

Sociology of quantification

Numbers for Policy: Practical problems of quantification, Castelldefels

In this session we look at the **Sociology of Quantification** as based on the review essay of Elizabeth Popp Berman and Daniel Hirschman (The Sociology of quantification: where are we now?).

Works reviewed

Caring Capitalism: The Meaning and Measure of Social Value, by **Emily Barman**. New York: Cambridge University Press, 2016. 226 pp.

Engines of Anxiety: Academic Rankings, Reputation, and Accountability, by **Wendy Espeland and Michael Sauder**. New York: Russell Sage Foundation, 2016. 281 pp.

The Quantified Self, by **Deborah Lupton**. Malden, MA: Polity, 2016. 183 pp.

The Seductions of Quantification: Measuring Human Rights, Gender Violence, and Sex Trafficking, by **Sally Engle Merry**. Chicago: University of Chicago Press, 2016. 249 pp.

Quantified: Biosensing Technologies in Everyday Life, edited by **Dawn Nafus**. Cambridge, MA: MIT Press, 2016. 243 pp.

Self-Tracking, by **Gina Neff and Dawn Nafus**. Cambridge, MA: MIT Press, 2016. 233 pp.

Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy, by **Cathy O'Neil**. New York: Crown, 2016. 259 pp.

When Bad Policy Makes Good Politics: Running the Numbers on Health Reform, by **Robert Saldin**. New York: Oxford University Press, 2017. 168 pp.

A decade ago, Wendy Espeland and Mitchell Stevens published an essay titled “The Sociology of Quantification.”

[...] one of the most notable political developments of the last thirty years has been increasing public and governmental demand for the quantification of social phenomena, yet sociologists generally have paid little attention to the spread of quantification or the significance of new regimes of measurement [...]

(Popp Berman & Hirschman)

However, this has clearly changed.

Nowadays there is a proliferation of scholarship on numbers.

This proliferation of scholarship on numbers goes hand in hand with a proliferation of numbers itself...

New technologies: **quantified-self**

Explosion of internet: **big data**.

“The role [of statistical indicators] has increased significantly over the last two decades. This reflects improvements in the level of **education** in the population, increases in the **complexity of modern economies** and the widespread use of **information technology.**”



CMEPSP (2009). Commission on the Measurement of Economic Performance and Social Progress, URL: http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf last accessed June 2014.

[...]“Sociology has become quantitative researchers and qualitative researchers studying quantification” [...]

Popp Berman & Hirschman revisit the sociology of quantification: emerging themes and signs of new subfield

General finding:

- Still very far from having general claims or a common theoretical language (more of a genre than a subfield)
- Lacks well-defined object of study, shared theoretical concepts and agreed-upon methodological toolkits
- Vibrant conversation about quantification happening across many different fields, but works are only loosely connected

Studies that touch on quantification cluster around **four** broad questions:

- 1. What shapes the production of numbers?*
- 2. When and why do numbers matter?*
- 3. Who should govern numbers?*
- 4. How should quantification be studied?*

Question 1: *What shapes the production of numbers?*

Focus is set on the technopolitical decision making that guides methodological choices (who gets to decide what we quantify and how we do it?)

[“The project of making numbers is in itself sociological, with some actors more influential than others and some numbers easier than others to produce”]

A significant part of the sociology of quantification is simply showing how social, technical and political factors interact to make stable numbers.

Question 2: *When and how do numbers matter? When does quantification make a difference?*

Much like the broader debate in political science and sociology around the causal power of ideas, it can be difficult to tease out **which kinds of numbers matter and when.**

Question 3: *How do we govern quantification? How Should we govern quantification?*

- **Contemporary controversies:** range from concerns about the fairness of predictive algorithms, to privacy concerns surrounding the circulation of our most intimate choices, captured and transformed into big data.
- New and old questions of **about governance.**
- Barriers to **democratic deliberation** (e.g. simple numbers/calculations can have a tremendous impact on policy areas such as education).

See Andrea's example on the OECD-PISA study in his 'Methods' lecture.

Question 4: *How should scholars study quantification?*

At least 3 varieties of quantification studies can be identified:

- Some authors focus on the effects of a **particular (often new) genre of quantification** (Popp Berman and Hirschman examine three texts that look at the quantified-self movement as examples of the approach)
- Some studies **compare across different practices of quantification** that share some common features or that are mobilized in the same empirical domain
- **Case studies** that situate a single calculative practice inside a deep study of a single field or decision-making context.

["The sociology of quantification remains a genre with recurring motifs only, not an integrated literature with coherent terminology and a clear research program"]

We take a closer look at studies that point to some productive ways of thinking about numbers...

Coming back to question 1: *What Shapes the Production of Numbers?*

(Bruna's lecture and the craft behind making numbers & labour involved to making quantitative knowledge claims)

Researchers interested in the power of quantification investigate **how and why we came to have the numbers we have.**

In particular, researchers focus on **the experts, politics and technologies** that shape the production of numbers.

Sally Engle Merry's *The Seductions of Quantification* and Emily Barman's *Caring Capitalism* tackle this question and approach is with slightly different theoretical orientations but with similar methods and very compatible findings.

Sally Engle Merry: *The Seductions of Quantification*

- Approaches the creation of human rights indicators through comparative ethnographic work (sited in the UN and U.S. State Department)
- Analyses the creation and circulation of indicators that attempt to measure violence against women, human trafficking and compliance with human rights treaties

- Indicators are produced by communities of shared expertise, and are shaped by power inequalities among competing experts.
- History matters: “expertise inertia” and “data inertia”.

→ Past decisions about who counts as an expert, how experts are trained, what kinds of data are relevant, and what data have actually been collected shape the potential for developing new indicators or reforming existing ones.

(In Merry’s case, experts were relatively limited in their capacity to collect data, and thus existing data sources became major resources and serious constraints, on the creation of global human rights indicators.)

Emily Barman: *Caring Capitalism*

Examines six cases of efforts to measure social value of activities for purposes of investment.

Finds that “value entrepreneurs” draw on their **own forms of expertise** (which suggest what to measure), in conjunction with their “communicative goals” (do they want the valuation device to establish legitimacy? show conformity? Change behaviour? Justify a field?) to produce a particular valuation device.

Demonstrate the role of expertise in suggesting what is worth quantifying and in the political process through which a number stabilizes (or fails to do so).

Put differently: the politics of quantification are not open and democratic, but closed and technocratic.

Experts thus figure prominently in the central challenges of commensuration (discussed by Andrea in his 'Ethics of quantification' lessons).

Neither Merry nor Barman attend much to the technologies through which quantification is built.

Both focus on somewhat older modes of quantification, but there are immense **new quantities of data being produced as parts of other technological and bureaucratic transformations.**

[...] Merry and Barman work helps us to think how this new data “avalanche” is opening up space for new forms of quantification and how this is channelled into particular measures and stabilized (or not) around the political projects of particular expert communities and entrepreneurs [...].

This brings us back to question number 2...

Back to Question 2: When and why does quantification matter?

(What does quantification actually do?)

[...]“The forces shaping the production and stabilization of new forms of quantification matters because quantification itself matters” [...]

[...]”there would be no reasons to care about how numbers are produced in absence of evidence that such numbers had the potential to powerfully alter the trajectories of individuals, organisations and fields “ [...]

Range of effects of quantification: from self- to scale

The quantification of every-day behaviours changes our *subjective experience*

Neff & Nafus *Self-Tracking*

Lupton *The Quantified Self*

Nafus eds. *Quantified: Biosensing Technologies in Everyday Life*

Focus on how new quantification technologies (e.g. self-tracking affects the self

How quantification affects the self.

Neff & Nafus: Discuss new tools that have become available for monitoring our steps, our meals and heartbeats.



People use self-tracking to achieve a variety of goals:

- To monitor and evaluate themselves (was I productive today?)
- To elicit sensations (how do I feel at a particular glucose level?)
- To satisfy aesthetic curiosity (what patterns can I see in a map of my bike rides?)
- To debug a problem (what food triggers my migraine?)
- To cultivate habits (can I hit 10,000 steps per day?)

How quantification affects the self.

...*Are the numbers liberating or disciplining?*

[...] Sociologists are likely to start with some doubt about the liberating nature of quantification – with fear that the technologies we use to monitor ourselves for fun or out of curiosity produce data that companies use to sell us products, and that employers constrain our actions [...]

Freely chosen activity ...

Beyond doubt that it can have positive impacts ...

..until your insurance provider requires it ...

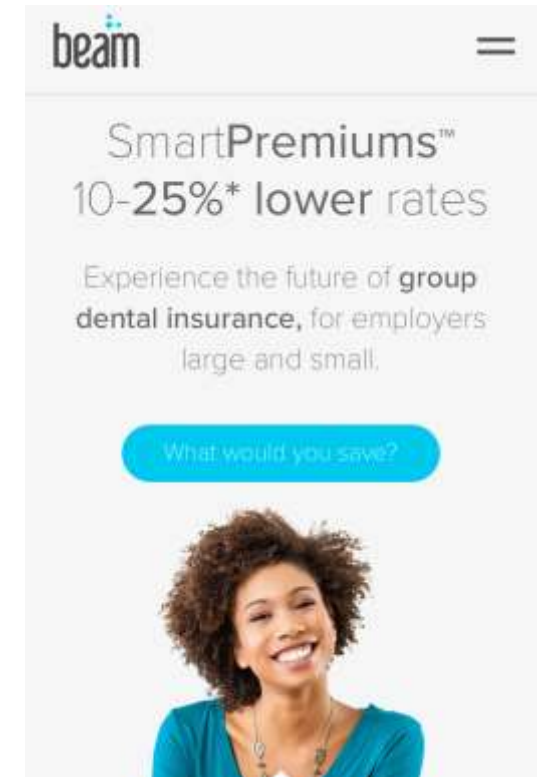
The Columbus, Ohio, company, called [Beam Dental](#), started out by selling Bluetooth-connected toothbrushes, meaning that their product communicates with an app.

Once they got people using it, the founders saw an opportunity to use more than a year's worth of data they collected to move into the dental insurance market. The idea is to figure out which of their users are regularly flossing and brushing their teeth, and therefore less likely to run into expensive problems like root canals and cavities, and offer them cheaper rates and other incentives.

Customers who sign up for Beam's plan get shipped a connected toothbrush plus a regular supply of things like floss and replacement heads. Those who opt-in to use the smart brush -- and share that data with the app -- can get a lower rate on their premiums.

The company stresses that it doesn't share the data about its users' brushing parties with third-parties.

For Kleiner, Beam represents an opportunity to crack into a lucrative corner of the medical insurance market. As Frommeyer puts it, dental involves "significantly fewer regulatory and network headwinds," than traditional health insurance.



The image shows a screenshot of the Beam Dental app interface. At the top left is the 'beam' logo, and at the top right is a hamburger menu icon. The main content area features the text 'SmartPremiums™' followed by '10-25%* lower rates'. Below this, it says 'Experience the future of group dental insurance, for employers large and small.' A blue button with the text 'What would you save?' is positioned below the text. At the bottom of the screenshot is a photograph of a smiling woman with curly hair wearing a teal top.

How quantification affects the self.

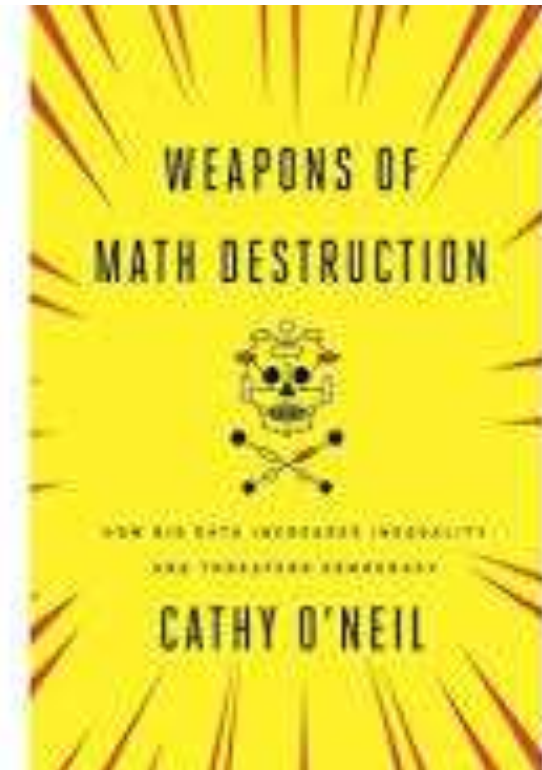
What cannot fully be answered is how we can encourage a *more liberating use* of quantification and *less of a controlling*.

The concept of “contextual integrity” is proposed by Nissenbaum and Paterson (in Quantified): ‘a new set of standards in architecture, law and policy that differentiate between contexts in which one should expect privacy, and others in which the sharing and sale of data can be assumed or conducted with permission’.

There are new and pernicious forms of how we interact and react to, many numbers that impact our lives at individual level...

O'Neil's Weapons of Math Destruction:

Numerous examples of models of decision-making that are opaque, damaging and scalable – the characteristics she says define Weapons of Math Destruction (WMD's).



Examples

The proprietary LSI – R (Level of Service Inventory – Revised) model:

Predicts a prisoner's chances of recidivism from a questionnaire.

It uses secret methods and is grounded in factors strongly associated with race and other forms of disadvantage.



When the numbers produced by WMD's lead to decisions that affect our lives, we are forced either

- to **respond** to the model (as when we try to raise our credit score) or*
- are **trapped without recourse** (if the model is fully opaque).*

*→ WMD's often make decisions based on statistical associations that are nevertheless **not causal** (poor credit does not in itself cause people to perform worse as employees)*

*→ Or they reflect **structural inequalities** (prior arrest is associated with neighbourhood, which in turns is associated with race; their accuracy of recidivism may have nothing to do with individual culpability)*

The effects of numbers are not just felt on the individual level, but also affect communities, organisations and fields

Espeland & Sauder Engines of Anxiety: tackles the U.S News & World Report law school rankings as a much simpler yet deeply transformative form of quantification.

Yale University

New Haven, CT

 #1 in Best Law Schools

\$62,170 (full-time) TUITION

625 ENROLLMENT (FULL-TIME)

Stanford University

Stanford, CA

 #2 in Best Law Schools

\$60,270 (full-time) TUITION

565 ENROLLMENT (FULL-TIME)

Harvard University

Cambridge, MA

 #3 in Best Law Schools

\$62,792 (full-time) TUITION

1,757 ENROLLMENT (FULL-TIME)

Espeland & Sauder show the organisational and field-level effects of law school rankings

Within organisations, practices emerge and relationships change in response to ranking

- Marketing becomes more important (both to generate applications and to improve reputational scores)
- Deans spend a substantial amount of energy on managing rankings
- Colleagues and other schools become competitors

Across the field, the distribution of status and opportunities changes.

- Reducing diverse schools to a single measure means homogenizing them and allowing fewer niches for specific types of excellence
- Small differences are amplified (students take it seriously that their life trajectory might be meaningfully worse if they attend #24 instead of #21, and so schools must as well)

Finally, beyond organisations and fields, **numbers also have effects on other numbers.**

- Numbers currently established affect what we will measure in the future (Merry's concept of "data inertia").
- Numbers produce their own future meaning, as they produce "**reactivity**" (Espeland & Sauder) among those subject to them.

O'Neils "**pernicious feedback loops**" are the most extreme version of this reactivity...

O'Neils “pernicious feedback loops”

A model predicts that a prisoner from a poor, highly policed neighbourhood will be more likely to be re-arrested and keeps him in prison longer...

When he is out and returns to his neighbourhood, he is more likely to re-offend having been in prison environment longer.

When he does, the model's prediction – offenders from this neighbourhood will re-offend – is proven correct and the model reinforced.

Plenty of questions remain about not just whether numbers matter, or how they matters, but when...

This leads us to the ethical questions...

Back to question 3: How should we govern numbers?

Numbers play an increasing role in governing social life.

Must we simply accept their proliferation in whatever form as inevitable, or are there better or worse ways they can be used?

*O'Neil Weapons of Math Destruction: Provides a rubric for deciding whether any given model for decision-making deserves our **condemnation**.*

O'Neil tells us to ask three questions:

Is it opaque?

Does it scale?

Can it do damage?



Define opaque and damage?

Example of a bad model:

The LSI – R model is opaque: What goes into it? How are scores generated?

It scales: 24 states in the U.S. use it at present according to O'Neil.

It has the potential to do serious damage, keeping someone locked up for longer based on factors that they have no control over.

Greater transparency as a solution ?

Greater transparency can actually be a double-edged sword:

- *Many numbers are meant to incentivise certain behaviour, and if their calculation is mysterious, they can't produce the desired effects.*
- *As long as numbers have consequences, though, people will try to game them, and transparency facilitates this...*

Saldin's Case study on the Community Living Assistance Service and Supports (CLASS) ACT.

The CLASS (Community Living Assistance Service and Supports) Act, designed to improve long-term care insurance, was included in Obama-care purely to improve its Congressional Budget Office (CBO) score. Users would pay premiums from day one but would not be eligible for benefits for five years. This meant that over the 10-year period that went into the CBO score, CLASS would look extremely lucrative, offsetting some of the Affordable Care Act's other costs. Yet over a 40-year period, it would cost \$2 trillion. The program was included in order to make the numbers work despite the fact that it was completely unsustainable. Despite becoming law, CLASS was never implemented, because the Obama administration couldn't find a way to make it remotely feasible.

[...] The transparency of the CBO process is precisely what made this gaming possible [...]

Greater transparency as a solution?

*[...] Opacity, despite its other drawbacks, may be the only way to quantify without changing behaviour [...]
(But no solution either when the actual purpose of quantification is to change behaviour).*

The needle to thread:

[...] The trick is to create quantification techniques that encourage the desired behaviour changes but minimizes the opportunities for gaming (with legislation that produces the desired numbers but undermines its intent) [...]

The examples highlight that there is a need to focus on the how of quantification as much as the mere fact of it – as with any powerful tool, the effect depend on intentions and implementation

[...] Though numbers in the wild may certainly be used in ways their creators never anticipated, clearer and more explicit attention to the purposes of both producers and consumers would help us think more clearly about variation in the quantification process across contexts [...]

[...] One of the clearest take-aways from these books [...] is the blurriness of quantification and the need for conceptual categories that will help to unpack it.

What qualities are specific to rankings, indicators, or models, or algorithms? What does quantification share with related concepts like commensuration or categorization? [..]