



Novel Designs and Methods for Behavioral Interventions: Comments

Bonnie Spring
Northwestern University

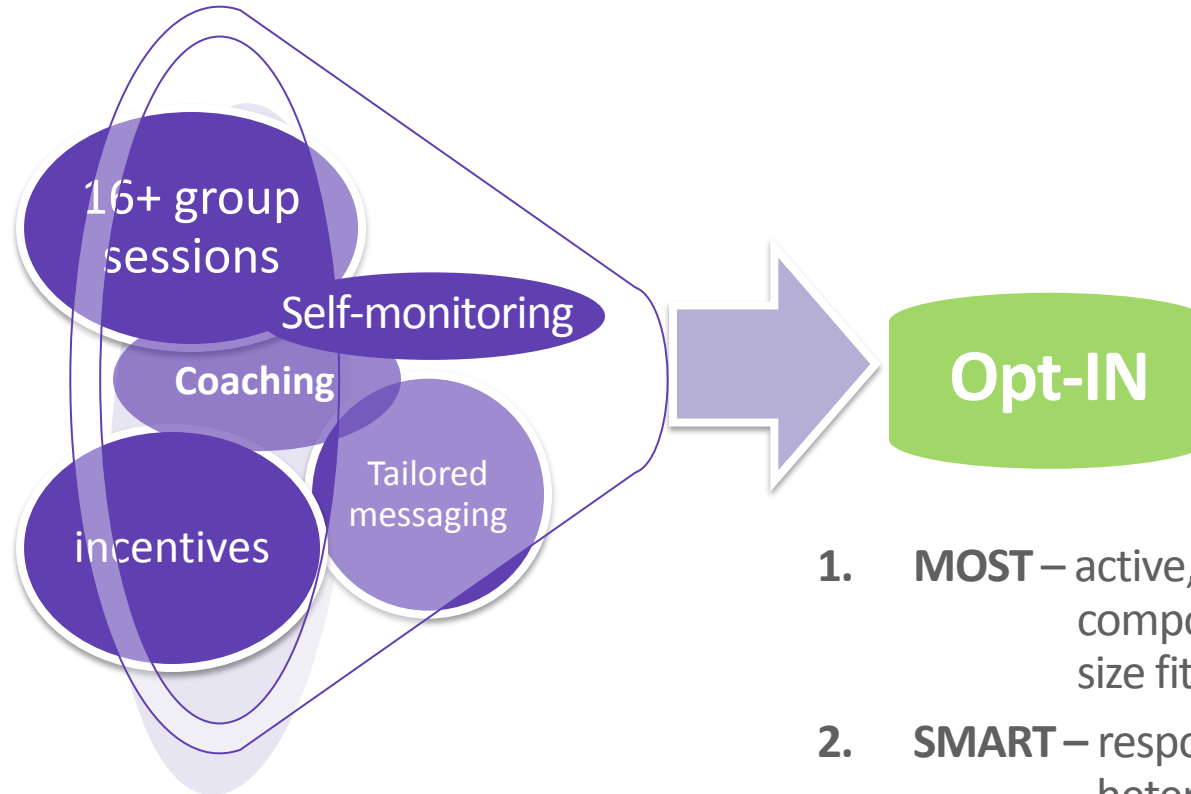
Michael Lauer

- “Even the naysayers agree clinical trials provide the highest quality evidence.”
- RCTs can change clinical practice
- Call for 4R's:
 - Randomized
 - Registry (EHR)
 - Representative (external validity)
 - Really inexpensive
- How disruptively innovative will we get with hierarchy of evidence?

Bethany Raiff, Jesse Dallery

- “**Visual analysis** prioritizes *clinically* significant change in health-related behavior... A statistically significant effect may be clinically meaningless. ... Decisions about whether the magnitude of change is clinically relevant should be based on visual analysis.”
- “**Scientific generality** is characterized by knowledgeable reproducibility, or knowledge of the factors that are required for a phenomenon to occur. It can be attained through systematic **replication** and thorough analysis of **behavioral mechanisms**.”
- Will single case experiments change clinical practice?
 - APA Division 12 ESTs and Gordon Guyatt

Kitchen Sink → Optimized Intervention



1. **MOST** – active, optimized components – best one size fits most
2. **SMART** – response heterogeneity, best strategy for adapting to non-response
3. **JITAI** - individualized just in time adaptive intervention

Optimization Criteria

- Cost
- Burden
- Efficiency
- Reach, Engagement, Retention
- “Happiness not health”
- Efficacy, effectiveness

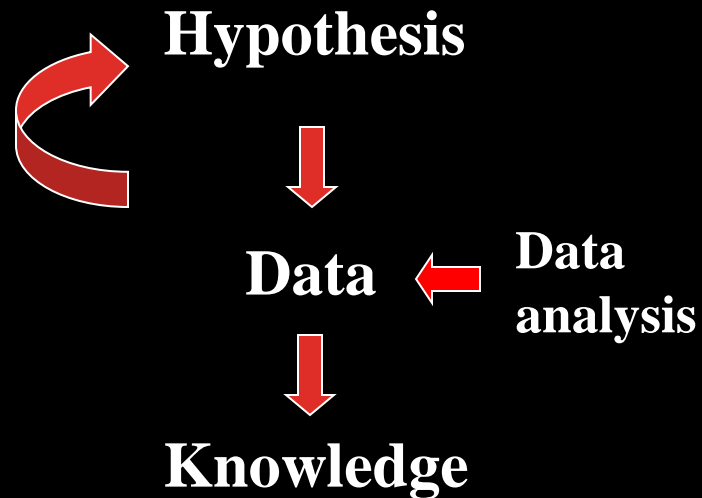
Interdisciplinary Team Science

- mHealth and technology supported interventions
 - RAPID PACE OF TECH DEVELOPMENT
 - Wireless sensing, wearable, continuous data,
 - Contextually informed
 - Dynamically adaptive in real time
- Behavioral scientists, medical experts, biostatisticians, computer scientists, design experts (HCI, IO), engineers... community

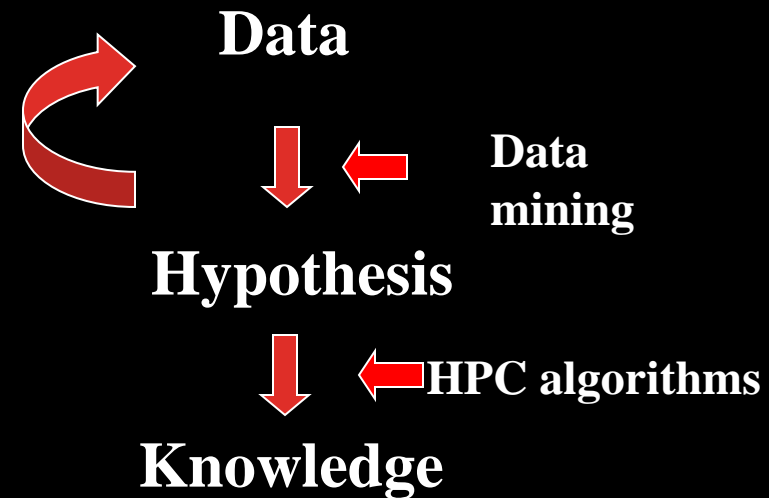


Classical Analytics Vs. Big Data Analytics

- Classical Analysis



- Big Data Analysis

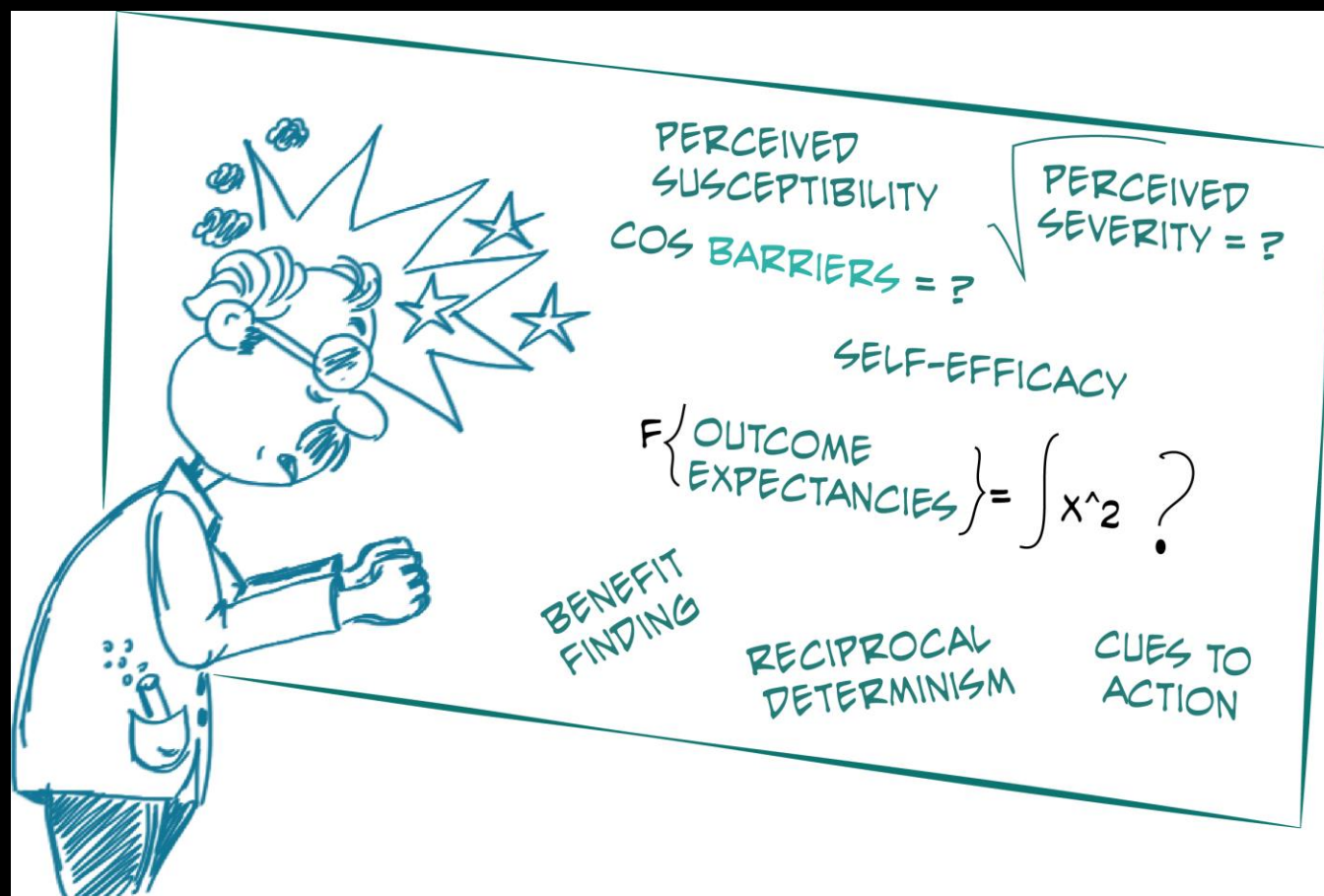


Big data view: “statistician as push button technician,” “cookie cutter”, “biostatistician police”

Classical view: “fishing,” “data dredging,” not building a generalizable base of scientific knowledge



TRANSDISCIPLINARY COMMUNICATION: WHAT'S A MODEL?



Spring, Gotsis, Paiva, Donna Spruijt-Metz (2013) Healthy Apps: [IEEE Pulse](#), 9(November/December), 34-40.