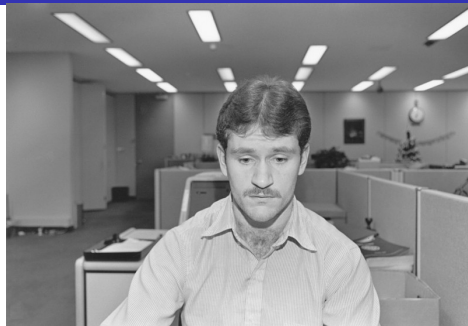


MIT 1985



Little Data: How Traditional Statistical Ideas Remain Relevant in a Big-Data World; or, The Statistical Crisis in Science; or, Open Problems in Bayesian Data Analysis

Andrew Gelman

Department of Statistics and Department of Political Science,
Columbia University

MIT statistics conference, 13 May 2015

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UFC 153

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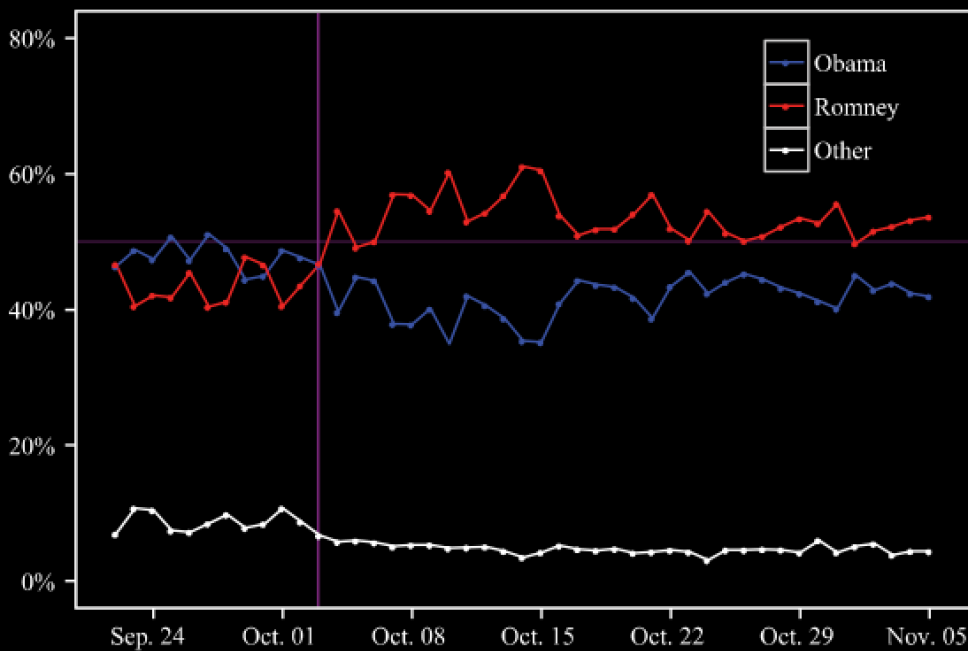
If the election were held today, who would you vote for?

Barack Obama

Mitt Romney

Other

Not sure



“This week, the New York Times and CBS News published a story using, in part, information from a non-probability, opt-in survey sparking concern among many in the polling community. In general, these methods have little grounding in theory and the results can vary widely based on the particular method used.”

— Michael Link, President, American Association for
~~Buggy Whip Manufacture~~ Public Opinion Research



Michael W. Link is Chief Methodologist for Research Methods at The Nielsen Company, with a long base of experience in survey research, having worked in academia (University of South Carolina, 1999), not-for-profit research (RTI International, 1999-2004), government (Centers for Disease Control and Prevention, 2004-2007), and the private sector (Nielsen, 2007-present). He received his PhD in Political Science from the University of South Carolina. Michael's research centers around developing and testing new methodologies for confronting some of the most pressing issues facing survey research, including new techniques for improving survey participation and data quality (use of address-based sampling, telephone call screening technologies), methodological issues involving use of multiple modes in data collection (mail, CATI, field, mobile, meters), and obtaining participation from hard-to-survey populations (e.g., isolated, racial and ethnic groups). His numerous research articles have appeared in *Public Opinion Quarterly* and other leading scientific journals.

An AAPOR member since 1993, Michael served as AAPOR Conference Chair in back-to-back years (2008 & 2010), a member of both the Cell Phone and Online task forces, an instructor for an AAPOR workshop, numerous short-courses, a reviewer for the student paper competition on several occasions, and a regular reviewer for *Public Opinion Quarterly*. He is a member of SAPOR, serving from 2006 to 2009 as President, Conference Chair, and Student Paper Competition Organizer and also a member of the AAPOR Council.

In 2011 he, along with several research colleagues, received AAPOR's Warren J. Mitofsky Award for their work on address based sampling designs. His current research focuses on new technologies, such as mobile and social platforms, as vehicles for measuring and understanding attitudes and behaviors. He will be teaching a short course on "The Role of New Technologies in Augmenting, or Replacing Traditional Surveys" at the 2012 AAPOR conference.

Nielsen feels the heat of competition as it flubs its ratings of news broadcasts, putting ABC ahead of NBC



BY DON KAPLAN

In spite of the goof, its global president took time to slam rival Rentrak, which collects different kind of data from viewers

NEW YORK DAILY NEWS / Sunday, October 19, 2014, 2:00 AM

AAA

MEDIA

TV Ratings by Nielsen Had Errors for Months

By **BILL CARTER** and **EMILY STEEL** OCT. 10, 2014



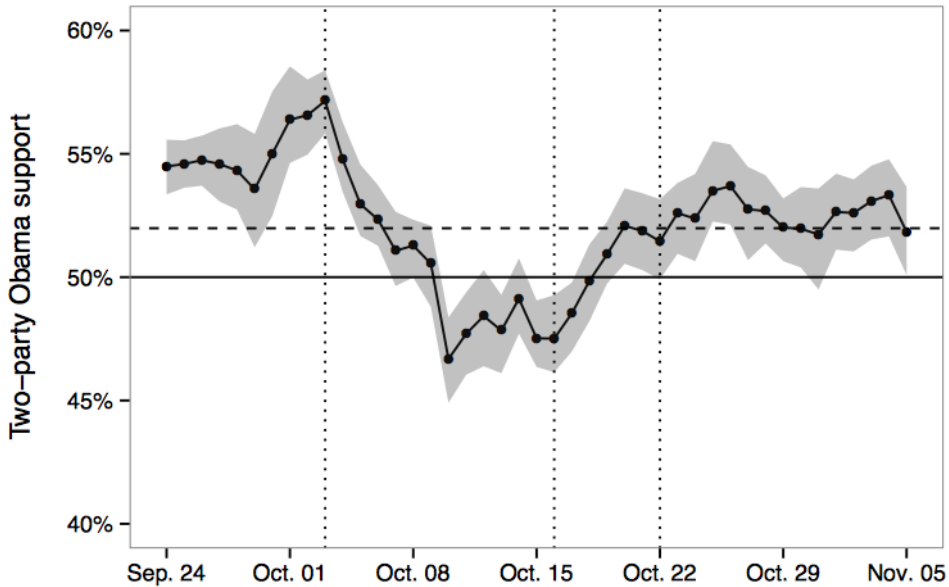
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Nielsen, the television research firm, acknowledged on Friday that it had been reporting inaccurate ratings for the broadcast networks for the last seven months, a mistake that raises questions about the company's increasingly criticized system for measuring TV audiences.

Xbox estimates, adjusting for demographics:

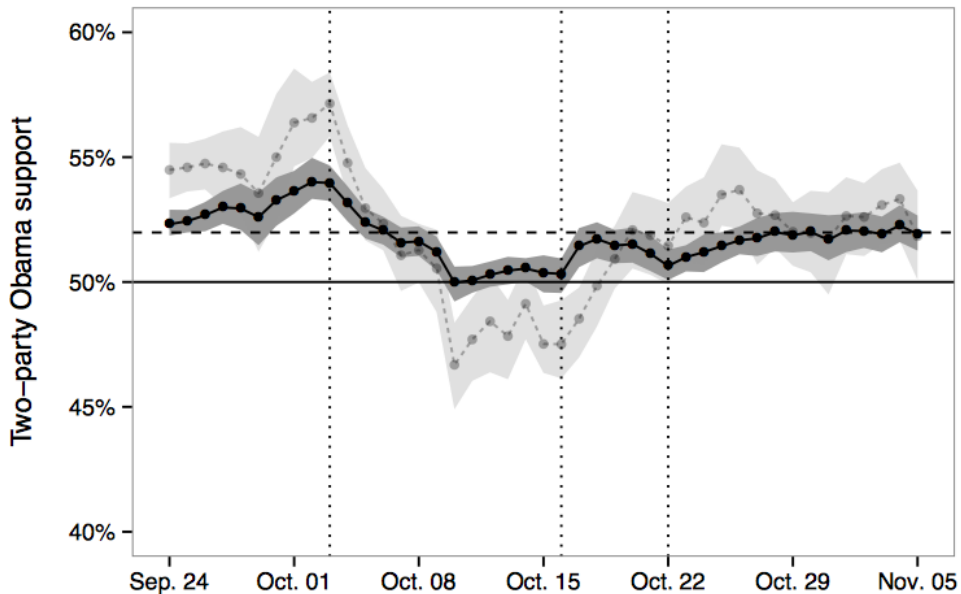




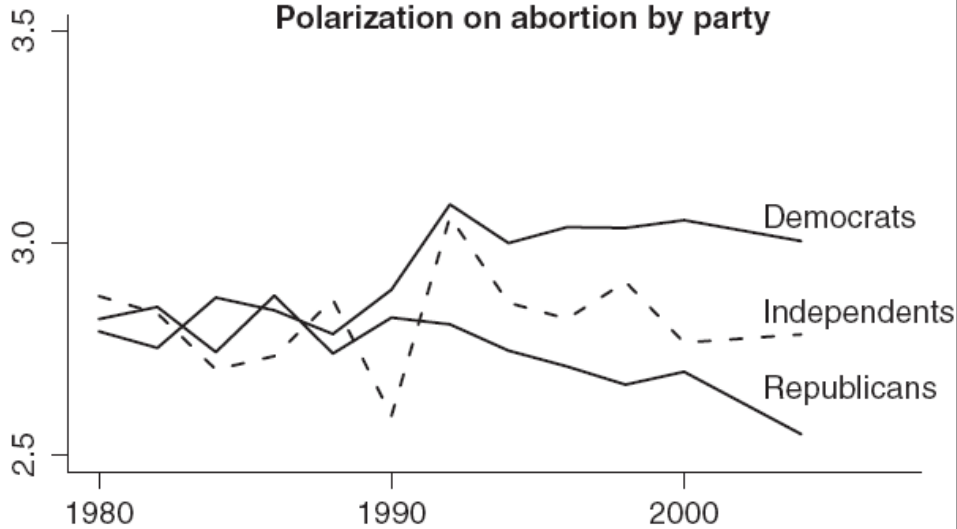


- ▶ Nate Silver, *New York Times*, 6 Oct: “Mr. Romney has not only improved his own standing but also taken voters away from Mr. Obama’s column.”
- ▶ Karl Rove, *Wall Street Journal*, 7 Oct: “Mr. Romney’s bounce is significant.”

Xbox estimates, adjusting for demographics and partisanship:



Polarization on abortion by party



WORLD

U.S.

N.Y. / REGION

BUSINESS

TECHNOLOGY

SCIENCE

HEALTH

SPORTS

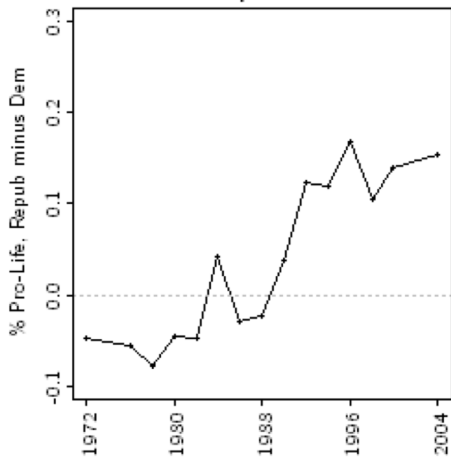
OPINION

POLITICS EDUCATION TEXAS

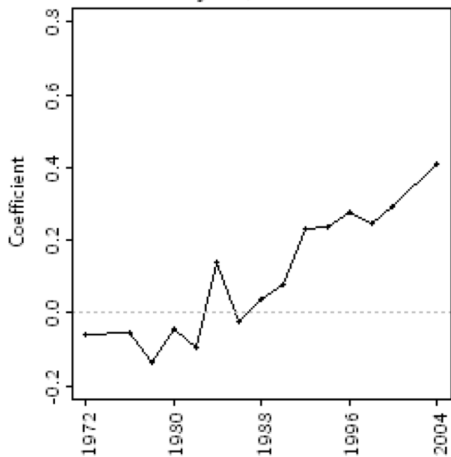
G.O.P. Pursues Hispanic Votes With Abortion Stance



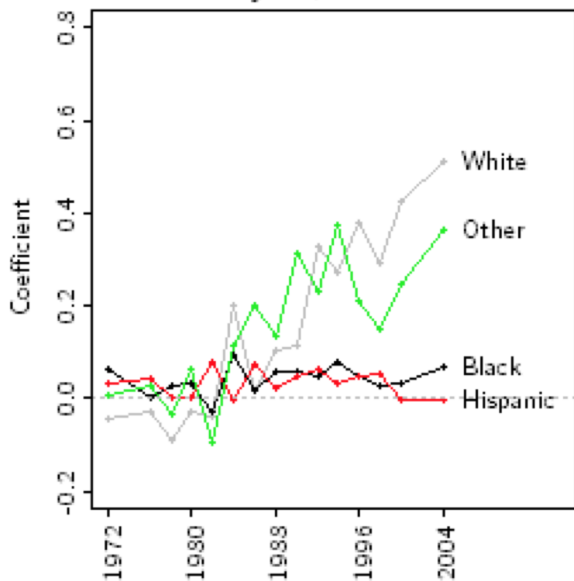
Pro-Life Tendency of
R's Compared to D's



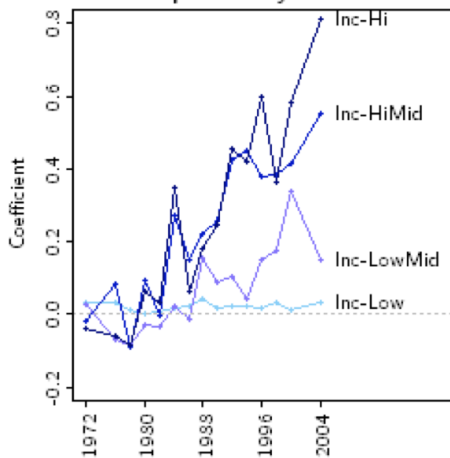
Coef of Abortion Opinion
on Party ID, fit with HLM



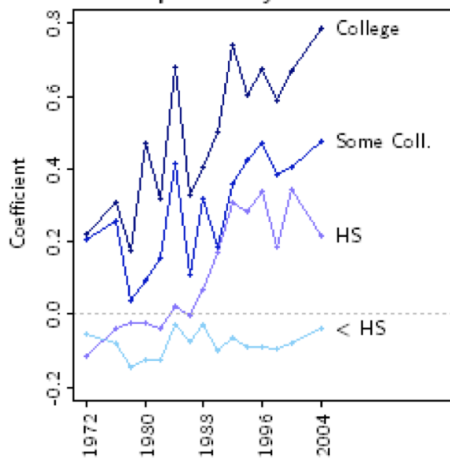
Coef of Abortion Opinion
on Party ID, fit with HLM



Coef for Whites Only,
Separated by Income



Coef for Whites Only,
Separated by Education

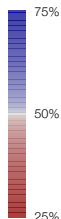
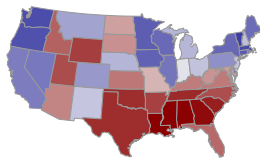
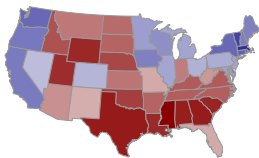
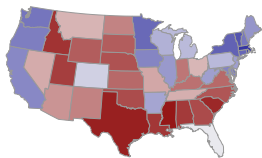


Annenberg 2000: Logit

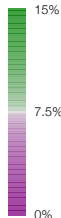
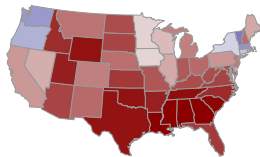
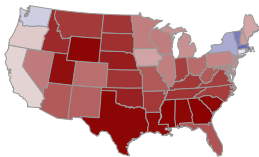
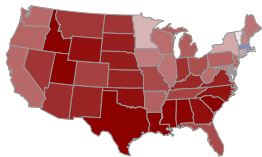
Annenberg 2004: Logit

Annenberg 2008: Logit

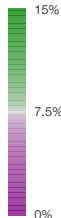
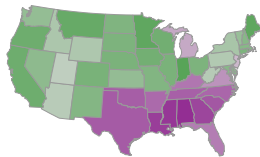
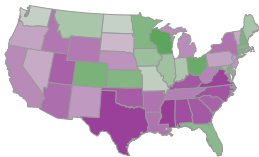
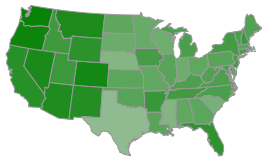
White Female



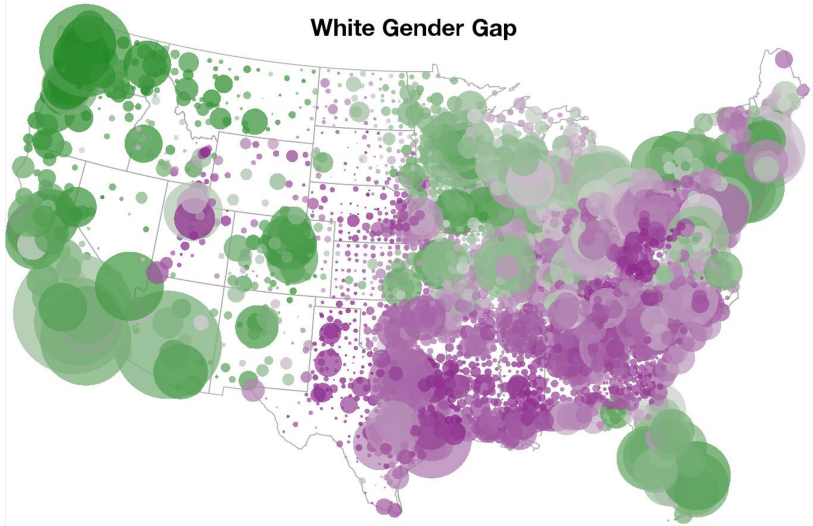
White Male



White Gender Gap

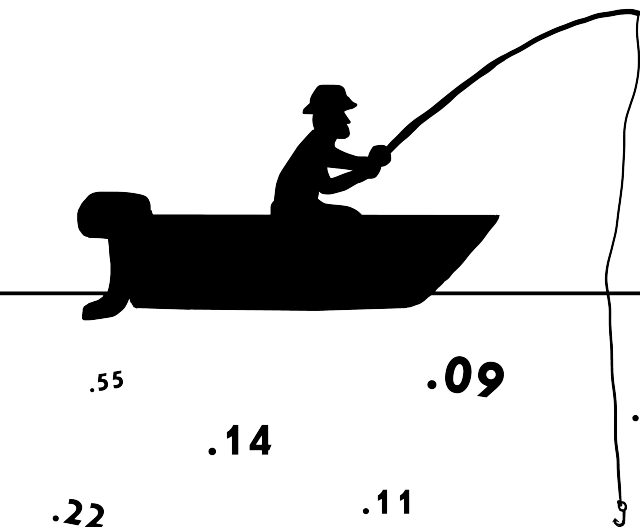


White Gender Gap



The blessing of dimensionality

- ▶ We learned by asking many questions at once!
- ▶ Consider the alternative . . .



.55

.09

.06

.01

.14

.22

.11

.03

.34

0.5

The Fluctuating Female Vote: Politics, Religion, and the Ovulatory Cycle

**Kristina M. Durante¹, Ashley Rae¹, and
Vladas Griskevicius²**

¹College of Business, University of Texas, San Antonio, and ²Carlson School of Management, University of Minnesota

Abstract

Each month, many women experience an ovulatory cycle that regulates fertility. Although the ovulatory cycle influences women's mating preferences, we proposed that it might also change women's political views. Building on theory suggesting that political and religious orientation are linked to reproductive status, we tested how fertility influenced women's politics, religiosity, and voting in the 2012 U.S. presidential election. Using data from two studies with large and diverse samples, ovulation had drastically different effects on single women and women in relationships. Ovulation led single women to become more liberal, less religious, and more likely to vote for Obama. In contrast, ovulation led women in committed relationships to become more conservative and more likely to vote for Mitt Romney. In addition, ovulation-induced changes in political orientation mediated women's voting behavior. Overall, the ovulatory cycle not only influences women's politics and religion differently for single women than for women in relationships.

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[GPA Ioannidis](#) - PLoS medicine, 2005 - [dx.plos.org](#)

Summary There is increasing concern that **most** current **published** research findings are **false**. The probability that a research claim is true may depend on the number of other studies on the same question, and, importantly, the

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[R Moonesinghe, MJ Khoury...](#) - PLoS Medicine, 2007 - [dx.plos.org](#)

DEAD

ON ARRIVAL

WORLD	U.S.	N.Y. / REGION	BUSINESS	TECHNOLOGY	SCIENCE	HEALTH	SPORTS	OPINION
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AFRICA	AMERICAS	ASIA PACIFIC	EUROPE	MIDDLE EAST
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Pollution Leads to Drop in Life Span in Northern China, Research Finds



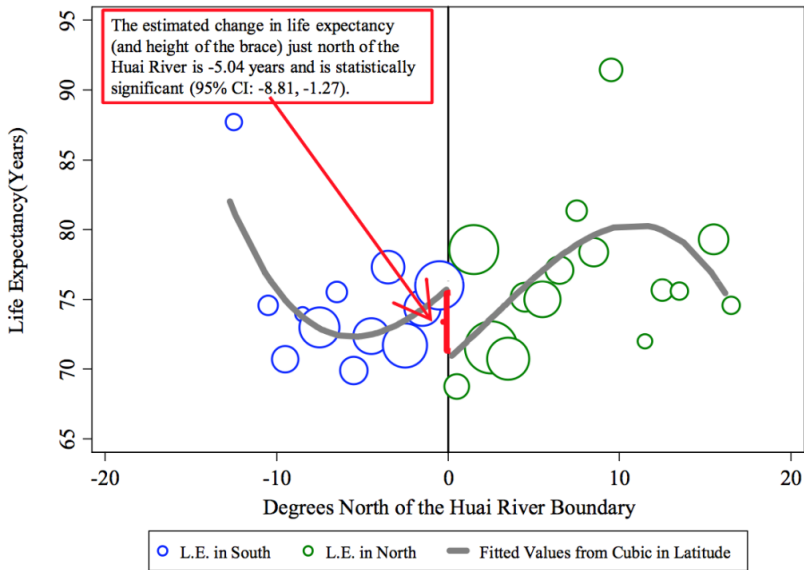


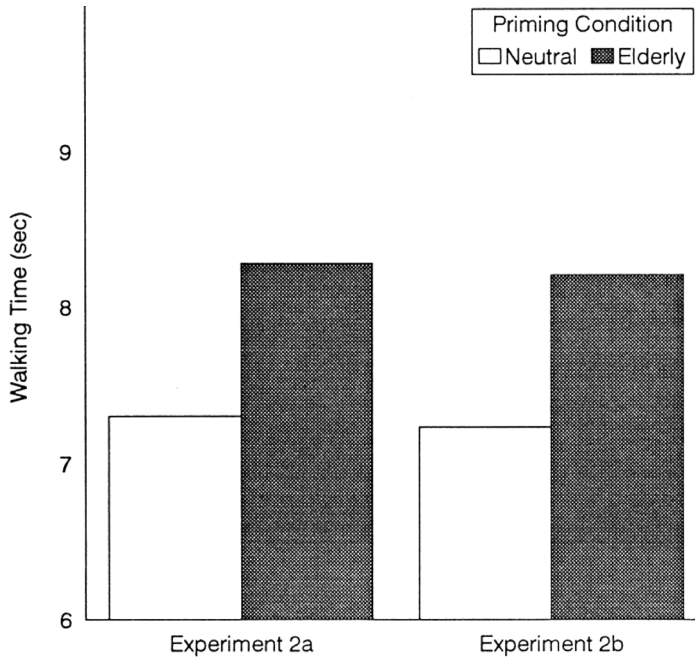
Fig. 3. The plotted line reports the fitted values from a regression of life expectancy on a cubic in latitude using the sample of DSP locations, weighted by the population at each location.

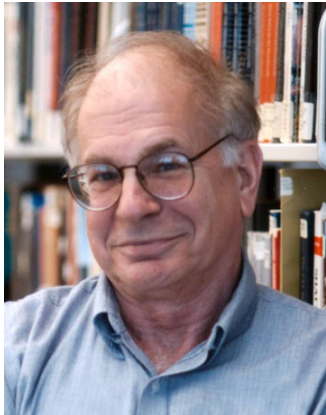
The famous study of social priming

Results

Experiment 2a. A t test was computed to ascertain the effect of the priming manipulation on walking speed. Participants in the elderly priming condition ($M = 8.28$ s) had a slower walking speed compared to participants in the neutral priming condition ($M = 7.30$ s), $t(28) = 2.86$, $p < .01$, as predicted.

Experiment 2b. In the replication, analyses revealed that participants in the elderly priming condition ($M = 8.20$ s) again had a slower walking speed compared to participants in the neutral priming condition ($M = 7.23$ s), $t(28) = 2.16$, $p < .05$.





Daniel Kahneman (2011):

"When I describe priming studies to audiences, the reaction is often disbelief ... The idea you should focus on, however, is that disbelief is not an option. The results are not made up, nor are they statistical flukes. You have no choice but to accept that the major conclusions of these studies are true."

Elderly-Related Words Prime Slow Walking (#15)

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Reference to Original Report of Finding

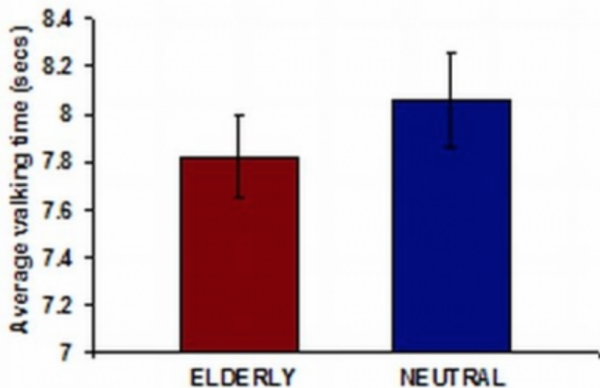
Bargh, J. A., Chen, M., & Burrows, L. (1996). Automatic action. *Journal of Personality and Social Psychology*, 71, 230-244.

Title

Elderly-Related Words Prime Slow Walking

The attempted replication

Average time (secs) to walk 32ft, as a function of priming stereotype condition



Daniel Kahneman (2011):

“When I describe priming studies to audiences, the reaction is often disbelief . . . The idea you should focus on, however, is that disbelief is not an option. The results are not made up, nor are they statistical flukes. You have no choice but to accept that the major conclusions of these studies are true.”

Wagenmakers et al. (2014):

“[After] a long series of failed replications . . . disbelief does in fact remain an option.”

Alan Turing (1950):



"I assume that the reader is familiar with the idea of extra-sensory perception, and the meaning of the four items of it, viz. telepathy, clairvoyance, precognition and psycho-kinesis. These disturbing phenomena seem to deny all our usual scientific ideas. How we should like to discredit them! Unfortunately the statistical evidence, at least for telepathy, is overwhelming."

Where does the math come in?

