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Statistical practice under a qualitative mental model

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Background and aims

My background:

- Training and appointment in **statistics**
- Frustrated with **rigid conventions**, lack of **critical tradition**
- Interest in **co-liberation**

“Statistics under a qualitative mental model”

- Does it **make sense**?
- **What is it**?
- Does it **inspire**?

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

- **Single-paradigm** approach to multi-methodological research (Teddlie & Tashakkori, 2003)

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

²**Mental 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**

Upended quantitative methodologies

Idea: Quantitative methodologies with **unorthodox foundations**
(Spitzner, 2023b)

- Guiding principles overlap with qualitative methodologies

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

Themes and examples (continued)

Theme 3: Espouse **theory**

Example 2: **Queer data** (Guyan, 2022)

- “Clash between queer theory and actual people”

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

Example 3: **Diffractive analysis** (Haraway, 1993; Barad, 2007)

- Draws on **new materialist** notion of material-discursive entanglement

⇒⇒⇒⇒⇒ Major points ⇐⇐⇐⇐⇐

Major Point 1: Many broad elements of statistics under a qualitative mental model are **already implemented**

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: (Stage, 2007)

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

Major Point 2: Statistics under a qualitative mental model is to extend **all the way** to statistical analysis itself

A path forward

Some basic guidelines:

- Prioritize close and critical examination over automated algorithms (M.L. Smith, 1997)
- Attend to the rhetoric of data-visualization (D'Ignazio & Klein, 2020)

What about statistical inference?

Example: How is research to inform the question of whether an intervention is effective?

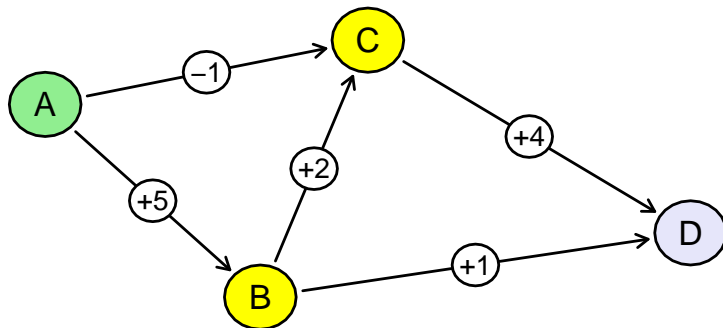
Big problem: Mathematical models

Legal perspective

It is the duty of a court to perform “the ultimate evidence evaluation of all information in the case combined”

(Nordgaard & Rasmusson, 2012)

Cognitive-map study: participant map



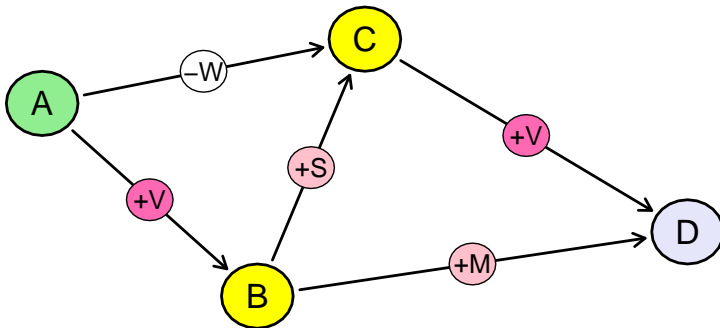
A = Recent woman immigrant to Canada

B = Poor access to mental health services

C = Risks of postpartum depression

D = Unmet postpartum healthcare needs

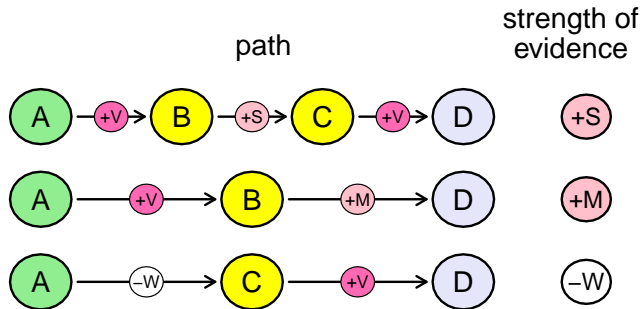
Cognitive-map study: strength of evidence



+W = weak positive impact
 +M = moderate positive impact
 +S = strong positive impact
 +V = very strong positive impact

-W = weak negative impact
 -M = moderate negative impact
 -S = strong negative impact
 -V = very strong negative impact

Cognitive-map study: pathways



+W = weak positive impact

+M = moderate positive impact

+S = strong positive impact

+V = very strong positive impact

-W = weak negative impact

-M = moderate negative impact

-S = strong negative impact

-V = very strong negative impact

⇒⇒⇒⇒⇒ Major point ⇐⇐⇐⇐⇐

Major Point 3: Strength-of-evidence can be assessed just as easily from words as it can from numbers

(Nordgaard and Rasmussen, 2012)

Verbal strength-of-evidence



Polisen

Swedish National Police and verbal strength-of-evidence

- Used “in daily practice in the lab”
- CSIs have “have no statistical background”

(Rådström, personal corresp.)

Strength of finding for Theory A (+)

	N	W	M	S	V
N	=	+W	+M	+S	+V
W	-W	=	+W	+M	+S
M	-M	-W	=	+W	+M
S	-S	-M	-W	=	+W
V	-V	-S	-M	-W	=

N = no strength

W = weak strength

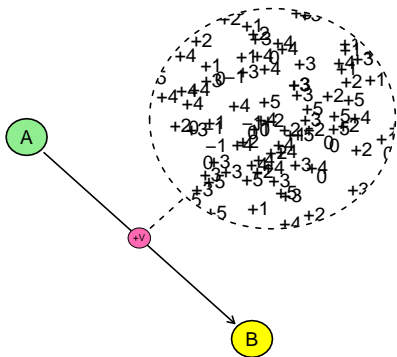
M = moderate strength

S = strong

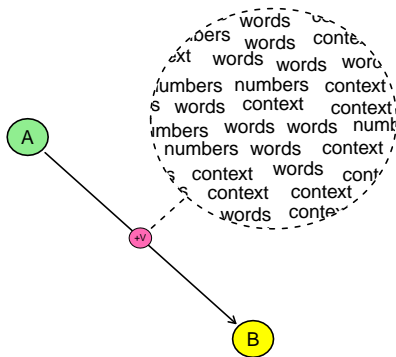
V = very strong

Cognitive-map data: verbal strength-of-evidence

Traditional statistics



Statistics under a qualitative mental model



Grounded theory history

1990's conflict: (Meixner, 2008)

- Anselm Strauss opens to constructivism
- Barney Glaser remains in positivism

Dimensional analysis: (Schatzman, 1991, p. 308)

“To tell a complex story, one must designate objects and events. . . , indicate a condition or two for whatever action or interaction is selected to be central to the story, and point to, or imply, one or more consequences”

Situational analysis: (Clarke, 2005, p. 29)

“...grounded theorizing through the development of sensitizing concepts and integrated analytics”

Diffraction analysis

“Reading insights through one another”

(Barad, 2007, p. 30)

- Highlight **entangled** structures within **ever-changing** phenomena, with **no frame of reference**

Diffraction apparatus:

- Data in a potentially boundless range of forms
- Focus on **interference patterns**
- Illuminates **differences**, an ongoing **process of becoming**

Aims

“Statistics under a qualitative mental model”

- Does it **make sense**?

Understand as a realignment of statistical practice with expansive and contextualized ways of knowing

- **What is it?**

A critical quantitative methodology that eschews automated algorithms and mathematical models in favor of socially-aware research practices

- Does it **inspire**?

(I hope so)

Thanks

Thank You!!

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