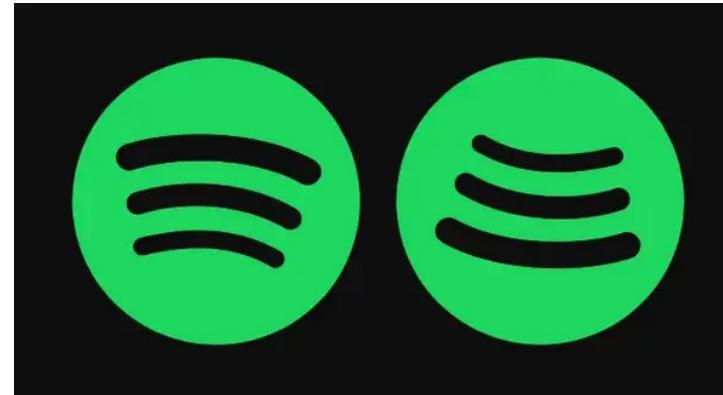
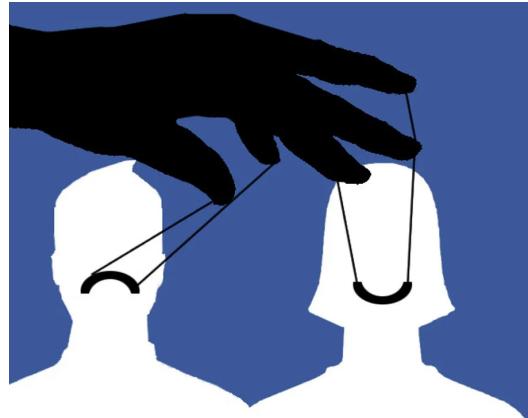


Tea Room Trade Study

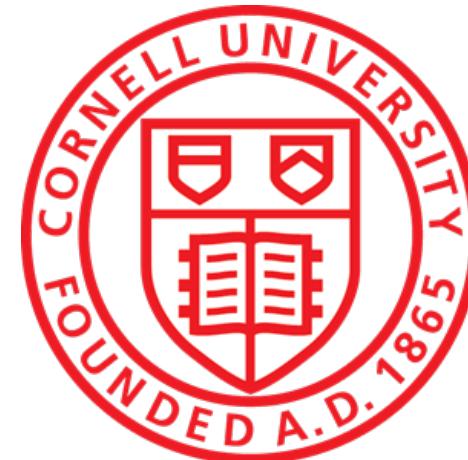
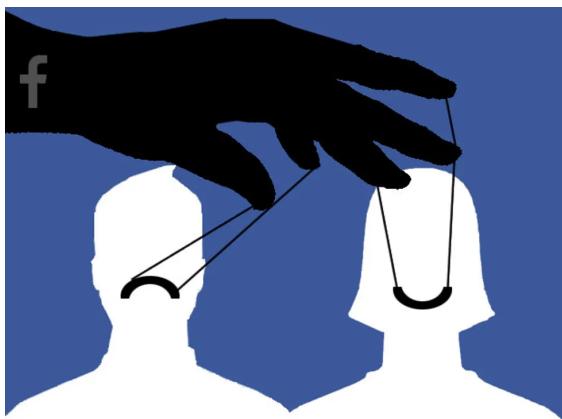


Especially when informed consent cannot be obtained in human-subject research, the benefits of the study should outweigh the harm of any invasion of privacy (Jouhki et al. 2016)

Mind Control/Mood Manipulation: Now Observing Behavior: Now



Facebook Emotional Contagion Study



PNAS

ARTICLES ▾ FRONT MATTER AUTHORS ▾ TOPICS +

RESEARCH ARTICLE | PSYCHOLOGICAL AND COGNITIVE SCIENCES | 8

Experimental evidence of massive-scale emotional contagion through social networks

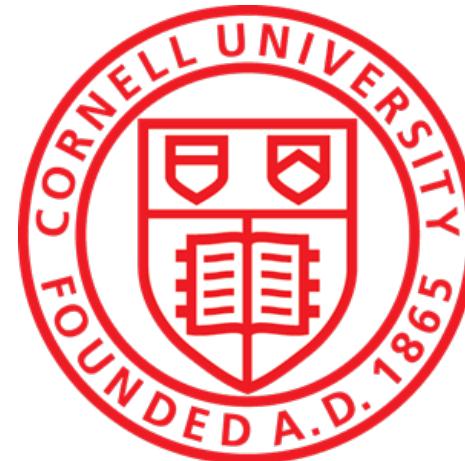
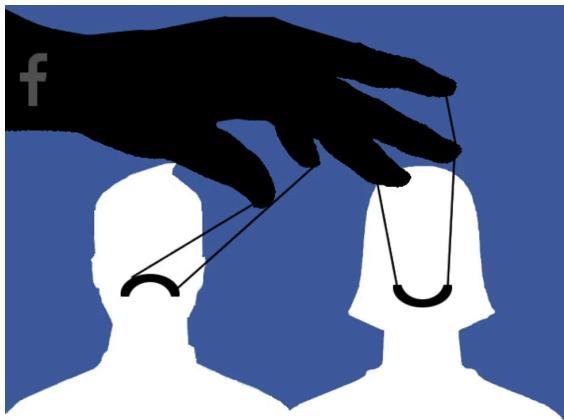
Adam D. I. Kramer, Jamie E. Guillory, and Jeffrey T. Hancock [Authors Info & Affiliations](#)

Edited by Susan T. Fiske, Princeton University, Princeton, NJ, and approved March 25, 2014 (received for review October 23, 2013)

June 2, 2014 | 111 (24) 8788-8790 | <https://doi.org/10.1073/pnas.1320040111>

[Check for updates](#)

Facebook Emotional Contagion Study



emotional states “can be transferred to others via emotional contagion, leading people to experience the same emotions without their awareness” (Kramer et al., 2014)

Facebook Emotional Contagion Study

- news feeds 689,003 Facebook users for 1 week were curated
- three million posts and over 122 million words
- reducing the amount of certain kind of emotional content in their feeds
- Cornell University analyzed the data after Facebook had collected them
- researchers themselves did not read any of the texts analyzed for the experiment as a linguistic software program was used to analyze the data

Facebook Emotional Contagion Study



Facebook Emotional Contagion Study: Ethical Concerns?

- Research as manipulation
- Informed consent

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Article

Facebook's Emotional Contagion Experiment as a Challenge to Research Ethics

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Facebook Emotional Contagion Study: Informed Consent

- study did not go through an ethical review at Cornell University
- authors interpreted Facebook's user agreement to mean informed consent
- When a user accepts the terms and signs up for Facebook, he/she is informed that the service provider will use the personal data for all sorts of things (Facebook, 2015a). **The user might give their consent but is most likely not well informed**
- scholars should at least have informed those users who were affected afterwards

Facebook Emotional Contagion Study

Manipulation

- the intended PR outcome —> Facebook can downplay negative content in their service and thus make customers happier
- “the experiment was controversial, but it was not an egregious breach of either ethics or law.” If Facebook is permitted to mine user data and study users for personal profit but academics are not permitted to use that information and learn from it, it “makes no one better off”
- if harming is defined as changing a participant’s mood, then a vast quantity of empirical research on humans is harmful, especially research that requires face-to-face interaction.

Facebook Emotional Contagion Study

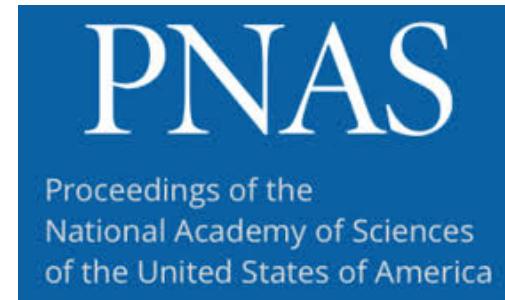
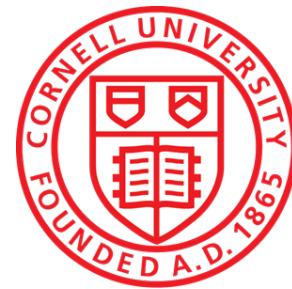
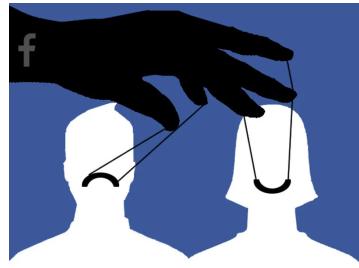
When is Manipulation ok? Maybe never?

- managed to increase voting activity (Bond et al., 2012)
- encourage people to register as organ donors, after which organ donor enrollment increased significantly in the US (Simonite, 2012)
 - > explicit forms of intended manipulation as more acceptable than covert forms, even if the explicit manipulation attempts to elicit significantly greater change in the subject than the covert form

Facebook Emotional Contagion Study: Damage Control?

- Statement by the CTO of FB
 - wrote an apologetic post that they should have “considered non-experimental ways” to do the research
- Introduction of a new framework
 - clearer guidelines for researchers
 - extensive review stages
 - training on privacy and security matters
 - establishment of a special research website

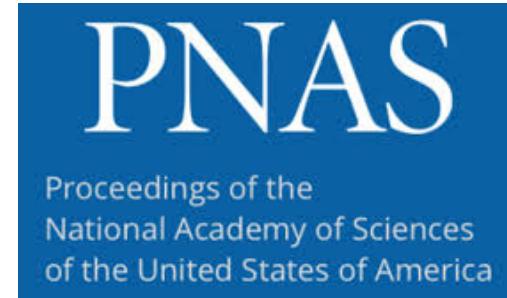
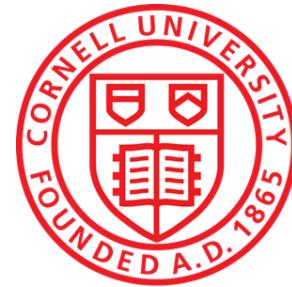
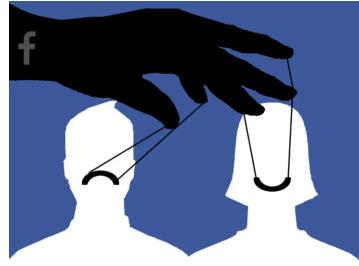
Facebook Emotional Contagion Study: Responsibility?



Should the data collectors abide by the ethical research norms of academia?

If they did, there would be a lot of ethical problems, particularly with data produced by third parties, such as filmed footage, photographs, Google Street View data, televised rock concert recordings, and so on. Even if participant anonymity was secured, the human subjects in these cases could not opt out.

Facebook Emotional Contagion Study: Responsibility?



Should the data collectors abide by the ethical research norms of academia?

Facebook cooperates with several universities such as Cornell, Stanford and Harvard the experiment has raised debate about whose research ethics prevail in such joint ventures

—those of a private company or those of an academic research institution?



Google+

F



Facebook Emotional Contagion Study: Closing thoughts

- utilitarian: little or no harm done
- deontology: privacy violation
- Facebook should have communicated “clearly why and how” they did the experiment (Schroepfer, 2014)
 - a person suffers less when he or she does not know or notice anything about such actions **vs** a person *is deprived of optimal well-being if the reasons and methods of any actions carried out on him or her are not properly communicated*

Facebook Emotional Contagion Study: Closing thoughts

- fact that data are accessible and public does not necessarily mean that using them is not jeopardizing **privacy** and is thus ethically justified (see e.g. boyd, 2010; Marx, 2013; Tinati, Halford, Carr, & Pope, 2014, p.673; Zimmer, 2010)



Privacy

- **utilitarian view:**
 - might allow certain incursions into privacy if the result is the greater good
 - when informed consent cannot be obtained in human-subject research, the benefits of the study should outweigh the harm of any invasion of privacy
- **deontological point of view:**
 - a certain level of privacy is a right that should not be violated, for example, by conducting a study without receiving the informed consent of the subjects of the study

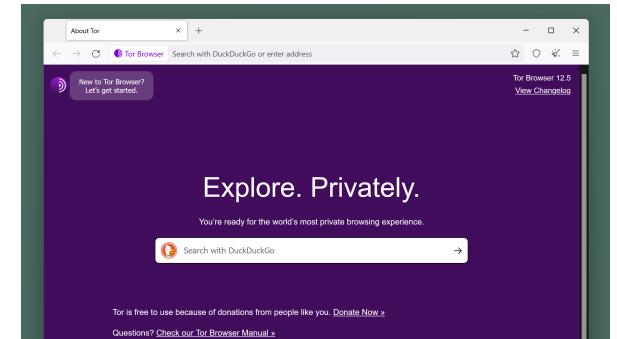
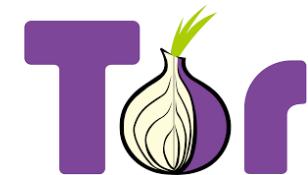
Privacy

- can you be a person on the internet without sacrificing all your data to the Google Powers that be?
- what would it take to not be detected? could you do it?

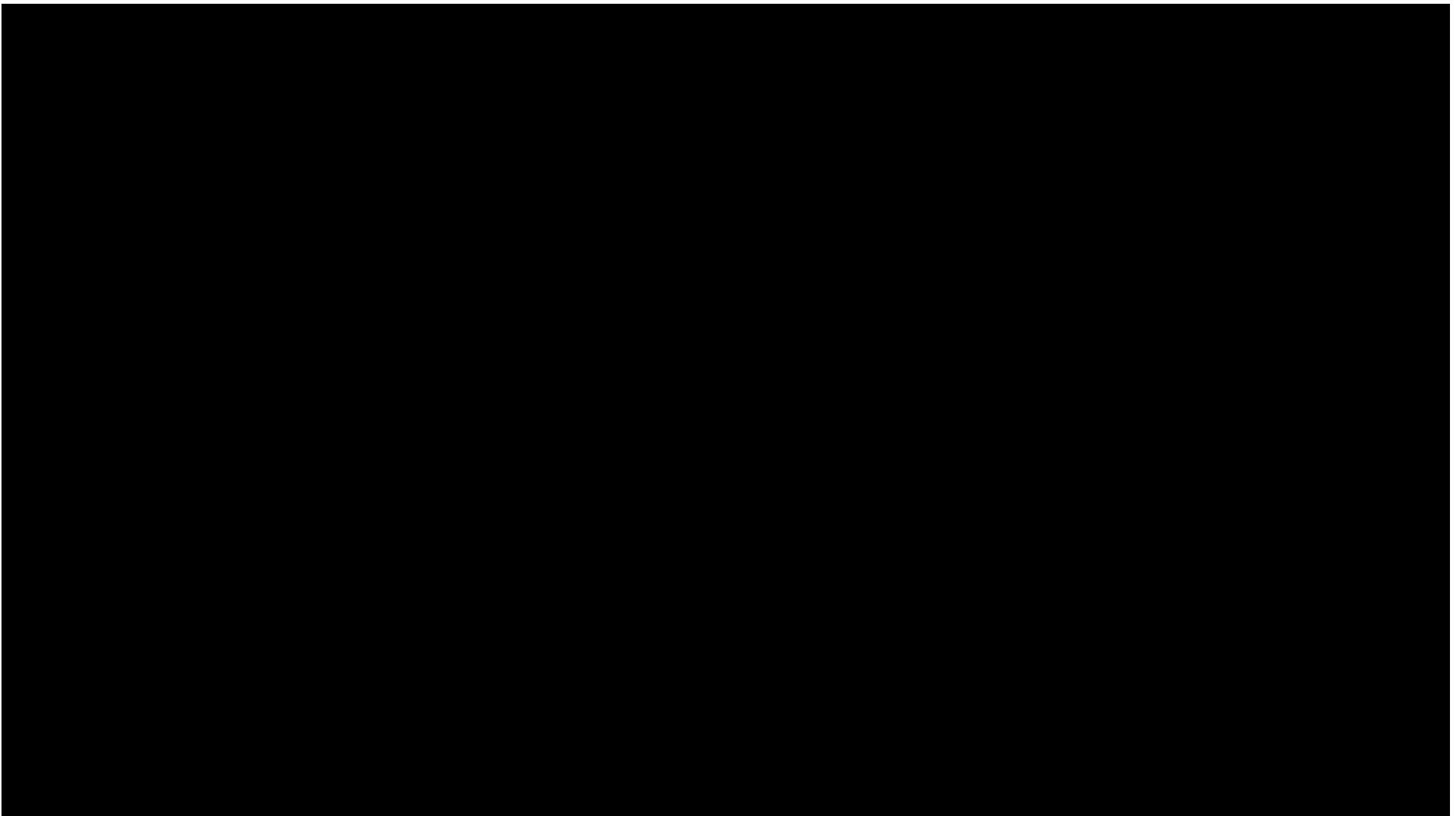
Meet The Woman Who Did Everything In Her Power To Hide Her Pregnancy From Big Data

JESSICA M. GOLDSTEIN  APR 29, 2014, 3:26 PM

<https://archive.thinkprogress.org/meet-the-woman-who-did-everything-in-her-power-to-hide-her-pregnancy-from-big-data-80070cf6edd2/>



Privacy



EXAMPLE

Privacy

project about contact support digital security  14k  5,132



the everyday sexism project

The Everyday Sexism Project exists to catalogue instances of sexism experienced by women on a day to day basis. They might be serious or minor, outrageously offensive or so niggling and normalised that you don't even feel able to protest. Say as much or as little as you like, use your real name or a pseudonym – it's up to you. By sharing your story you're showing the world that sexism *does* exist, it *is* faced by women *everyday* and it *is* a valid problem to discuss.

If you prefer to e-mail me at laura@everydaysexism.com I can upload your story for you instead. Follow us on Twitter (and submit entries by tweet) at @EverydaySexism.

[add your story](#)

Ale

21st September 2022

When I was younger my cousin moved to an apartment complex and I used to go there a lot. I met this guy, he was a year older than me, I kind of like him and we kissed a couple of times but nothing more. As time went on we continued as just friends and I thought that was it. However, a year later he kept trying to get too close to me, making sexual jokes about me I would just shrug it off or insult him in return. At the time his actions seemed harmless but as time went on he started to be disrespectful. I remember one time we were talking while our friends were playing soccer and he just touched my boob as if it was nothing and when I confronted him in front of everyone he just laughed it off, he received high-fives and pats on the back and none of my 'friends' said anything, not even my cousin. After this incident, I tried to distance myself but he was still making jokes about it with his friends, in other occasions, he tried to touch my butt but I stopped him. The last time I saw him I was in a relationship and he knew it, at first he started making jokes about my sex life with my boyfriend and towards the end of the night he was getting uncomfortably close to me and on one occasion he tried to kiss me. Also on multiple occasions one of my cousins had to intervene when he was talking about me in a denigrating way to his friends.

Anon

21st September 2022

I'd like this start this by saying that I'm not a woman but sincerely admire what this project is doing. I'm the son of immigrant Indian parents living in Europe and I'd like to share my experience of observing sexism in my household. My family is a conservative, traditionalist Brahmin Hindu one. My parents had an arranged marriage organised by their parents, with their consent obviously. Now to my observations. For starters, my

Table 1. Descriptions of the Categories of Sexism Used in the Sexism Classification Dataset



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21st September 2022

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ID	Category	Description
1	Role stereotyping	Socially constructed false generalizations about certain roles being more appropriate for women; also applies to such misconceptions about men
2	Attribute stereotyping	Mistaken linkage of women with some physical, psychological, or behavioral qualities or likes/dislikes; also applies to such false notions about men
3	Body shaming	Objectionable comments or behaviour concerning appearance including the promotion of certain body types or standards
4	Hyper-sexualization (excluding body shaming)	Unwarranted focus on physical aspects or sexual acts
5	Internalized sexism	The perpetration of sexism by women via comments or other actions
6	Hostile work environment	Sexism encountered by an employee at the workplace; also applies when a sexist misdeed committed outside the workplace by a co-worker makes working uncomfortable for the victim
7	Denial or trivialization of sexist misconduct	Denial or downplaying of sexist wrongdoings
8	Threats	All threats including wishing for violence or joking about it, stalking, threatening gestures, or rape threats
9	Sexual assault	Any sexual contact without consent; unwanted touching
10	Sexual harassment (excluding assault)	Any sexually objectionable behaviour
11	Moral policing and victim blaming	The promotion of discriminatory codes of conduct for women in the guise of morality (also applies to statements that feed into such codes and narratives); the act of holding the victim responsible (fully or partially) for sexual harassment, violence, or other sexism perpetrated against her
12	Slut shaming	Inappropriate comments made about women (1) deviating from conservative expectations relating to sex or (2) dressing in a certain way when it gets linked to sexual availability
13	Motherhood and menstruation related discrimination	Shaming, prejudices, or other discrimination or wrongdoings related to periods or the notion of motherhood (also applies to the violation of reproductive rights)
14	Other	Any type of sexism not covered by the above categories

cohen's kappa* = 0.584

*<https://www.youtube.com/watch?v=z4CiQPV0Mgw>

Ethical threats possible in the flow of research

- Where can ethical issues arise in research?
 - Planning/Anticipating
 - Conducting/Doing
 - Reporting/Disseminating

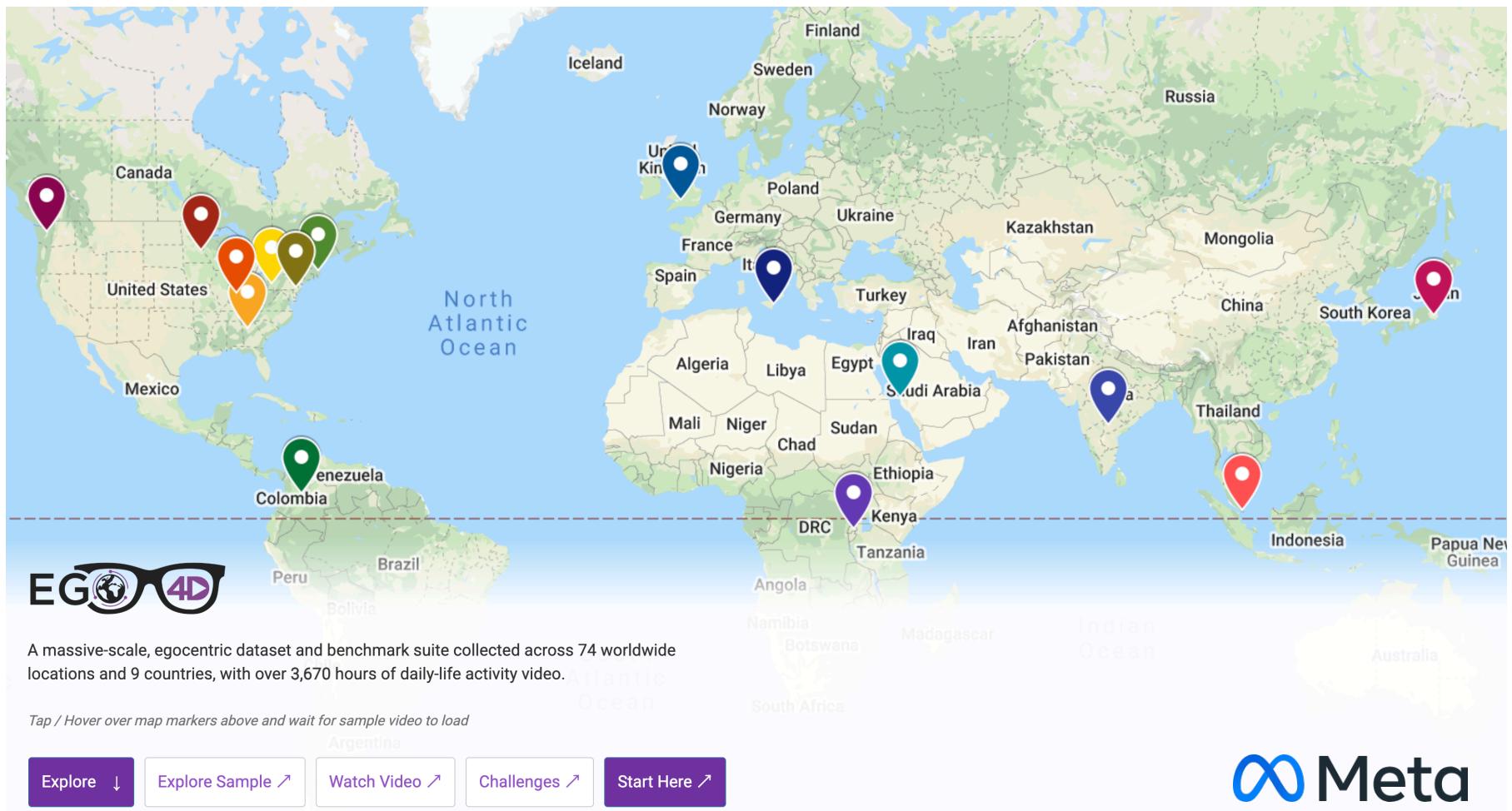
Ethical concerns?

- predictive analytics
 - insurance
 - bank loans
 - success of startups
 - hit song prediction
 - rehabilitation success

EXAMPLE

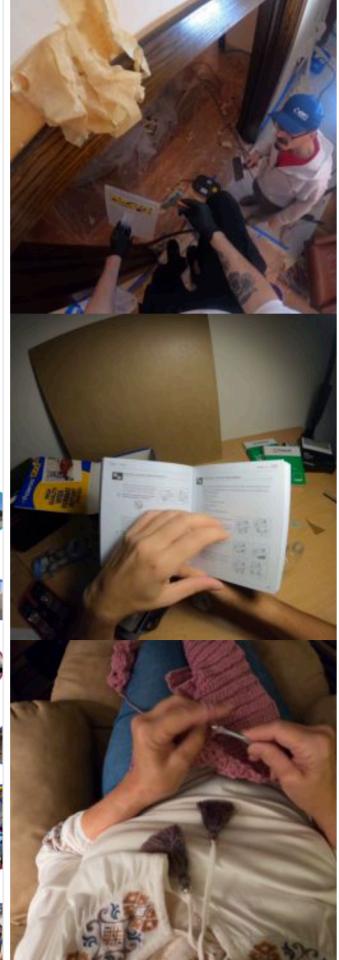
anticipating/planning —> doing —> disseminating

EXAMPLE



anticipating/planning → doing → disseminating

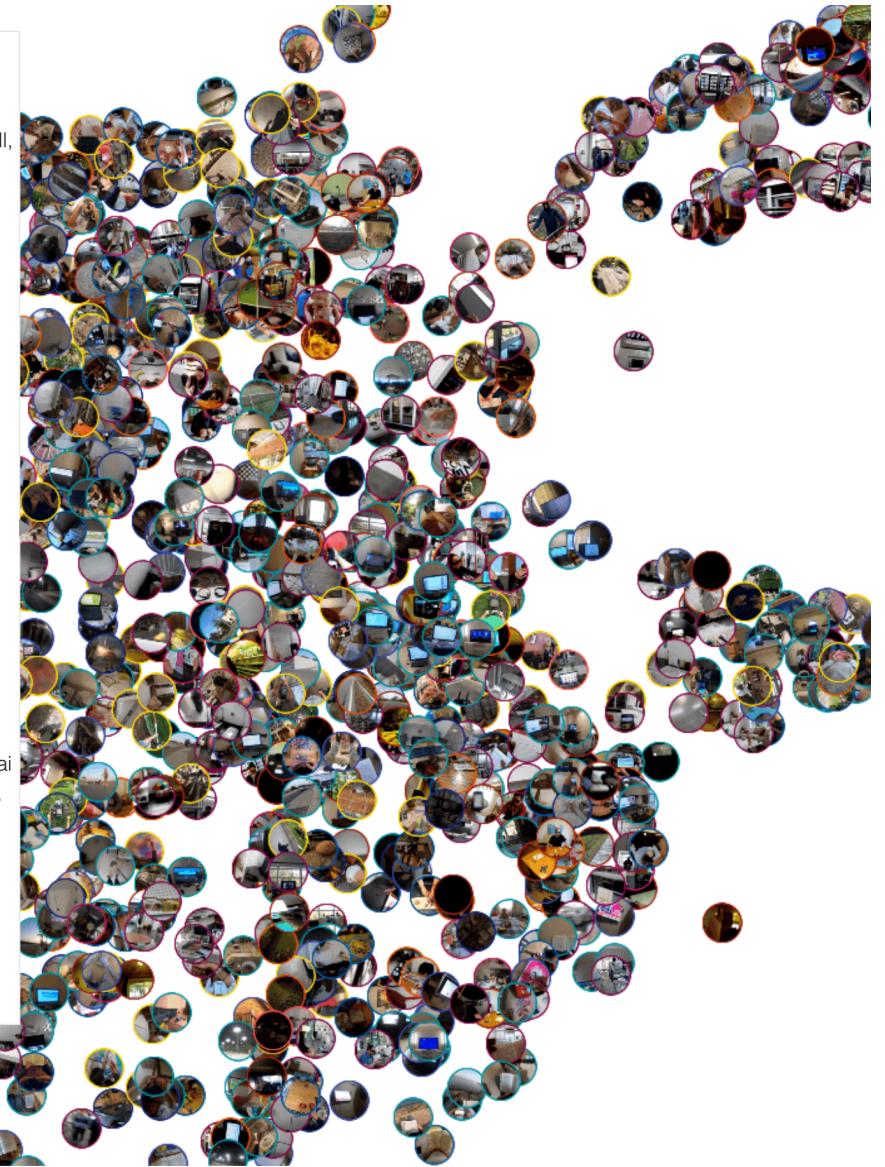
Ethical concerns?



- **Source:** CMU
- **Scenario:** Construction/renovation jobs
- **Topic:** room, remove, paint, wall, putty, knife, remove, paint, putty, knife, stripper

- **Source:** UNICT
- **Scenario:** Cleaning / laundry
- **Topic:** seat, desk, flip, page, book, pick, different, item, desk

- **Source:** CMU
- **Scenario:** Crafting/knitting/sewing/drawing/painting
- **Topic:** room, crochet, yarn, lap, crochet, hook, sit, chair



Ethical concerns?



anticipating/planning → doing → disseminating

Flow of Research: Ethical Concerns

anticipating/planning → doing → disseminating

Planning/Anticipating

Research begins with a question, an idea, or a hypothesis. From the very beginning ethical issues arise: Which hypothesis should be pursued? Are there questions that should not be asked? How can this idea be tested responsibly? Although they pertain to the entire flow of research, three issues are particularly important at the stage of planning and anticipation: (a) mentoring; (b) conflict of interest; and (c) judging the value of the research.

Planning/Anticipating

- **Mentoring**
 - the mentor's experience and judgment are necessary for informing the conceptualization of a research project and the distribution of responsibilities for bringing it to fruition
 - from the inception of a project, mentors also play a leading role in ensuring the collegial atmosphere and accountability necessary for successful collaboration.

Planning/Anticipating

- **Mentor-Mentee relationship**
 - Mentor-Mentee relationship is defined by an imbalance of power, knowledge and experience
 - Mentors may abuse their power by overworking their students, excluding them from the planning stages of grant proposals, failing to give them proper credit, discriminating against them, or failing to advance their careers. Yet those who strive to be good mentors often face obstacles such as lack of time and few incentives for effective mentoring.

Planning/Anticipating

- **Mentor-Mentee relationship**

The 1967 discovery of pulsars by Jocelyn Bell, then a twenty-four-year-old graduate student, is an important example of the difficulties associated with allocating credit between mentors and mentees. Under the supervision of her thesis adviser, Anthony Hewish, Bell was in charge of operating and analyzing data from a radio telescope. One day she detected “a bit of scruff” on the chart. She remembered seeing the same signal earlier, so she measured the period of its recurrence and determined it must be coming from an extraterrestrial source. Bell and Hewish later found more examples and together with three others published a paper announcing the discovery of what came to be known as “pulsars.” Hewish was awarded the Nobel Prize; Bell did not share in the award. Some claimed that her recognition of the signal was the key act of discovery. But others, including Bell herself, said that she received ample recognition and was only doing what graduate students are expected to do.

Testing on Students for course credit?

- does this violate the Belmont Principles?
 - respect of persons (autonomy and informed consent)
 - beneficence (maximizing benefits, minimizing harm)
 - justice (fair distribution of research benefits and risks; unfairly expose a subset of people to risk)

Planning/Anticipating

- **Conflict of Interest**

a person has a conflict of interest if, and only if, that person (a) is in a relationship with another requiring the exercise of judgment in the other's behalf and (b) has a (special) interest tending to interfere with the proper exercise of such judgment.²⁵

Scientists are responsible for thinking through potential conflicts in the anticipatory phase, before they become real and cause harm. Once a conflict of interest is in place, it can infect the entire flow of research.

Planning/Anticipating

- **Conflict of Interest**

- can exist at both the individual and institutional levels. Those involving financial gain and personal relationships are the most important (ex: gifts; single blind reviews)
- undermine scientific integrity and objectivity in two ways
 - they can affect a person's thought processes (judgment, perception, decision-making, or reasoning)
 - can affect motivation and behavior. i.e., a scientist may be perfectly capable of sound thinking but might fail to carry it out due to temptations. Scientists need not be aware of conflicts of interest in order for them to impact thought and behavior, and even small gifts can exert subconscious influences.

Planning/Anticipating

- **Judging the Value of Research**

When planning a project, researchers face difficult questions that should be confronted explicitly. Is the research really worth doing? Whose interests will it serve? Are there possible negative side effects? What are the justifications: making money, gaining notoriety, advancing theoretical understanding, developing applications, for military purposes, etc.? Researchers should consider if these reasons are morally justifiable and consistent with their obligations and integrity as scientists.

Planning/Anticipating

- **Judging the Value of Research**

Scientists must make claims to private or public benefactors about the value of their proposed work. The scarcity of funds compared with the abundance of potential scientific pursuits pressures scientists to make exaggerated claims about the import of their work. This poses questions about what constitutes ethical promising and how to distinguish justifiable claims from unjustified hype.

Doing Research

- **Objectivity, inferences and data management**
 - How do we define a valid inference?
 - What is an outlier?
 - Questionable statistical procedures

Doing Research

- **Objectivity, inferences and data management**



“ If you torture the data long enough, it will confess to anything. ”

RONALD COASE

Doing Research

- **Objectivity, inferences and data management**
 - How do we define a valid inference?
 - What is an outlier?
 - Questionable statistical procedures
 - Image manipulations
 - Negligence, haste, inattention, carelessness in design, measurement and record keeping
 - Incorrect referencing
 - Citing articles without actually reading them

Doing Research

- **Biases**
 - Difficult to identify
 - Once the community accepts a bias, it is likely it won't be identified
 - Biases are not always unethical but more akin to hypotheses that are later proven wrong.
 - can also stem from consciously made false assumptions
 - Ex: hypotheses such as the assumption of craniometrists that human head sizes and shapes determine personality traits and intelligence
 - biases can stem from racial, patriarchal, or other assumptions

Doing Research

- **Self-deception**
 - perhaps the greatest threat to the ethical ideal of scientific objectivity
 - stems from carelessness and wishful thinking
 - hoping that his or her theory is true, a researcher may fall into the trap of experimenter expectancy, or seeing only what he or she wants to see
 - it is not intentional fraud – the researcher truly believes that he or she has not manipulated the data to accord with a preferred outcome
 - ex: Neuroscience

Doing Research

- **Self-deception**

For the ethical ideal of objectivity, getting the right answer is not most important. How that answer is derived is the key. It cannot be the result of blind faith or obedience, of expediency, or of deception, intentional or otherwise.

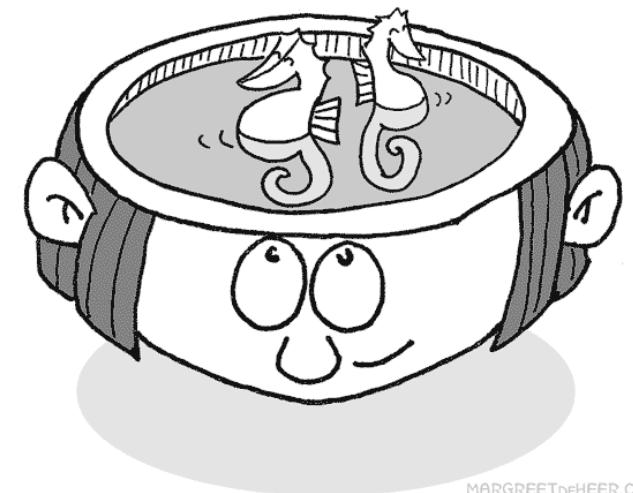
Doing Research

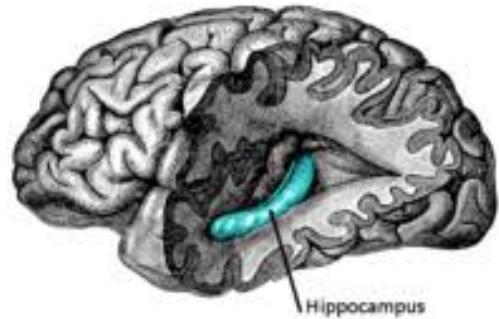
- **Self-deception**

ex: A study in 2012 reported that researchers were only able to confirm six of fifty-three “landmark studies” in preclinical cancer research

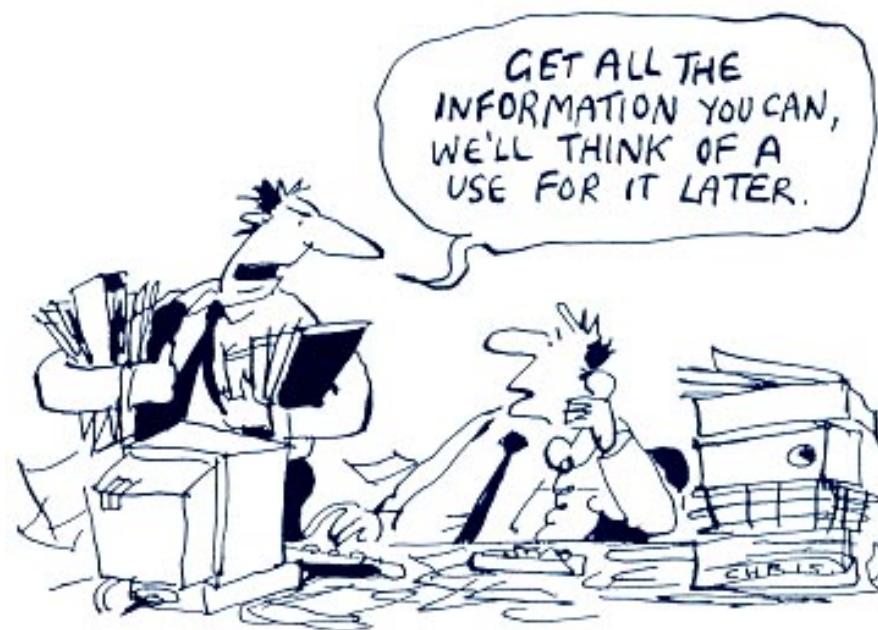
Hippocampus structure vs. Affective personality dimensions

EXAMPLE



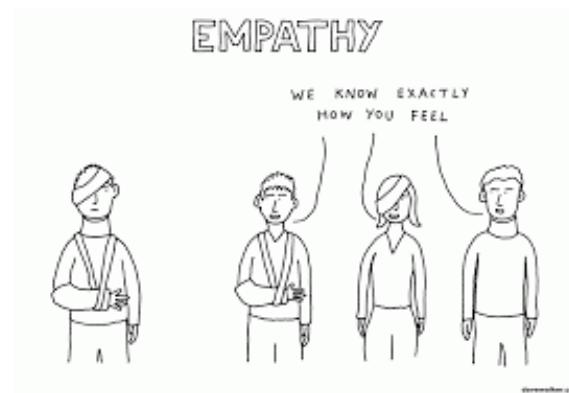


Personality Traits



Dimensionality Estimation

28 personality measures



Problem of Variable Collinearity



EMOTIONAL REGULATION



EMPATHY

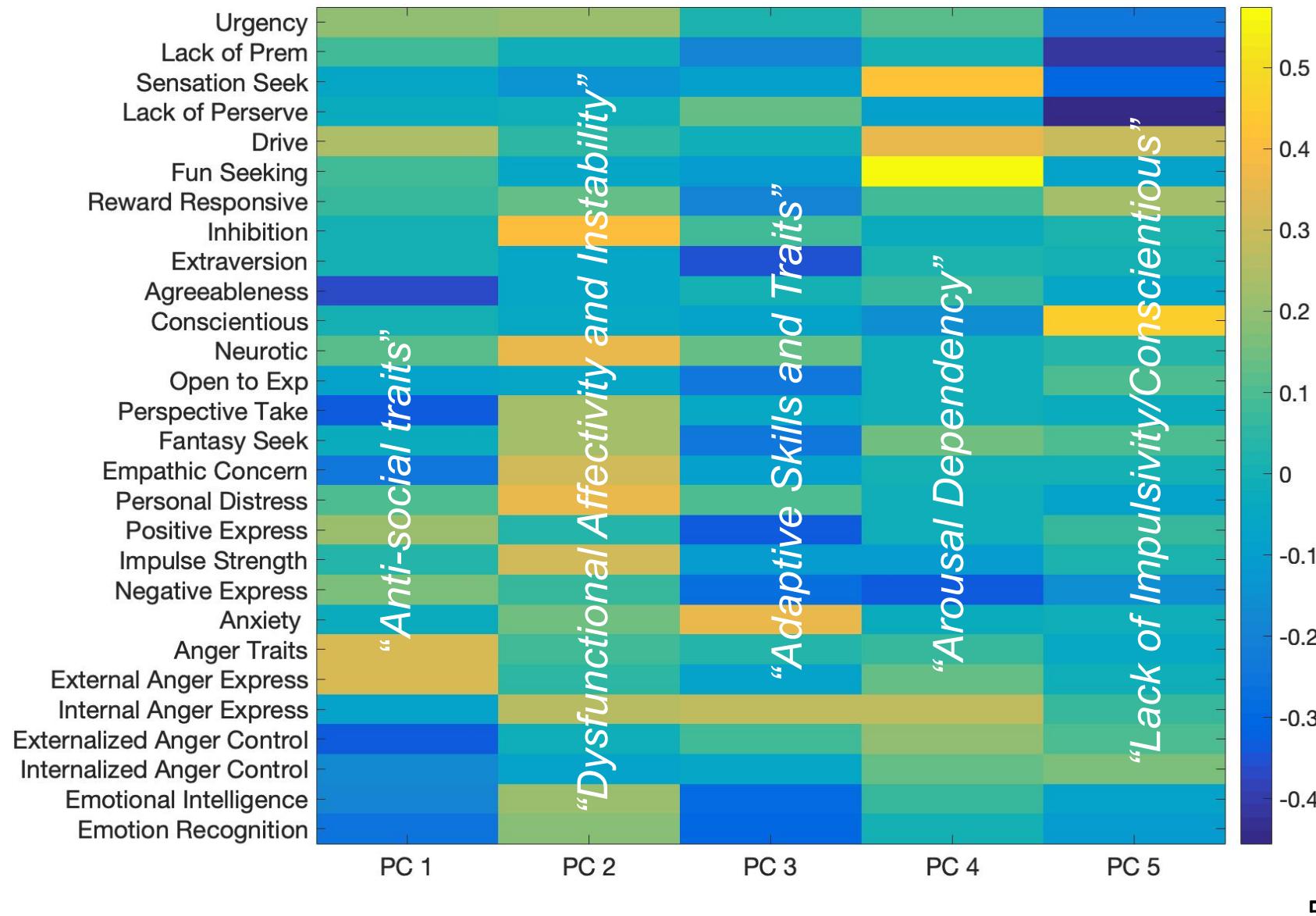


Dimensionality Estimation

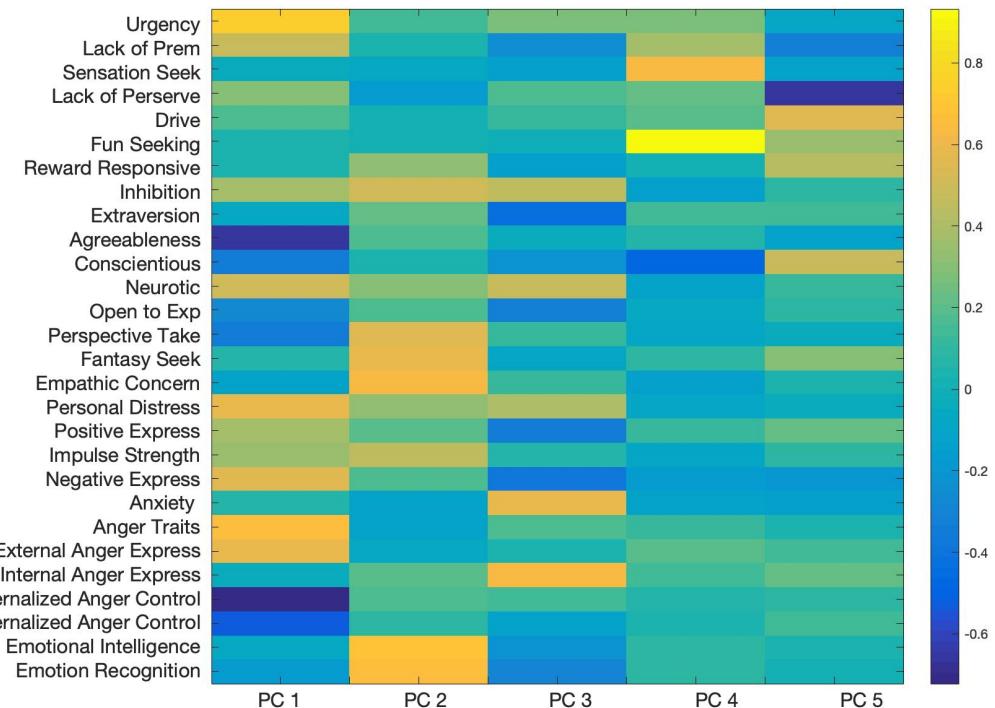
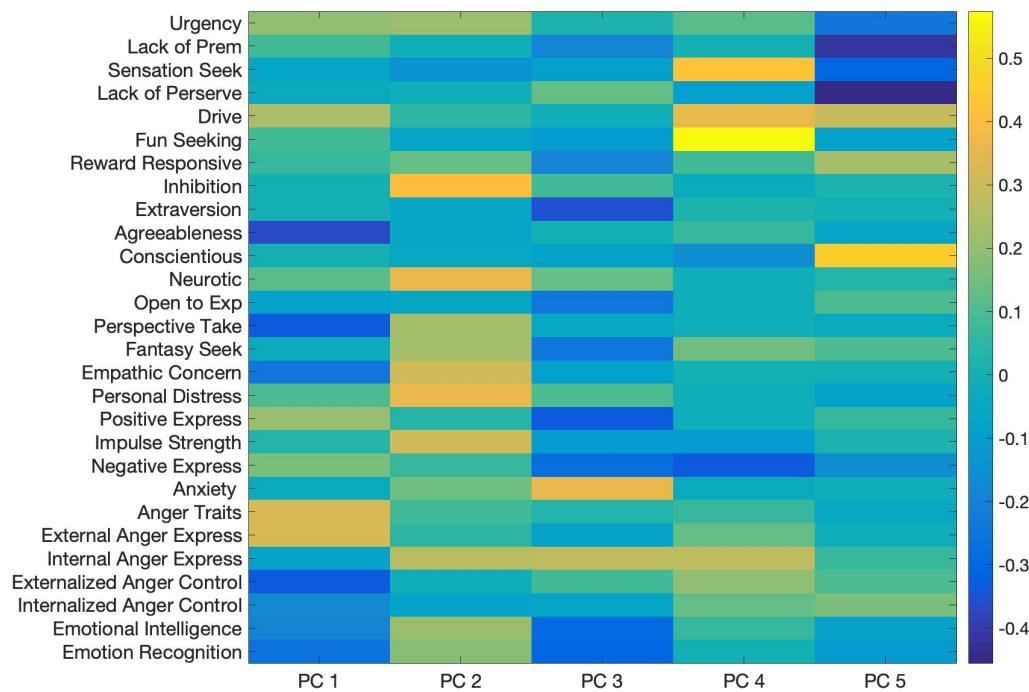
- the Kaiser (1960) criterion 9
 - Cattell's scree plot test 5/9
 - Parallel Analysis (PA) 5
 - Velicer's Minimum Average Partial (1976) 5



PCA Loading Matrix



PCA vs FA Loading Matrix



5 final variables

“Anti-social traits”

“Dysfunctional Affectivity and Instability”

“Adaptive skills and traits”

“Arousal Dependency”

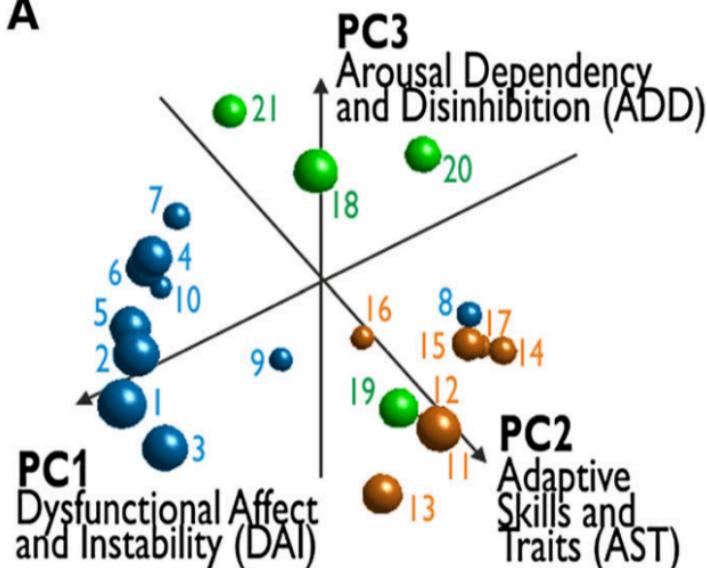
“Impulsivity”



But

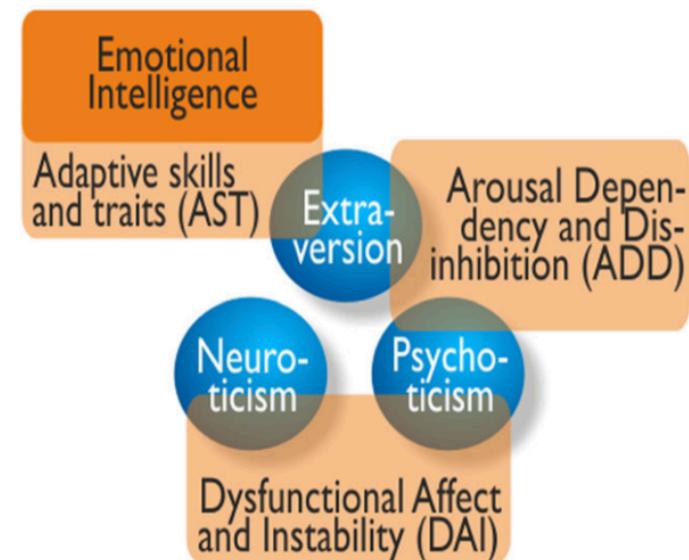
50% variance

A



- 1 Neuroticism (BFI)
 2 Personal distress (IRI)
 3 Behavioral inhibition (BIS/BAS)
 4 Urgency (UPPS)
 5 Negative affect (PANAS)
 6 Trait anger (STAXI)
 7 Anger expression / Control (STAXI)
 8 Agreeableness (BFI)
 9 Emotional expressivity (BEQ)
 10 Trait anxiety (STA)
 11 Emotion recognition ability (GERT)
 12 Emotional understanding (STEU)
 13 Empathy (IRI)
 14 Extraversion (BFI)
 15 Positive affect (PANAS)
 16 Behavioral activation (BIS/BAS)
 17 Openness (BFI)
 18 Lack of premeditation (UPPS)
 19 Conscientiousness (BFI)
 20 Sensation seeking (UPPS)
 21 Lack of perseverance (UPPS)

B



So

“Anti-social traits”

“Arousal Dependency”

“Impulsivity”



“Arousal Dependency & Disinhibition” (ADD)



TO PUBLISH
OR NOT TO PUBLISH?

Doing Research

- **Trust: Science is a communal system**

If scientific predecessors conduct careless or dishonest work, then their shoulders will not be reliable perches for seeing further. Each member of an increasingly networked scientific community that relies on more and more specialized domains of expertise must trust in the work of all the others.

Scientists have neither the time nor the expertise to independently verify every finding derived from the work of others; and in an endeavor that values priority of discovery, they certainly do not have the motivation.

Doing Research

- **Values in research design**
 - When scientists make decisions about equations, models, constants, and variables, they often must make certain assumptions that amount to the embedding of values in their experimental design. The ideal of objectivity demands self-awareness and an explicit justification of such choices.

Doing Research

- **Values in research design**

In making one decision rather than another, a researcher creates and measures one reality rather than another. What counts as a cost, a benefit, a risk? Whose interests are included?

The ideal of objectivity is not to avoid or eliminate these value judgments. Rather, it is to make them transparent and explicit and to justify them rationally while remaining open to the potential merits of alternative formulations.

Doing Research

- **Values in research design**

ex: when constructing models for pandemic response,
researchers must decide which metrics to prioritize

Model 1: minimizing the total number of infections

Model 2: reducing mortality

Model 3: protecting hospital capacity

Model 4: minimizing economic disruptions

Doing Research

- **Values in research design**

ex: when constructing models for pandemic response, researchers must decide which metrics to prioritize

Data aggregation:

Approach 1: aggregate data at the national level (which may obscure the disproportionate impact of diseases on marginalized communities)

Approach 2: disaggregate data by socioeconomic status, ethnicity, or geographic region may provide a more equitable perspective (but require additional assumptions about disparities in healthcare access and vulnerability)

Doing Research

- **Values in research design**

ex: when constructing models for pandemic response, researchers must decide which metrics to prioritize

—> epidemiological models are not neutral representations of reality but **constructed frameworks that embody ethical and political values**

—> recognizing and explicitly justifying these values enhances the transparency and credibility of public health research, ensuring that policy decisions are not just technically sound but also ethically defensible

Doing Research

- **Values in research design**

ex: Integrated Assessment Models (IAMs) are complex computational models that combine insights from economics, environmental science, and social sciences to evaluate and propose strategies for climate change management, sustainable development, etc.

They are instrumental in informing policies, but their design embeds certain value choices that influence outcomes and recommendations.

Doing Research

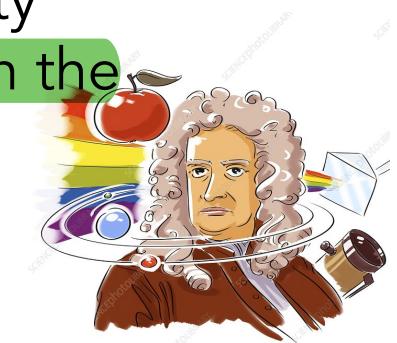
- **Values in research design**

ex: Integrated Assessment Models (IAMs)
perhaps a better way to structure IAMs is not with
globally aggregated utility, but with utilities
disaggregated by region or nation. African utility and
consumption could be optimized separately and
weighted equally with North American utility and
consumption

Disseminating Research

- **Peer review**

- Defined as a system that disseminates high quality information
- 17th century - new findings were kept secret so others could not claim as their own. Henry Oldenburg, secretary of the Royal Society, solved this problem by guaranteeing authors in the society's Philosophical Transactions both rapid publication and the support of the society if an author's claim to priority of discovery was questioned. Oldenburg also pioneered the practice of submitting manuscripts for review by experts prior to publication. ***These innovations evolved into the modern scientific journal and the practice of peer review.*** Together, they create a system that rapidly disseminates high-quality information and rewards authors with recognition through the practice of citation.



Disseminating Research

- **Peer review**
 - Defined as a system that disseminates high quality information
 - Many flaws can skip through
 - Insufficient review times (conferences vs journals)
 - No incentives
 - Conflict of interest/bias
 - Some violate the confidentiality of the work under review by stealing ideas, theories, or hypotheses

Disseminating Research

- **Peer review**
 - How is a peer defined?
 - Who ought to have the power to determine the value of research?
 - ex: PhD students as reviewers?
 - One curious case study is the journal *Rejecta Mathematica*, which publishes papers that have been rejected by peer reviewers at other journals. The journal's website lists several ways in which previously rejected papers can be of value to the scientific community.



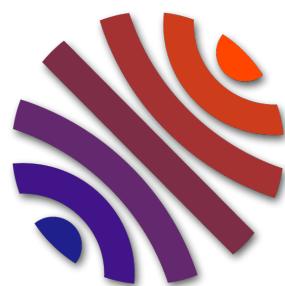
Rejecta Mathematica

Disseminating Research

- **Peer review**
 - Is there ever a legitimate role for the inclusion of nonexperts in peer-review processes? Should scientific peers evaluate the broader social impacts of an article or grant proposal in addition to its intellectual merit?

Disseminating Research

- Peer review
 - open science



Disseminating Research

- **Authorship and allocation of credit**
 - Credit distribution
 - ex: Mentors as first authors? how fair is that?
 - collaborations:
 - multiple forms of expertise and even multiple laboratories (ex: covid+music)
 - Does this mean that each author can legitimately be held responsible for the entirety of the publication?

Disseminating Research

- **Authorship and allocation of credit**
 - Deciding the appropriate allocation of credit and responsibility is often made difficult by the communal nature of science
 - if there is evidence of misconduct, whom is it directed towards?
 - Self citing to inflate numbers
 - self-cite only when relevant

Disseminating Research

- **Authorship and allocation of credit**

A fundamentally important question bearing both on peer review and the allocation of credit is: What metrics should be used to determine a scientist's excellence, influence on the field, and value to society?

Disseminating Research

The easiest metric is simply to **count his or her number of publications**, but this does not measure the quality of the work or the impact factor of the journals that print it. Incentivized by metrics that reward sheer quantity of publications, authors are often tempted to shingle their work or to divide it into the “least publishable unit” in order to inflate their numbers.

Another strategy is to use a **citation index** that ranks scientists according to how often their work is cited. This may be a better metric, but it does not capture the reasons why the scientist is being cited or what qualitative influence their work has had on their field or beyond.

Disseminating Research

This Indian watchdog is cleaning up ‘mess’ in academia—falsification, fabrication & fraud

India Research Watchdog founder revealed that top institutes are those with the most number of plagiarised papers. 58 papers by 12 top IITs were retracted between 2006 & 2023.

MOHANA BASU 22 January, 2024 02:56 pm IST



irw.co.in

India Research Watch (IRW)
Cleaning Indian Research, One Paper at a Time.
Higher Education · Delhi · 42K followers · 2-10 employees

Hyper Authorship, Excessive Self Citations, Unusual Collaborative citation patterns (citation cartels).

Disseminating Research

Alarming rise of scientific misconduct recorded in India

Retractions from India have increased 2.5-times between 2020 and 2022 over the number recorded between 2017 and 2019

DATA POINT

Achal Agrawal

In the surface, Indian research has never been better. India recently became the third largest producer of scientific articles in the world (**Chart 1(a)**), a notable achievement for the world's fifth largest economy. But behind the barrage of research papers lies a telling statistic that should be a considerable cause for concern to Indian academia: the number of retractions (**Chart 1(b)**). Published papers are retracted when they are found to have mistakes, and retractions remove them from the scientific literature. In many instances, papers are also retracted when they are found to contain data or claims produced as a result of misconduct. Historically, a very small fraction of scientific misconduct has been caught.

As such, retractions are the tip of the misconduct iceberg. The Retraction Watch database lists 109 reasons for which papers have been retracted. For simplicity, the reasons can be grouped into three categories: grave reasons (constituting serious breach of academic and scientific integrity), including criminal proceedings, hoax pan-

number of retractions, consider the ratio of the former to the latter. As a proxy for quality (**Chart 1(c)**), it indicates an alarming drop in the country - almost halving.

As for the domains of retractions (**Chart 2**), engineering accounts for almost 48% of all cases, up from 36% in 2017-2019, while the humanities grew by 567%.

Science itself appears to be relatively untouched by this phenomenon. It is difficult to ascertain the major reasons for the rise given the number of factors at play, although the opinion of the research community itself could give us some insights. For example, **Chart 3** shows the results of a small survey conducted by India Research Watchdog with 364 respondents. A little more than half believe that university ranking parameters are behind the rise. Another 35% attributed it to unethical researchers, while 10% pointed to the minimal action taken when an allegation is reported or when an offender is 'caught'. There are other factors as well, including making it compulsory for PhD students to publish papers (a change instituted in 2017), as a result forcing those unable to do so to resort to low-quality publications, and the proliferation of predatory journals.

While more investigation is re-

Cause for concern

The data for retractions were sourced from the Retraction Watch Database and the publication data were sourced from Scimago

Chart 1 (a): The chart shows the number of publications over time for five countries. India recently became the third largest producer of scientific articles in the world

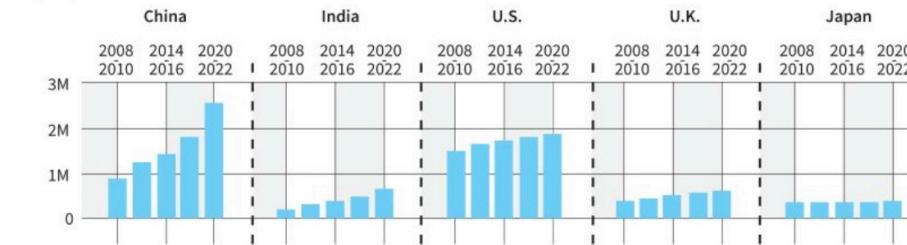
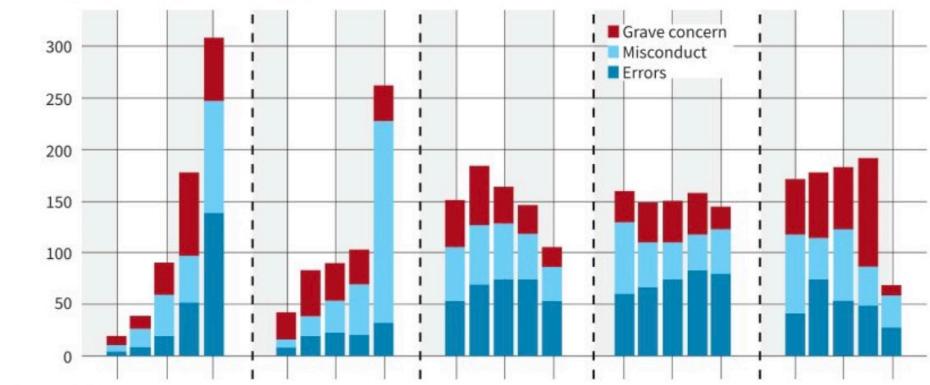


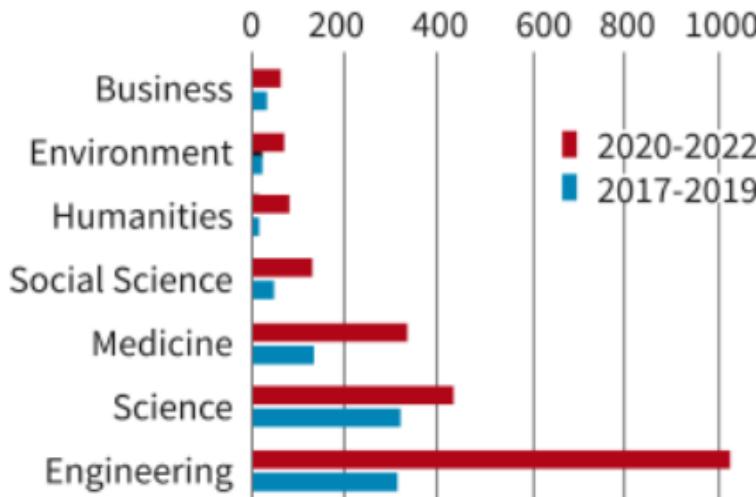
Chart 1 (b): The chart shows the number of retractions over time for the five countries. Graphs are in multiple scales: China (X20), India (X5) and the U.S. (X5)



Disseminating Research

Alarming rise of scientific misconduct recorded in India

The chart shows retractions by domains in India. Engineering accounts for almost 48% of all cases

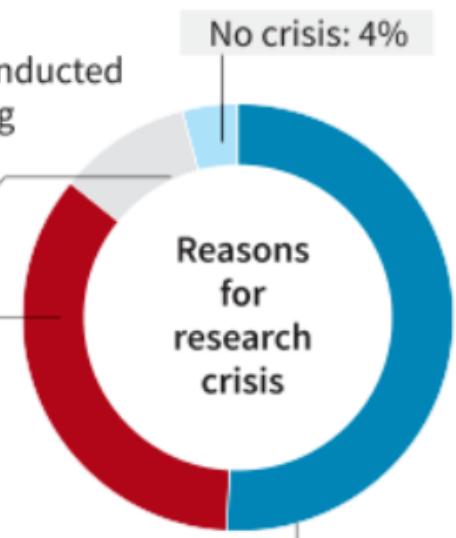


The chart shows the results of a small survey conducted by India Research Watchdog

Light punishment: 10%

Unethical researchers: 35%

University ranking parameters: 51%



In sum, there are several realities of science that can conflict with and undermine the normative ideal.

Careerism, commercialization, Big Science, and human weaknesses are some of the major realities of science that can conflict with its ideal norms. When the norms are undermined, the result is misconduct and questionable research practices.

Misconduct is not simply the anomalous workings of deranged minds or immoral characters. It is also endemic in contemporary science because it often results from the incentives and pressures established by the system itself.

Misconduct can be defined narrowly as fabrication, falsification, and plagiarism or more broadly to include other practices that seriously deviate from widely accepted standards. A broader definition may help to identify inappropriate behaviors, but it also may stifle novel approaches to science.

Throughout the flow of research – anticipating, doing, and disseminating – scientists face difficult choices about applying the norms, and powerful temptations to stray from the norms.

Anticipating research raises issues about the appropriate roles of mentors, identifying potential conflicts of interest, and asking substantive questions about the value of the proposed work.

Doing research involves upholding the standards of objectivity. This means upholding norms of honesty, carefulness, and open-mindedness in the interpretation and management of data and critically evaluating assumptions that might be built into research designs. Objectivity is threatened by bias and self-deception and is dependent on trust.

Disseminating research poses questions about peer review and quality control, authorship and allocation of credit, and the appropriate role for intellectual property rights in scientific research. As a globalizing enterprise, scientific research is engaged in a dynamic tension between diverse local practices and standard, universal principles.