Title

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Statistical practice under a qualitative mental model

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Statistical practice under a qualitative mental model
Introduction
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Aims

Aim 1: "What is a statistician doing at a qualitative conference?"

Co-liberation from constraints on qualitative and quantitative knowledge

Resist quantitative imperialism

(see Bartels, 2010, discussion of King et al., 1994)

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Aim 2: "What is statistics under a qualitative mental model?"

- Work in progress
- Substantial pieces in place

Introduction

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Background



My background:

- I ♥ math!
- Never bought into a quantitative imperative

My sharp left turn (circa 2019) ...

Dual entry point:

- Mixed methods research: Coordination of qualitative and quantitative knowledge
- Socially-inclusive research: Community over individualism

Practice and worldview

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Realignment

Idea:

Alignment	Practice	Worldview
Traditional	Statistics	Scientific
Realigned	Statistics	Socially-inclusive ¹

Statistics under a qualitative mental model: Distinguishes between a researcher's practice and mental model²

¹Socially inclusive worldview: emphasis on "unity, cohesion, civic engagement, togetherness, or bridging the gap between 'us' and 'the other"' (Koikkalainen, 2011, p. 2).

²Mental model: reference to a researcher's "set of assumptions, understandings, predispositions, and values and beliefs" (Greene, 2007, p. 53). Roughly synonymous with paradigm or worldview $(\square \land (\square) (\square$

Practice and worldview

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 $\Rightarrow \Rightarrow \Rightarrow \Rightarrow Major point \Leftarrow \Leftarrow \Leftarrow \Leftarrow$

Major Point 1: Distinction between qualitative and quantitative need not be sharp

Statistics under a qualitative mental model:

- Not implausible as a **qualitative** tool
- Single-paradigm approach to multi-methodological research (Teddlie & Tashakkori, 2003)

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- Upended quantitative methodologies
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Upended quantitative methodologies

- Idea: Quantitative methodologies with **unorthodox foundations** (Spitzner, 2023b)
 - Guiding principles overlap with qualitative methodologies

Defining a qualitative mental model:

- Varies across research communities and evolves
- Seen in themes of upended quantitative methodologies ⇒ Socially-inclusive flavor

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- Upended quantitative methodologies
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Themes and examples

Theme 1: Center ethical criteria

Theme 2: Prioritize context

Example 1: Indigenous statistics

(Walter & Andersen, 2013; Kukutai & Walter, 2019)

- Lack of context ⇒ deficit narratives and victim-blaming of marginalized communities
- Constructivist(!) quantitative methodology

Transformative-emancipatory paradigm: Pragmatic while guided by social-justice aims (Mertens, 2003, 2012, 2018)

- Upended quantitative methodologies
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Themes and examples (continued)

Theme 3: Espouse theory

- Example 2: Queer data (Guyan, 2022)
 - "Clash between queer theory and actual people"
- Example 3: Social epidemiology (Krieger, 2001)
 - "A marriage of sociological frameworks to epidemiological inquiry"
- Example 4: Quantitative criticalists (Stage, 2007)
 - Guided by tenets from European critical theory (Kincheloe & McLaren, 1994)

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Themes and examples (continued)

Theme 4: Attends to complexity, multidimensionality, and co-constituted nature of research phenomena

Example 5: Diffractive analysis (Haraway, 1993; Barad, 2007)

- Relevant to quantitative methodologies (Dixon-Román, 2017)
- Draws on new materialist notion of material-discursive entanglement
- Focus on interference patterns of varied data types and methodologies

Weakens qualitative vs quantitative distinction

Upended quantitative methodologies

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Major Point 2: Many broad elements of statistics under a qualitative mental model are already implemented

However, variations are apparent ...

Indigenous statistics:

- Unquestioning acceptance of statistical tools
- Relies on the "social and political acceptance of the validity of statistical analysis" (Walter & Andersen, 2013)

Quantitative criticalists:

- Attend to nuances of statistical analysis
- Retains key aspects of traditional science

Upended quantitative methodologies

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$\Rightarrow \Rightarrow \Rightarrow \Rightarrow \Rightarrow$ Major point $\Leftarrow \Leftarrow \Leftarrow \Leftarrow \Leftarrow \Leftarrow \Leftarrow \Leftarrow \Leftarrow \Leftrightarrow \Leftrightarrow \blacksquare$

Major Point 3: Statistics under a qualitative mental model is to extend to statistical and inferential data analysis

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Statistical and inferential data analysis

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Blueprint

From data in the form of numbers, one makes inferences in the same way as with data in the form of words, not by virtue of probabilistic algorithms. Statistics are not privileged. Inference is not mechanized.

-M. L. Smith (1997)

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Decontextualized statistical practice

Shortcomings of mathematical models:

■ Models prescribe generic analysis procedures ⇒ Validity from standardization (

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(Porter, 2020)
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- Models prioritize cleanliness and control
 ⇒ Drives eugenics movements (D'Ignazio & Klein, 2020)
- Models are fundamentally representations ⇒ Separation of subject and object (Barad, 2007; Dixon-Román, 2017)
- Models can be **ambiguous** ⇒ Intersectionality research and "interaction" (Bauer, 2014)

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Socially-aware data-visualization

Idea: Presentation of numbers has a rhetoric (Hullman & Diakopoulos, 2011; Kennedy *et al.*, 2016)



Two contrasting presentations of the same unemployment data

The rate has fallen more than 2 points since its recent peak

The rate was above 8 points for 43 months

(D'Ignazio & Klein, 2020)

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Bayesian inference

Compatibility with a qualitative mental model:

- Simplifies to an organizational framework \Rightarrow no models
- Departs from strict objectivity \Rightarrow room for **positionality**³, **reflexivity**⁴, **diffractive reading**
- Probabilistic, but amenable to non-traditional interpretations

Socially-inclusive interpretation: Probability derives from argument and counterargument (Spitzner, 2021)

³Positionality: the fluid, overlapping identities of research participants and the influences of culture, history, and social location (Alcoff, 1988; Kezar & Lester, 2010; Meixner & Spitzner, 2021; Spitzner & Meixner, 2023) ⁴Reflexivity: "a self- scrutiny...a self-conscious awareness" (Bourke 2014)

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Pool reduction

Idea: Contextualized evidence-reporting

Decontextualized statement: Inquiry is a **gambling game** "97% chance in favor of a particular conclusion"

Pool reduction:

"In a pool of 100 potential constructions of the situation, 97 are inconsistent with study results, leaving 3 remaining, two of which remain alongside the one conclusion of particular interest."

- Pool reduction is explicit about the tasks of decision-making
- Non-standard articulation of Bayesian inference

(Spitzner, 2023a)

Closing

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Status

Current focus:

- Ambiguity of models in intersectionality research
 - (Hinze et al., 2012)

Person-centered analysis

(Malcom-Piqueux, 2015)

Parallel experiences:

- Conducting qualitative research (Spitzner & Meixner, 2021)
- Teaching statistics majors to think critically
- Writing, writing, and more writing⁵

⁵...also reading, reading, and more reading

Closing

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$\Rightarrow \Rightarrow \Rightarrow \Rightarrow$ Major point $\Leftarrow \Leftarrow \Leftarrow \Leftarrow \Leftarrow \Leftarrow$

Major Point 4: Advances in methodology are made within an ecology of methodologies, criticisms, and social forces

Q: "What is a statistician doing at a qualitative conference?"

A: Making new connections, participating in new communities, listening

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Closing

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Thanks

Thank You!!



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