

# Critical technical awakenings

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# Outline

1. Activity: why quantification?
2. The “desert” and the “swamp”
3. Theorizing
4. Breaking free
5. Parting thoughts

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# 1. Activity: why quantification?

- Leave aside AI for a moment. Why do some people go into quantitative fields/careers, and others don't?
  - Could include engineering, economics, finance, accountancy, software development, information technology...
- Activity: get your reflections and thoughts!

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# Padlet

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- Link:

[https://padlet.com/  
mominmalik/why-  
quant-  
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## 2. The “desert” and the “swamp”

# A metaphor from legal studies

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“In contrast to the law-and-economics scholars, law-and-society scholars have long been aware that norms and self-help play important roles in coordinating human affairs... Anyone who widely reads in both law-and-economics and law-and-society literature is bound to come away feeling that economists, although often dismayingingly blind to realities, are clearer, more scientific, and more successful in building on prior work. The late Arthur Leff, who read extensively in both, called **law-and-economics a desert and law-and-society a swamp.**” (Ellickson 1987)



# The Desert

# The world as *knowable* (Bricmont and Sokal 2001)

"In the same way that nearly everyone in his or her everyday life disregards solipsism and radical skepticism and spontaneously adopts a 'realist' or 'objectivist' attitude toward the external world, scientists spontaneously do likewise in their professional work. Indeed, scientists rarely use the word 'realist,' because it is taken for granted: **of course they want to discover (some aspects of) how the world really is! And of course they adhere to the so-called correspondence theory of truth**<sup>1</sup> (again, a word that is barely used): if someone says that it is true that a given disease is caused by a given virus, she means that, in actual fact, the disease is caused by the virus."

<sup>1</sup> "We would not even call it a 'theory'; rather, **we consider it a precondition for the intelligibility of assertions about the world.**"

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# The desert (imagination of)

- Arid and harsh
- Seems barren and empty; uniform and endless
- Visible vastness, seemingly laid bare
- With the right vehicle, rapidly traversable



Photo by Walid Ahmad from Pexels

# The Swamp



Image by Dirk (Beek!) Schumacher from Pixabay

# The world as messy and dense

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“Enthusiasts of ethnography might ask, Why, in a thick world, do economists stride with heads high through the corridors of power, while cultural historians pass along their possibly profound insights to one another? Why, in the world of business and administration, are lengthy reports with all their uncertainties circulated among underlings, while the ‘executive summary,’ purged of ambiguity and detail, goes to the people at the top?” (Porter 2012)

“But it is striking how absolutely these assumptions [of statistical models] contradict those of the major theoretical traditions of sociology. Symbolic interactionism rejects the assumption of fixed entities and makes the meaning of a given occurrence depend on its location—within an interaction, within an actor's biography, within a sequence of events... Marx, Weber, and work deriving from them in historical sociology all approach social causality in terms of stories, rather than in terms of variable attributes.” (Abbott 1988; see also Kiviat 2023)

# Quant can't account for itself

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"The declared aim of modern science is to establish a strictly detached, objective knowledge. Any falling short of this ideal is accepted only as a temporary imperfection, which we must aim at eliminating. **But suppose that tacit thought forms an indispensable part of all knowledge, then the ideal of eliminating all personal elements of knowledge would, in effect, aim at the destruction of all knowledge.** The ideal of exact science would turn out to be fundamentally misleading and possibly a source of devastating fallacies." (Polanyi 1966)

# The swamp (imagination of)



Kayak trail cypress pond on Pixabay

- Sticky and humid
- Dense and impermeable
- Deafening buzzing all around; mosquito-filled; strange things slithering beneath the surface
- Human-made structures are hidden, inaccessible
- Travel, even with the right tools and vehicles, is slow and laborious

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**VERTIGO**

# Narrow technical training

- Phil Agre (1997):

- “My college did not require me to take many humanities courses, or learn to write in a professional register, and so I arrived in graduate school at MIT with little genuine knowledge beyond math and computers. This realization hit me with great force halfway through my first year of graduate school...
  - “I was unable to turn to other, nontechnical fields for inspiration... The problem was not exactly that I could not understand the vocabulary, but that I insisted on trying to read everything as a narration of the workings of a mechanism.”

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# "Awakening"

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"At first I found [critical] texts impenetrable, not only because of their irreducible difficulty but also because **I was still tacitly attempting to read everything as a specification for a technical mechanism...** My first intellectual breakthrough came when, for reasons I do not recall, it finally occurred to me to stop translating these strange disciplinary languages into technical schemata, and instead simply to learn them on their own terms..."

"I still remember the **vertigo** I felt during this period; I was speaking these strange disciplinary languages, in a wobbly fashion at first, without knowing what they meant – without knowing what sort of meaning they had..."

"In retrospect, this was the period during which **I began to 'wake up', breaking out of a technical cognitive style that I now regard as extremely constricting.**"

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# 3. Theorizing this vertigo

# What is theory?

- “Theory” in sciences (e.g., theoretical/“pure” maths—including “theories” like group theory, graph theory, category theory, etc.—theoretical physics, statistical theory, statistical learning theory, etc.) involve *mathematical derivations within axiomatic systems*
- Quantitative theory in social sciences is generally a *causal mechanism*, often irreducible and expressible in terms of attributes (statistical variables)

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# What is theory?

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- Critical theory: realizing, articulating and interrogating the building blocks of our realities (personal, institutional, civilizational).
- Fay (1987) identifies critical theories in a *humanist* variant of "estrangement theory": there is a hidden/extraordinary sphere that is "true/real" and a manifest/mundane one that is "false" ("false consciousness"). Classic articulation: Plato's parable of the cave. Humanist variant is locating the hidden sphere not in a religious or spiritual plane (like religious and mystical traditions do), but in the social plane.
- Includes (Ibid.) a *theory of false consciousness* (what it is, and how it is maintained), *theory of education* (necessary and sufficient conditions to overcome false consciousness), and a *theory of transformative action* (what needs to change, and a plan of action)
- Critical theories can have problems...

# "Paradigms of inquiry"

	<b>Issue</b>	<b>Positivism</b>	<b>Post-positivism</b>	<b>Critical theory et al.</b>	<b>Constructivism</b>	<b>Participatory</b>
Introduction	Ontology	Naïve realism: Reality independent of and prior to human conception of it, apprehensible	Critical realism: Reality independent of and prior to human conception, but imperfectly and approx. apprehensible	Disenchantment theory: reality is secret/hidden, shaped by power structures and solidified over time	Relativism: multiple realities, constructed in history through social processes	Participative: multiple realities, co-constructed through interactions between specific people and environments
Activity: why quantification?	Epistemology	Reality knowable. Findings are singular, neutral, perspective-independent, atemporal, universally true	Findings provisionally true; multiple descriptions can be valid but are probably equivalent; findings can be affected/distorted by social + cultural factors	How we come to know something, or who knows it, matters for how meaningful it is	Relativistic: no neutral perspective to adjudicate competing claims	We come to know things, create new understandings, & transform world by involving other people in process of inquiry
Theorizing	Methodology	Hypotheses can be verified as true. Quant methods, math.	Falsification of hypotheses; primacy of quant, but some qual and mixed methods	Dialogic (conversation + debate) or dialectical ( $\text{thesis}_1 \rightarrow \text{antithesis}_1 \rightarrow \text{synthesis}_2 := \text{thesis}_2\dots$ )	Dialectical, or exegetical (reading between the lines)	Collaborative, action-focused; flattening hierarchies; engaging in self- and collective reflection, action
Breaking free	Axiology	Quant knowledge-holders have access to truth, and responsibility from it	Quant knowledge valuable but can be distorted; qual can help find and correct	Marginalization provides unique insights, knowledge of marginalized valuable	Understanding construction is valuable; value relative to given perspective	Reflexivity, co-created knowledge, and non-western ways of knowing are valuable and combat erasure and dehumanization
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Malik and Malik (2021), via Guba and Lincoln (2005)

# "Ways of understanding a person" (see Kiviat 2023)

	<b>As a case (quant)</b>	<b>In narrative (qual)</b>
Context/ circumstance	Stripped away	Key
Mental states	Absent (for the most part)	Crucial; constitutive
Relevant features	Determined in advance	Emergent
Orientation to time	Atemporal	Chronological
Ordering of features	Unimportant	Meaningful
Other actors	Invisible	Often present
Causal logic	Mathematical	Theoretical
Boost predictive validity	Add cases	Know person better

Slide from Barbara Kiviat, based on "Bowker and Star 2000; Bruner 1986; Desrosières 1998; Espeland 1998; Espeland and Stevens 1998, 2008; Fourcade and Healy 2017; Hacking 1990; Porter 1994, 1995; Ricouer 1998; White 1980, 1984". I would add: Abbott 1988

# False consciousness(es) of AI/tech?

- The newest iteration of a long history of quantitative consciousnesses: the idea that with the “right” quantitative abstraction, we can control the world (and the idea that whatever we have now finally achieves that)
- Any problems with this abstraction are just kinks to be worked out (with more abstractions)
- There are also the eschatological false consciousnesses of AI... (“TESCREAL”, Gebru and Torres 2024)
- All are wrong, and harmful

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# Theorizing quantification (Malik 2020)

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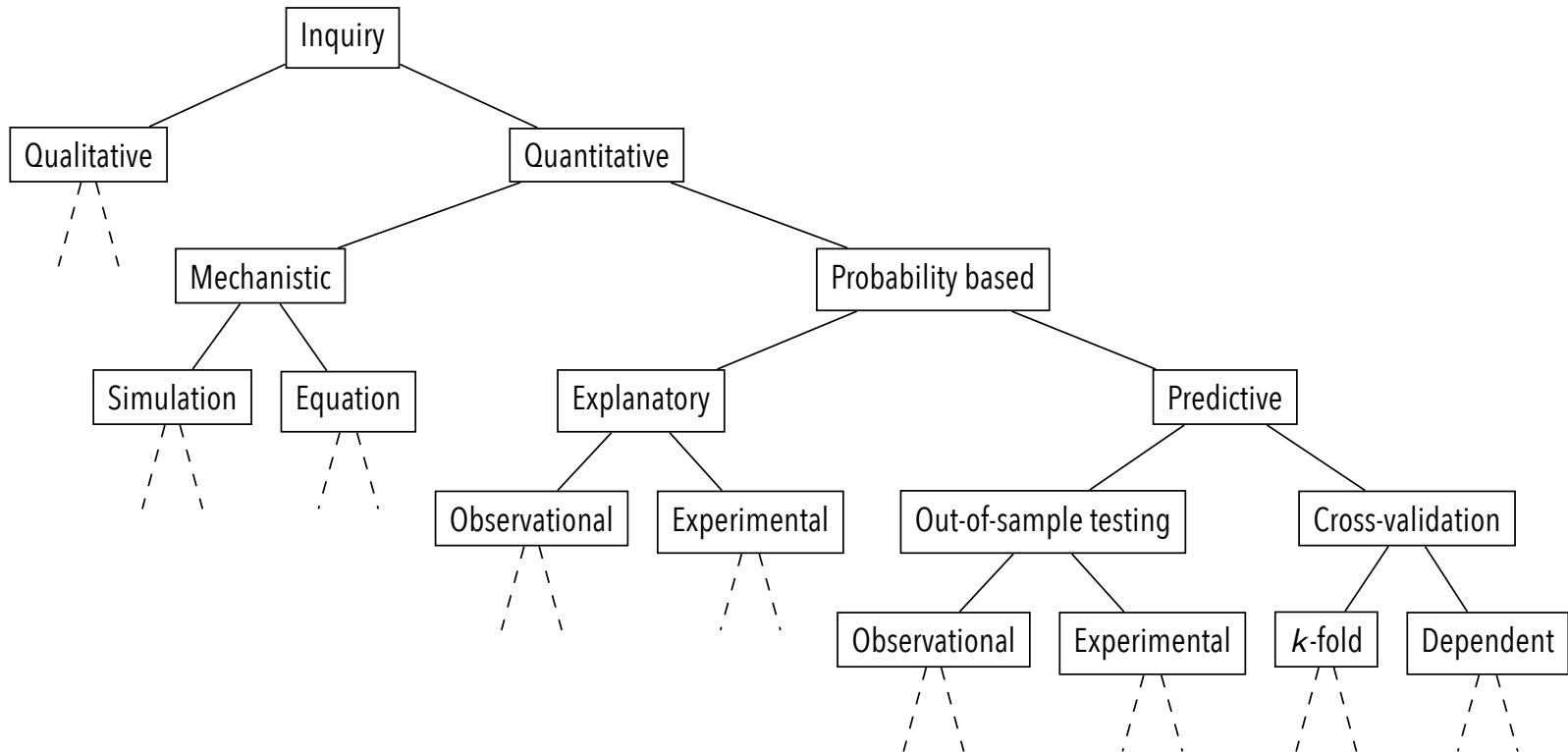
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## 4. Breaking free

“I began to ‘wake up’, breaking out of a technical cognitive style that I now regard as extremely constricting.”

# Agre: *Conscientization*, but incomplete

- Critical technical practice failed to take hold: only scattered adoption, mostly in Human-Computer Interaction, and nothing within AI. (Recent review: van Geenen, van Es, and Gray 2024)
- Matches a Kuhnian paradigm shift, but better understood through Freire's "conscientization," and subsequent studies and theorizing of "perspective transformation" in adult education (Mezirow 1978).
  1. A disorienting dilemma
  2. Self-examination with feelings of guilt or shame
  3. A critical assessment of assumptions
  - 4. Recognition that one's discontent and process of transformation are shared and that others have negotiated a similar change**
  - 5. Exploration of options for new roles, relationships, and actions**

...

# Awakenings as a theory of change

- Agree is not the only one: we also give examples of Phil Rogaway (cryptography) and Kentaro Toyama (ICT4D)
- Probably are many others, but without a published statement
- After awakenings, practices transformed towards coalition-building, openness in types of knowledge that are respected (although this is imperfect and needs guidance)
- This is a model for what we can try to do with technical practitioners; to encourage and guide awakenings (rather than, say, teach ethics from a formal perspective)

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# Encouraging critical awakenings

- Need step 4, “Recognition that one’s discontent and process of transformation are shared and that others have negotiated a similar change”
- After the fact:
  - Exposure to anti-positivist and anti-realist ideas
  - Contact with non-technical individuals
  - Finding ways to combat compartmentalization
  - Spaces for personal reflection, community sharing
- Incorporate into technical training

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# Channeling critical awakenings

- Need step 5, “Exploration of options for new roles, relationships, and actions”
- Advocating for using, respecting, and resourcing qualitative approaches within organizations
- In general, *we won't know what good actions will be*; must get it from people who are affected.  
Listening to and being in community with those who are harmed by tech

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- Interdisciplinary work as utilizing different ways of knowing, epistemologies, knowledge constructs
- Arts-based methods as valid modes of inquiry, knowledge production, and mobilization
- Non-western ways of knowing as valuable

Kenyatta A. C. Hinkle, 2019, *The Rubber Tree*



# Lessons learned from non-quant research

- Reflexivity

- Positionality

- Cultural humility (lifelong learning)

- Transformative Education

- Community Based Participatory/Participatory Action Research

- Validity of arts-based methods and ways of knowing

- Disciplines as a barrier

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# Reflexivity

- What is it?
- Why it is important to all research and not just qualitative processes?
- What underlying theoretical/philosophical assumptions are involved in the practice of reflexivity?
  - Social constructivist and post positivism

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# Positionality



Kara Walker, 2000, *Emancipation Approximation 7.19*

- Positionality of my collaborators
- My perspective
- Identify what you bring to the inquiry e.g., social location, professional and personal experience
- What is the social, cultural, political, institutional context of this inquiry?
- The positionality of my discipline
- Where is the power?

# Positionality affects all parts of the research process

- Design
- Data collection
- Data analysis
- Implementation
- Co-production
- Dissemination
- Knowledge mobilization



Kara Walker, 2000, *Emancipation Approximation 7.14-7.15*

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# Quant reflexivity

- What might reflexive quant (Jafar 2018) work look like?
  - A way to define the boundaries of one's research
  - Address biases directly within paper
  - Show limit of scope of research in reporting and dissemination of information
  - Contextualize work



Kara Walker, 2000, *Emancipation Approximation 7.16*

# Equity-focused



- Makes us think about the possible harms our study and the outcomes can have on marginalized populations we interact with
- Possible harms my work can cause (how can this knowledge produced be weaponized by those in power against the marginalized?)

# Action/impact-focused

- Changing things in the real world
- Getting outside the academic bubble
- Focusing on “street tasks” versus solely intellectual tasks
- Acknowledges the importance of policy, systems, structures, institutions in connection with knowledge production
- Research with actionable goals



Kara Walker, Untitled (Girl with Bucket)

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# Parting thoughts

# Redeeming quant?

- Reifying a source of epistemic violence that enables and sustains structural violence
- Toni Morrison (1975): “The function, **the very serious function of racism is distraction**. It keeps you from doing your work. It keeps you explaining, over and over again, your reason for being. Somebody says you have no language and you spend twenty years proving that you do. Somebody says your head isn’t shaped properly so you have scientists working on the fact that it is. Somebody says you have no art, so you dredge that up. Somebody says you have no kingdoms, so you dredge that up. None of this is necessary. There will always be one more thing.”

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# Quant/qual binary as a trap?

“...cultural studies have maintained a hermeneutics of suspicion toward the methods of quantification. But, to what extent does this suspicion toward quantitative inquiry compromise the deconstructive project of cultural studies by falling into the trap of the quantitative/qualitative and, related, nature/culture binaries?” (Dixon-Román 2016)

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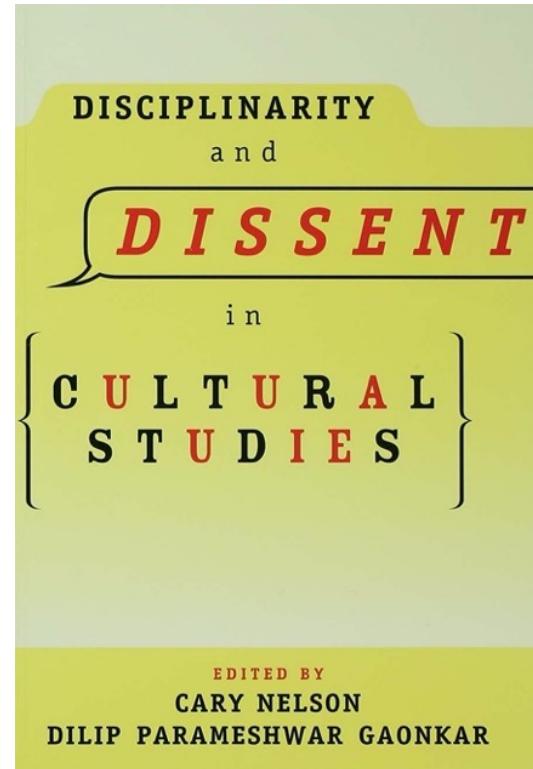
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# Symmetry?

“But that is how disciplines police their boundaries, by training their members to internalize them, naturalize them, and then fancy themselves free as birds. In some sectors of the culture... the unthinkable and undoable could be named and cast out when necessary. One of those sectors was the academy, and its disciplines would discipline unruliness whenever it arose.” (Nelson and Gaonkar 1996)



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# My “predictions”

- Machine learning/AI will hit a wall (another so-called “AI winter”)
- Funding will collapse; entire industries that have pivoted to AI will have a major reckoning as the tools they rely on will no longer be maintained, and the costs of maintaining and depending on such systems will become apparent
- AI researchers and evangelizers will have to rationalize its failure as due to external forces; they will focus on going after and attack the “delegitimizers” of machine learning instead of ignoring them
- Something else new will come along that become the “next great hope” of positivist fantasies that the right abstraction will grant control and power without intimacy, sacrifice, or care

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