Selecting and Applying Implementation Theories, Models, and Frameworks

Sarah A. Birken, PhD

Associate Professor

Department of Implementation Science

Wake Forest School of Medicine

Preface: Why use Implementation Theories, Models, and Frameworks?

Per Nilsen

Theories can contribute to…

…clarifying **causal mechanisms**, **core components**, **active ingredients**, etc. that influence implementation outcomes – i.e. opening the **black box**!

…explaining **HOW** and **WHY** certain outcomes are achieved

…**improved** implementation

Rationale for using theories compared to "no-theory" (common sense, experience, habits, etc.)

- Theories are **explicit** and open to **question and examination**; beliefs and assumptions tend to be more difficult to challenge.
- Theories can be **adapted or abandoned**; we may hold on to our beliefs and assumptions even if proven incorrect.
- Theories are more consistent with **accumulated knowledge** than beliefs and assumptions.
- Theories give individual facts a meaningful context and build an **integrated body of knowledge**; common sense is more likely to produce isolated facts.

”There is nothing so practical as a good theory”

(Kurt Lewin, 1952)

OK Kurt, but which should we choose?

A Taxonomy of TMFs

Nilsen, P. (2015). Making sense of implementation theories, models and frameworks. *Implementation Science, 10*(53). https://doi.org/10.1186/s13012-015-0242-0

Implementation TMFs

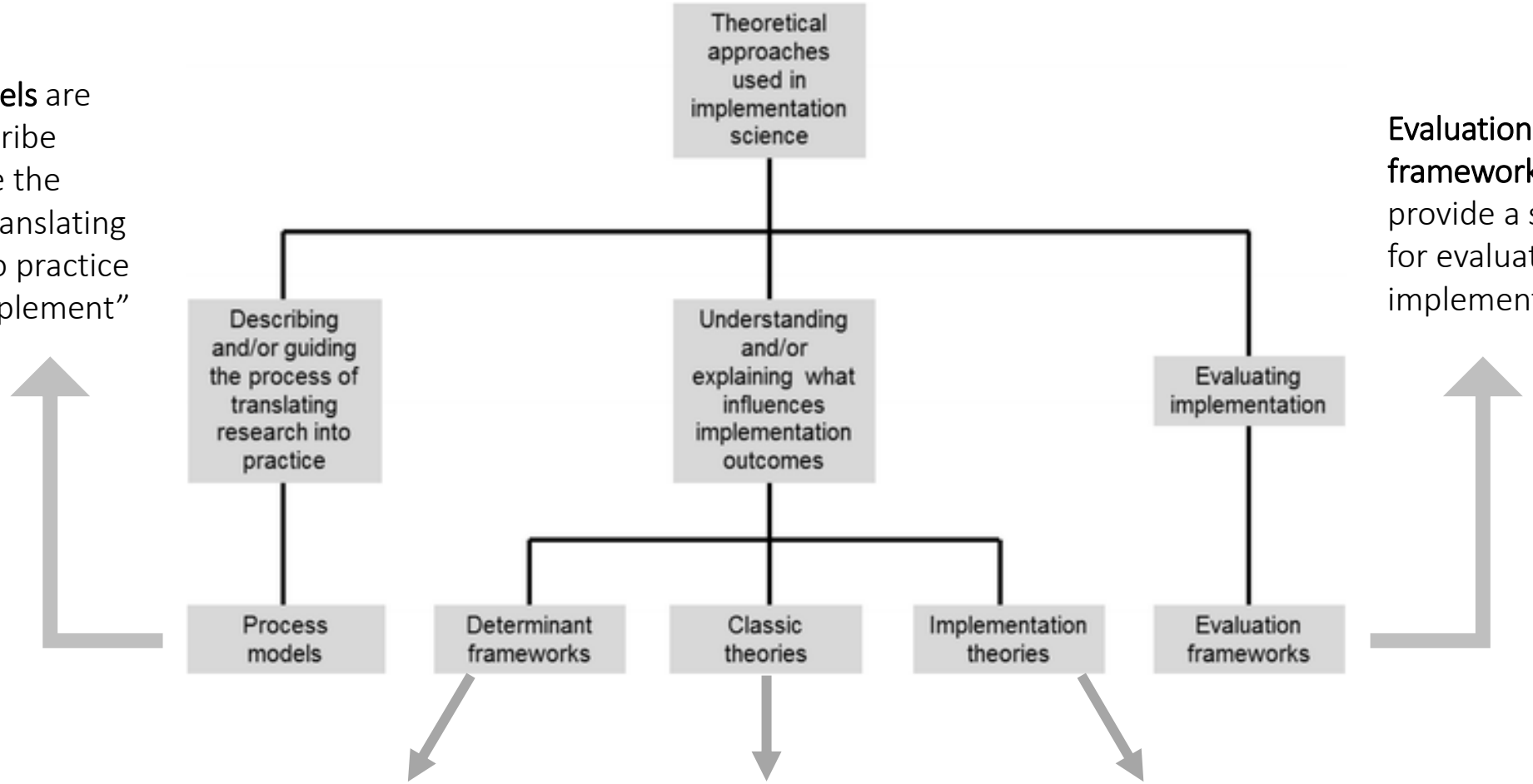
Theories PREDICT/attempt to explain the causal mechanisms (i.e., *how* and *why*) of implementation

Models are used to DESCRIBE/guide the *process* of translating research into practice

Frameworks IDENTIFY factors believed/found to influence implementation outcomes

Models and frameworks do not specify the mechanisms of change; they are typically more like checklists of relevant factors to various aspects of implementation

Process models are used to describe and/or guide the process of translating research into practice (”how-to-implement” models)



Evaluation frameworks provide a structure for evaluating implementation

Determinant frameworks describe general types (classes or domains) of determinants hypothesized/found to influence implementation outcomes

Classic theories were developed in other fields

Implementation theories were developed in the field

Selecting Implementation TMFs

Sarah Birken

Conceptual Model for Implementation Research

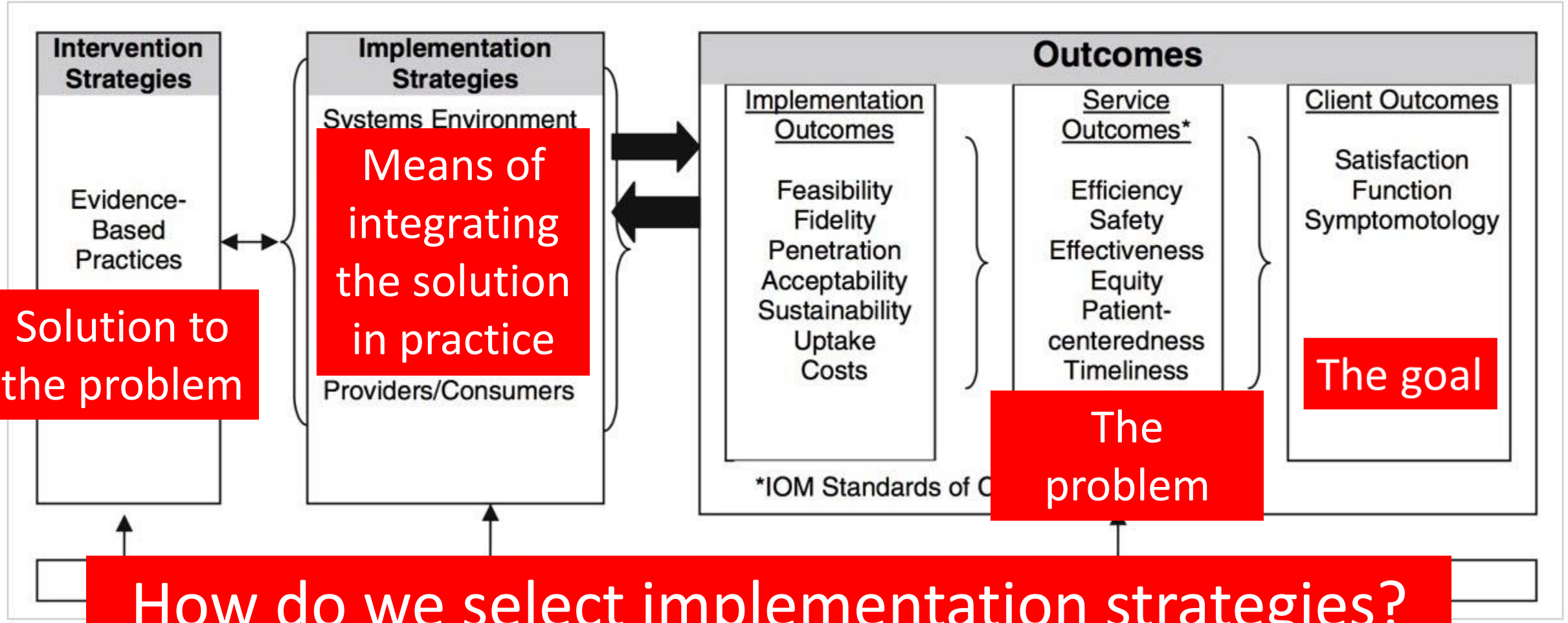
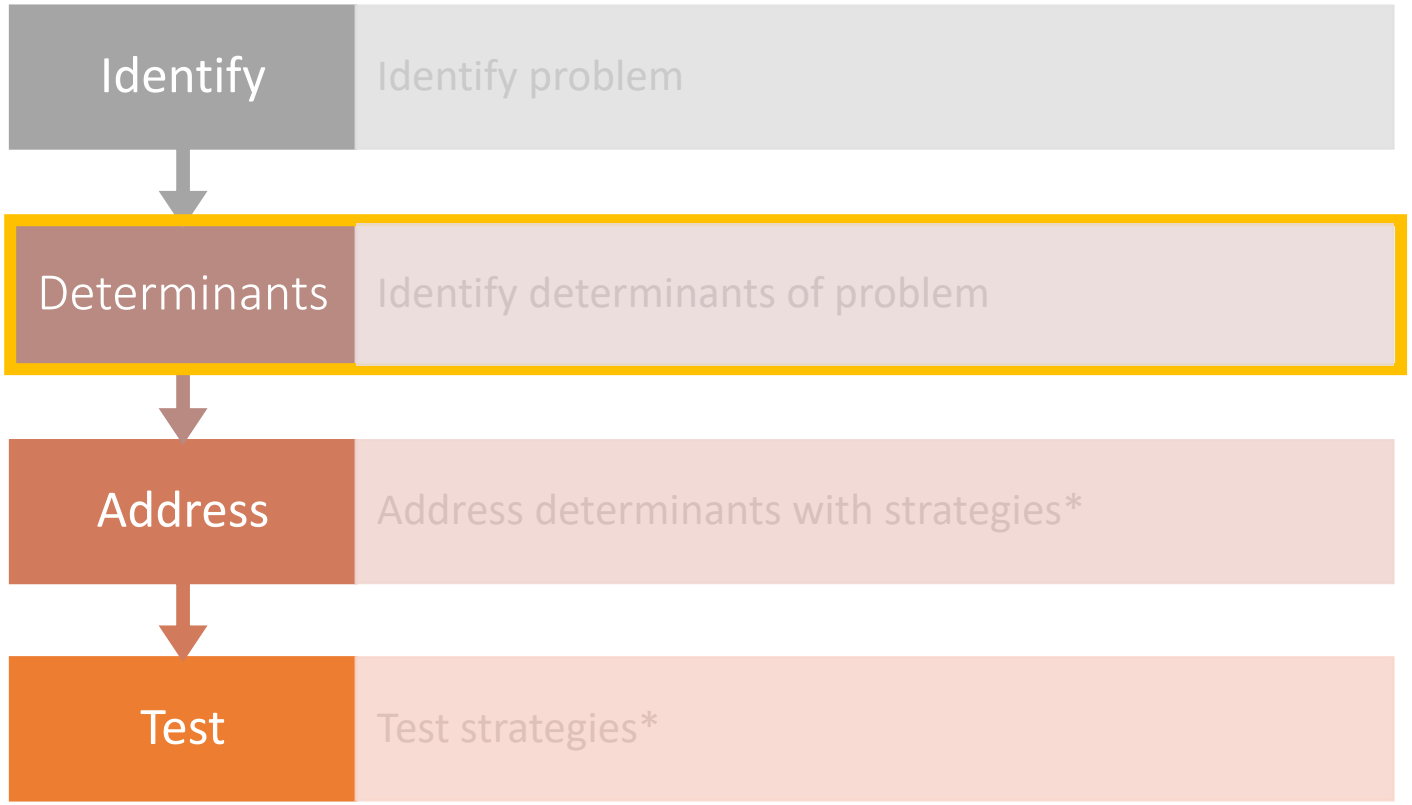


Image source: Proctor, E. K., Landsverk, J., Aarons, G., Chambers, D., Glisson, C., & Mittman, B. (2009). Implementation research in mental health services: An emerging science with conceptual, methodological, and training challenges. *Administration and Policy in Mental Health and Mental Health Services Research, 36*(1), 24–34.

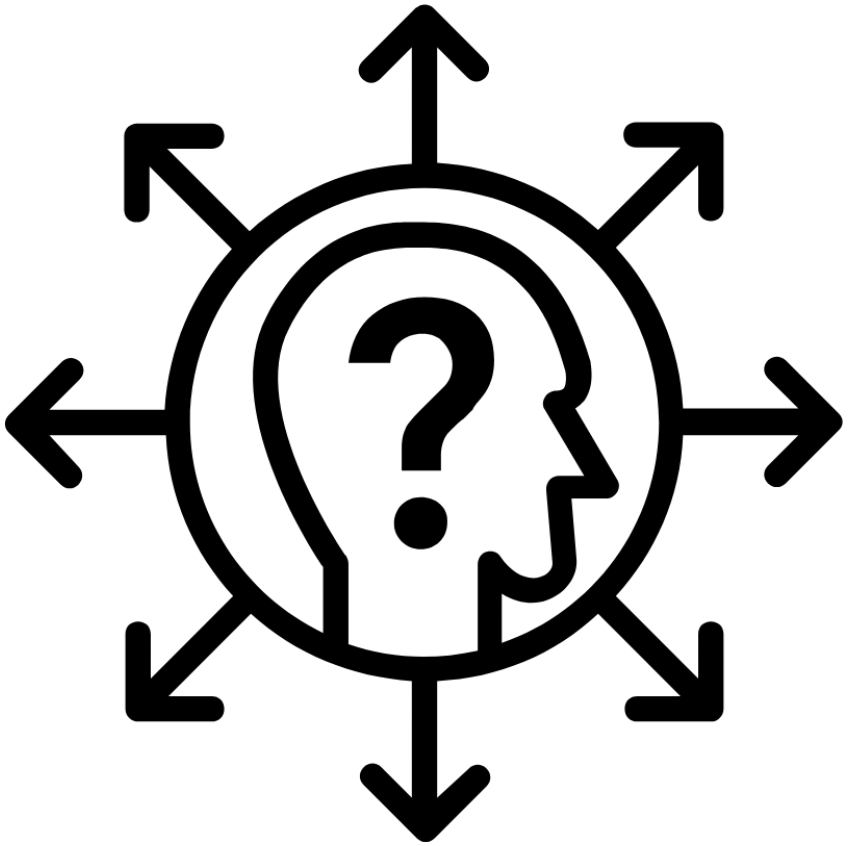
Selecting implementation strategies*



*Any effort to modify the intervention, implementation context (inner and/or outer setting), implementation process, and/or individuals responsible for implementation

(1) Identify problem

- Gap in practice:
  - What is it?
  - Where is the gap coming from?
  - Who is contributing to/not filling the gap?
  - Etc.
- Example: CT use for low-risk microscopic hematuria

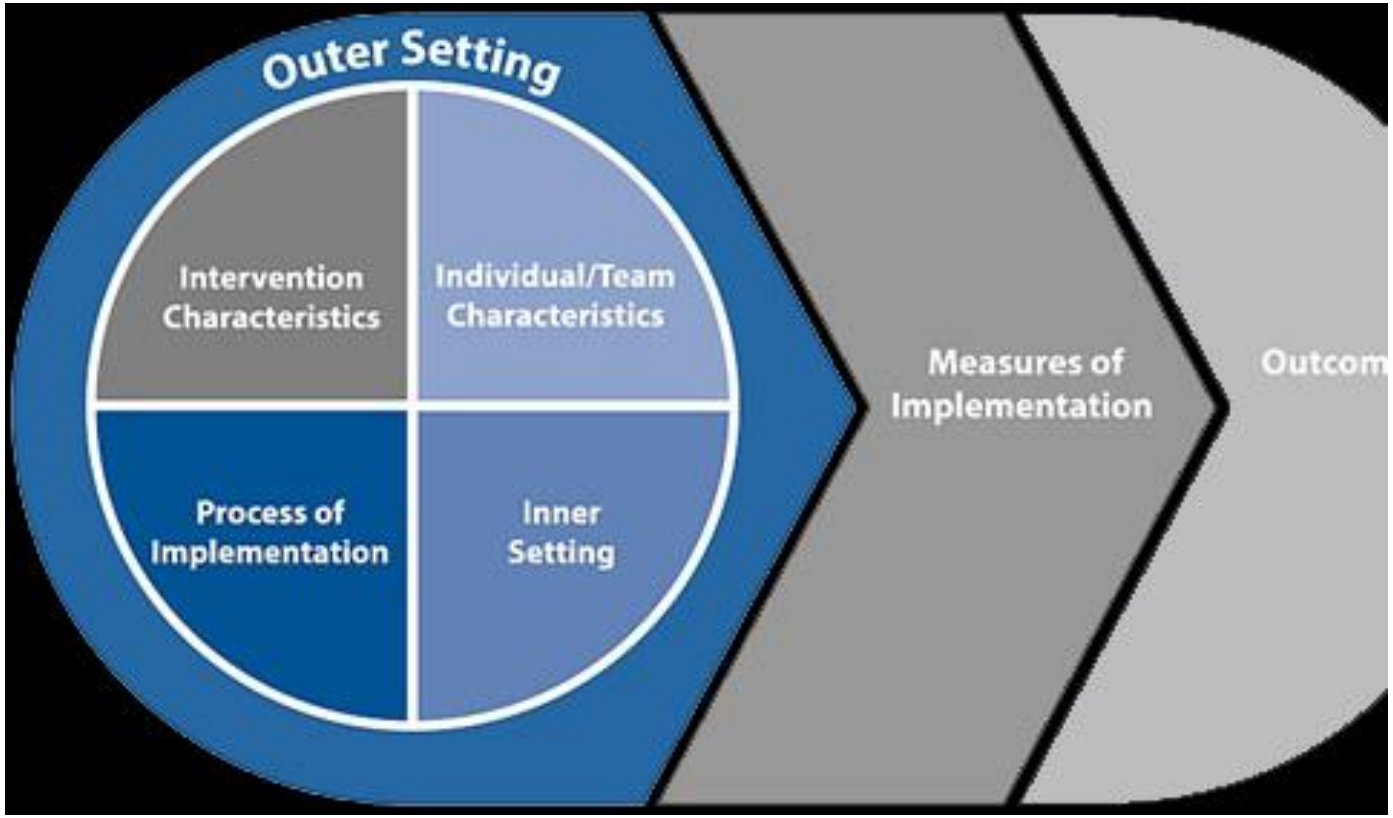


(2) Identify determinants of problem

Goal

(2) Identify determinants of problem

Means: CFIR+TDF



Agency for Healthcare Research and Quality. (2017). Spreading lean: Taking efficiency interventions in health services delivery to scale. Retrieved from https://www.ahrq.gov/practiceimprovement/delivery-initiative/execsumm.html

(2) Identify determinants of problem

Birken *et al. Implementation Science* 2014, **9**:167
http://www.implementationscience.com/content/9/1/167

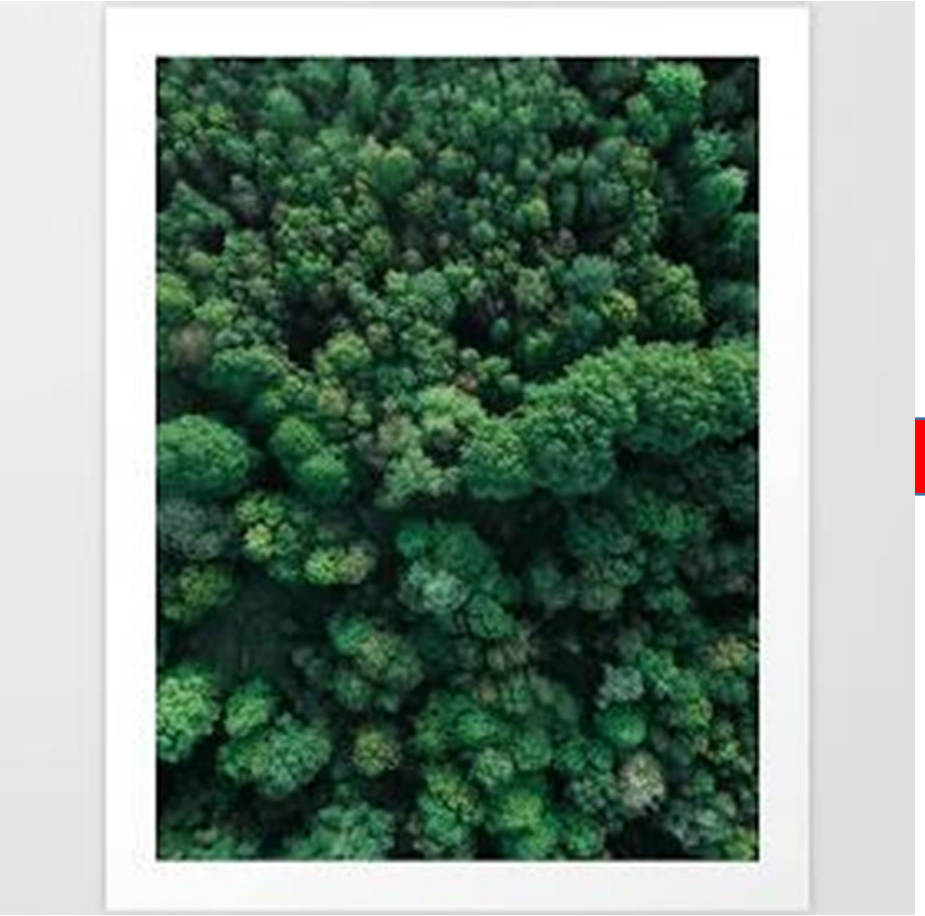
IMPLEMENTATION SCIENCE

RESEARCH Open Access

Potential determinants of health-care professionals' use of survivorship care plans: a qualitative study using the theoretical domains framework

Sarah A Birken[1*], Justin Presseau[2], Shellie D Ellis[3], Adrian A Gerstel[4] and Deborah K Mayer[4]

(3) Target determinants with strategies*



Implementation climate

Accreditation

Knowledge

Patient flow

Reimbursement

(3) Target determinants with strategies

- Strategies should be theory-informed (i.e., if knowledge ISN'T a problem, then training/education WON'T help)
  - Individual-level determinants: Use psychological theories
    - A good resource: https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-6-42
  - Organization-level determinants: Use organization theories
    - OTIS (org theory for implementation science) is in progress; see https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7076554/

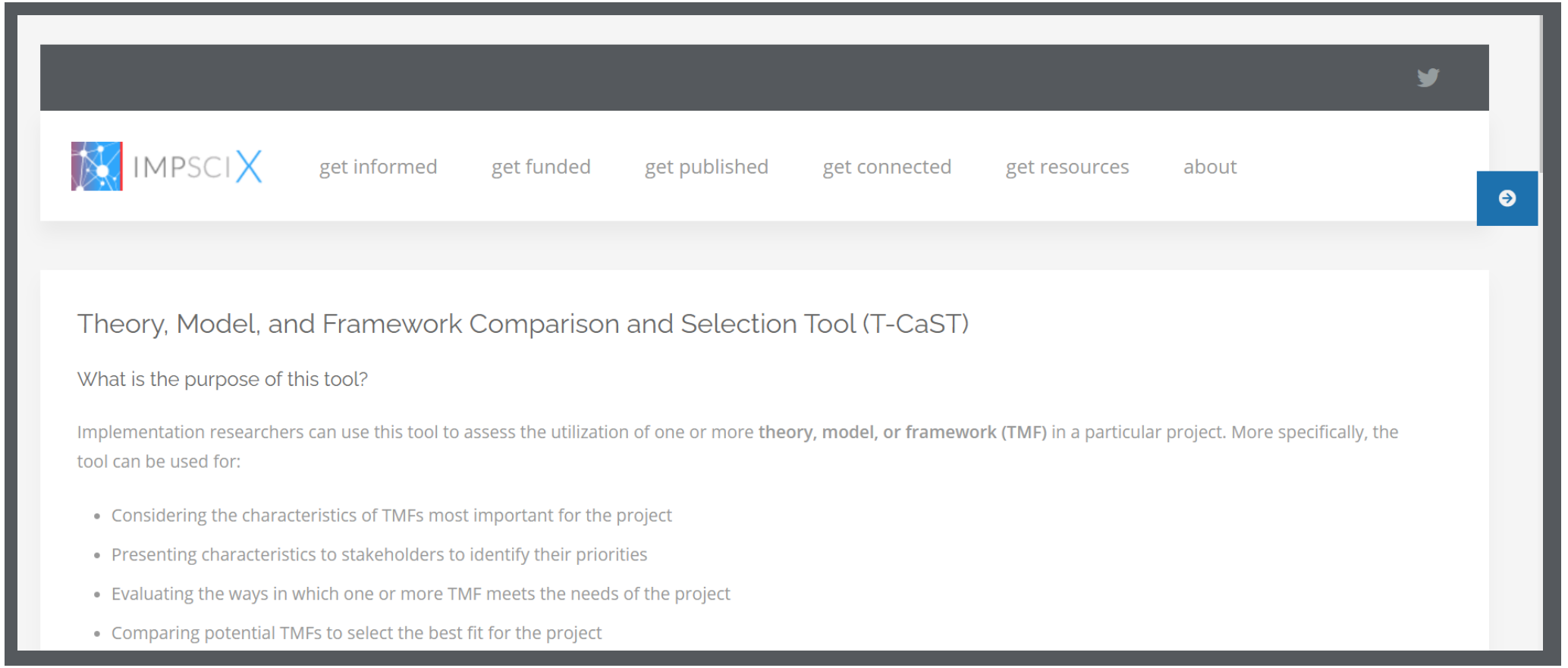
(3) Target determinants with strategies

- Approaches
  - Implementation mapping
  - Behavior change wheel
  - The Center for Implementation - https://thecenterforimplementation.com/courses

(3) Test strategies

- Effectiveness-implementation hybrid design
- Example: testing START intervention to facilitate implementation of high-quality survivorship care

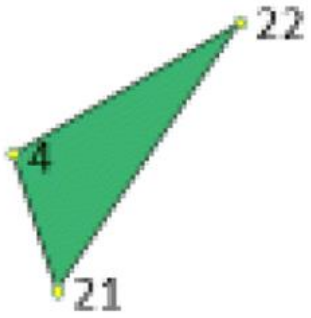
Selecting Implementation TMFs: The Theory Comparison and Selection Tool (T-CaST)

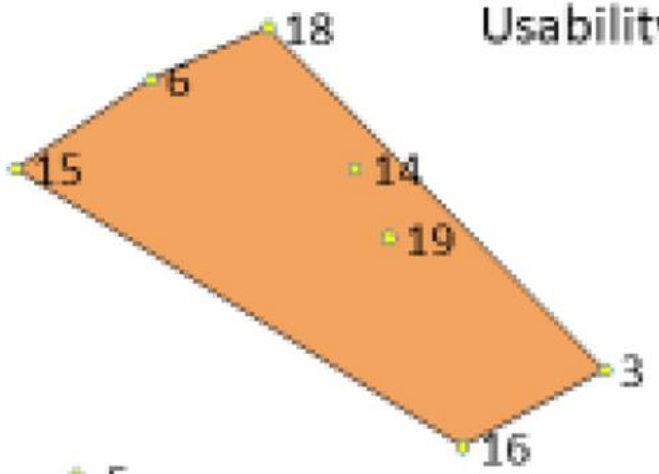


T-CaST domains

Familiarity

Extent to which PI or research team is familiar with the theory or framework

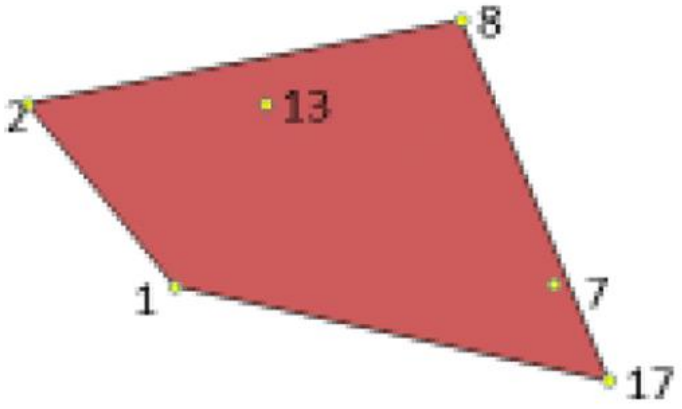


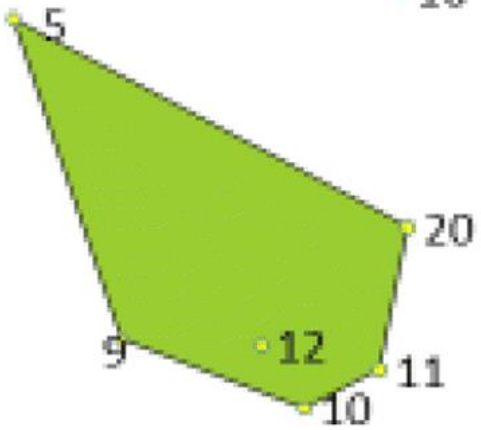


Usability

Applicability

Generalizable to various disciplines, settings, and populations





Testability

Generates hypotheses that can be empirically tested

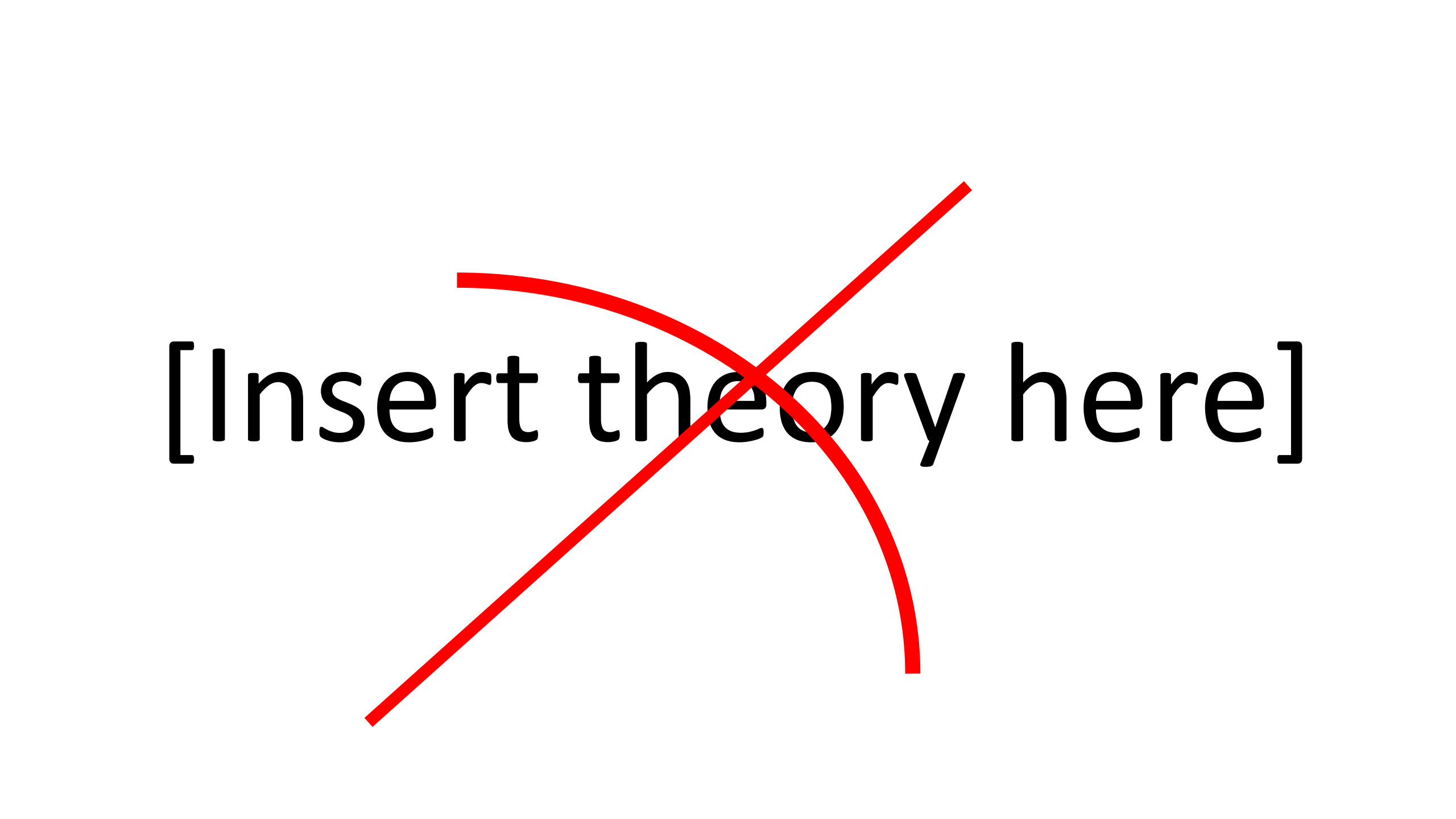
Speaking practically…

1. **Identify the stage of your implementation research** (Birken – slides X-X)
2. **Consider your goal (Nilsen – slides X-X)**
    a. Describe and/or guide the process of translating research into practice → process model
    b. Evaluate implementation → evaluation framework
    c. Identify/predict implementation determinants → determinant frameworks; classic or implementation theories
3. **Do a google!**
4. **Phone a friend**

Applying Implementation TMFs

Alexis Kirk

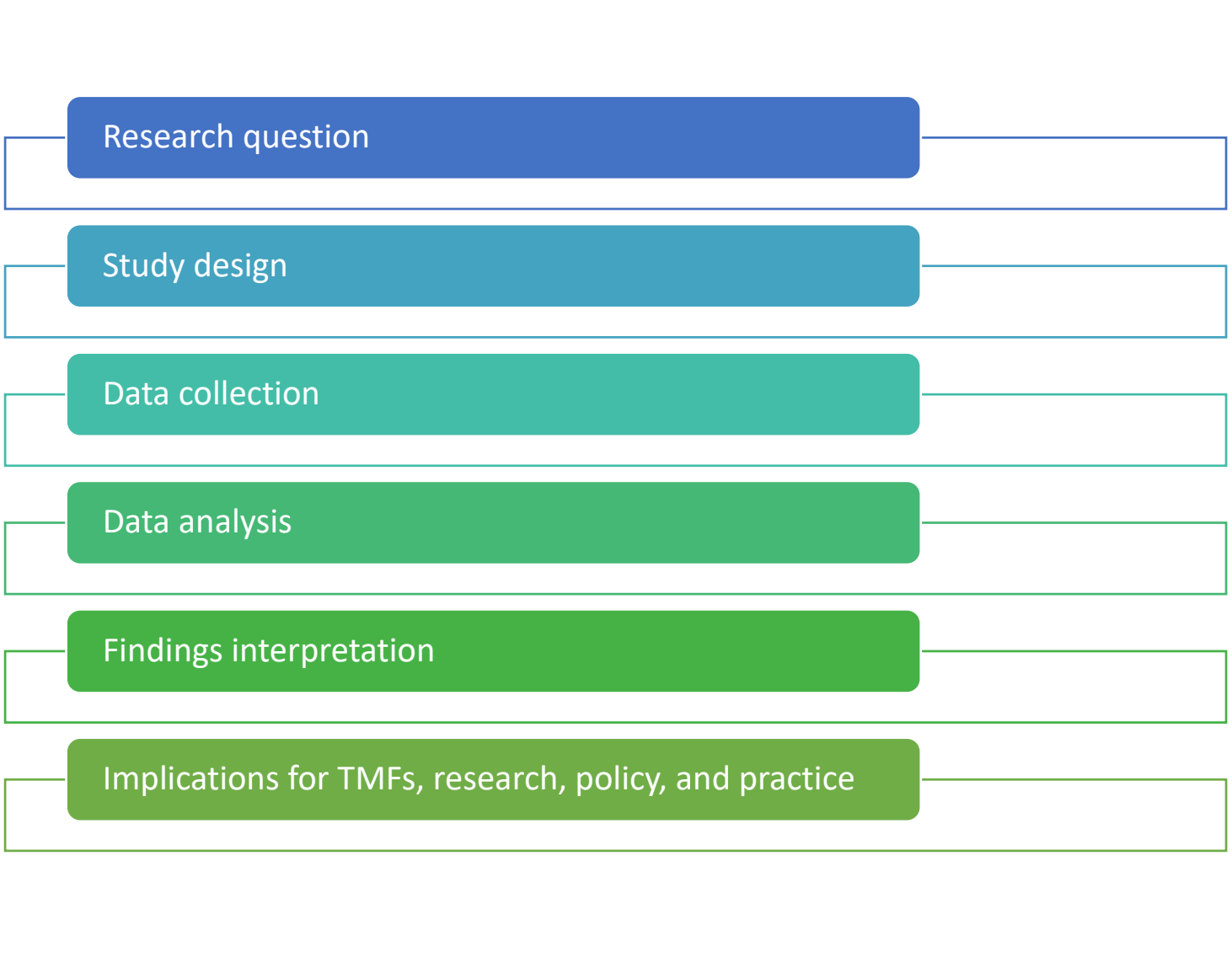
Kirk, M.A., Kelley, C., Yankey, N., Birken, S.A., Abadie, B., & Damschroder, L. (2015). A systematic review of the use of the Consolidated Framework for Implementation Research. *Implementation Science, 11*(72). https://doi.org/10.1186/s13012-016-0437-z


[Insert theory here]

1. Explicitly justify TMF selection

(See slide 27)

2. Integrate TMF throughout project



a. Use TMF to shape research question

ORGANIZATION SIZE AND FAILURE AMONG HEALTH MAINTENANCE ORGANIZATIONS*

DOUGLAS R. WHOLEY
Carnegie Mellon University

JON B. CHRISTIANSON
University of Minnesota

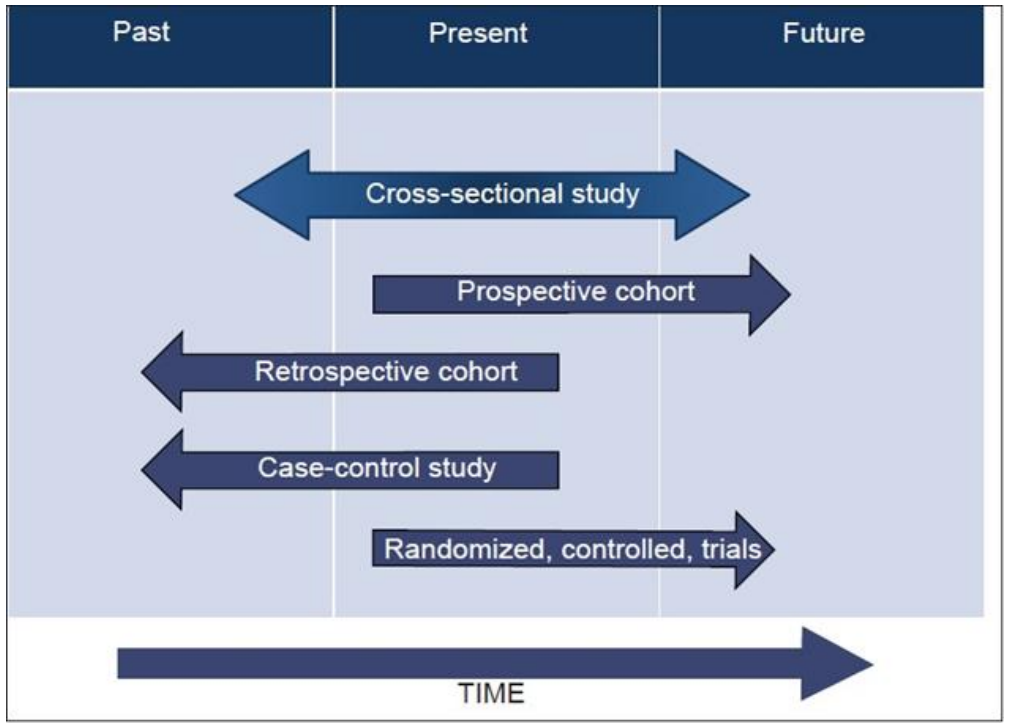
SUSAN M. SANCHEZ
University of Missouri, St. Louis

We extend the organizational ecology literature by examining the relationship between organization size and failure. Contrary to the typical monotonically declining relationship between organization size and failure rates found in ecology research, we show that this relationship varies by type of organization. Using data from censuses of Health Maintenance Organizations in the United States, we find that the relationship assumes an inverted U-shape for one type of HMO and a monotonically declining shape for another type of HMO. These relationships result from differences between the two types of HMOs in level of commitment to the organization and to the "liability of the middle."

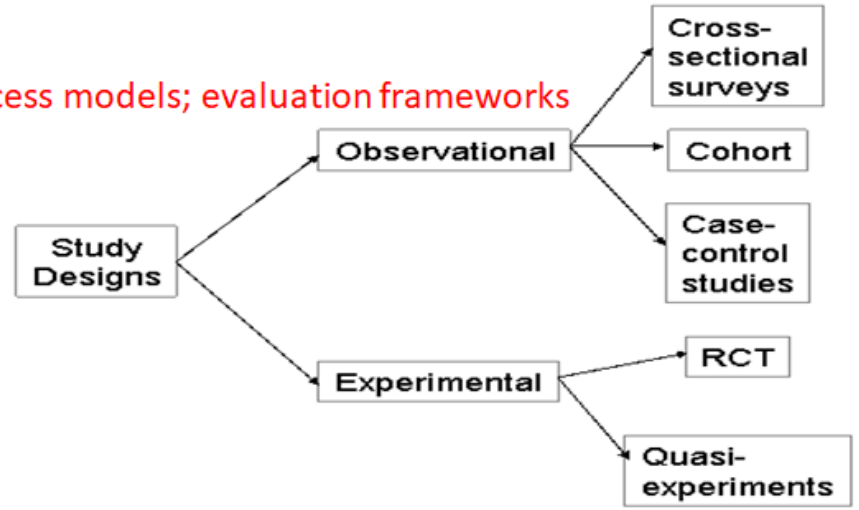
Existing research in organizational ecology suggests that the relationship between organization size and failure declines monotonically—large organizations are less likely to fail than are small organizations. However, some theoretical arguments suggest that the relationship should take an inverted U-shape. For example, organization growth may produce changes in organizational structures that increase the chance of failure tween small and large organizations in the effect of size on failure. We consider this oversimplification by using more flexible functional forms that allow the relationship between organization size and failure to differ between small and large organizations and between different types of Health Maintenance Organizations (HMOs).

THEORY

b. Use TMF to guide study design



Process models; evaluation frameworks



Determinant frameworks

Advantages	Disadvantages
Quick; can cover whole population, giving representative information whether or not people are seeking care	Based mainly on self-report (biases?); diagnostic information usually inaccurate; can't establish causal sequence
Prospective, so can establish causal sequence; can estimate incidence	Time-consuming; costly; attrition of cohort?
Relatively cheap way of focusing on causal factors	Requires recall of past events (inaccurate?); controls not equivalent to cases
Controls for all main forms of bias; good for both etiological and evaluative research	Ethical concerns in etiological applications; Often uses selected populations: issue of generalizability?
May be more practical than RCT: can use "natural experiments"	Allocation bias often significant (exp'tal and control groups not equivalent)

c. Use TMF to drive data collection

Modes

Interview

Survey

Secondary data (e.g., EHR; operational data)

What data should be collected??

c. Use TMF to drive data collection: Interview

Interview Question	Construct
Would you please describe what you know about SCPs? Prompts (make sure all are addressed in response): • What are they? • Why are they supposed to be used? • How are they supposed to be used? • For whom are they supposed to be used? • When are they supposed to be used?	Knowledge
• How difficult or easy is it to use SCPs? • What problems/difficulties do you encounter in using SCPs? • How confident are you about using SCPs, despite these difficulties? • How prepared do you feel to use SCPs?	Beliefs about capabilities
• How much do you want to use SCPs? • Is using SCPs incompatible with other efforts that you make to enhance survivors outcomes? • Are any incentives offered for SCP use?	Motivation and goals

c. Use TMF to drive data collection: Survey

Survey Item	Construct
Perception that survivorship care plans will not help survivors to make the transition to routine care	Performance Expectancy
Perception that survivorship care plans are difficult to develop	Effort Expectancy
Influential people (e.g., physician champions, managers) have not advocated for SCPs to be used.	Subjective Norms (social expectations)
Providers do not care whether influential people (e.g., physician champions, managers) think that SCPs should be used.	Subjective Norms (motivation to comply with expectations)
Resources (e.g., time, staff, training, money) are not adequate for using SCPs	Perceived Behavioral Control (resources/opportunities)
Providers do not feel confident in using SCPs	Perceived Behavioral Control (self-efficacy)

d. Use TMF to guide data analysis

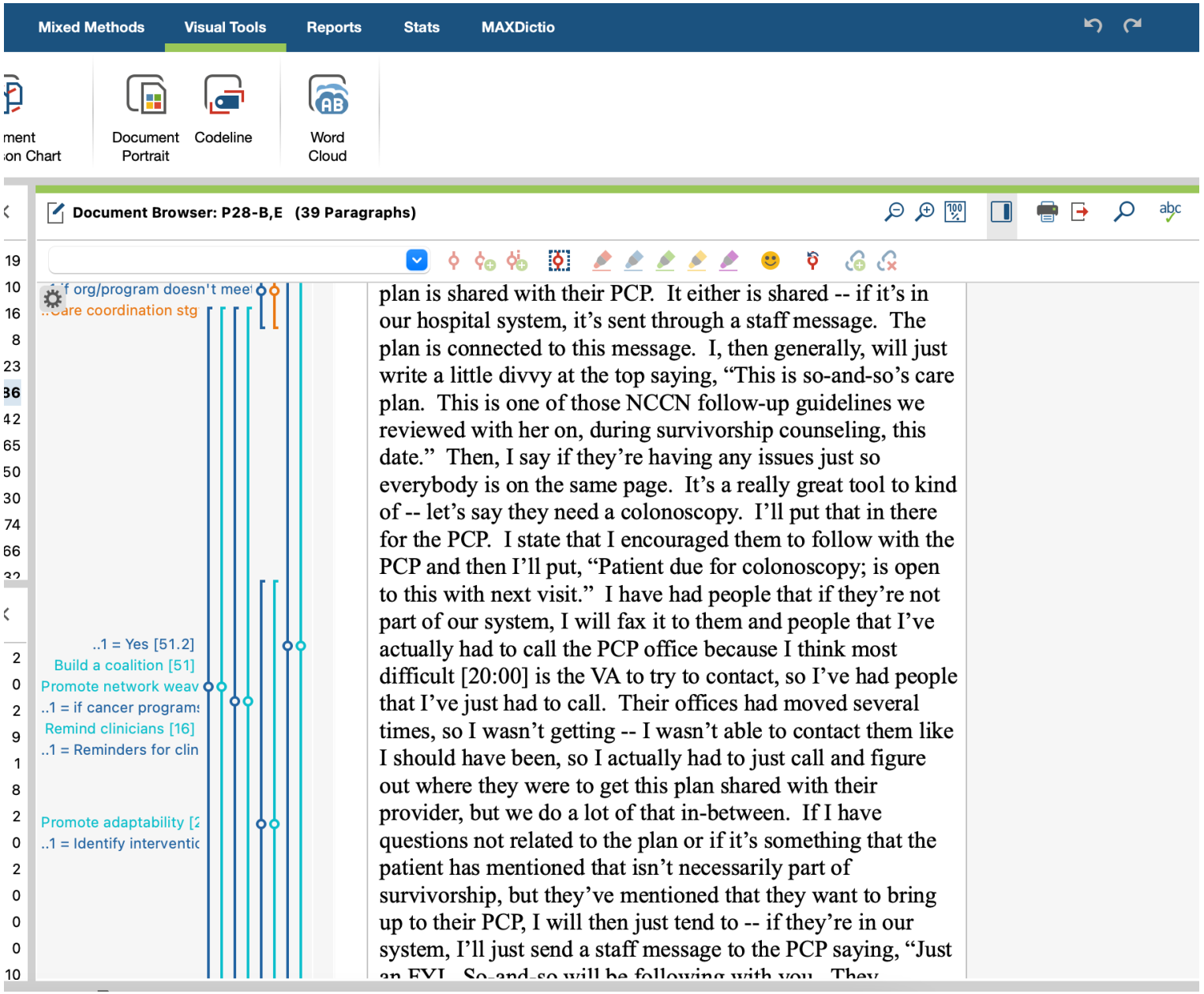
Qualitative

Quantitative

Standard regression

Configurational comparative methods

d. Use TMF to guide data analysis: Qual



d. Use TMF to guide data analysis: Quant

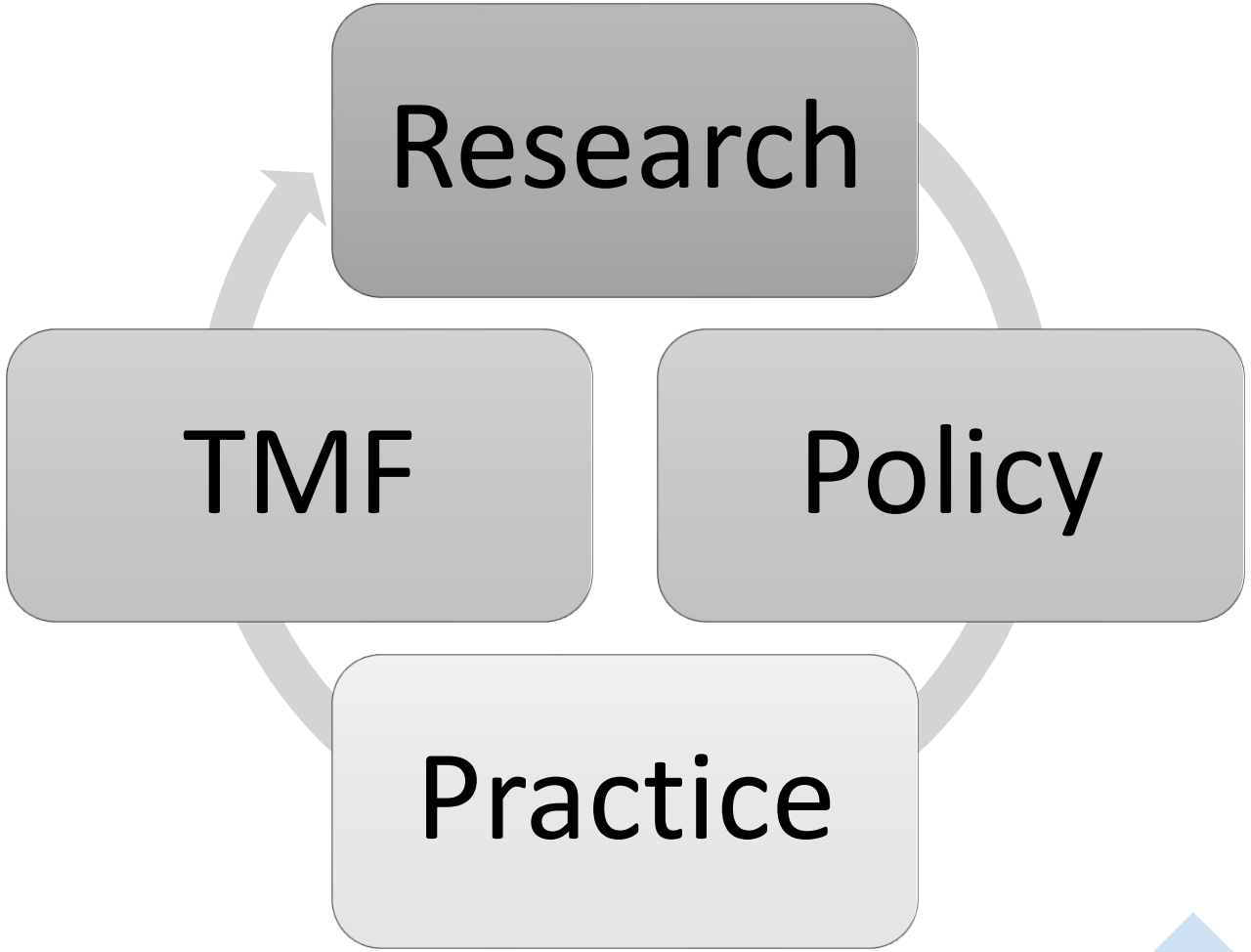
WHICH VARIABLES TO INCLUDE

HOW TO MODEL THE VARIABLES (IN RELATION TO EACH OTHER)

e. Use TMF to guide findings interpretation

- What does the TMF say??

e. Glean from TMF implications



e. Glean from TMF implications: Research

- What evidence has been found in other applications of the TMF?

e. Glean implications: Policy and practice

- What does theory suggest regarding levers of change?
  - Implementation mapping
  - Behavior change wheel
  - The Center for Implementation - https://thecenterforimplementation.com/courses

e. Glean implications: TMF

- Are study findings (in)consistent with findings from other applications of the TMF?

Conclusions

"All theories are wrong; some are useful" - George Box

TMFs should not be an albatross; they should give you wings

Acknowledgements

- Cheyenne Wagi
- Alexandra Peluso
- Per Nilsen
- Alexis Kirk