data-ppf.github.io 2021-01-26

lecture 3 of 14: risk and social physics

chris wiggins + matt jones, Columbia

student observations: data

```
  46 individual
  27 gigerenzer
  27 mortality/death/deaths
   8 physics
   5 subjectivity
...
   3 race
...
   2 phrenology
```

students on individual

Role of individuals in Q's program:

- "Like my classmates, I was quite struck by Quetelet's conjecture that statistical laws are true for groups even when they might be false for the individual. . . 'obliteration of the particular by the general is responsible for the preservation of society,' "

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  - Q emphasizes: individual deviations do not disprove the rule
- " 'individual will' itself is submerged beneath general facts and causes of the society." Q interprets as challenge to free will!

Gigerenzer: Risk, resistance, and subjectivity

- " Gigerenzer notes that even when statistical research was done to the benefit of those taking risks, such as when buying lottery tickets or annuities, the people taking these risks were hesitant to actually follow the courses suggested by the data."

Gigerenzer: Risk, resistance, and subjectivity

- " Gigerenzer notes that even when statistical research was done to the benefit of those taking risks, such as when buying lottery tickets or annuities, the people taking these risks were hesitant to actually follow the courses suggested by the data."
- “Gigerenzer also highlights the bias of the general public towards statistics, noting how insurance companies and other such businesses of risk (gamblers) initially ignored the statistical findings on mortality because such findings contradicted instituted business practice as based on a particular worldview”

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- ““practitioners of risk” who were “positively anti-statistical” "

Race and phrenology

The most memorable quote from this week's reading: "Criminals, for instance, have the animal organs largely developed, and those of the moral and intellectual faculties or at least the moral, deficient; and the uses of the regularity in the number of crimes will be found in these causes which produce a given number of defective brains annually. . . " (Quetelet, 1842). By today's standards, this sentient would be considered grossly wrong, but such assertions, much like outdated practices such as phrenology and eugenics have used science to justify flawed assertions about the workings of the world. Though not discussed much in today's readings, Quetelet also developed the body mass index (BMI) system, which has been criticized today for giving a flawed measure of personal health to the lack of consideration of muscle density versus fat.

guiding questions every week

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- Scientific and mathematical development

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- Technologies and engineering

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- Driving forces: money, prestige, resources, Imperial competition

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- Scientific and mathematical development
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- how did new capabilities rearrange power? (who can now do what, from what, to whom?)

themes

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- non obviousness and resistance to statistical analysis of human phenomena

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- focus on deviance (in Europe) + understanding "otherness" (colonial/imperial spaces)

readings: Gigerenzer, Quetelet, Porter, F. N. David

Vulgar statistics and the resistance to numeration

Against numerical statistics

"These stupid fellows," a German polemicist wrote in 1806, "disseminate the insane idea that one can understand the power of of a state if one just knows its size, its population, its national income, and the number of dumb beasts grazing around."
Numerical depiction "does not touch upon the spiritual forces and relationships of states, morals, the divine." Such statisticians "see quality not at all, but only quantity."

Illegitimacy of quantification

- a French Academy of Sciences in 1831 reported against any numerical method in medicine “for each patient has his own individuality, problems in medicine are always individual, the facts presenting themselves for solution one by one, the treatment in each case depends on a happy instinct supported by numerous comparisons and guided by experience.” (in David, 11)

And yet. . . “avalanche of numbers”

Counting of

- crops

Census hard wired into US Constitution of 1791

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Counting of

- crops
- resources

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And yet. . . “avalanche of numbers”

Counting of

- crops
- resources
- peoples – massive demographic worries

Census hard wired into US Constitution of 1791

Numerical but not mathematical

Not much of application of

- Probability

Largely descriptive endeavor

Numerical but not mathematical

Not much of application of

- Probability
- Statistics of observational data

Largely descriptive endeavor

Pre-statistical background: Gigerenzer, et al.

The Empire of Chance: How Probability Changed Science and Everyday Life. Ideas in Context. Cambridge: Cambridge University Press, 1989, Section 1.6 (“Risk and Insurance”)

resistance

resistance

- Why resistance to probability among practitioners of risk: science of risk "positively anti-statistical"
  "Writers on annuities gave analogous advice. The practice of risk was not simply astatistical; it was positively antistatistical in its focus on the individual case to the neglect of large numbers and the long term."

Whose knowledge matters

- Whose knowledge significant in this case?

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- Whose knowledge significant in this case?
- How do they gain expertise?
- What sort of knowledge needed for, say insurance?
- Who is best placed to make descriptive and prescriptive judgments?

What needs to change in conception

- What is new conception of world and of people required?

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- How do numbers apply to contingency in the world?

What needs to change in conception

- What is new conception of world and of people required?
- How do numbers apply to contingency in the world?
- Are human “countable” in any meaningful way

Prescriptive

- What do we prescribe–what do we do as a matter of policy–on the basis of understandings of risk?

guiding question what do you need for a statistical world-view?

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- next few weeks seeing

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guiding question what do you need for a statistical world-view?

- next few weeks seeing
  - change in practitioners
  - change in sources of knowledge
  - political and social power of statistical inquiry

2) Adolphe Quetelet

"Preface" and "Introductory," *A Treatise on Man* (1842)

- What is this new science of man?

Let's talk through a few stages of *On Man*.

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  - Who produces this knowledge
  - How different from earlier "sciences" of "man"?

Let's talk through a few stages of *On Man*.

Experience

Experience alone can with certainty solve a problem which no a priori reasoning could determine. It is of primary importance to keep out of view man as he exists as an insulated, separate, or in an individual state, and to regard him only as a fraction of the species. In thus setting aside his individual nature, we get quit of all which is accidental, and the individual peculiarities, which exercise scarcely any influence over the mass, become effaced of their own accord, allowing the observer to seize the general results. [5]

Regularity

This remarkable constancy with which the same crimes appear annually in the same order, drawing down on their perpetrators the same punishments, in the same proportions, is a singular fact, which we owe to the statistics of the tribunals. In various writings, I have done my utmost to put this evidence clearly before the public; I have never failed annually to repeat, that there is a budget which we pay with frightful regularity—it is that of prisons, dungeons, and scaffolds. [6]

“society”

Society includes within itself the germs of all the crimes committed, and at the same time the necessary facilities. It is the social state, in some measure, which prepares these crime, and the criminal is merely the instrument to execute them. Every social state supposes, then, a certain number and a certain order of crimes, these being the merely the necessary consequences of its organization. [6]

Moral phenomena resemble physical phenomena

It would appear, then, that moral phenomena, when observed on a great scale, are found to resemble physical phenomena; and we thus arrive in inquires of this kind, at the fundamental principle: that the great the number of individuals observed, the more do individual particularities, whether physical or moral, become effaced, and leave in a prominent point of view the general facts, by virtue of which society exists and is preserved. [6]

fundamental focus: “average man”

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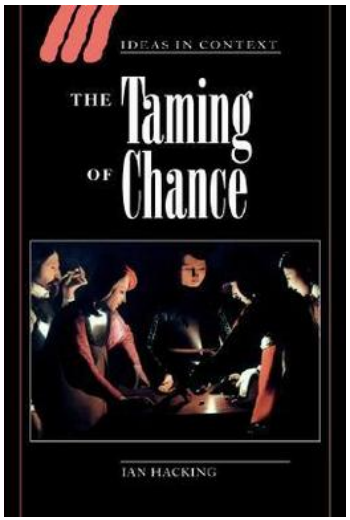
- averages *characterize* the normal types of a given society or race

  "A race would be characterized by its measurements of physical and moral qualities, summed up in the average man of that race." (Ian Hacking, 107)



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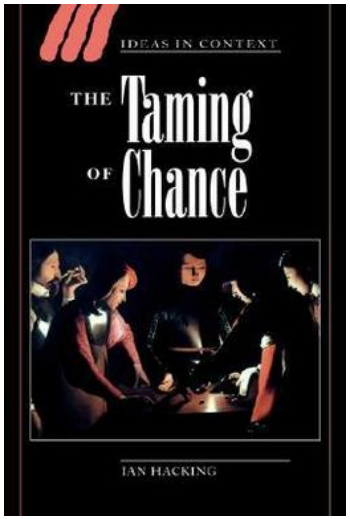

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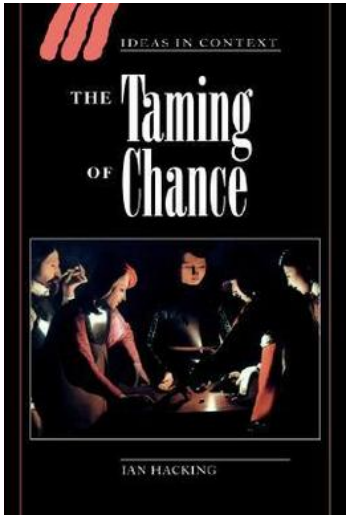

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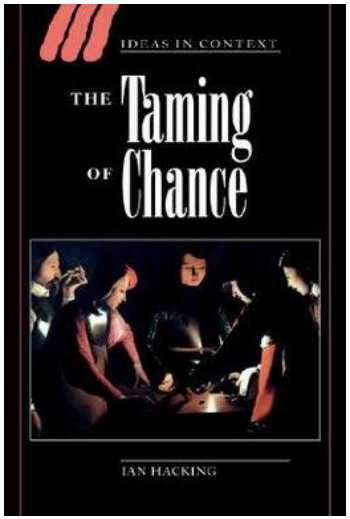
- developmental: differences of individual human being



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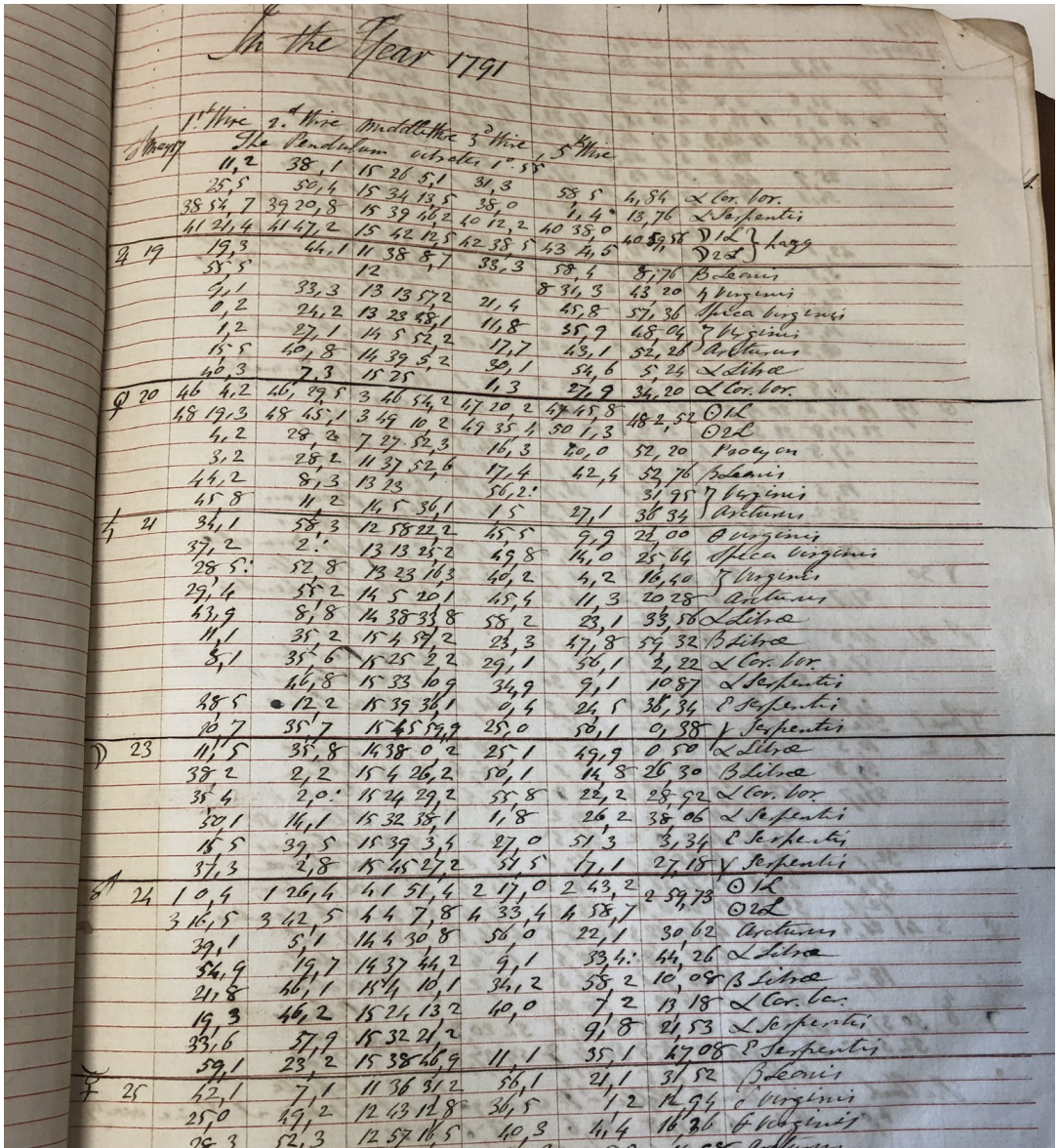
technologies of dealing with data

- major conceptual leap in moving from astronomy to society
- combine *larger* amounts of data with
- mathematical techniques for dealing with *observational* data

astronomy

- issue: variation among observations taken by various people at different times with different equipment



astronomy

- how find true value of the star's position given variation in *observations* by fallible humans and instruments

astronomy

- how find true value of the star's position given variation in *observations* by fallible humans and instruments
- great mathematicians (Legendre, Gauss, Laplace) show how to use least squares to reduce data and discern "true" position of the star

Quetelet applies this *technology* to human beings

- transfer idea of discerning average amid variation to measurements of *many different human beings*

instead of asking:

He now asks now:

Quetelet's crazy jump was to treat averages *about human beings* as if they were real quantities out there that we were discovering, as if the average height of a population was a real thing, just like the position of a star, to describe the population "objectively."

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instead of asking:

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He now asks now:

- how find true "average" given variation among members of a *population*

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Example: measuring soldiers

- measurement of chests of Scottish soldiers

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- LAB on Thursday!

movement from PHYSICAL to MORAL characteristics

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- stability of marriages, crimes, etc.

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movement from PHYSICAL to MORAL characteristics

- stability of marriages, crimes, etc.
- display very similar regularities to those of height, weight, etc.
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from regularities to laws of *society*

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With Quetelet work, "statistical laws that were merely descriptive of large-scale regularities" turned into "laws of society and nature that dealt in underlying truths and causes." [Hacking 108]

- average captures something real above and beyond each person, something about the group itself, something about how each individual group member acts.

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- Porter is a *secondary source*: what questions should we ask in reading one?

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- lots of context around Quetelet's role in shaping our thinking about data, people, and policy.
- Generally, how does P interpret and explain what Q is up to?
- Anything you found wanting in P's interpretation?

Connection with science

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J. E. Portlock, organizer of the short-lived statistical society of Ulster, who be- lieved that statistics represented the empirical stage of a social science [like] "astron- omy, zoology, botany, chemistry, and geology."

LIBERAL POLITICS

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LIBERAL POLITICS

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- 46: "If social physics is to be conceived in part as a testament to the confidence and ambition of the astronomer, it must also be recognized as a paean to social order in the spirit of gradualist liberalism".
- 56: "Secular social evolution" rather than what sort of political change?

DEVIANCE and HUMAN MEAN

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"The implication of Quetelet's idealizations of the mean was that all deviation from it should be regarded as flawed, the product of error. This did not imply, however, that variation must stand outside the domain of science, for the special task of probability theory was"to establish an admirable precision where one believed there were only games of chance." (Porter, 104)

CHARACTERIZING PEOPLE AND RACES: LOOKING AHEAD

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- Average man as "type" of nation [Porter 52]
  The perfectibility of the human species is derived as a necessary consequence of all our investigations. Defects and monstrosities disappear more and more from the body; the frequency and the gravity of maladies are combated with greater effectiveness through the progress of medical science; the moral qualities of man will meet with improvements no less tangible; and the more we advance, the less need we fear the effects and the consequences of great political upheavals and wars, the plagues of humanity. [On man, vol 2., 326-7]

pointing towards eugenics

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Two parts of eugenics

- characterizing humans with new "objective" measurements

"In short, the average man led to both a new kind of information about population and a new conception of how to control them." (Hacking 108)

NEXT WEEK: GALTON AND EUGENICS

pointing towards eugenics

Two parts of eugenics

- characterizing humans with new "objective" measurements
- social policies to alter "average qualities of race"

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NEXT WEEK: GALTON AND EUGENICS

WHAT SCIENCE MAKE POSSIBLE and THINKABLE

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- Social MODEL for new forms of science of mass phenomena

> *The evident success of statistics as an approach to social science was not interpreted by contemporaries as vindication of a metaphysic which regarded the laws governing certain domains as only probable. On the contrary, statistical laws were deliberately formulated to extend the certainty of sciences like astronomy and mechanics to knowledge of phenomena which hitherto had resisted exact scientific investigation. (69; our emphasis)*

WHAT SCIENCE MAKE POSSIBLE and THINKABLE

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- new sense of what means to accept *uncertainty* around individuals while having knowledge of whole

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power and principles

how did new capabilities rearrange power? who can now do what, from what, to whom?

role of rights, harms, justice?

foreshadowing data for Thursday

reminder of themes/big main takeaways

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up next

appendix

appendix

- 2021-01-12: intro to course

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- 2021-01-19: setting the stakes

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- 2021-01-26: risk and social physics

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- 2021-01-26: risk and social physics
- 2021-02-02: statecraft and quantitative racism

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- 2021-02-23: WWII, dawn of digital computation
- 2021-03-09: birth and death of AI
- 2021-03-16: big data, old school (1958-1980)
- 2021-03-23: data science, 1962-2017
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appendix

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- 2021-01-26: risk and social physics
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- 2021-04-13: present problems: attention economy+VC=dumpsterfire
- 2021-04-15: future solutions