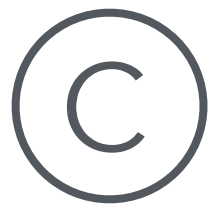


Big data, social physics, positivisme

Introduction à l'épistémologie du numérique

Wikipédia - Savoir - Historique - 14 mars 2013

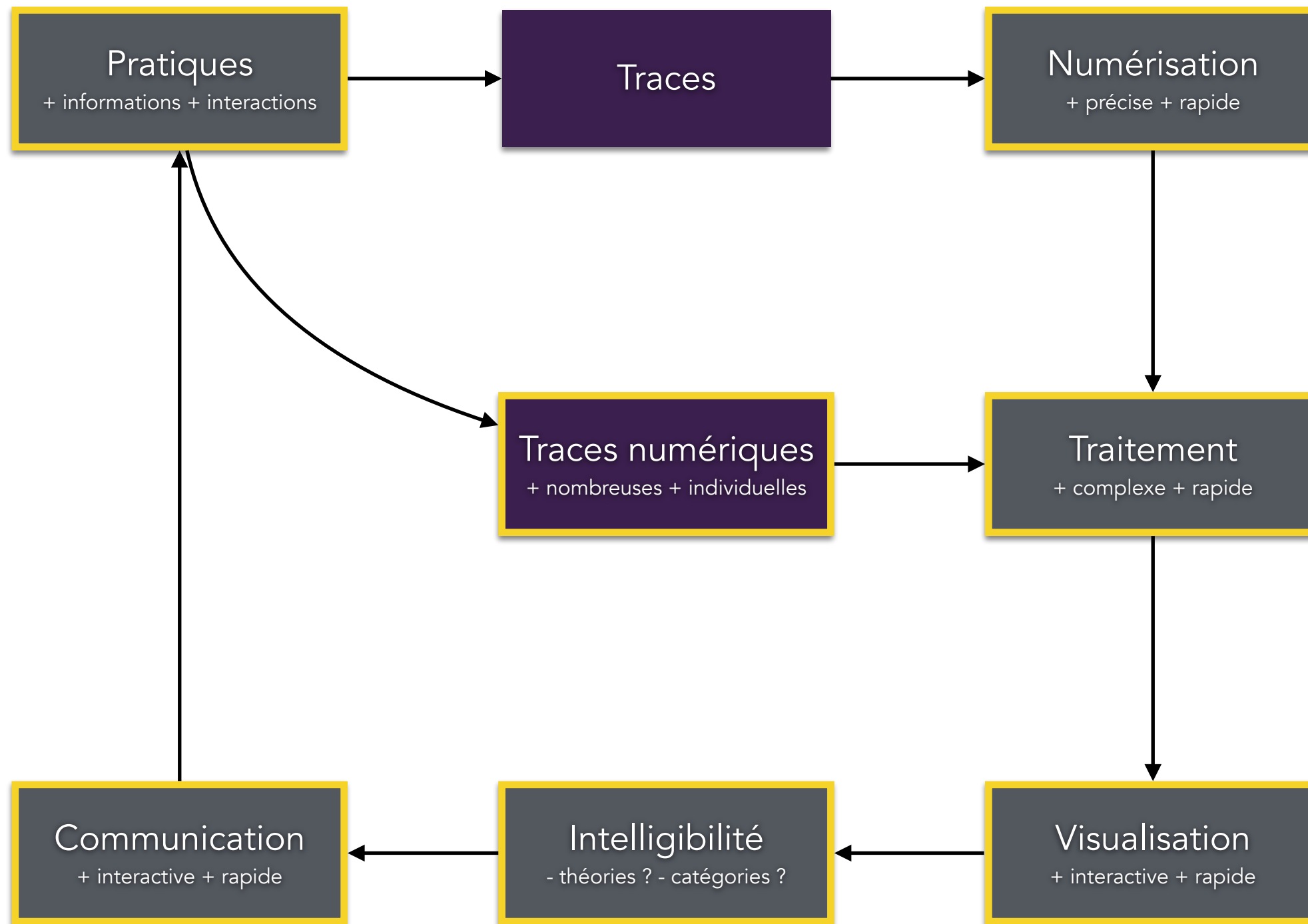
• (actu diff)	6 février 2011 à 05:16	SimonMalenky	(discuter contributions) . . (13 512 octets) (-1) . . (→Définitions) (défaire)
• (actu diff)	16 décembre 2010 à 05:16	SimonMalenky	(discuter contributions) . . (13 512 octets) (-1) . . (→Définitions) (défaire)
• (actu diff)	21 novembre 2010 à 11:12	Ralphmax	(discuter contributions) . . (13 535 octets) (-1) . . (→Définitions) (défaire)
• (actu diff)	18 novembre 2010 à 20:05	Céréales Killer	(discuter contributions) . . (13 536 octets) (-61) . . (→Définitions : retrait de l'article) (défaire)
• (actu diff)	18 novembre 2010 à 16:06	80.11.52.253	(discuter) . . (13 597 octets) (+1) . . (Annulation des modifications) (défaire)
• (actu diff)	17 novembre 2010 à 18:17	Trizek	(discuter contributions) . . (13 596 octets) (-1) . . (→Gestion du savoir) (défaire)
• (actu diff)	17 novembre 2010 à 18:00	206.41.88.119	(discuter) . . (13 597 octets) (-2) . . (vandalisme) (défaire)
• (actu diff)	17 novembre 2010 à 18:00	Auregann	(discuter contributions) . . (13 599 octets) (+2) . . (→Définitions) (défaire)
• (actu diff)	17 novembre 2010 à 17:59	206.41.88.119	(discuter) . . (13 597 octets) (+30) . . (→Définitions) (défaire)
• (actu diff)	17 novembre 2010 à 17:58	206.41.88.119	(discuter) . . (13 567 octets) (-10) . . (vandalisme) (défaire)
• (actu diff)	17 novembre 2010 à 17:57	Auregann	(discuter contributions) . . (13 577 octets) (+10) . . (→Gestion du savoir) (défaire)
• (actu diff)	17 novembre 2010 à 17:56	206.41.88.119	(discuter) . . (13 567 octets) (+23) . . (→Voir aussi) (défaire)
• (actu diff)	19 avril 2010 à 11:19	212.123.4.203	(discuter) . . (13 544 octets) (-25) . . (→Définitions) (défaire)
• (actu diff)	15 avril 2010 à 21:53	Codex	(discuter contributions) . . (13 569 octets) (-26) . . (bot : révocation) (défaire)
• (actu diff)	15 avril 2010 à 14:18	Salebot	(discuter contributions) . . (13 595 octets) (+26) . . (→Définitions) (défaire)
• (actu diff)	15 avril 2010 à 14:18	Salebot	(discuter) . . (13 569 octets) (+30) . . (Homonymie) (défaire)



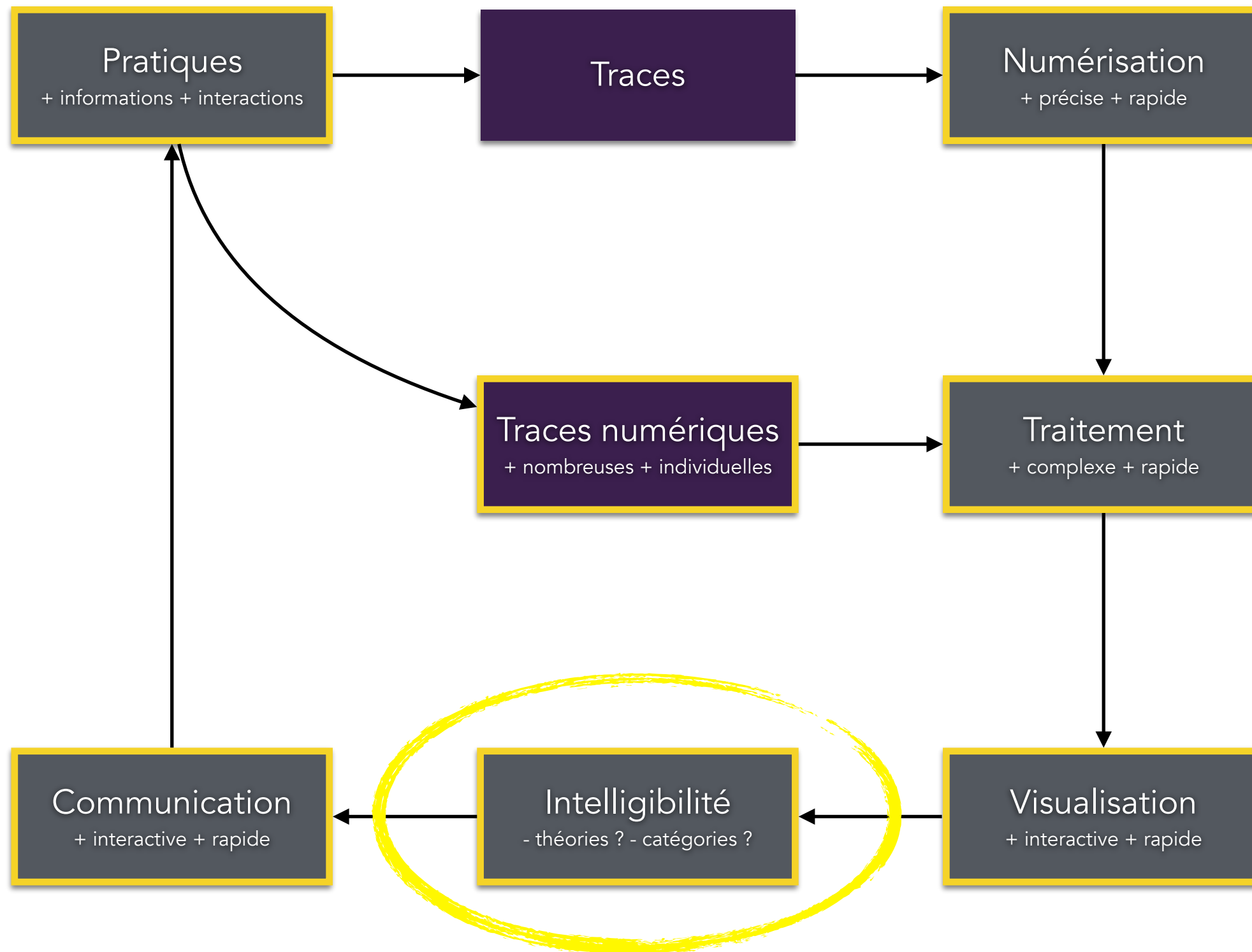
Changer
de science

- *Big Data*
- *Social physics*
- Positivisme

C | Changer de science

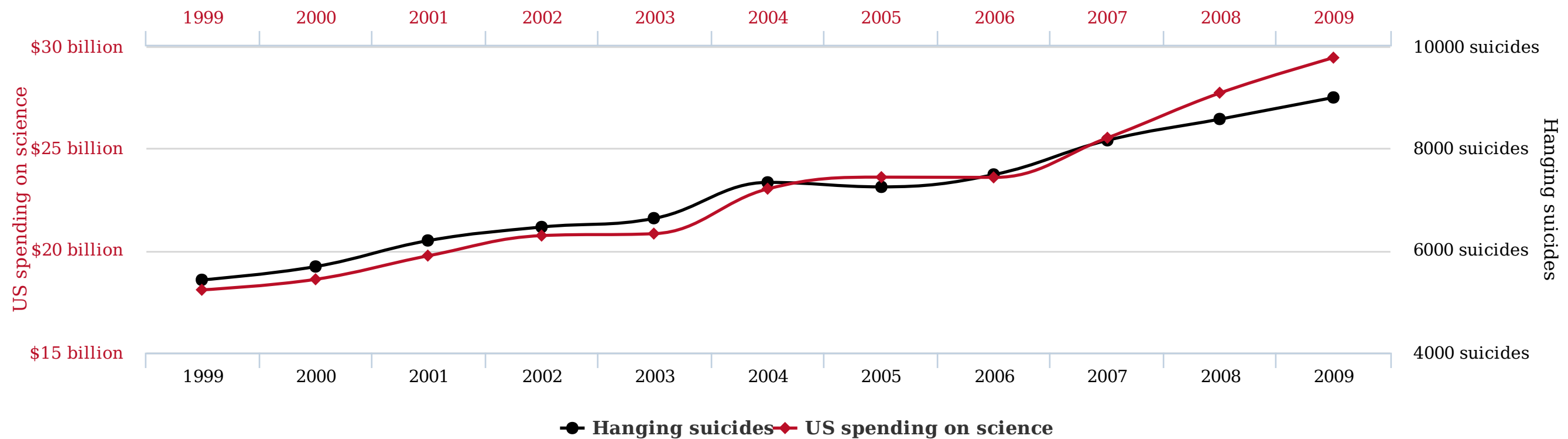


C | Changer de science



Big data, social physics, positivisme

US spending on science, space, and technology correlates with Suicides by hanging, strangulation and suffocation

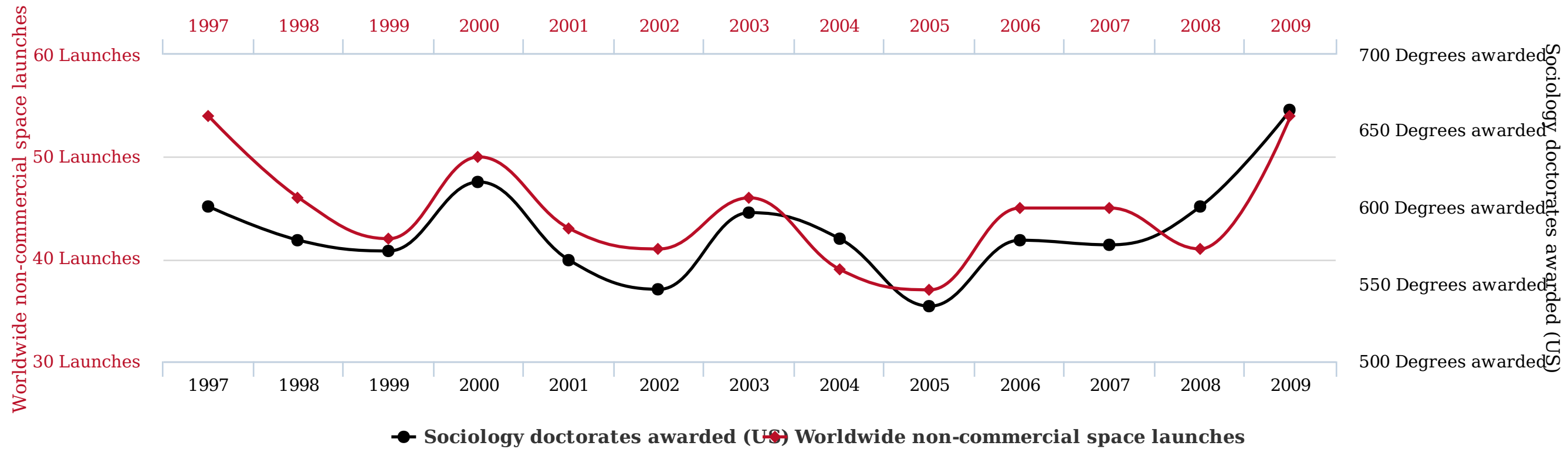


tylervigen.com

Tyler Vigen - Spurious Correlation (<http://tylervigen.com>) - 2014

Big data, social physics, positivisme

Worldwide non-commercial space launches correlates with Sociology doctorates awarded (US)



tylervigen.com

Tyler Vigen - Spurious Correlation (<http://tylervigen.com>) - 2014

Big data, social physics, positivisme

"I WANT TO GO SEE" TWEET VALUE



How Much is a Single Tweet Worth? For Movies, 560 - Jaime Brugueras - 2015 - Networked Insights

Big data, social physics, positivisme

"I WANT TO GO SEE" TWEET VALUE



So what should movie marketers take away from the data? Tweets matter, and the more direct and far in advance they are, the better. Encourage fans to tweet about movies long before opening weekend or to make plans over Twitter to attend a showing with friends. Any way you can encourage an authentic conversation on social media about your film will expand your audience and raise opening weekend revenue as a result.



How Much is a Single Tweet Worth? For Movies, 560 - Jaime Brugueras - 2015 - Networked Insights

Big data, social physics, positivisme



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Networked Insights - homepage - mars 2016

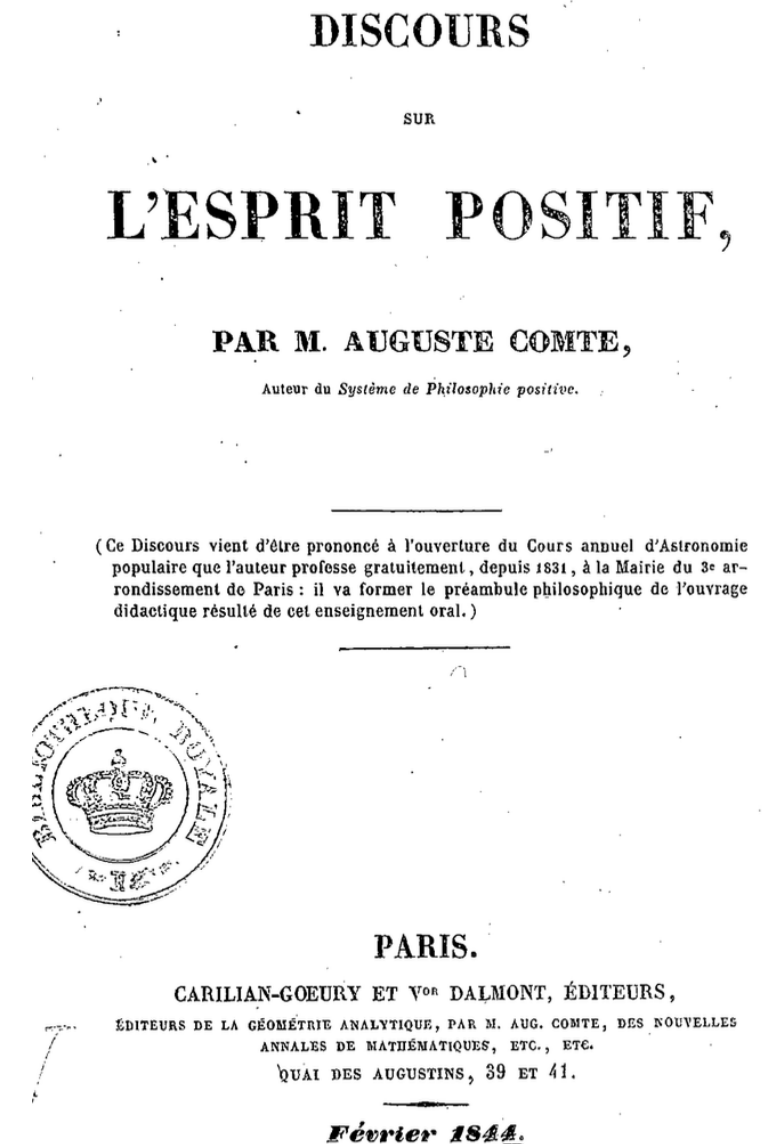
Big data, social physics, positivisme

« Discours sur l'esprit positif »

Auguste Comte, 1844.

« C'est dans les lois des phénomènes que consiste réellement la science, à laquelle les faits proprement dits, quelque exacts et nombreux qu'ils puissent être, ne fournissent jamais que d'indispensables matériaux. Or, en considérant la destination constante de ces lois, on peut dire, sans aucune exagération, que la véritable science, bien loin d'être formée de simples observations, tend toujours à dispenser, autant que possible, de l'exploration directe, en y substituant cette prévision rationnelle, qui constitue, à tous égards, le principal caractère de l'esprit positif, comme l'ensemble des études astronomiques nous le fera clairement sentir. [...]

Ainsi, le véritable esprit positif consiste surtout à voir pour prévoir, à étudier ce qui est afin d'en conclure ce qui sera, d'après le dogme général de l'invariabilité des lois naturelles », p. 16-17.



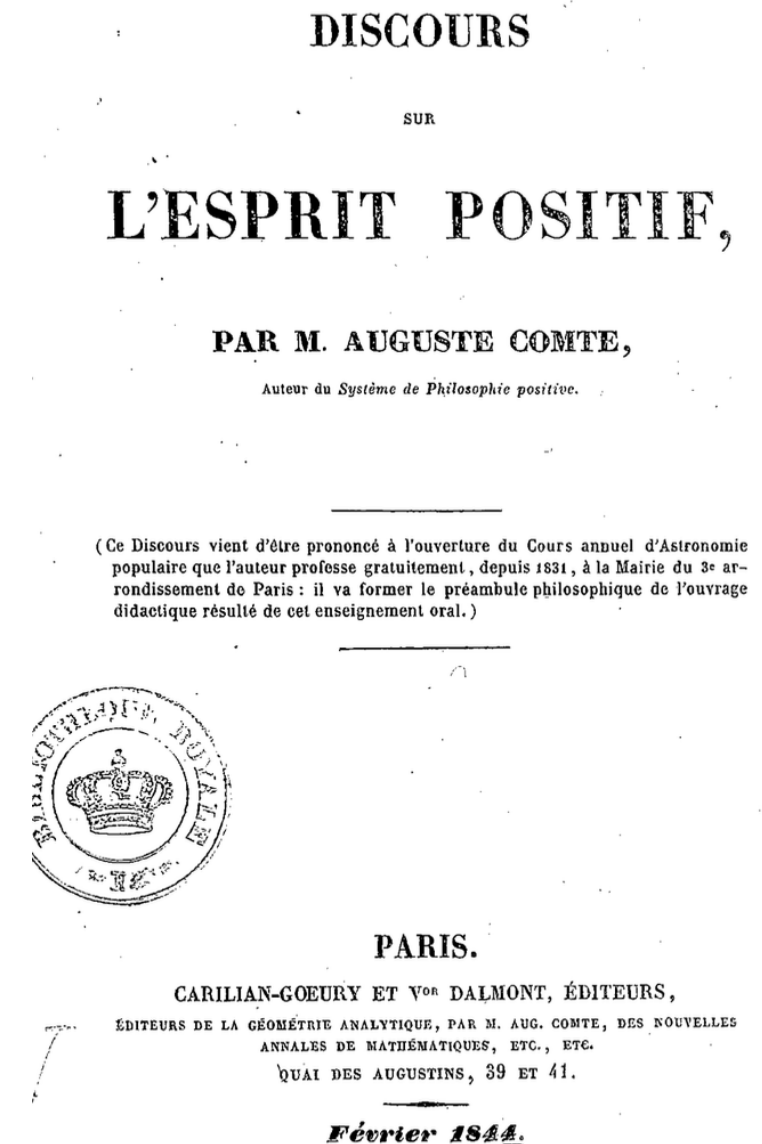
Big data, social physics, positivisme

« Discours sur l'esprit positif »

Auguste Comte, 1844.

« En un mot, la révolution fondamentale qui caractérise la virilité de notre intelligence consiste essentiellement à substituer partout, à l'inaccessible détermination des causes proprement dites, la simple recherche des lois, c'est à dire des relations constantes qui existent entre les phénomènes observés.

Qu'il s'agisse des moindres ou des plus sublimes effets, de choc et de pesanteur comme de pensée et de moralité, nous n'y pouvons vraiment connaître que les diverses liaisons mutuelles propres à leur accomplissement, sans jamais pénétrer le mystère de leur production », p. 13.

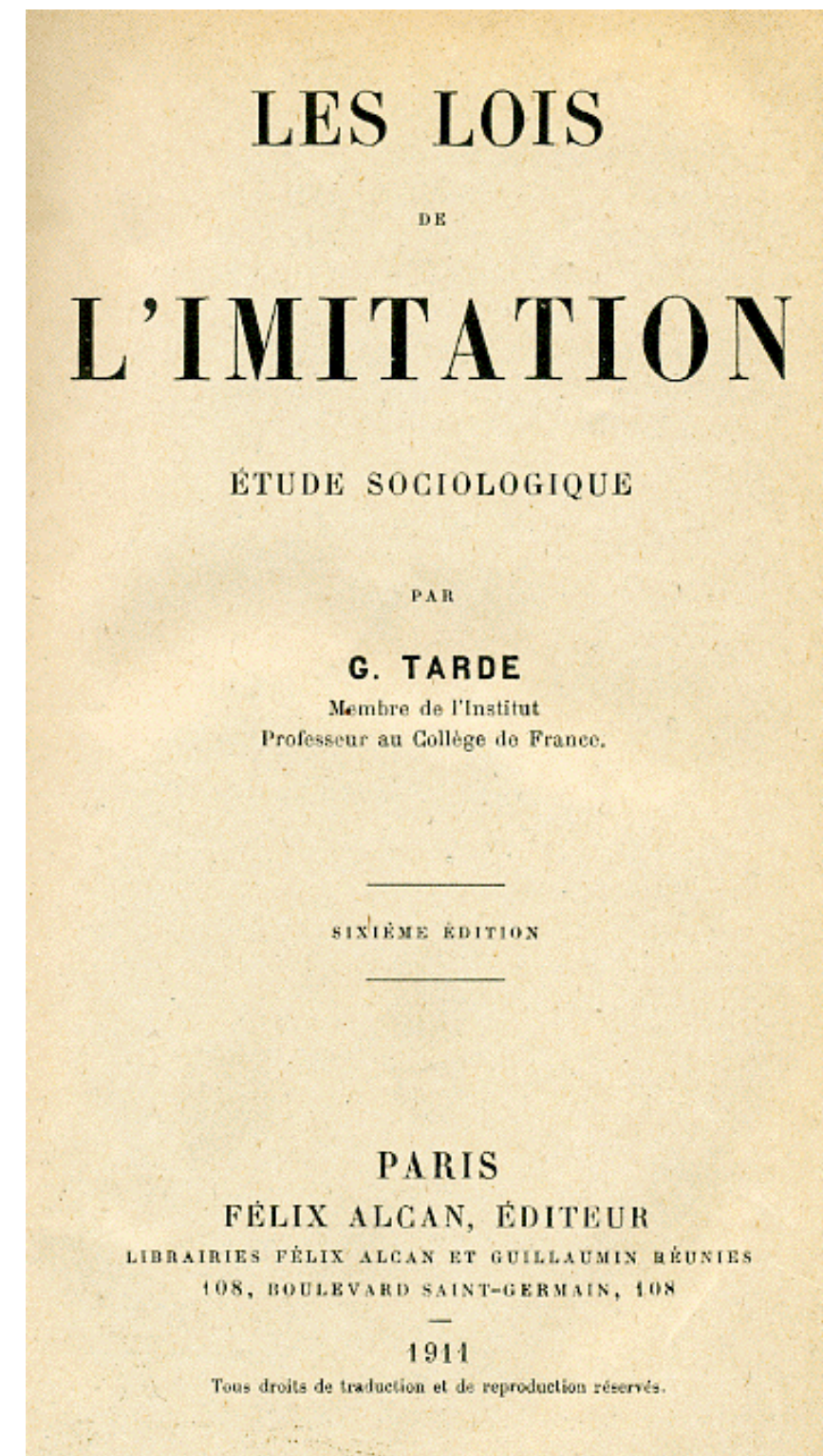


Big data, social physics, positivisme

« Les Lois de l'imitation »

Gabriel Tarde, 1890.

« Si la statistique continue à faire les progrès qu'elle a faits depuis plusieurs années, si les informations qu'elle nous fournit vont se perfectionnant, s'accéléérant, se régularisant, se multipliant toujours, il pourra venir un moment où, de chaque fait social en train de s'accomplir, il s'échappera pour ainsi dire automatiquement un chiffre, lequel ira immédiatement prendre son rang sur les registres de la statistique, continuellement communiquée au public et répandue en dessins par la presse quotidienne », p. 192.



Big data, social physics, positivisme

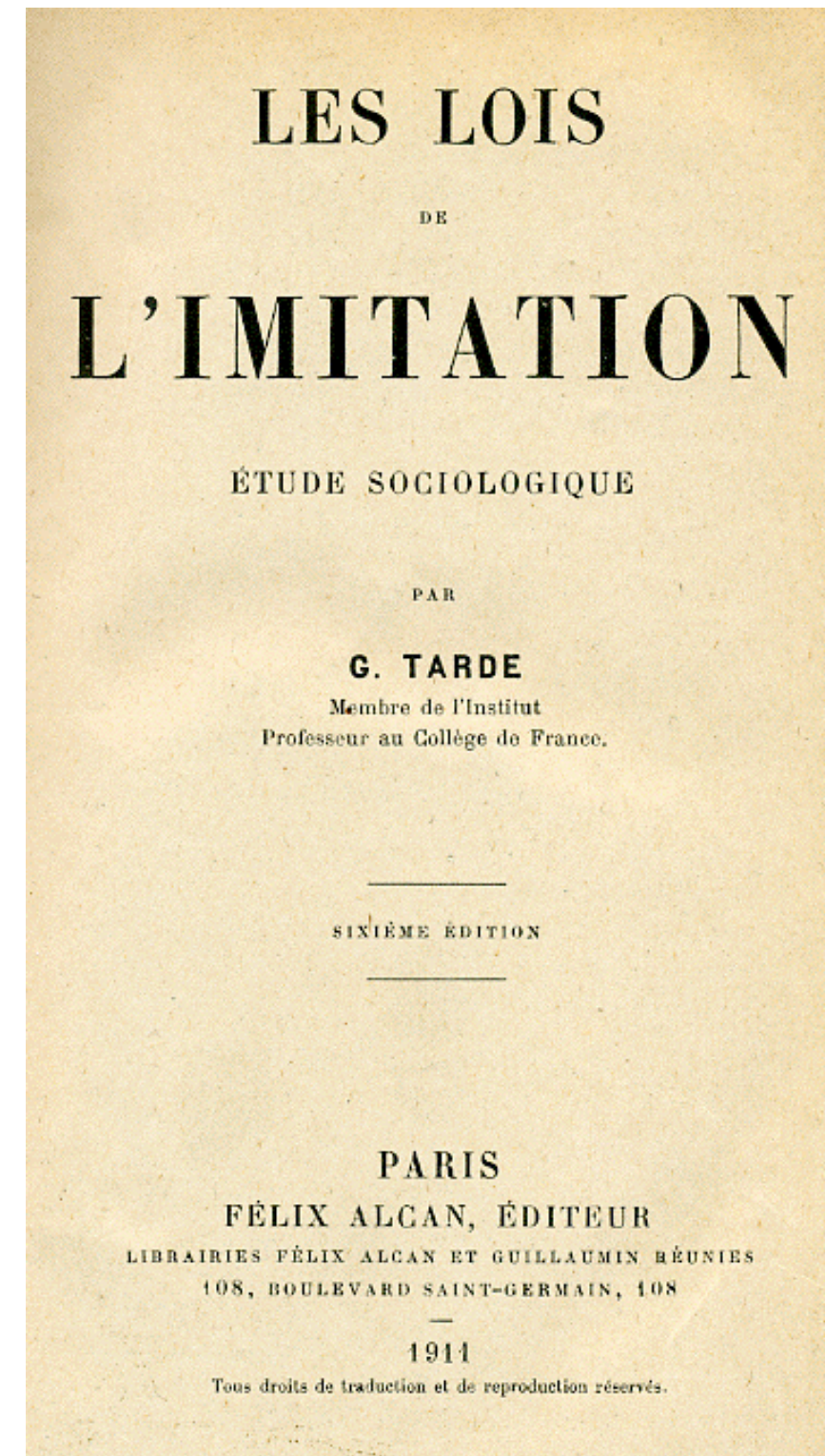
« Les Lois de l'imitation »

Gabriel Tarde, 1890.

« Est-ce qu'on ne surfait pas la statistique quand on émet, à propos d'elle, certaine espérance qu'il me faut indiquer en finissant ?

Comme on voit ses résultats numériques se régulariser, affecter plus de constance, à mesure qu'elle porte sur de plus grands nombres, on est quelquefois enclin à penser que, bien plus tard, si la marée montante de la population continue à accroître et les grands États à grandir, un moment viendra où tout, dans les phénomènes sociaux, sera réductible en formules mathématiques. D'où l'on induit abusivement que le statisticien pourra un jour prédire l'état social futur aussi sûrement que l'astronome la prochaine éclipse de Vénus. En sorte que la statistique serait destinée à plonger toujours plus avant dans l'avenir comme l'archéologie dans le passé.

Mais nous savons par tout ce qui précède que la statistique est circonscrite dans le champ de l'imitation et que celui de l'invention lui est interdit », p. 196.

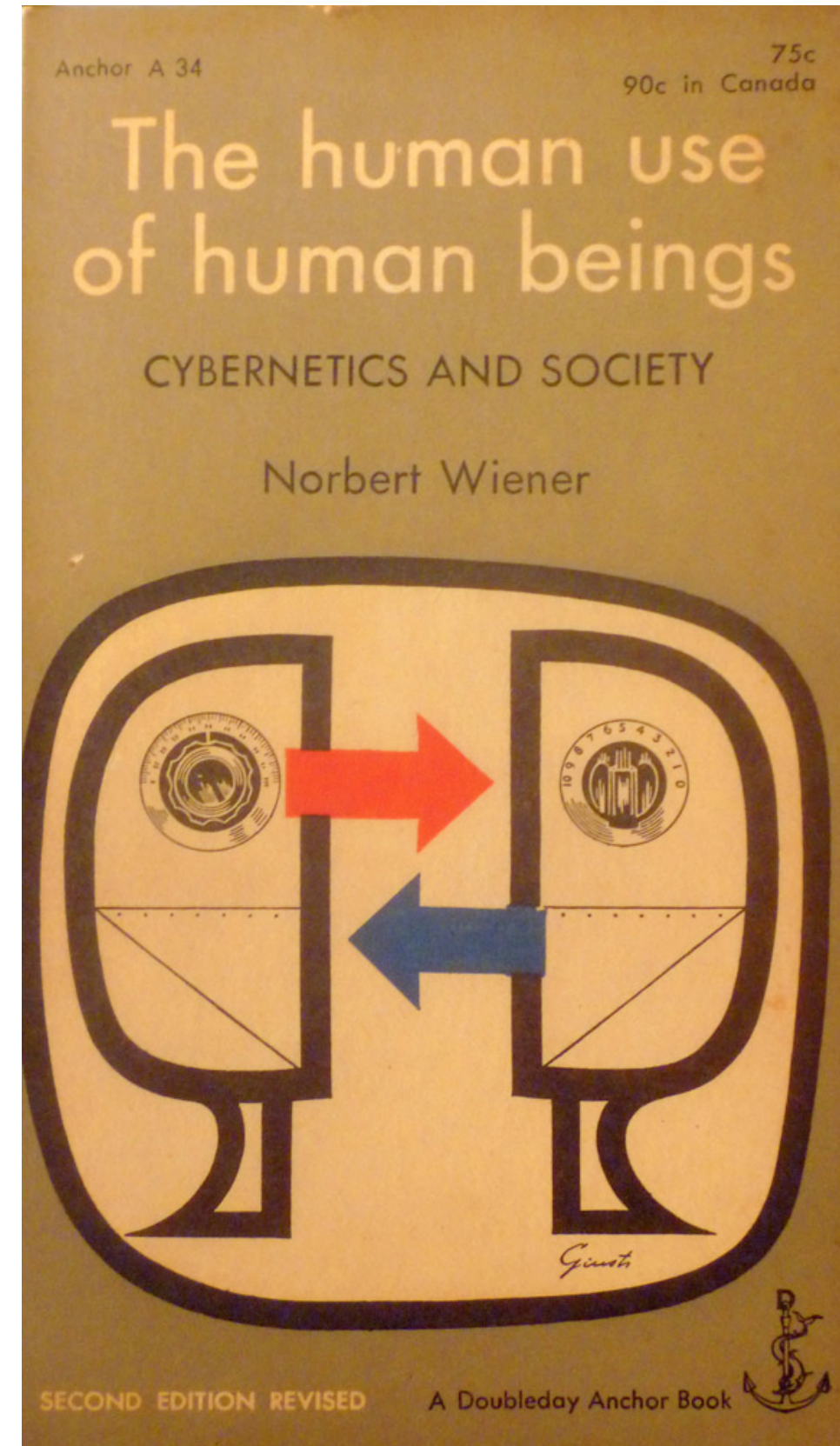


Big data, social physics, positivisme

“The human use of human beings”

Norbert Wiener, 1950.

« Je soutiens que le fonctionnement de l'individu vivant et celui de quelques machines très récentes de transition sont précisément parallèles. Dans ces deux cas, l'un des stades du cycle de fonctionnement est constitué par des récepteurs sensoriels. Chez l'un comme chez l'autre il existe un appareil spécial pour rassembler l'information provenant du monde extérieur selon des niveaux de faible énergie et pour la rendre utilisable en vue du fonctionnement de l'individu et de la machine », p. 28 (édition française, Deux rives, 1952) .



Big data, social physics, positivisme

“The End of Theory: The Data Deluge Makes the Scientific Method Obsolete”

Chris Anderson, Wired, 23 juin 2008.

“The Petabyte Age is different because more is different”

“With enough data, the numbers speak for themselves”

“Hypothesize, model, test is becoming obsolete”

“Petabyte allow us to say : correlation is enough”

“There is no reason to cling to our old ways.

It's time to ask : what can science learn from Google”

The screenshot shows the Wired website interface. The article title is "THE END OF THEORY: THE DATA DELUGE MAKES THE SCIENTIFIC METHOD OBSOLETE" by Chris Anderson, published on 06.23.08 at 12:00 PM. The article features a large yellow graphic with the word "THEORY" crossed out with a red 'X'. Below the graphic, the text reads: "All models are wrong, but some are useful." and "This article has been reproduced in a new format and may be missing content or contain faulty links. Contact wiredlabs@wired.com to report an issue."

So proclaimed statistician George Box 30 years ago, and he was right. But what choice did we have? Only models, from cosmological equations to theories of human behavior, seemed to be able to consistently, if imperfectly, explain the world around us. Until now. Today companies like Google, which have grown up in an era of massively abundant data, don't have to settle for wrong models. Indeed, they don't have to settle for models at all.

Sixty years ago, digital computers made information readable. Twenty years ago, the Internet made it reachable. Ten years ago, the first search engine crawlers made it a single database. Now Google and like-minded companies are sifting through the most measured age in history, treating this massive corpus as a laboratory of the human condition.

On the right side of the screenshot, there are several "MOST POPULAR" articles listed, including "Happy Socks X PEWDIEPIE" and "The Neuroscientist Who's Building a Better Memory for Humans".

Big data, social physics, positivisme

“Big Data : A revolution that will transform how we live, work, and think”

Viktor Mayer-Schönberger et Kenneth Cukier, 2013.

“**Correlations** are useful in a small-data world, but in the context of big data they really shine. Through them we can glean **insights** more easily, faster, and more clearly than before.

At its core, a correlation quantifies the statistical relationship between two data values. A strong correlation means that when one of the data values changes, the other is highly likely to change as well. We have seen such strong correlations with **Google Flu Trends**: the more people in a particular geographic place search for particular terms through Google, the more people in that location **have the flu**. Conversely, a weak correlation means that when one data value changes little happens to the other. For instance, we could run correlations on individuals' hair length and happiness and find hair length is not especially useful in telling us much about happiness.” p. 52.



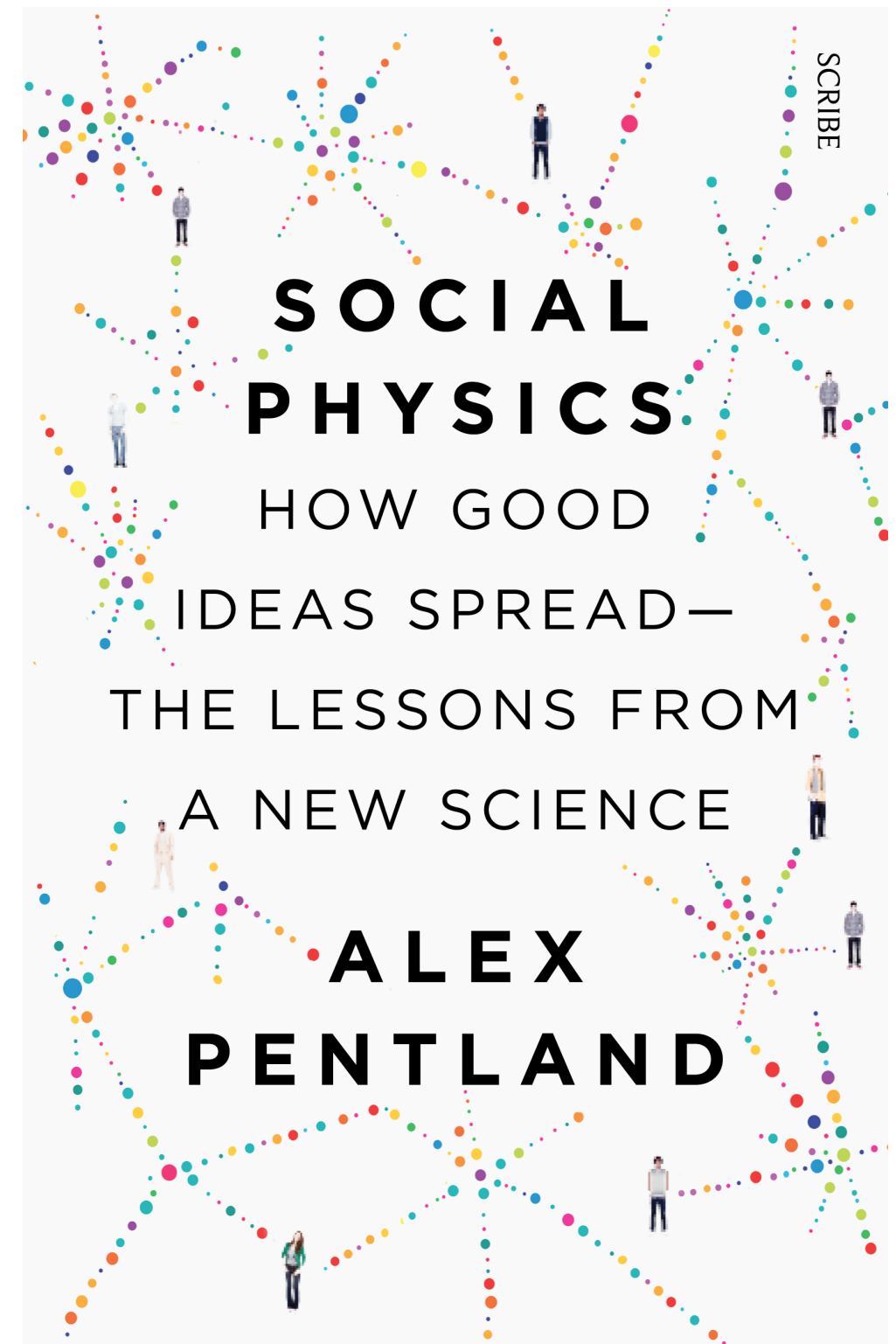
Big data, social physics, positivisme

“Social Physics”

Alex Pentland, janvier 2016.

“Because modern culture puts so much emphasis on independence and personal choice, it is often difficult to realize that it is a good thing that most of **our life is highly patterned**, and that we are all quite similar rather than being completely different individuals with different patterns of behavior. » p. 190.

“There is another reason why people should prefer the concepts of **social physics** to that of **markets** and **classes**. Because markets and classes are **averages** or **stereotypes**, reasoning that uses these terms leads inevitably to considering all people in the market or class to be the same. Adam Smith’s markets end up being as dehumanizing as Karl Marx’s classes”, p. 190.



Big data, social physics, positivisme

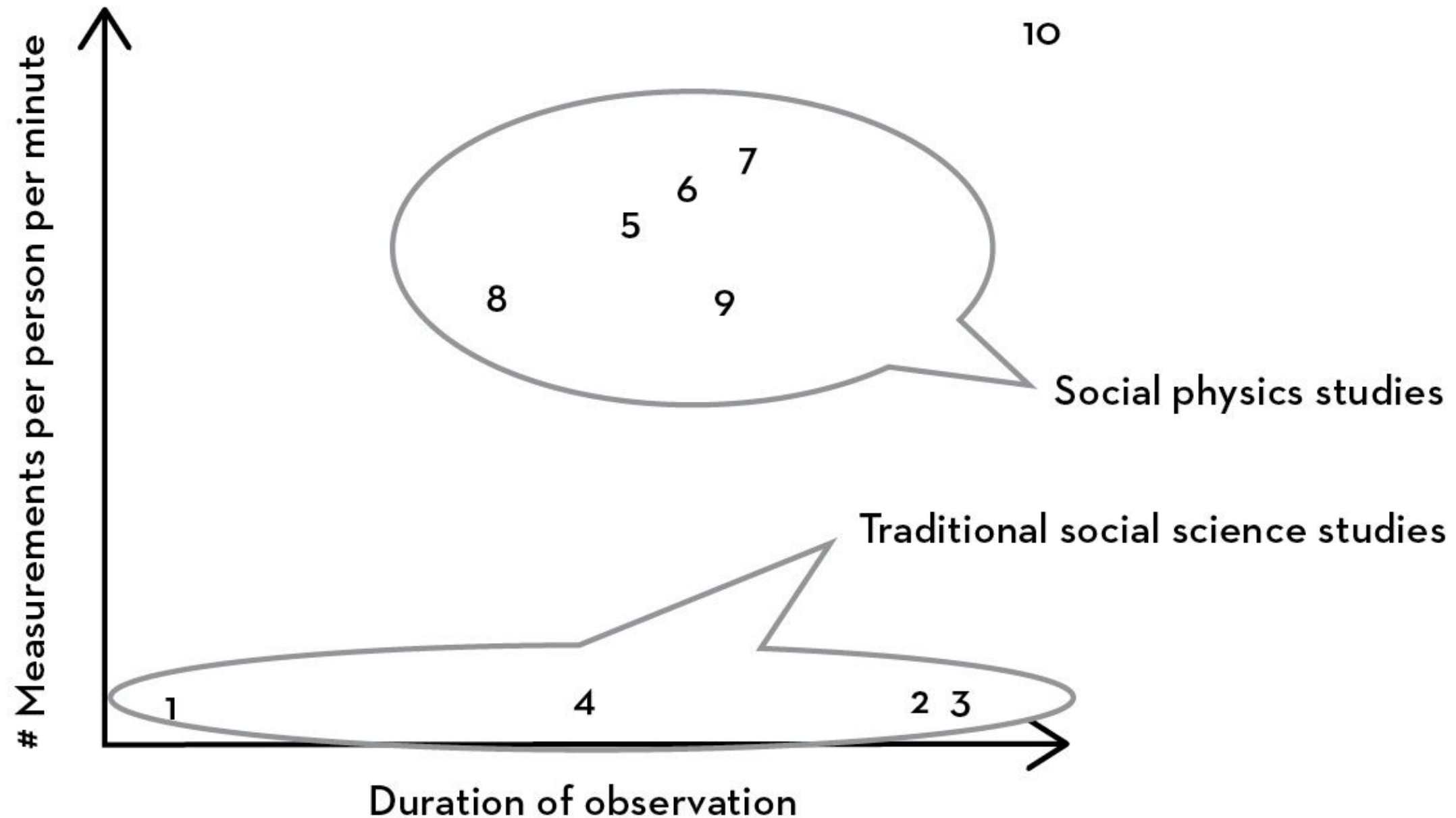


Figure 1. Qualitative overview of social science observatories and experiments, with the horizontal axis showing data collection duration and the vertical axis showing richness of the information collected. Data sets include: (1) Most social science experiments, (2) Midwest Field Station,^{*} (3) Framingham Heart Study,^{*} (4) Large Call Record data sets^{*} (5) Reality Mining,^{*} (6) Social Evolution,^{*} (7) Friends and Family,^{*} (8) Sociometric Badge studies,^{*} (9) Data for Development (D4D) data set,^{*} (10) where the world is headed.

Big data, social physics, positivisme

How Everything Is Connected to
Everything Else and What It Means for
Business, Science, and Everyday Life

Linked

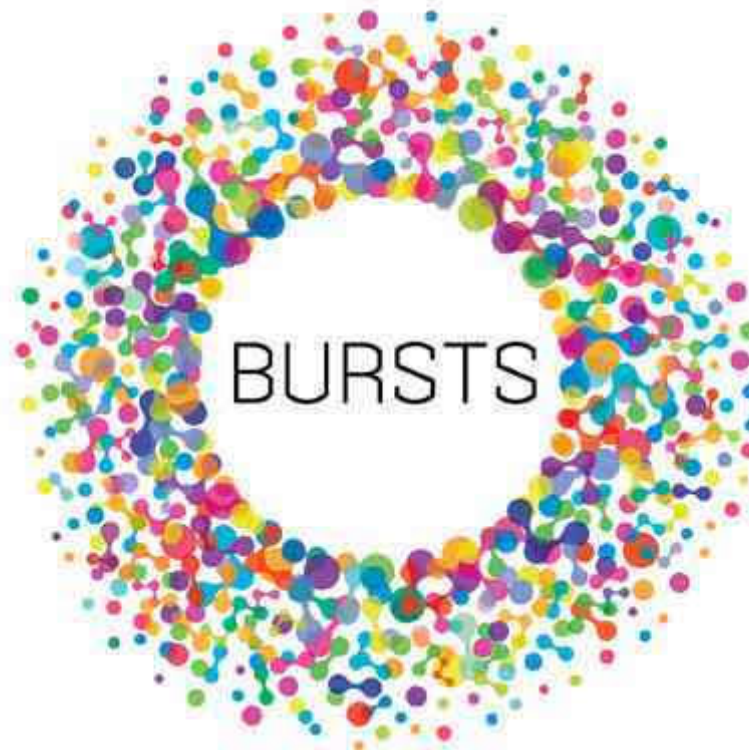


"Remarkable.... A sweeping look at a new and exciting science." —*Science*

Albert-László Barabási

2002

The Hidden Pattern Behind
Everything We Do

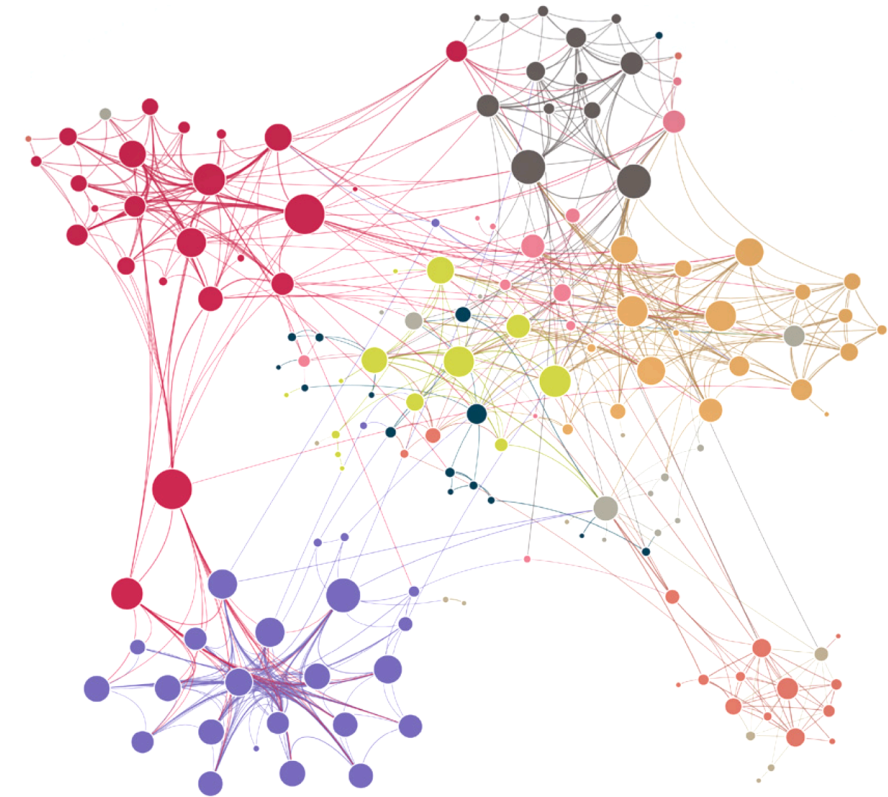


BURSTS

Albert-László Barabási

Author of *LINKED*

2010

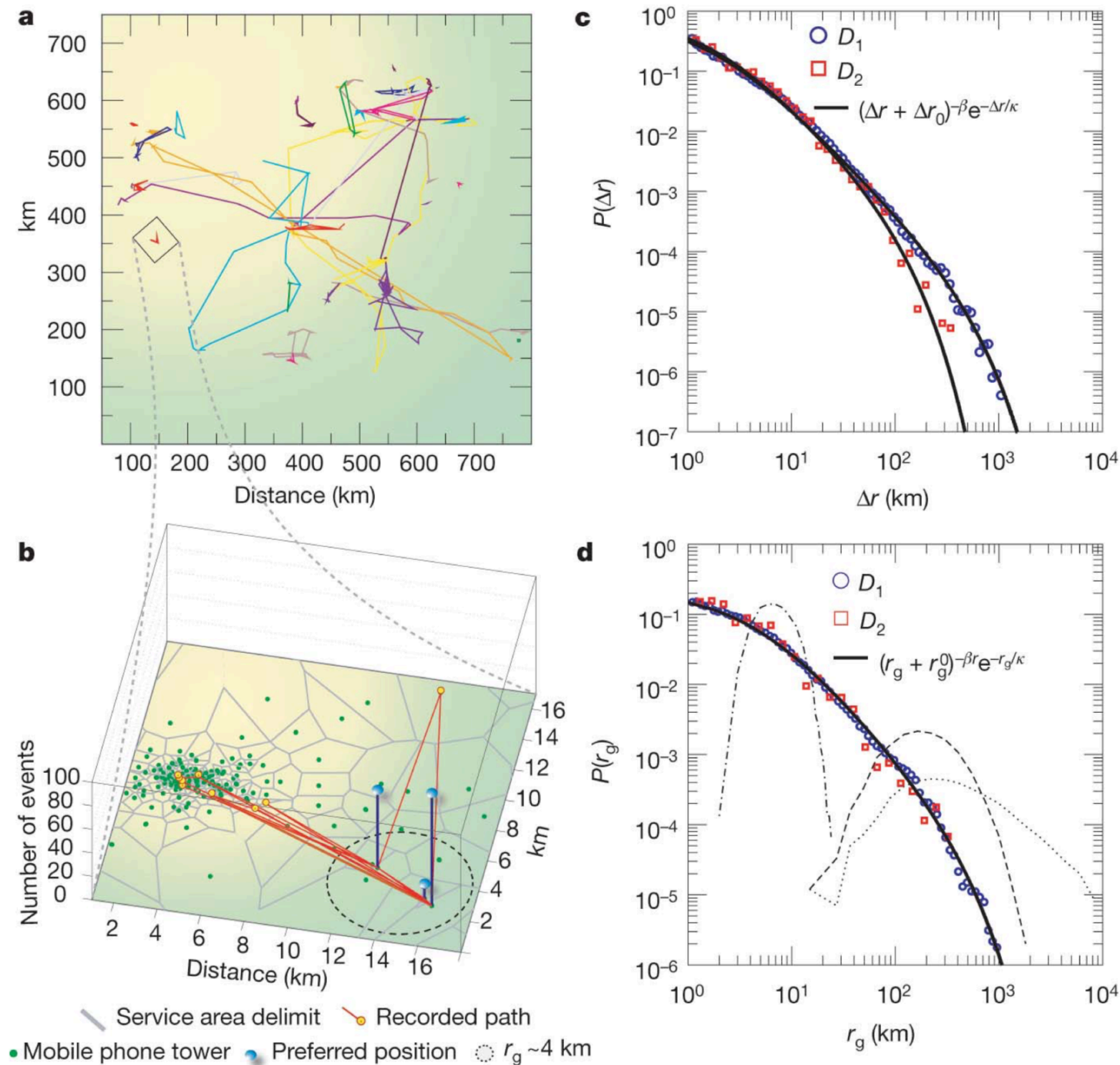


Albert-László Barabási

**NETWORK
SCIENCE**

2016

Big data, social physics, positivisme



González, Marta C, César A Hidalgo, and Albert-László Barabási. 2008. "Understanding individual human mobility patterns." *Nature* 453(7196): 779-782.

Big data, *social physics*, positivisme

“**Individuals** display significant **regularity**, because they return to a few highly frequented locations, such as **home** or **work**. This regularity does not apply to the bank notes: a bill always follows the trajectory of its current owner; that is, dollar bills diffuse, but humans do not”, p. 781.

Big data, social physics, positivisme

Network Science

by Albert-László Barabási

- Personal Introduction
- 1. Introduction
- 2. Graph Theory
- 3. Random Networks
- 4. The Scale-Free Property
- 5. The Barabási-Albert Model
- 6. Evolving Networks
- 7. Degree Correlations
- 8. Network Robustness
- 9. Communities
- 10. Spreading Phenomena
- Preface

Start Reading

Big data, social physics, positivisme

Network Science by Albert-László Barabási

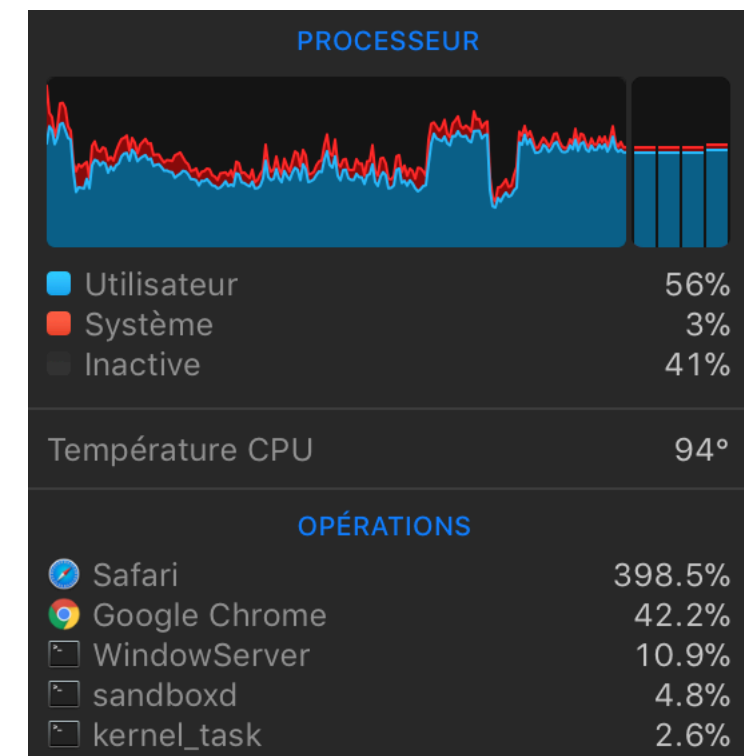
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Decode/Unescape Unicode Entities

Example: %u0639%u0631%u0628%u0649 to عربى

Note:Unicode Entity numbers are in Hex

Unicode Entities

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Convert

Result

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```

Big data, social physics, positivisme



coinhive

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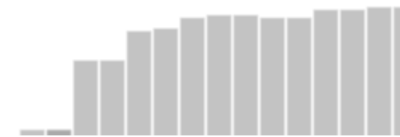
A Crypto Miner
for your Website

HASHES/S
56.1

TOTAL
400

THREADS
8 + / -

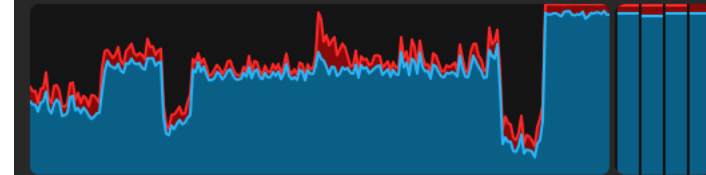
SPEED
100% + / -



Monetize Your Business With Your Users' CPU Power

INTEGRATE COINHIVE ON YOUR WEBSITE

PROCESSEUR



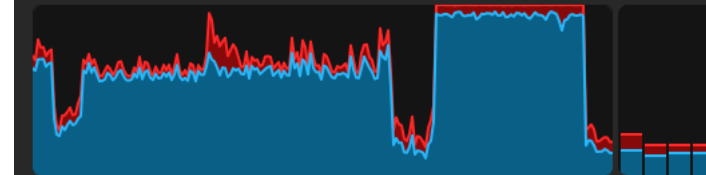
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Système	6%
Inactive	0%

Température CPU 96°

OPÉRATIONS

Google Chrome	709.0%
bird	17.6%
WindowServer	16.0%
sandboxd	7.4%
Finder	5.8%

PROCESSEUR



Utilisateur	13%
Système	6%
Inactive	81%

Température CPU 68°

OPÉRATIONS

Google Chrome	72.4%
WindowServer	16.7%
Finder	14.3%
vyprvpnservice	8.2%
sandboxd	7.6%

Big data, social physics, positivisme

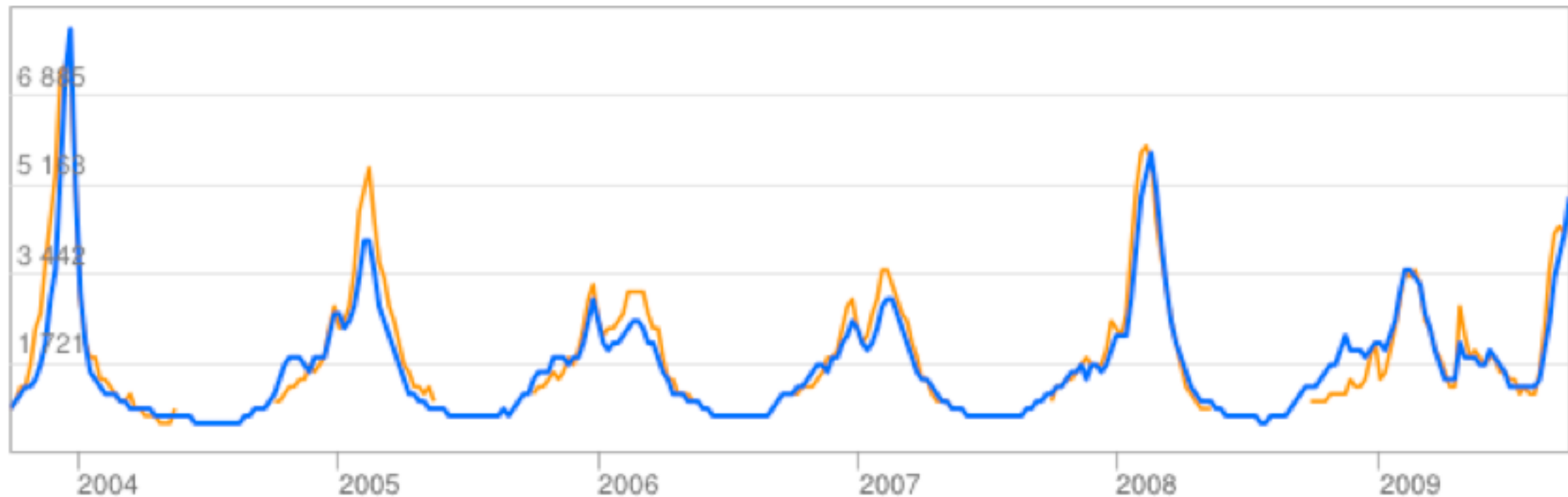
Estimations historiques

Voir les données pour : États-Unis

États-Unis - Propagation du virus

Estimation de la grippe

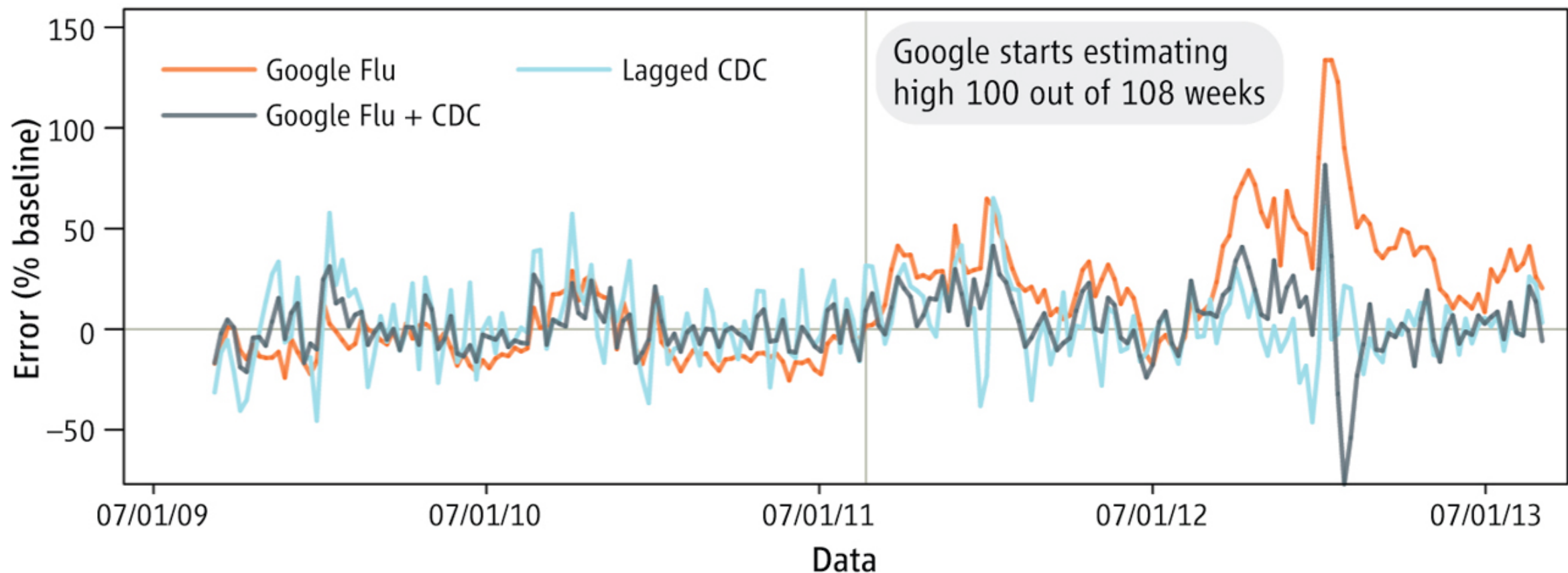
● Estimation Google Suivi de la grippe ● Données pour : États-Unis



États-Unis : Données publiques sur le syndrome grippal (ILI) fournies par les [Centres américains de prévention et de contrôle des maladies](#).

Ginsberg, Jeremy et al. 2008. “**Detecting influenza epidemics using search engine query data.**” *Nature* 457(7232): 1012–1014.

Big data, social physics, positivisme

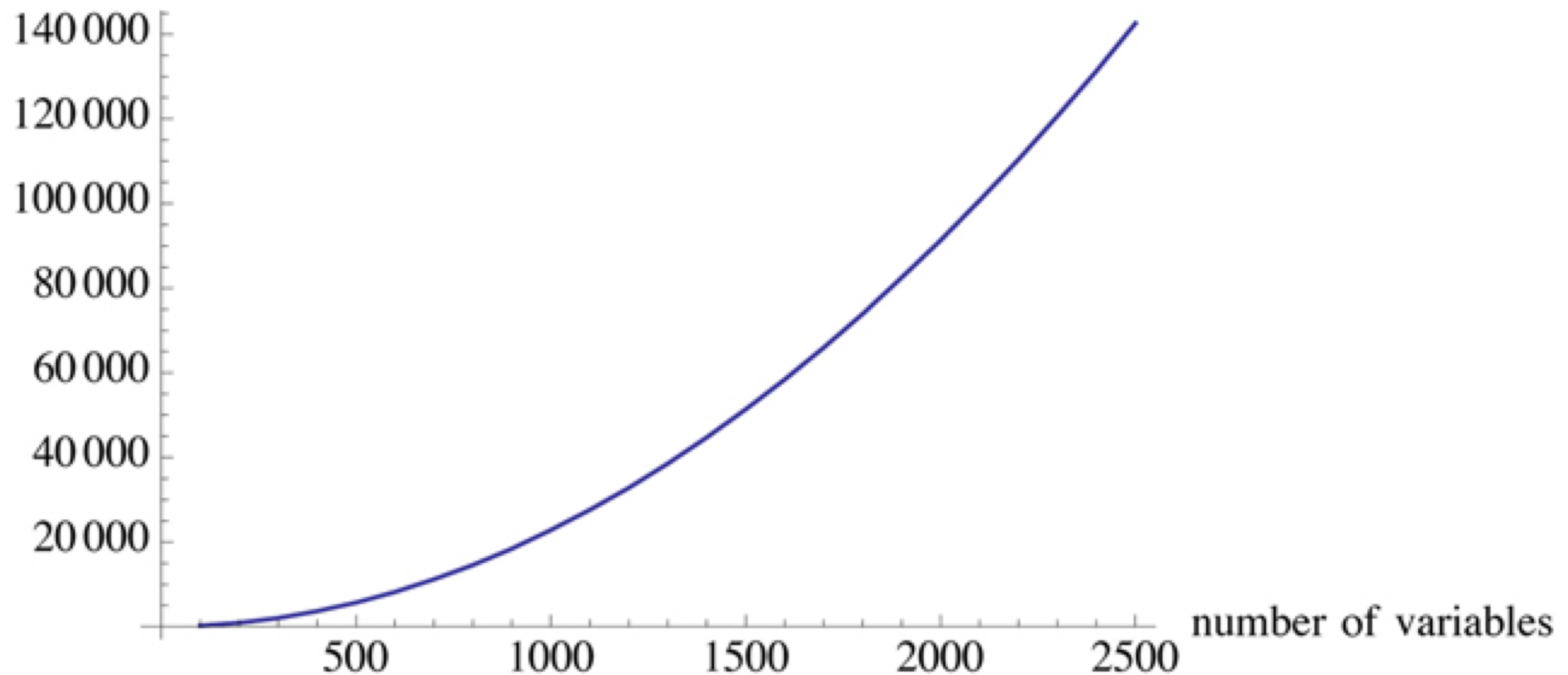


« Instead of focusing on a “big data revolution,” perhaps it is time we were focused on an “all data revolution,” where we recognize that the critical change in the world has been innovative analytics, using data from all traditional and new sources, and providing a deeper, clearer understanding of our world ».

David Lazer, et al. 2014, **The Parable of Google Flu: Traps in Big Data Analysis**, Science 343(6176): 1203-1205.

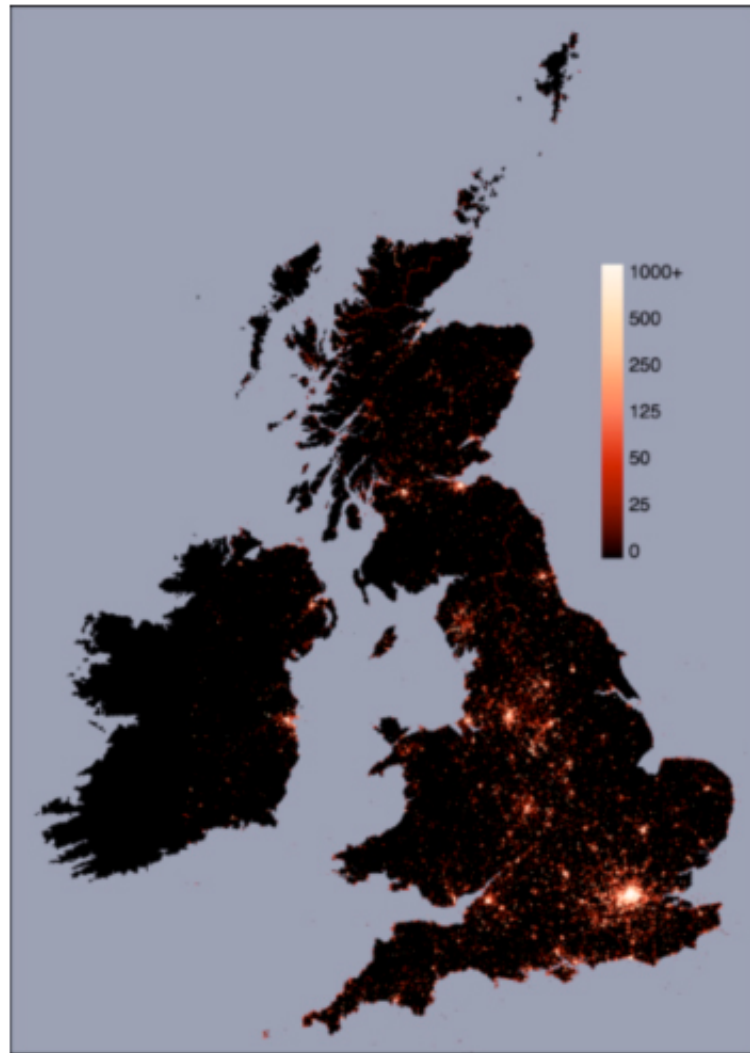
Big data, *social physics*, positivisme

Spurious Correlations

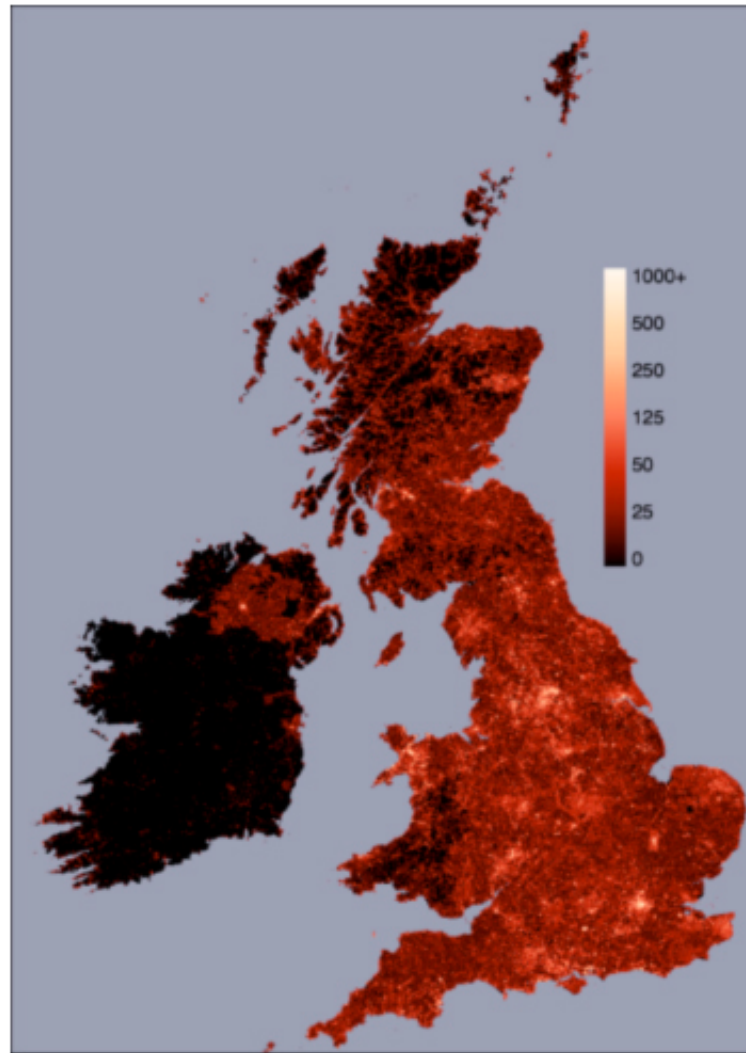


Nassim Taleb, **Antifragile**, 2014

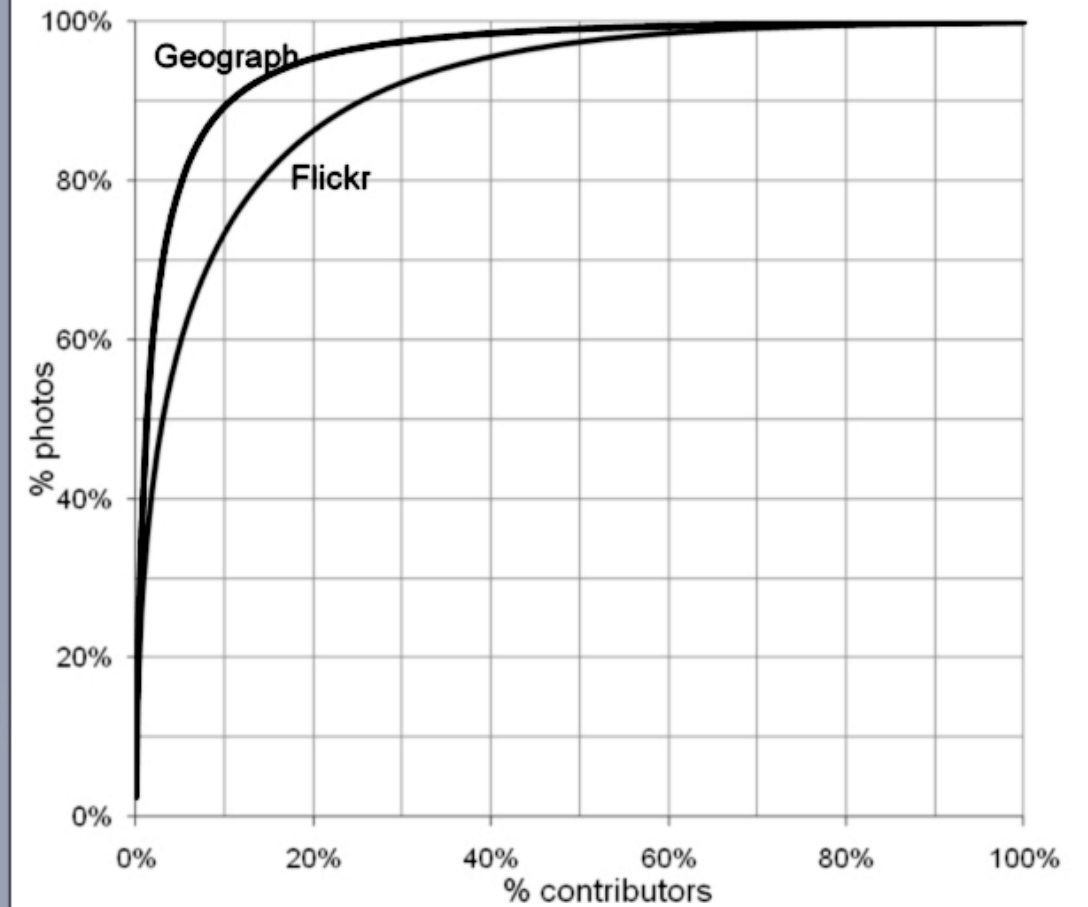
Big data, *social physics*, positivisme



Flickr



Geograph



Purves et Edwardes, **Inégale représentativité spatiale à gauche et sociale à droite**, 2011

Big data, *social physics*, positivisme



Open Street Map et Cloud Made, Lausanne - EPFL, 2008

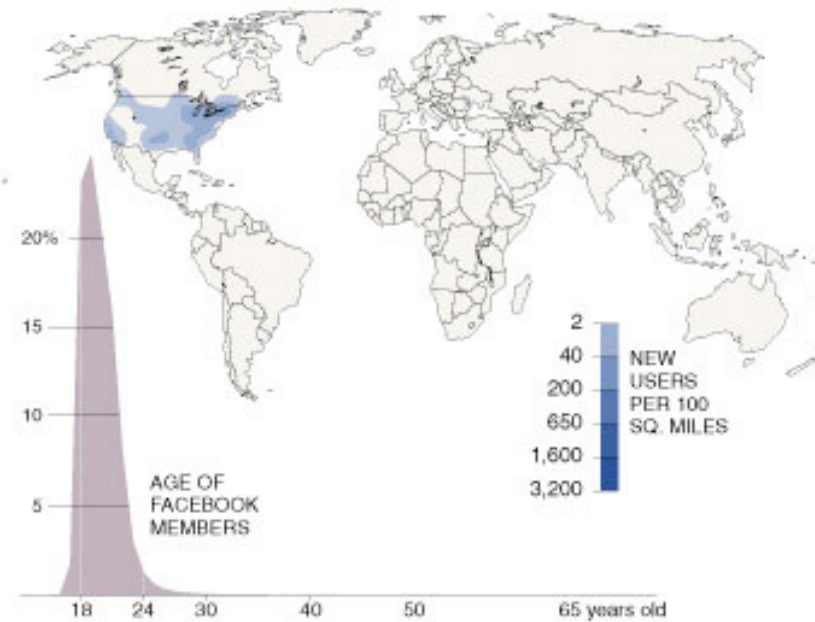
Big data, social physics, positivisme

The Road to 200 Million

Facebook began as a private network for colleges and universities, but has grown into an international social networking site with almost 200 million members. Lee Byron, a member of Facebook's data team, created maps and network diagrams that show the site's expansion and use.

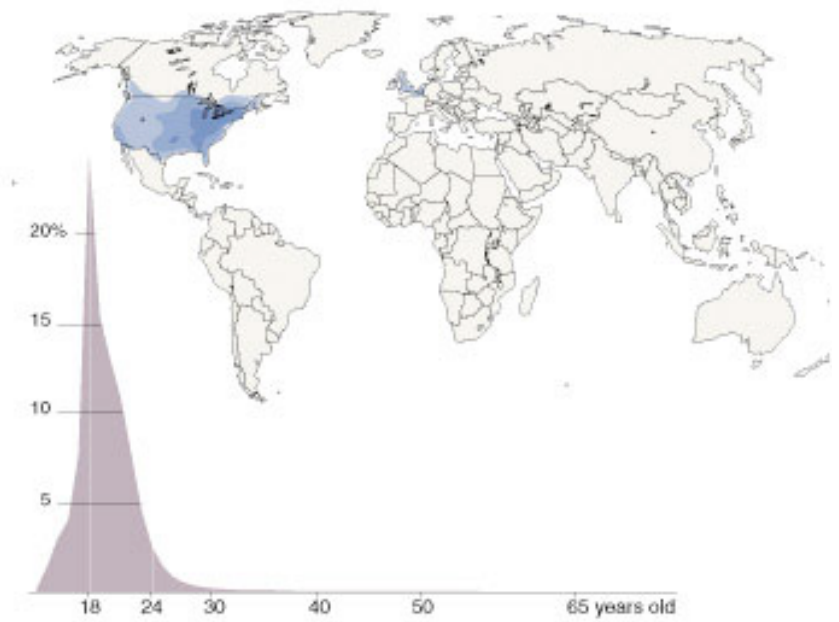
February 2004 to January 2005

Facebook begins at Harvard, and expands to a few universities at a time.



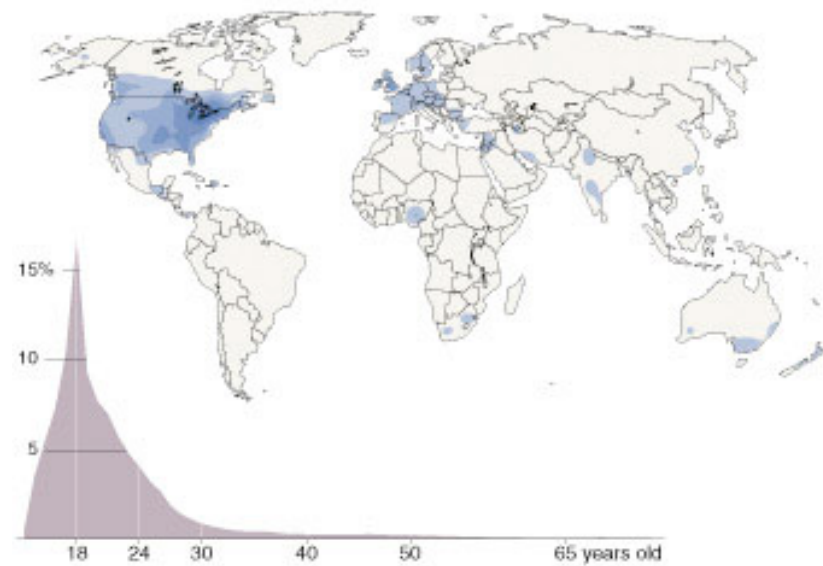
February 2005 to January 2006

Facebook expands to include most American colleges and high schools.



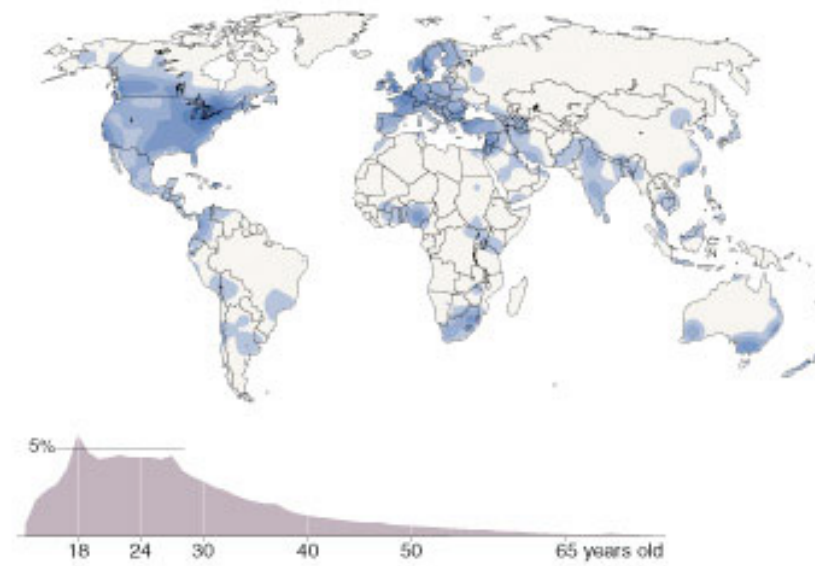
February 2006 to January 2007

Facebook opens registration to allow anyone to join, which brings in older members.



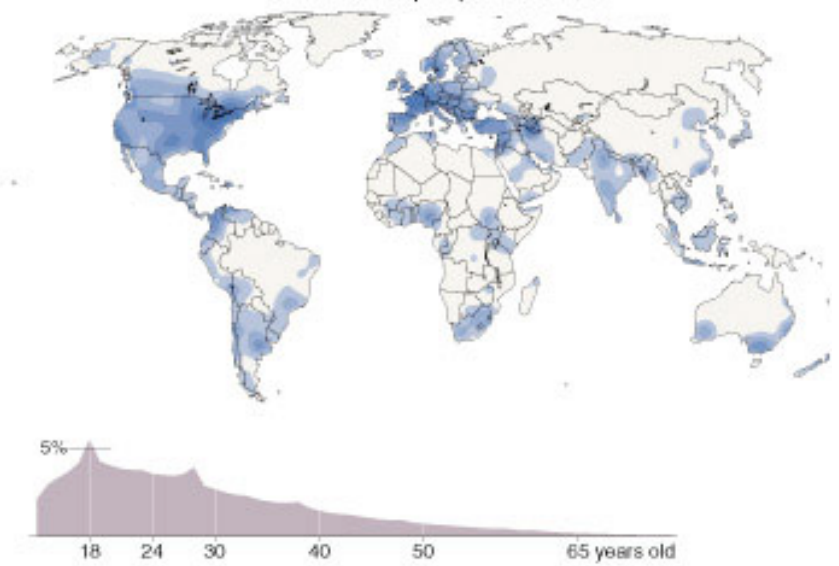
February 2007 to January 2008

Facebook reaches 50 million users, with Canada and Britain growing fastest.



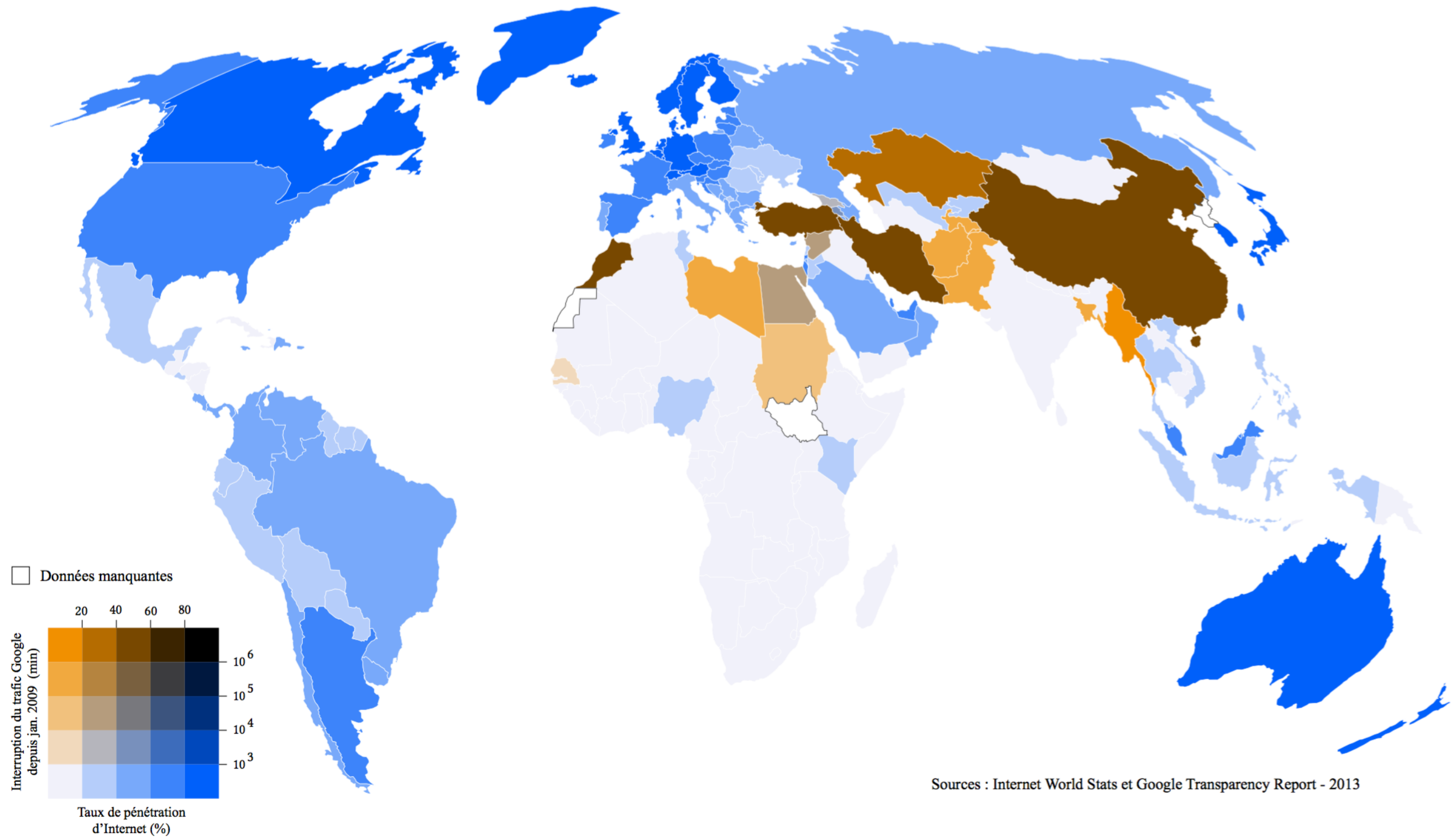
February 2008 to January 2009

Facebook is translated into more than 40 languages. The fastest-growing group of members is people over 35.



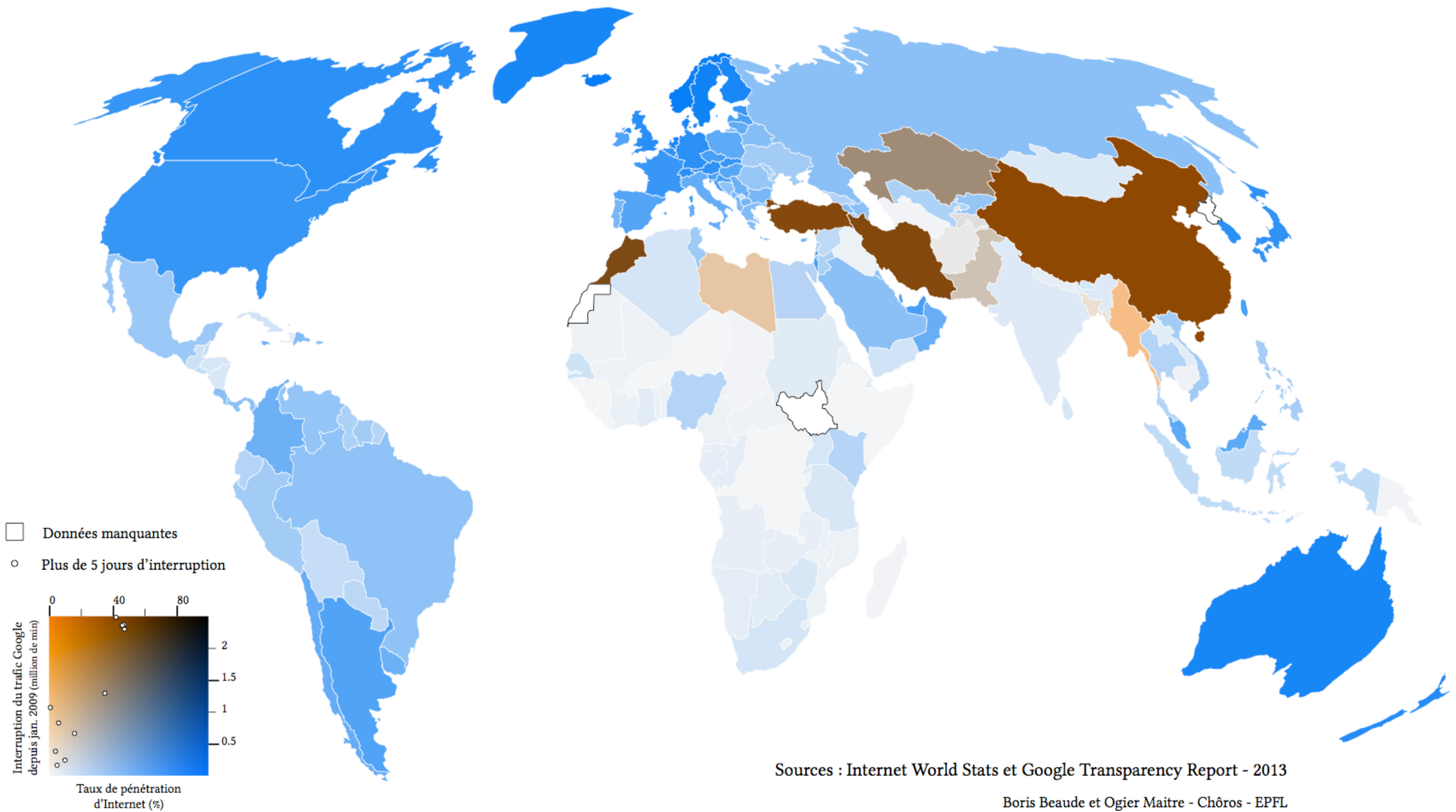
Lee Byron, **Facebook Growing to 200 Million**, 2008

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Boris Beade et Ogier Maitre - L'ubiquité fracturée - 2014

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Boris Beaude et Ogier Maitre - L'ubiquité fracturée - 2014

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“Critical questions for Big Data”

dana boyd & Kate Crawford, Information, Communication & Society, June 2012, pp. 662–679.

« Technology is neither good nor bad; nor is it neutral »

1. Big Data changes the definition of knowledge
2. Claims to objectivity and accuracy are misleading
3. Bigger data are not always better data
4. Taken out of context, Big Data loses its meaning
5. Just because it is accessible does not make it ethical
6. Limited access to Big Data creates new digital divides

danah boyd & Kate Crawford

CRITICAL QUESTIONS FOR BIG DATA

Provocations for a cultural,
technological, and scholarly
phenomenon

The era of Big Data has begun. Computer scientists, physicists, economists, mathematicians, political scientists, bio-informaticists, sociologists, and other scholars are clamoring for access to the massive quantities of information produced by and about people, things, and their interactions. Diverse groups argue about the potential benefits and costs of analyzing genetic sequences, social media interactions, health records, phone logs, government records, and other digital traces left by people. Significant questions emerge. Will large-scale search data help us create better tools, services, and public goods? Or will it usher in a new wave of privacy incursions and invasive marketing? Will data analytics help us understand online communities and political movements? Or will it be used to track protesters and suppress speech? Will it transform how we study human communication and culture, or narrow the palette of research options and alter what ‘research’ means? Given the rise of Big Data as a socio-technical phenomenon, we argue that it is necessary to critically interrogate its assumptions and biases. In this article, we offer six provocations to spark conversations about the issues of Big Data: a cultural, technological, and scholarly phenomenon that rests on the interplay of technology, analysis, and mythology that provokes extensive utopian and dystopian rhetoric.

Keywords Big Data; analytics; social media; communication studies; social network sites; philosophy of science; epistemology; ethics; Twitter

(Received 10 December 2011; final version received 20 March 2012)

Technology is neither good nor bad; nor is it neutral . . . technology’s interaction with the social ecology is such that technical developments frequently have environmental, social, and human consequences that go far beyond the immediate purposes of the technical devices and practices themselves. (Kranzberg 1986, p. 545)



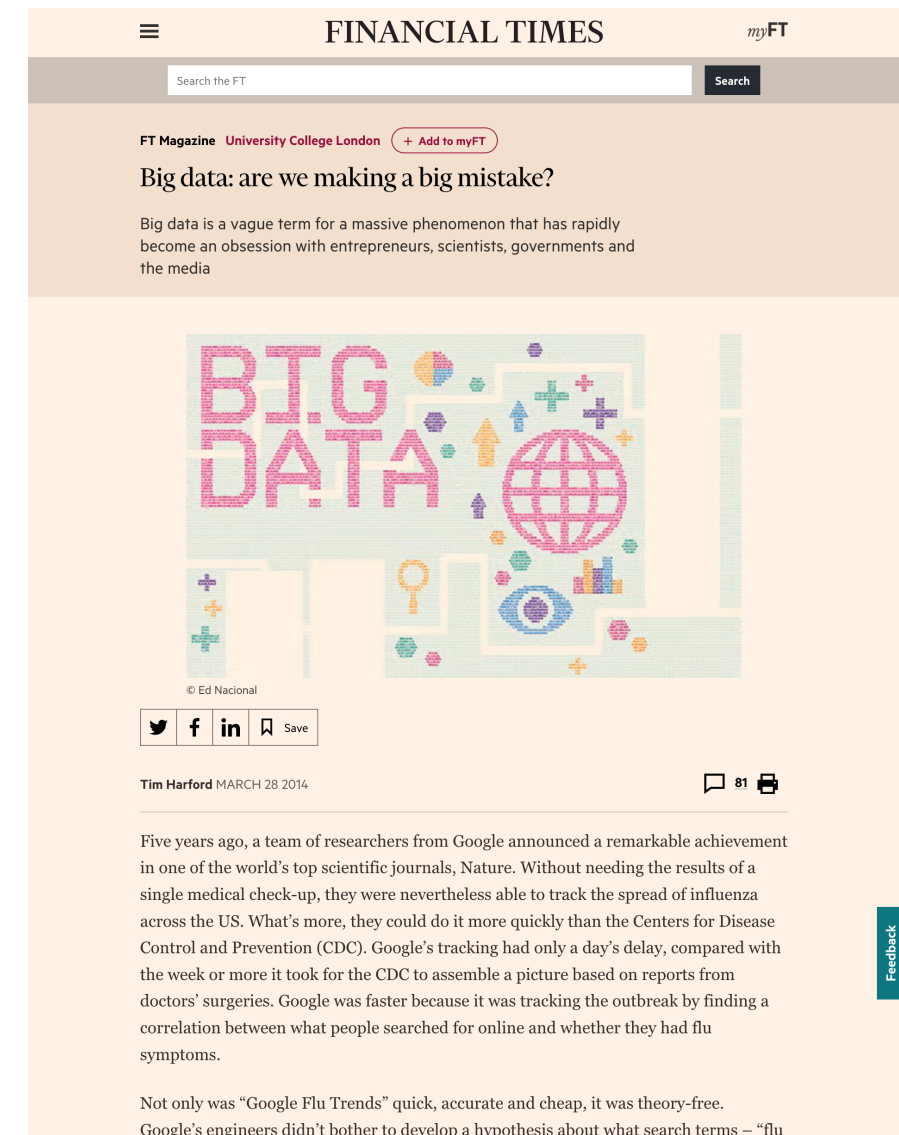
Information, Communication & Society Vol. 15, No. 5, June 2012, pp. 662–679
ISSN 1369-118X print/ISSN 1468-4462 online © 2012 Microsoft
<http://www.tandfonline.com> <http://dx.doi.org/10.1080/1369118X.2012.678878>

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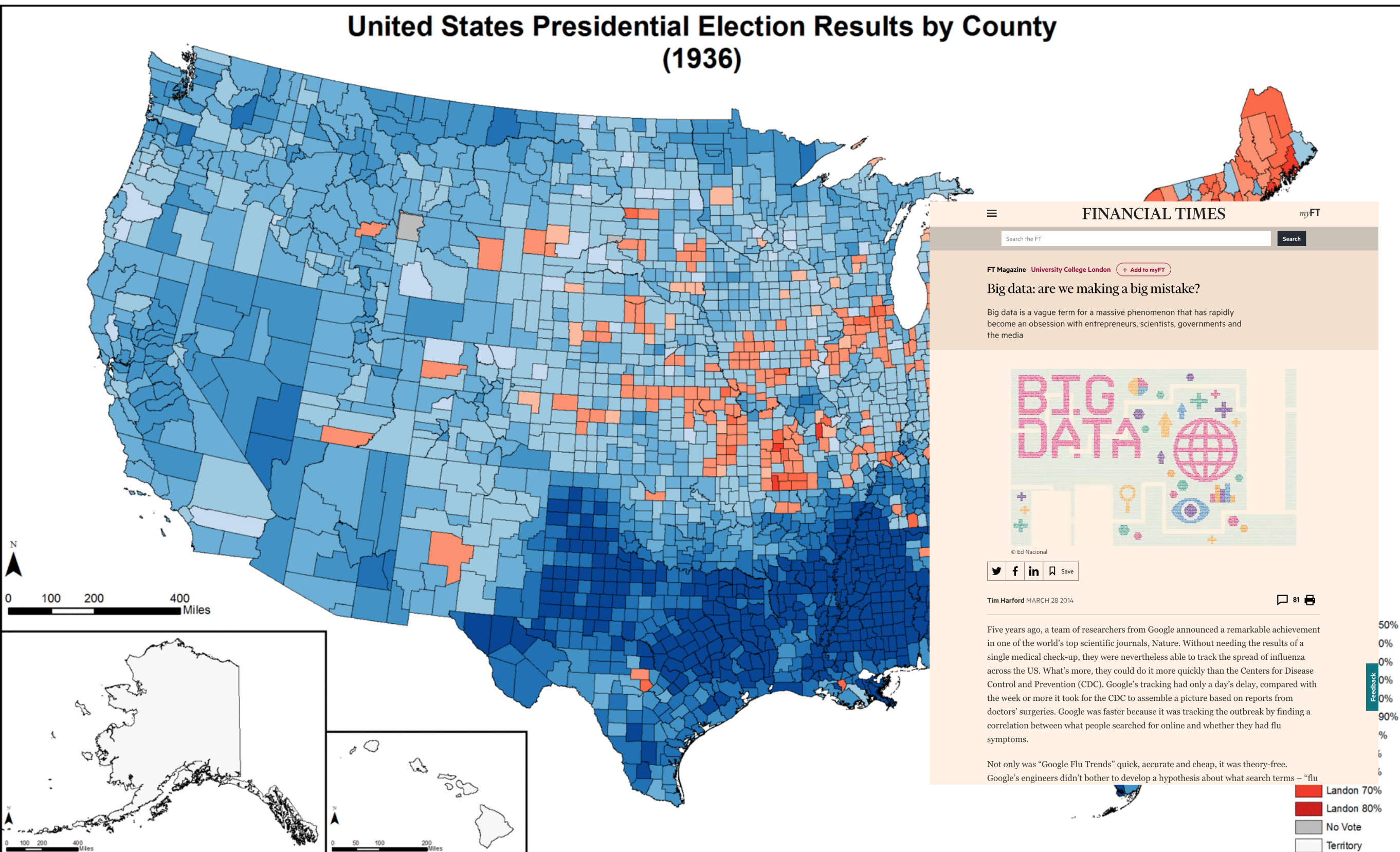
“Big data: are we making a big mistake?”

Tim Harford, *Financial Times Magazine*, March 28, 2014.

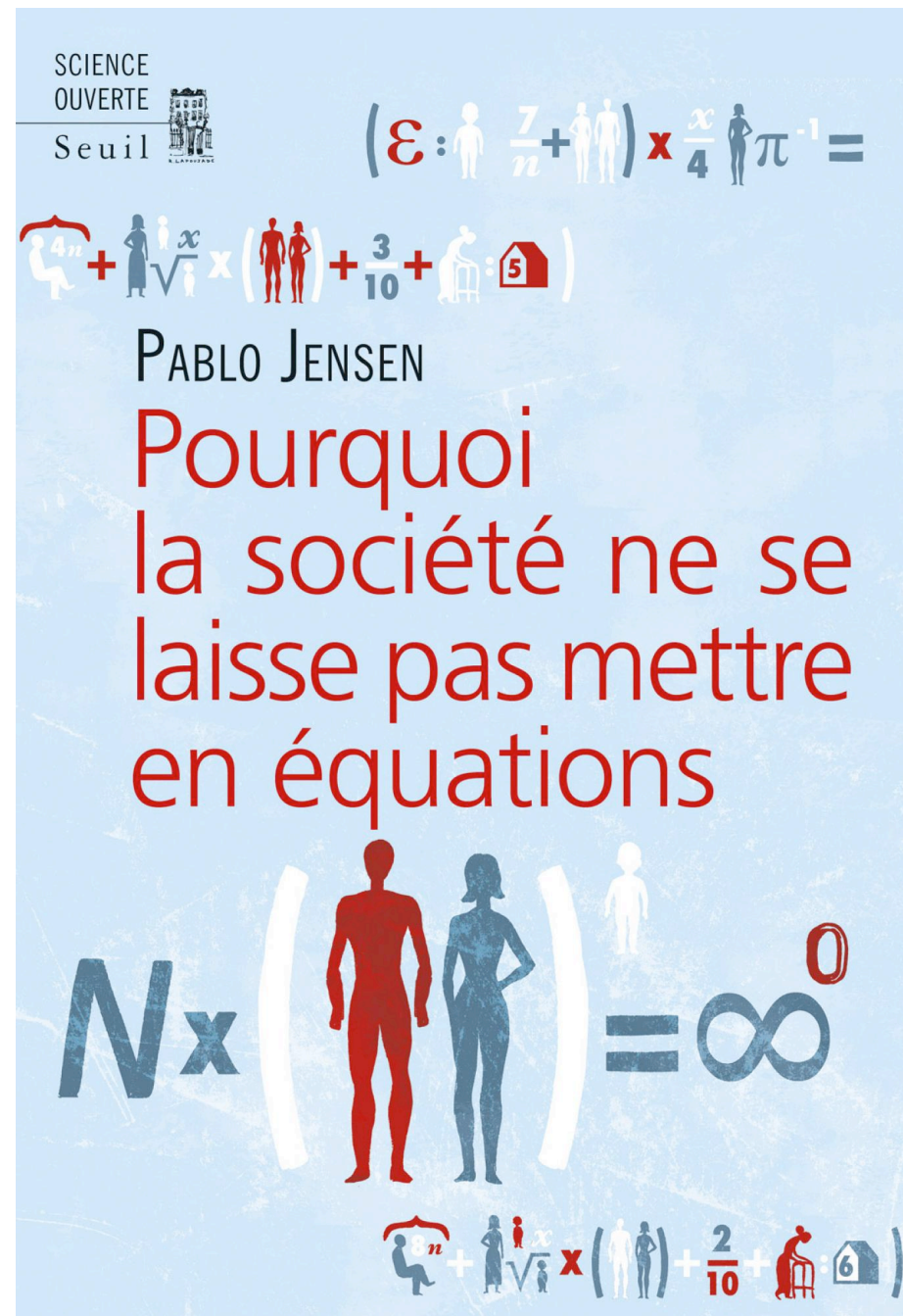
- Numbers don't speak for themselves
- Theory free analysis is fragile
- N=all doesn't exist
- Sampling error & Sampling biais
- Correlations are not causation
- We are not studying a stable environment
- Alfred Landon vs Franklin Roosevelt (1936) and *sampling error*
- Street Bump (Boston) and *sampling biais*
- Target and baby clothes (2012) and *false positives*
- John Ioannidis (2005) - Why most published research findings are false ? and *spurious correlations*



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2018



2018

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United States Presidential Election Results by County (1936)

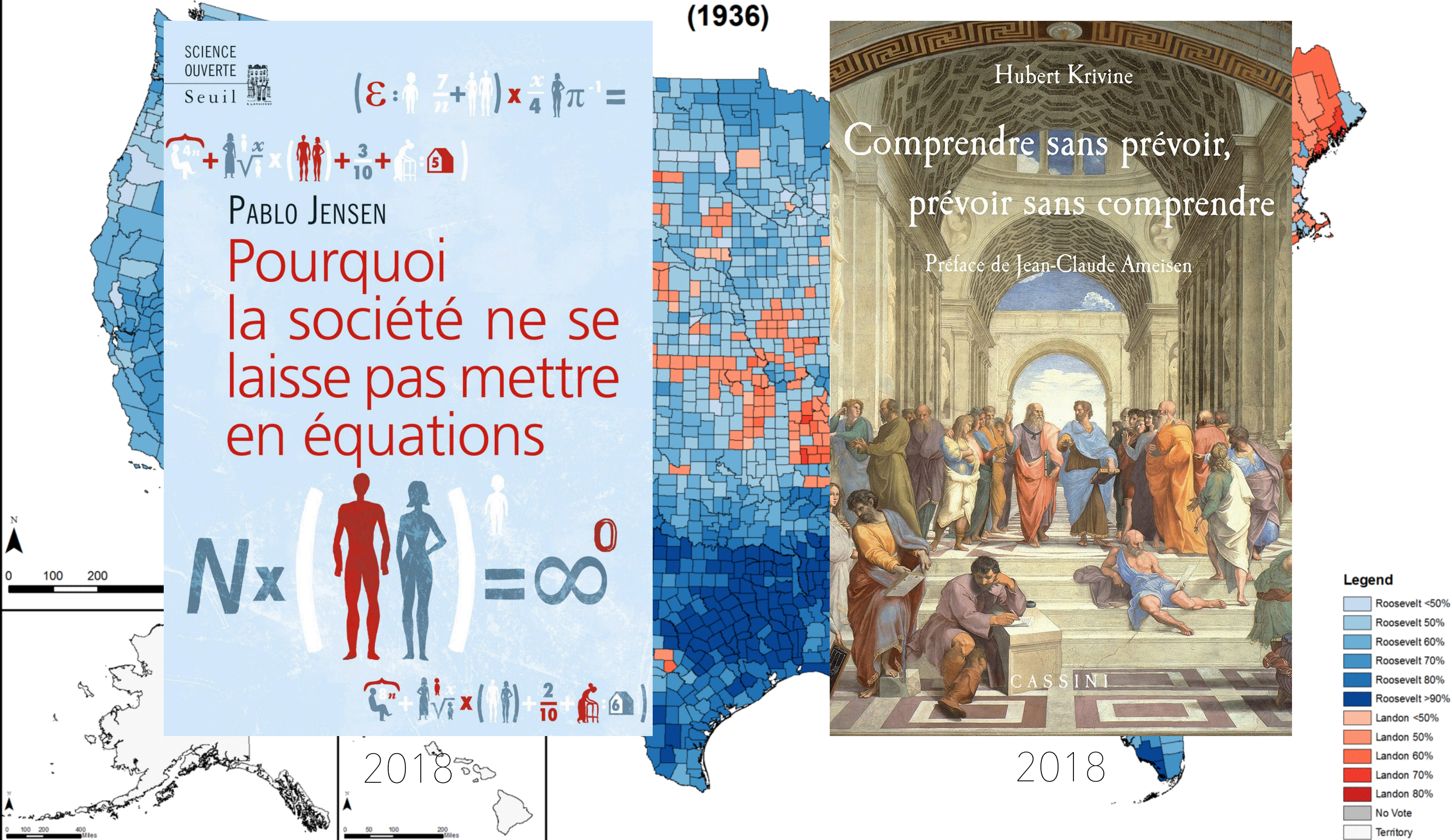




Illustration : Zak Bickel / The Atlantic / 2015

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Facebook : [nofluxin](https://www.facebook.com/nofluxin)

Les fins d'Internet, Fyp, 2014

<http://www.beaude.net/ie/>

Internet, changer l'espace, changer la société, Fyp, 2012

<http://www.beaude.net/icecs/>