COMMUNI
SC TO THE PUBLIC

Be wary of the 32%

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NEW ANTI-INTELLECTUALISM: TRENDS

- HOW WE COMMUNICATE.

  In *The Age of American Unreason*, Jacoby posited that it trickled down from the top, fueled by faux-populist politicians striving to make themselves sound approachable rather than smart. (Jacoby, 2008).

  EX: The average length of a sound bite by a presidential candidate in 1968 was 42.3 seconds. Two decades later, it was 9.8 seconds. Today, it's just a touch over seven seconds and well on its way to being supplanted by 140/280-character Twitter bursts.

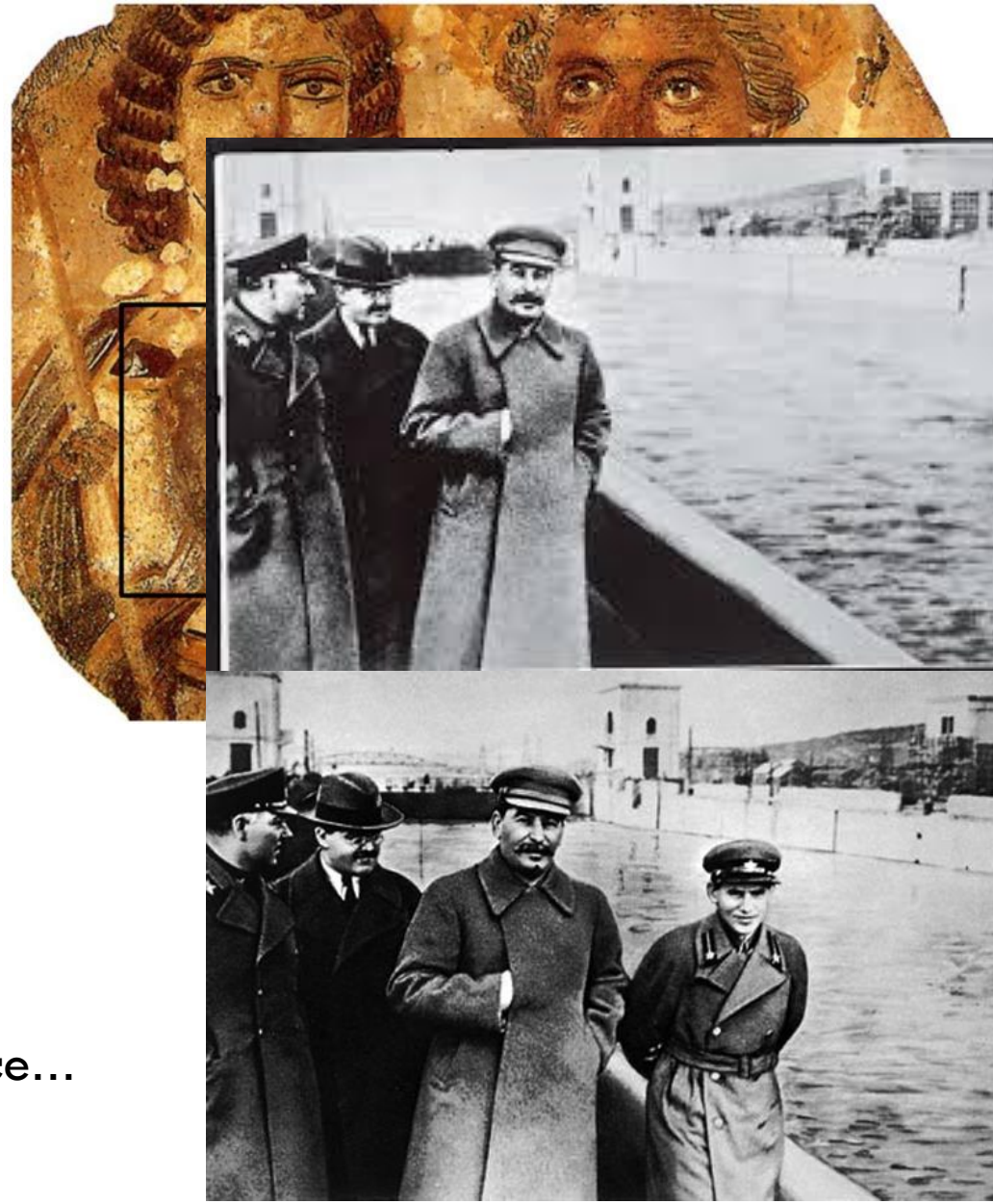
- DATA FRAMING.
  - When asked if they **truly** believe what scientists tell them, only 36 percent of respondents said yes. Just 12 percent expressed **strong confidence** in the press to accurately report scientific findings.

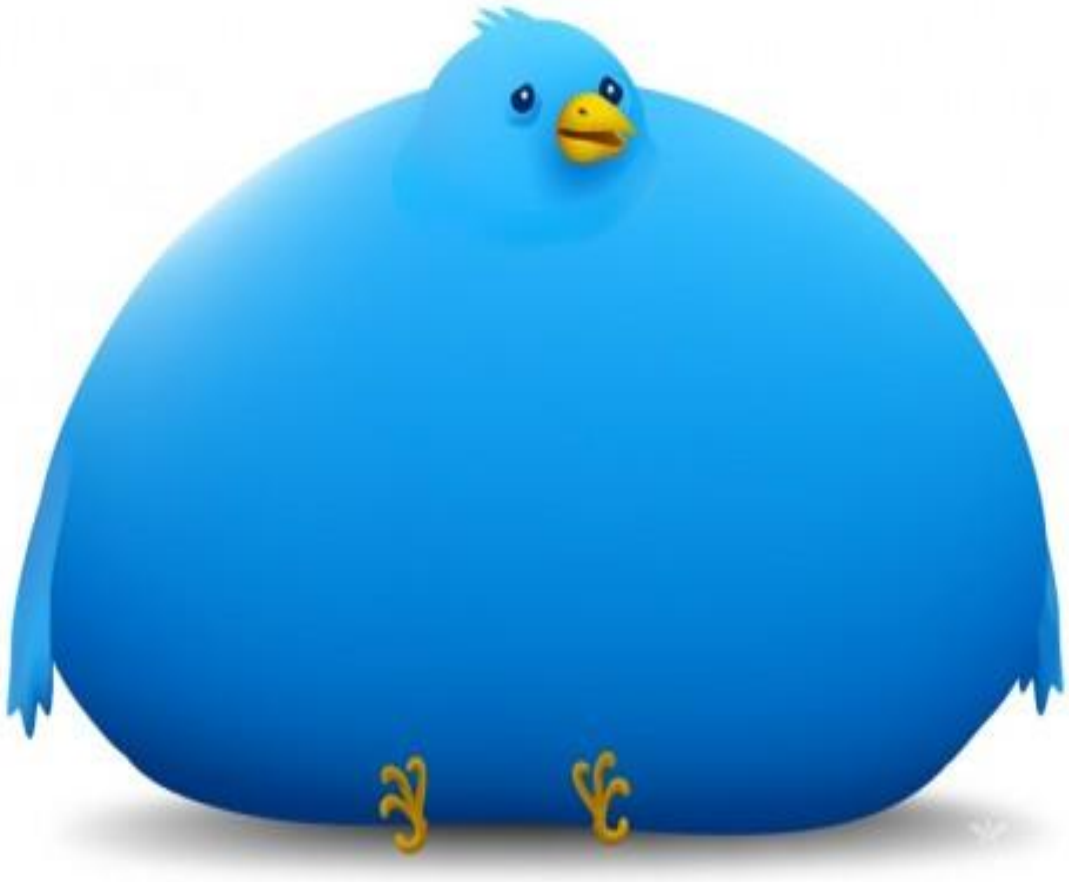
- ROLE OF THE PUBLIC.

  A study by two Princeton University researchers, Martin Gilens and Benjamin Page, released Fall 2014, tracked 1,800 U.S. policy changes between 1981 and 2002, and compared the outcome with the expressed preferences of median-income Americans, the affluent, business interests and powerful lobbies. They concluded that **average citizens "have little or no independent influence" on policy in the U.S.**, while the rich and their hired mouthpieces routinely get their way. "The majority does not rule," they wrote.

RATIONALE FOR RESEARCH:

- Anti-intellectualism and suspicion (trends).
  - Trump world – outsiders/insiders.
  - Erasing/re-writing history – damnatio memoriae.
- False news.
  - Infoxication (CC) and infobesity.
  - Aggregators and managed reality.
  - Affirmation and confirmation bias.
- Negotiating reality.
  - New tribalism is mostly ideational not political.
  - Unspoken – guns, birth control, sexual harassment, race…





“The amount of technical information is doubling every two years. For students starting a 4-year degree, this means that half of what they learn in their first year of study will be outdated by their third year of study” (Dickerson, 2017).

EFFECTIVENESS:

- Naïve scientists.
  - Voluntary – some publics have excluded themselves from science by choice.
  - Involuntary – some publics have been denied opportunities to participate in science due to other socio-cultural variables.
- Cognitive misers.
  - 1st law of thermo-dynamics – conservation of energy (digitalized sound bites).
  - Losers game: public perceives less benefits and more risks to nanotechnology. Nice data but incomplete, we they perceive less benefits and more risks is the issue. Survey data missing power.
- Cognitive bias.
  - Expert biases – ex: first language, perceived effect (single study), design bias,
  - Inexpert biases – 80 plus.

BIASES, EFFECTS, FALLACIES…

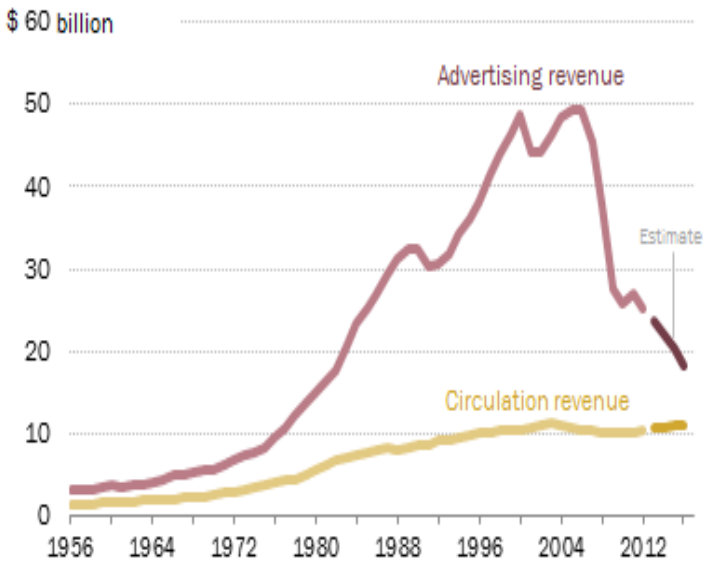
accessibility bias, actor-observer bias, ambiguity effect, affirmative bias, anchoring or focalism, attentional bias, availability heuristic, availability cascade, backfire effect, bandwagon effect, base rate fallacy or base rate neglect, belief bias, bizarreness effect, blind spot bias, cheerleader effect, change bias, childhood amnesia, choice-supportive bias, clustering illusion, confirmation bias, congruence bias, conjunction fallacy, conservatism or regressive bias, consistency bias, context effect, contrast effect, cross-race effect, cryptomnesia, curse of knowledge, decoy effect, defensive attribution hypothesis, denomination effect, distinction bias, Dunning-Kruger effect, duration neglect, egocentric bias, empathy gap, endowment effect, essentialism, exaggerate expectation, experimenter's or expectation bias, extrinsic incentives bias, fading affect bias, false consensus bias, false memory, functional fixedness, focusing effect, fundamental attribution error, forer effect, framing effect, frequency illusion, gambler's fallacy, generation effect, Google effect, group attribution error, halo effect, hard-easy effect, hindsight bias, hostile media effect, hot-hand fallacy, humor effect, hyperbolic discounting, identifiable victim effect, IKEA effect, illusion correlation, illusion of asymmetric insight, illusion of control, illusion of external agency, illusion of transparency, illusion of truth effect, illusion of superiority, illusion of validity, illusion correlation, impact bias, information bias, in-group bias, insensitivity to sample size, irrational escalation, just-world hypothesis, lag effect, less-is-better effect, levelling and sharpening, levels of processing effect, list length effect, loss aversion, ludic fallacy, mere exposure effect, misinformation effect, modality effect, mood congruent memory bias, money illusion, moral credential effect, moral luck, naïve skepticism, negativity effect, negativity bias, neglect of probability, next in line effect, normalcy bias, observation selection bias, observer-expectancy effect, omission bias, optimism bias, ostrich effect, outcome bias, out-group homogeneity bias, overconfident effect, pareidolia, part list cueing effect, peak end rule, persistence, pessimism bias, planning fallacy, picture superiority effect, positivity effect, post-purchase rationalization, primacy effect, processing difficulty effect, pro-innovation bias, projection bias, pseudocertainty effect, reactance, reactive evaluation, recency effect, recency illusion, reminiscence bump, restraint bias, rhyme as reason effect, risk compensation or Peltzman effect, rosy retrospection, selective perception, self-reference effect, self-serving bias, Semmelweis effect, serial position effect, shared information bias, social comparison effect, social desirability bias, source confusion, spacing effect, status quo bias, stereotyping, sub-additivity effect, subjective validation, suffix effect, suggestibility, survivorship bias, system justification, telescoping effect, testing effect, time-saving bias, tip of the tongue phenomenon, trait ascription bias, ultimate attribution error, unit bias, verbatim effect, Von Restorff effect, well-traveled road effect, worse than average effect, Zeigarnik effect, zero-risk bias, and zero-sum heuristics.

PUBLIC INFORMATION SEEKING.

- In 1978, 42 per cent of Americans reported that they had read 11 or more books in the past year.
- In 2014, just 28 per cent can say the same, while 23 per cent proudly admit to not having read even one, up from eight per cent in 1978.
- Newspaper and magazine circulation continues to decline sharply, as does viewership for cable news. The three big network supper-hour shows drew a combined average audience of 22.6 million in 2013, down from 52 million in 1980.
- The digital audience engaged with newspaper content (August 2015) totaled 179.3 million adult unique visitors in August 2015. The count is a 10% increase in adult unique visitors measured by comScore since August 2014, and is double the growth rate for the Internet overall (5%).

Newspapers' circulation revenue climbs steadily even as advertising declines

Total revenue for U.S. newspapers in U.S. dollars



Note: Break in line indicates switch to estimated revenue. There are no data for circulation revenue in 1990.
Source: News Media Alliance, formerly Newspaper Association of America (through 2012); estimate based on Pew Research Center analysis of SEC filings of publicly traded newspaper companies (2013-2016).

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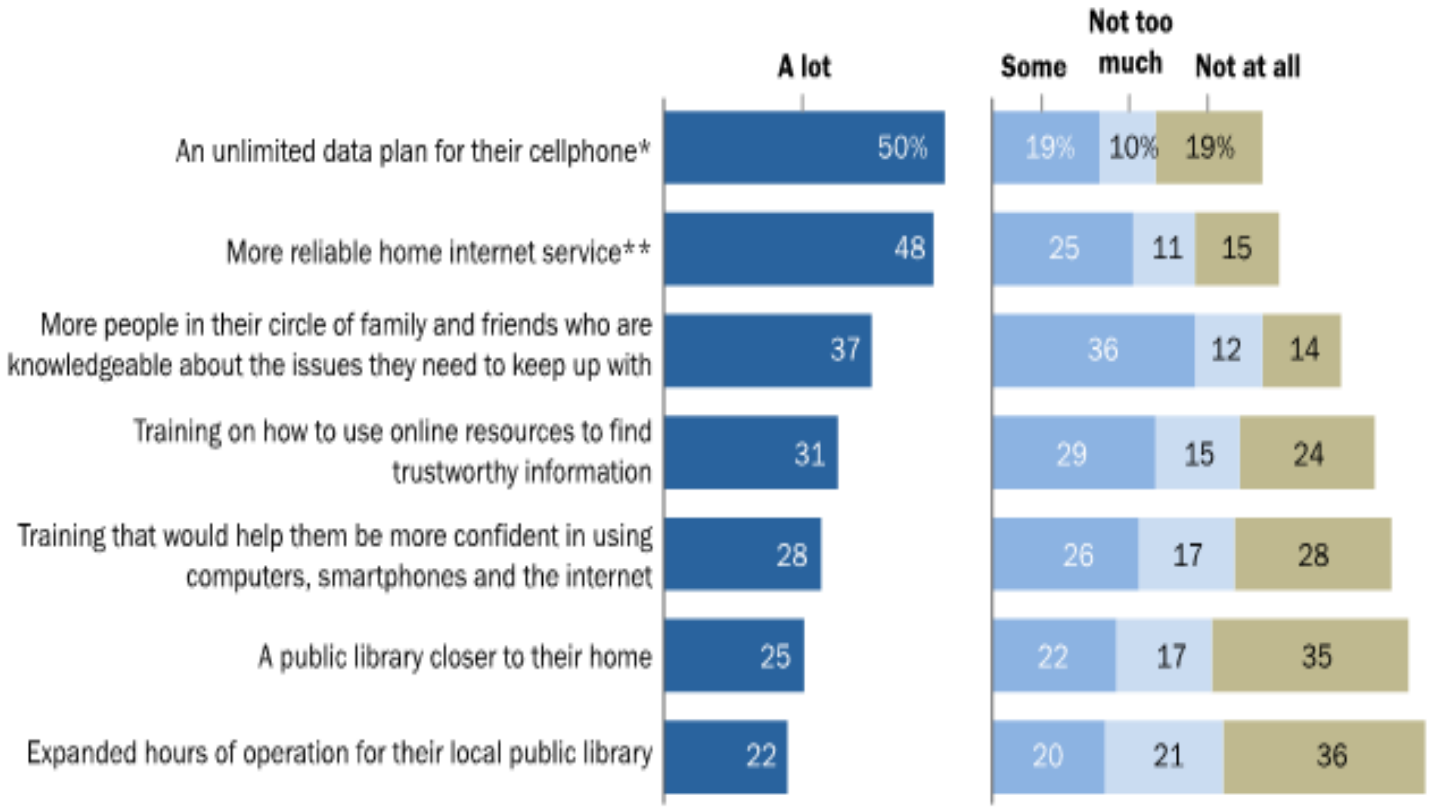
Mobile and home internet connectivity top people's wish list for aids in getting information to make decisions

% of U.S. adults who say the following things would help them in making decisions ...



* Based on cellphone users.
**Based on those who use the internet at home.
Source: Survey conducted Sept. 29-Nov 6, 2016.
"How People Approach Facts and Information"

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DIGITAL NEWS

- Call for a new "digital illiteracy" <u>or the aggregators win.</u>
- Call for a new pedagogy for digital literacy: teaching users what is available ignores the outstripping phenomenon (new platforms come and go quickly).
- Call is for teaching how to unpack new tools and decide on overall utility.

EXPERT INFORMATION SEEKING:

- Dunning: This "grey" area between non-experts and experts is populated by fools and charlatans as well as miscreants and monsters. When they impersonate experts to represent their own best interests and not those of others. Oftentimes, when the public interest crosses with their own it is serendipitous.
- Publications (reflectively critical):
  - over-solicitation (there are over 4,000 predatory journals and nearly 25% are open-access),
  - fraud and retraction (recently, a presumably peer-reviewed counterfeit cancer study was accepted by 70 percent of 106 journals and while a recent study found only about 25% of retractions were due to fraud in 2000-2010, a PNAS study by Fang linked two-thirds of retraction since 1977 to fraud).
  - the persistence of contradicted claims (as many of 21 percent of retracted papers had not been tagged as such in PubMed),
  - the decline effect (Amgen reported that in search of new drugs, they selected 53 promising basic-research papers from leading medical journals and attempted to reproduce the original findings with the same experiments. They failed nine times out of ten"), and
  - BS (Springer and IEEE removed more than 120 papers from their subscription services after they were revealed to be computer-generated nonsense).

And false citation effects, the single study effect, negative results, review circles, etc.

OBSERVATIONS ON SCIENCE LITERACY

- PUS (belief-driven) -
  - 42 per cent of Americans are "not too" or "not at all" confident that all life on Earth is the product of evolution.
  - 51 per cent of people expressed skepticism that the universe started with a "big bang" 13.8 billion years ago, and
  - 36 per cent doubted the Earth has been around for 4.5 billion years.
- PoPP – (stupidity assumption) "perception of public perception." This is where governance misinterprets public understanding as we did with the Texas Super-collider.

WHY SHOULD BE CARE:

- Public participation and representative democracies – publics who want to **participate** in science policy making should be given the tools to do so.
- Technocratic elite and global corporatism – incentives exist to keep the understanding of science to the few who directly profit from it in order to shield what is being done from being **transparent**. Includes everything from patents and licensing to ego self-defense of the scientific elite.
- Humanity as a production variable (**new citizen scientists**) – science employs humanity to work as production units in a grant scheme to maximize profit from investment in new and sometimes uncertain investments in science (rain levels to local species counts).

CONSEQUENCES:

Consumption – when given a choice, the public can decided to shop using negative labelling (non-nano). In some applications, they will elect to ignore its inclusion (such as medicine).

Boycotts – when the cost of science are born by some publics and the benefits are predominantly shared among different publics, when choice can be exercised, the products of science will be rejected.

Protests – when the costs of doing science becomes too expensive and the bill is shouldered by those outside the technoscience sphere, then public unite to reject the direction of science.

Anti-scientism – when science is driven by corporatism and poverty becomes the norm, then blame shifts outward from the individual to the state.

SIX THESES: (1/3)

1. We need to understand why publics cognize nanotechnology the way they do. Rather than understand "what" public feel, we need to move to "why" publics feel the way they do about nanotechnology. This involves the functions of attitudes and beliefs and their interaction which may help us predict behavior. By and large, these are experimental designs rather than surveys.
2. The interaction between governance and publics needs to be understood in cross-national settings. Paths of interaction between regulators, researchers, and consumers need to be modeled to enable the construction of predictive and evaluative algorithms. We need to understand the cross-national macroeconomics of advanced technologies and the roles played by government and industry in research and development.
3. The promotion of science and technology remains controversial yet with the extensive delay in return on investment, some common investment in new technologies may be inevitable. It is time to begin to gather data on how productive funded research has been in moving nanotechnology forward.

SIX THESES (4-6)

4. It would be useful to comprehend how different players interact in laboratory and commercial settings by continuing to embed social sciences and the public into places scientists and engineers work. This organic work may provide information that we can use to address a whole gamut of wicked and sticky problems we may come to confront.
5. It might be important to attend to if not re-examine what we know about media as the internet and its social/digital nature of it continues to mature. Information availed to publics about advanced technologies, including nanotechnology, are found in online public forums rather than in traditional media settings. This trend will continue as media moves from its traditional print and video formats to digital formats.
6. Sixth and finally, given the problems of expertise we may need to develop new and creative ways to tap expert opinion when needed through expert probably online crowd-sourcing. Expert intuition is built on high levels of exposure to process and method. We can experiment with including experts from other disciplines as well as other stakeholders within each expert crowd. Multiple experts crowds can be concatenated with new toolsets.

Research Triangle Nanotechnology Network
A Partnership Between NC State University, Duke University, and UNC Chapel Hill

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