journal articles and conference papers and thus marginalisation of arts, humanities and social science work (THE reporters 2016). Elsevier, and their competitors know that ownership of data flows (K. Ball et al. 2016; Baker and Millerand 2007; J. van Dijck 2015; Helmond 2015) is valuable. In August 2016 another large publisher, Wiley, acquired the publishing software company Atypon (Wiley 2016), who provide the hosting platforms and analytics services used by their rivals SAGE (SAGE 2016) and Taylor & Francis (Atypon 2016). Academic publishing is no longer primarily a 'content' business (Lovink and Rossiter 2005; Schonfeld 2017).

Elsevier market Snowball Metrics as 'crucially, bottom-up' (Snowball Metrics 2017b), with project partners at research-intensive universities in the UK and working group members in the US, Australia and New Zealand. This framing implies that researchers themselves are driving the

metrics initiative (Jump 2014; Green 2014). However, the endorsements plastered across the Snowball Metrics website are from research management staff, not academics. John T. Green, the originator of the concept, is keen to sell himself as a Life Fellow of Queen's College, Cambridge (Green 2013), but had ceased being an active researcher many years ago. He was working in research administration before he entered the academic publishing industry and then education consultancy. The language of these website endorsements is alien, resembling the technocratic and managerialist approach that is mocked and resisted by increasing numbers of researchers (Brandist 2016; Wood 2010; D. West 2016; Morrish 2014). For example:

> Snowball Metrics is about working on and sharing a common language so that institutions are confident that they can use all of their data to compare their performance with each other in an apples-to-apples way. (Jennifer Johnson in Snowball Metrics 2017c)

> We have begun to source data, taking that which is readily available and trying to ensure it conforms to standards, yet cognisant that something is better than nothing in what is a sector that has struggled to grasp and accept performance management. (Rutherford, in Snowball Metrics 2017a)

Snowball Metrics 'agreed and tested methodologies' are provided in the friendly-sounding 'Recipe Book' (Colledge 2014; Snowball Metrics 2017c). These metrics enable institutions to benchmark their performance against their competitors and inform decision-making about individuals and departments. For example, the metric Applications Volume 'calculates the number and price of research grant applications that are submitted to external funding bodies'. Researchers and departments can be evaluated using the various metrics against the expected amount of citations, grant income per full-time equivalent member of staff and number of co-authored outputs for their field.

Academic librarians and scholarly communications professionals serve two masters—their institution and their users (academics and/or students). Sometimes they see benefit in serving a third—commerce. The

publishers and vendors of research-related services who sell their products to these professionals are not the enemies of research, clearly, but there is a conflict of interest when said professionals can be found shilling for metrics providers at conferences, on vendor websites and in journal articles. Librarians profess to hold values relating to intellectual freedom and serving the user (Berg and Jacobs 2016; Weissinger 2003; Foster and McMenemy 2012), which are aligned with researcher values and ideals such as academic freedom and furthering the sum of human knowledge (Winter and O'Donohue 2012; Morrish and Sauntson 2013; Ylijoki 2003). These values become compromised when this third master is served, when librarians involve themselves with promoting Elsevier's competitive measures of productivity (Reznik-Zellen 2016) and provide data and justification for strategies that quantify 'Publications in Top Journal Percentiles' and 'Academic-Corporate Collaboration Impact' (Clements et al. 2016a) . Information is shared between Snowball Metrics users via a 'free' data brokerage system, but how aware are those at the sharp end of being measured that this is even happening? What value does this kind of quantification bring to an institution unless it is thinking of itself predominantly as a business?

Elsevier and the academic support professionals who promote them make quantification seem reasonable by referencing the need to employ more than one metric and supplement numerical data with qualitative data from peer review (Reznik-Zellen 2016; Darroch and Colledge 2016), as if it were the crudity of single numbers that was the problem and not the process of assessment itself and its links with funding income and employability, precarity and stress (Martín–Martín et al. 2016; Trullen and Rodríguez 2011; Raaper 2015). Metricisation only serves to intensify this process.

Elsevier produced metrics-based models (Jump 2015), marketing fluff (Wise et al. 2016) and responded to consultation (Elsevier 2014), trying to legitimise a use for their data foam products such as SciVal and Snowball in potential reforms to the REF that would replace or 'enhance' peer review with metrics in research evaluation (Wilsdon et al. 2015; Green 2014) . This idea has thankfully since been rejected (Stern 2016). Via the Freedom Of Information (FOI) process, despite attempts by the relevant department to block his requests, Martin Eve was also

able to discover the content of a meeting between Elsevier representatives and the UK Minister for Higher Education (Eve 2016), which discussed metrics further.

Researchers engaging with openly sharing their research outputs have to relinquish control over how and by whom data related to their identity (Jefferies 2016) and their research workflow is circulated (Beer 2013) at some point, be it to the institution, academic SNS, their funder, the State, etc. However, when one supplier controls or has access to most of the data flows, individual pieces of information can be combined in ways that are harmful to the individual, their community or both (Bossewitch and Sinnreich 2012; José van Dijck 2014; José van Dijck et al. 2016; Leszczynski 2015). Is it fair or reasonable that the same highly-profitable companies (Larivière et al. 2015) who publish your work, paying nothing for your labour in writing and reviewing, also profit selling from data about you and services based on their ability to quantify your worth?

The individual researcher is encouraged to think about their own research, their own metric scores, their own career. Considering the impact on their community is not part of the marketing of research evaluation metrics, nor how competition and quantification can work against the values held by researchers. Metrics are sold as accountability and transparency, of personal benefit to the ambitious researcher, the very least deserved by the mythical 'taxpayer' funding the research.

Possessive individualism, where every individual is a self-interested and competitive 'proprietor' of their skills, owing nothing to society, is the prevailing attitude of people in a 'marketised' society—according to Macpherson (Macpherson 2011), who defined the term, and others writing about the modern era confirm his view (Gilbert 2013; Hayles 2005; Garrod 2016; Sevignani 2012). The 'digital possessive' (Gordon 2014)—where digital networks are material objects and those objects are ordered within personal interfaces—can be seen in online profiles, which are an externalisation of a person's subjectivity, experiences and networks (Boyd and Ellison 2011; Baym and Boyd 2012). Academic SNS and some of the features of institutional and commercial research software can be seen to support this new 'possessive' profile and network norm, in a marketised higher education environment (Hall 2015). The digital possessive and possessive individualism come together not only in

research sharing infrastructures, such as the rebadging of the University of Sheffield's implementation of the Symplectic system as 'MyPublications', but in attitudes to academic entrepreneurship (Ozga 1998; Peters 2001; Winn 2013; Giroux 2013), knowledge production (Olssen 2016) and the power of having access to and being able to disseminate knowledge online (Cottey 2010, 2014).

Academic researchers differ from many other workers engaged in research and development activity, in that while their work may officially be 'work for hire', academic convention has it that the university waives its copyright claim and returns it to the researcher (Wesolek and Royster 2015; Kelty 2014). Unless the Stern Review (Stern 2016) recommendations on the non-portability of research outputs is implemented, it is also currently the case in the UK that the institution where the researcher works at the time of the REF can claim their output, rather than at the time of acceptance or publication, which gives researchers with publications in hand a 'bargaining chip' when looking to be hired or promoted by an institution. Research outputs belong to the individual researcher—not the institution or the public. They are 'theirs' to share. The metrics associated with those outputs may be the only academic capital that the contract researcher, holding neither grant money nor job security, is able to accrue.

While established academics may rightly feel aggrieved at the increased level of surveillance and quantification in academia (Burrows 2012; Shore and Wright 2015; Morrish and Sauntson 2013), it could be argued that the real victims of data foam and the metrics gold rush are Ph.D. students and early career researchers. Universities are handing over large amounts of money for the right to use proprietary products, such as Altmetric, Plum Analytics, Scopus, Web of Science et al. (Schonfeld 2017) while entrusting much of their teaching and research to low-paid precarious workers and research students (UCU 2016). Meanwhile, senior researchers have name recognition and social and financial capital (Walsh 2016; Fuller 2015), and can afford to make bold proclamations on the evils of sharing work via Academia.edu and ResearchGate (Bond 2017) and ridicule the use of social media by vulnerable scholars (Stewart 2016; Lupton 2014). The level of autonomy wished for by junior researchers, captured by Beyoncé in Brown et al. 2016 - 'I dream it, I work hard/I grind 'til I own it' - is stymied by the realities of the modern academic job market.

The prestige economy (Blackmore and Kandiko 2011) favours male academics (Coate and Howson 2014), and the numbers do too (J.D. West et al. 2013; van den Brink and Benschop 2012; Bröckling 2005). Google Scholar's algorithms and the use of citation indices to filter the vast quantity of publications in the literature searches (Gruber 2014) prioritise the already-cited over the new and exciting. Meanwhile, women, people of colour and disabled researchers are overrepresented in 0 h and casual contracts (UCU 2016; Lopes and Dewan 2013)—if they manage to remain within academia at all. Precarious researchers and those without current institutional affiliation cannot rely on the visibility of university website profiles, that for them tend to disappear at the end of their contract if they are entitled to one in the first place, and a track record built over years of 'academic freedom'. New academics have to prove their worth, be discoverable to potential employers and collaborators and stand out in recruitment exercises that prioritise high scores for h-index and grant income figures over the reading and understanding of their work, their skills and their potential (Havergal 2016).

Success in the 'basket of metrics' and the ranking systems such as university league tables employing this data assume the norms of scientific disciplines and English-speaking countries (Fiormonte and Priego 2016). Books and book chapters have not been well accounted for (THE reporters 2016), which disadvantages humanities and social science scholars, as well as disciplines that produce outputs aimed at practitioners outside academia as well as researchers. Additionally, practice-based outputs in the arts are badly captured by systems for capturing information and metrics about research, as well as the artworks themselves (Nadim and Randall 2013; Research Councils UK 2015; White, Wendy and Hemmings 2010; Gramstadt 2012). Productivity and quality are based on the quantity and venue of publication, and speedy citation, rather than a longer term or qualitative view. Spending 2 years writing a book that only counts as two outputs in a research assessment exercise and takes 10 years to show its influence, while bringing in a few thousand in related grant income, looks shabby in quantitative terms next to a life scientist who co-authors 30 highly cited articles a year and is able to command a multimillion-pound lab.

There has been a move in the UK REF from the submission of a variety of outputs suitable to their field (books, performance, media, etc.) towards publication patterns that favour academic journal articles across the disciplines (HEFCE 2016). While humanities researchers, in particular, have explained the problems around using metrics to assess their work, including differences in citation patterns and the half-life of research outputs (Thelwall and Delgado 2015; Hicks and Wouters 2015; Benneworth 2014; Stelmach and Von Wolff 2011), the response from the data foam industry has been to conjure up yet more metrics for predicting and measuring success (Brynjolfsson and Silberholz 2016; Taylor 2016; Van Noorden 2016).

Clegg (2013) suggests that the move towards affective economies—where 'emotions do things, and they align individuals with communities' (Ahmed 2004)—in higher education, which has been criticised for gendering division of academic labour (Hey 2011), may lead to a 'more hopeful account of the academy'. In this account, people are more likely to act meta-reflexively (Archer 2007, 2010), reflecting on their own reflections, and fight for their values rather than adhere to self-interest and societal norms. Some signs of this hope can be seen in the recently published *Academic Diary* (Back 2016) and the fostering of collaborative online communities that are values-driven (Costa 2015; Hall 2013; Gornall and Salisbury 2012; McAlpine 2016).

More negatively, along with the increase in corporate agency also foreseen by Clegg, evident in individualised 'wellness' approaches to managing the 'risk' of ill-health in the academy (Saltmarsh and Randell-Moon 2015), there are less sanguine examples of acting on principle such as the resignation of Sara Ahmed in protest at institutional failure to address the problem of sexual harassment (Ahmed 2016). Principles of one department may not be aligned with another. As Hanke (2016) states: 'a new dependency arises in the fluidity of the network university when data on institutional-level research performance is processed and used by upper-level administrators to manage lower-level faculty-administrators'. Services have an interest in collecting data to prove their value to senior management (Curtis + Cartwright Consulting 2011; D. Maxwell 2015), and are often required to report to external agencies and initiatives—such as UK anti-terrorism programme Prevent

(Heath-Kelly 2013) —which do not necessarily benefit, or can even harm, users of those services. Buying into data foam products like metrics and algorithmic software of dubious value in order to fulfil these requirements may come to characterise this era of management. As Bowie (2002) asks, 'Why stay in a sad place where they don't care how you are?' - researchers could legitimately ask how valued they are by the institution and question the values held by those who promote data foam. Whether the research office or the academic library handles the invoices for the data foam explosion, it is the quantified researcher who pays.

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