THEORIES, FRAMEWORKS, AND MODELS

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Overview

- Importance of frameworks and theories (models) in D&I research
- Inventory and categorization of models
- Dissemination and implementation models and frameworks
- Resources for selecting/using models

Theories vs Frameworks vs Models

- Theories
  - describe a way of understanding events or behaviors
  - provide descriptions of interrelated concepts or constructs that explain or predict events or behaviors by spelling out the relationships between variables
  - not content specific; they are generic, abstract, and broadly applicable.

- Frameworks
  - conceptual structures or scaffolds that can provide a systematic way to develop, manage, and evaluate interventions.

- Model
  - A description of analogy used to help visualize something that cannot be directly observed (Meriiam-Webster, 2013); application of the constructs to your particular research question

- While conceptually different, both theories and frameworks can be used to enhance D&I research

Benefits of Theory/Framework/Model

- Provide systematic structure for the development, management, and evaluation of D&I efforts
- Enhance effectiveness of interventions
- Ensure inclusion of essential D&I strategies
- Enhance interpretability of findings; helps explain why an intervention works (or doesn't)
- Link aims, research designs, measures and analytic strategies
- Provide an opportunity to advance theories in the field
- Source of innovation (e.g., use of models from outside of health)

Caveats to use of Models for D&I

- There is no comprehensive model sufficiently appropriate for every study or program
- Not all models are well operationalized
- Models should be considered dynamic

Chambers, 2014 (Chapter Two) in Beidas & Kendall (eds), OUP.

Inventory and categorization of models

Tabak et al. review

- Identified 109 models
- Exclusions
  - 26 focus on practitioners
  - 12 not applicable to local level dissemination
  - 8 end of grant knowledge translation
  - 2 duplicates
- Included 61 models
- Categories: Construct Flexibility, Socio-ecological Framework, D *vs.* I

Tabak, Rachel G., et al. "Bridging research and practice: models for dissemination and implementation research." American journal of preventive medicine 43.3 (2012): 337-350.

Model Categories

Construct Flexibility (CF)

1: Broad — *Loosely outlined and defined constructs; allows researchers greater flexibility*

2

3

4

5: Operational — *Detailed, step-by-step actions for D&I research*

Dissemination and / or Implementation (D/I)

D only — *Focus on active approach of spreading EBIs to target audience via determined channels using planned strategies*

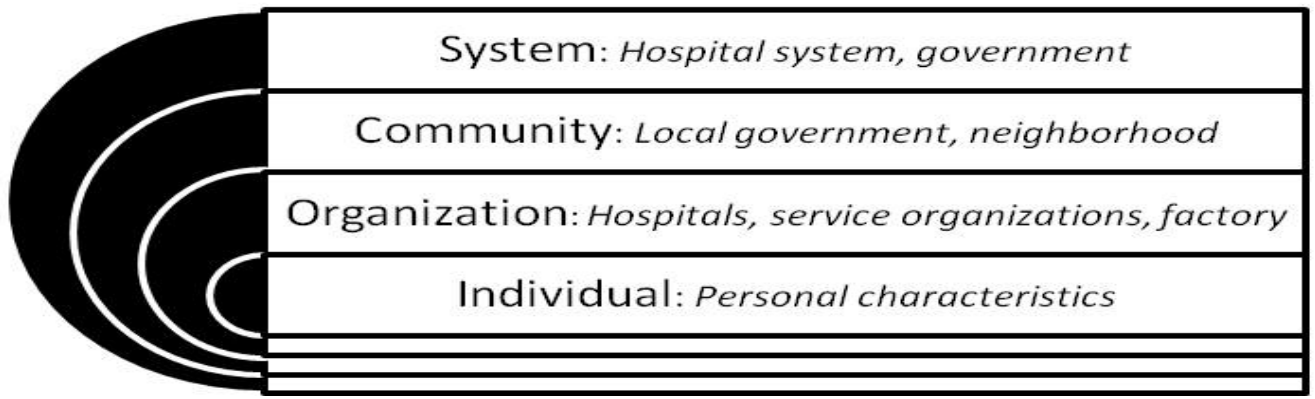
D > I

D = I — *Equal focus on dissemination and implementation*

I > D

I only — *Focus on process of putting to use or integrating evidence-based interventions within a setting*

Socio-ecological Framework (SEF)



Nilsen *Implementation Science* (2015) 10:53
DOI 10.1186/s13012-015-0242-0

Implementation Science
IMPLEMENTATION SCIENCE

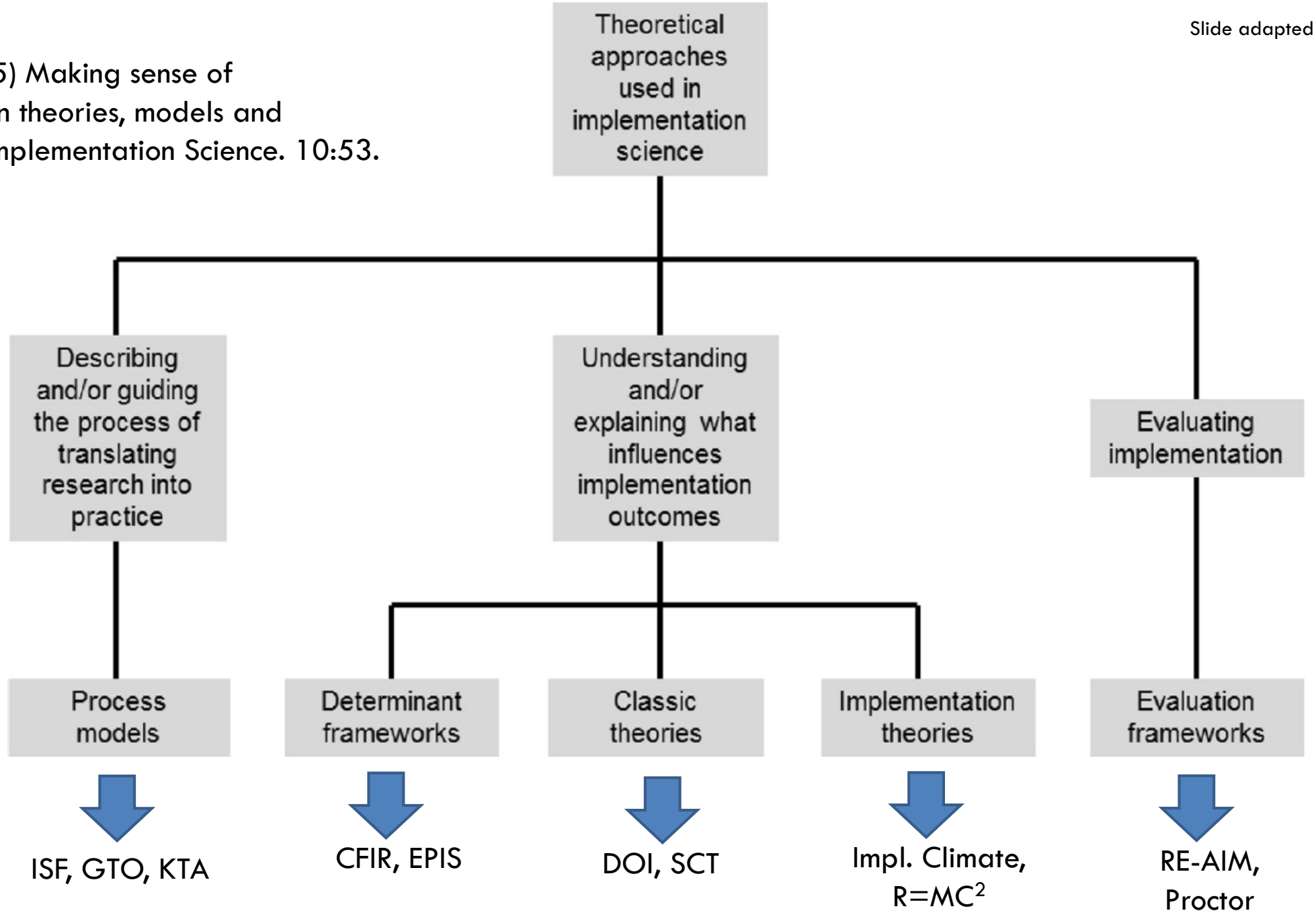
DEBATE Open Access

Making sense of implementation theories, models and frameworks

Per Nilsen

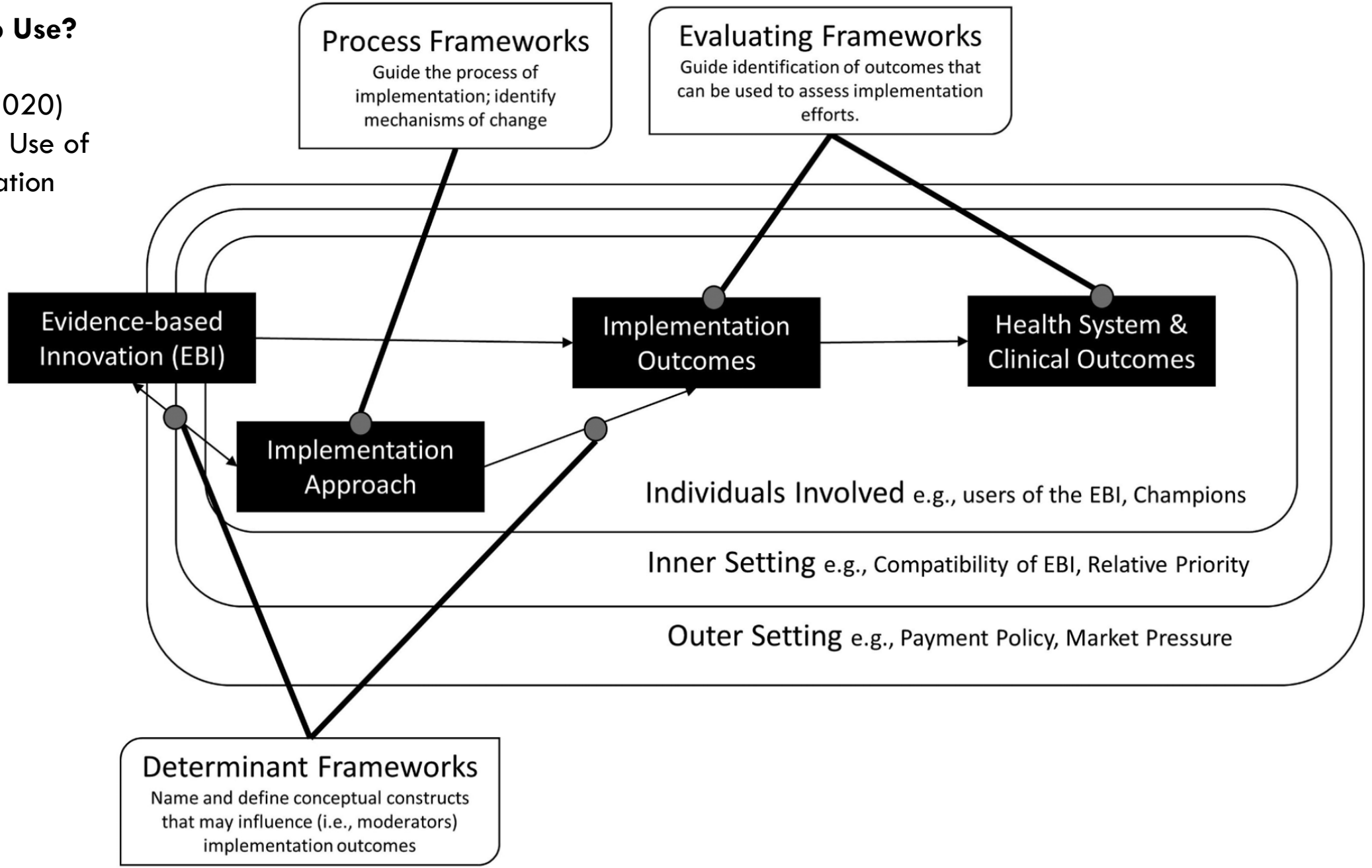
Slide adapted from Dr. Lane-Fall

Nilsen,P. (2015) Making sense of implementation theories, models and frameworks. Implementation Science. 10:53.

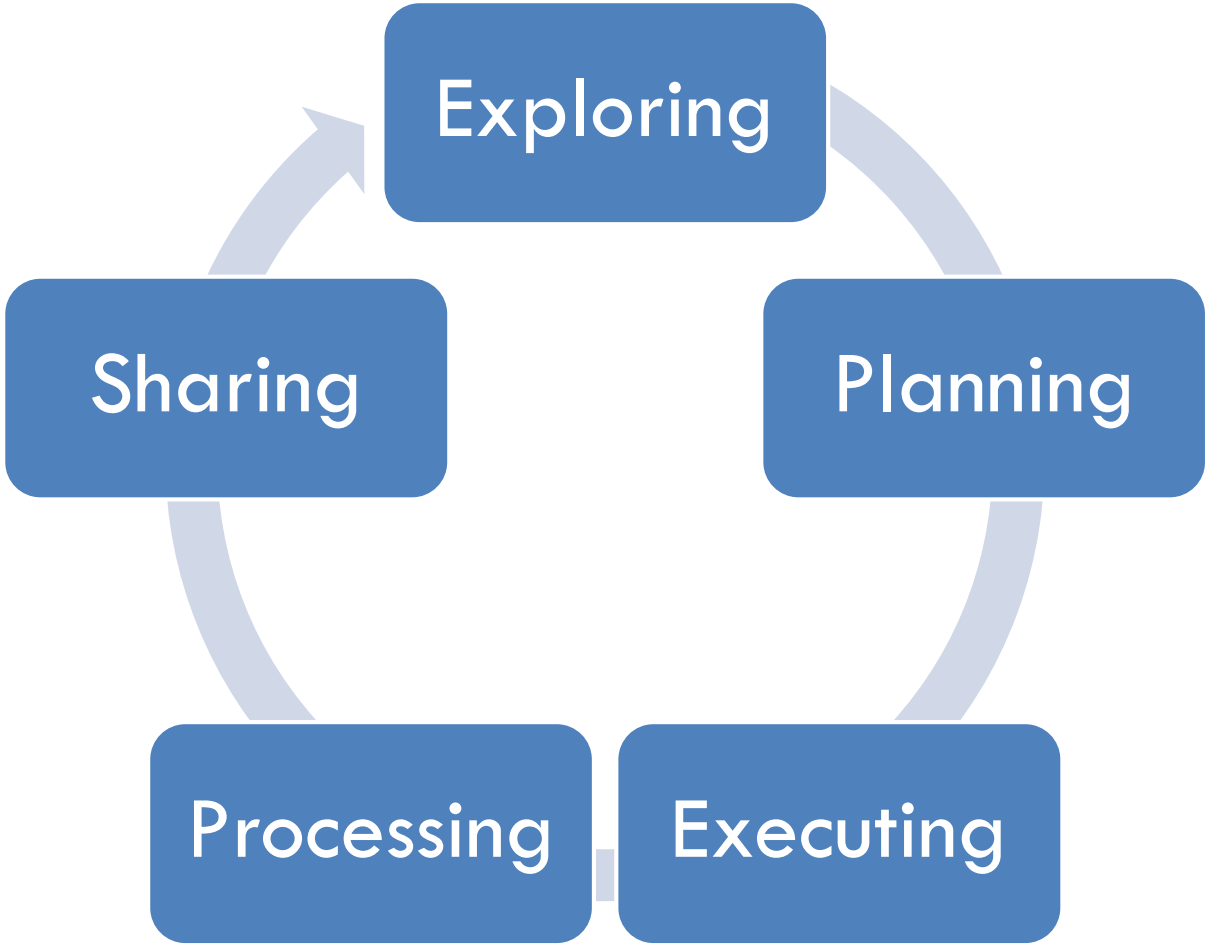


Which D&I Model to Use?

Damschroder, L.J.. (2020) Clarity out of chaos: Use of theory in implementation research. Psychiatry Research. Vol. 283.



Which D&I Model to Use and When?



Slide adapted from Dr. Lane-Fall

D&I Models and the Exploration Phase

The exploration phase of research includes:

- Choosing a topic
- Literature review
- Developing a research question

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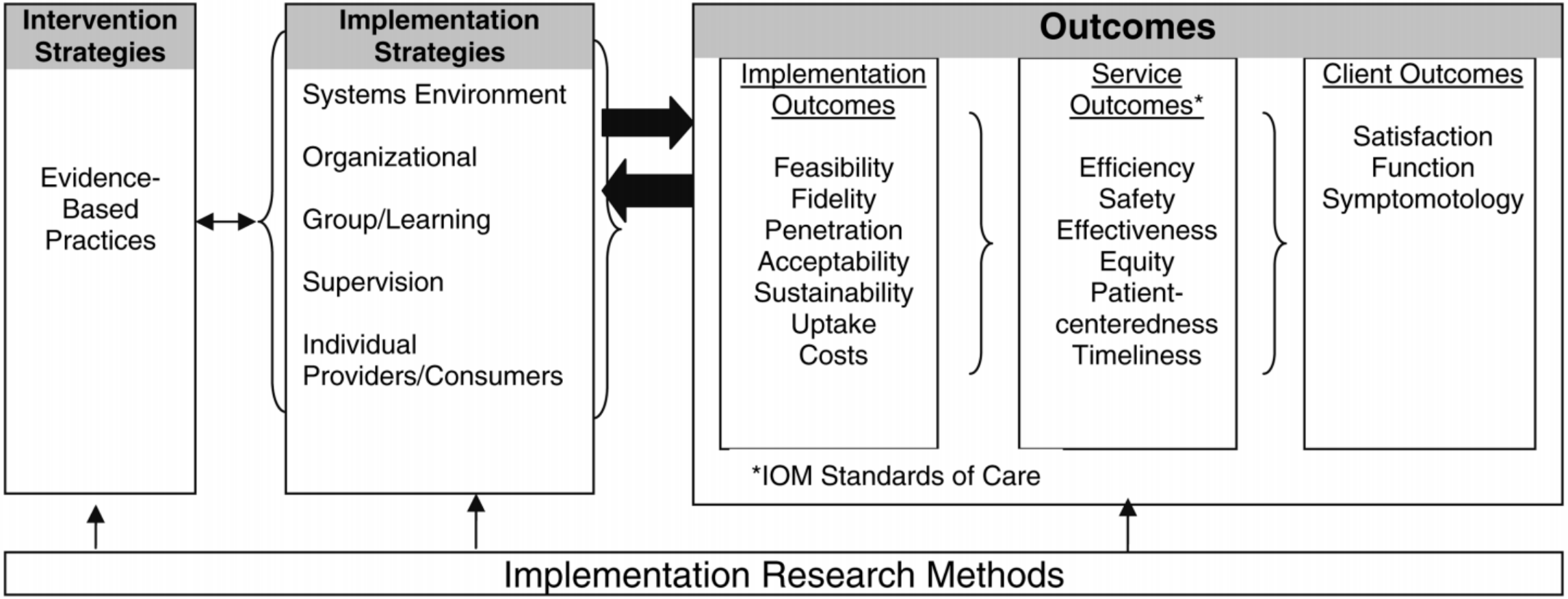
Enola Proctor's Conceptual Model



Proctor, E.K., et al., Implementation research in mental health services. Adm Policy Ment Health 2009: 36(1)

Slide adapted from Dr. Lane-Fall

D&I Models and the Planning Phase

The planning phase of research includes:

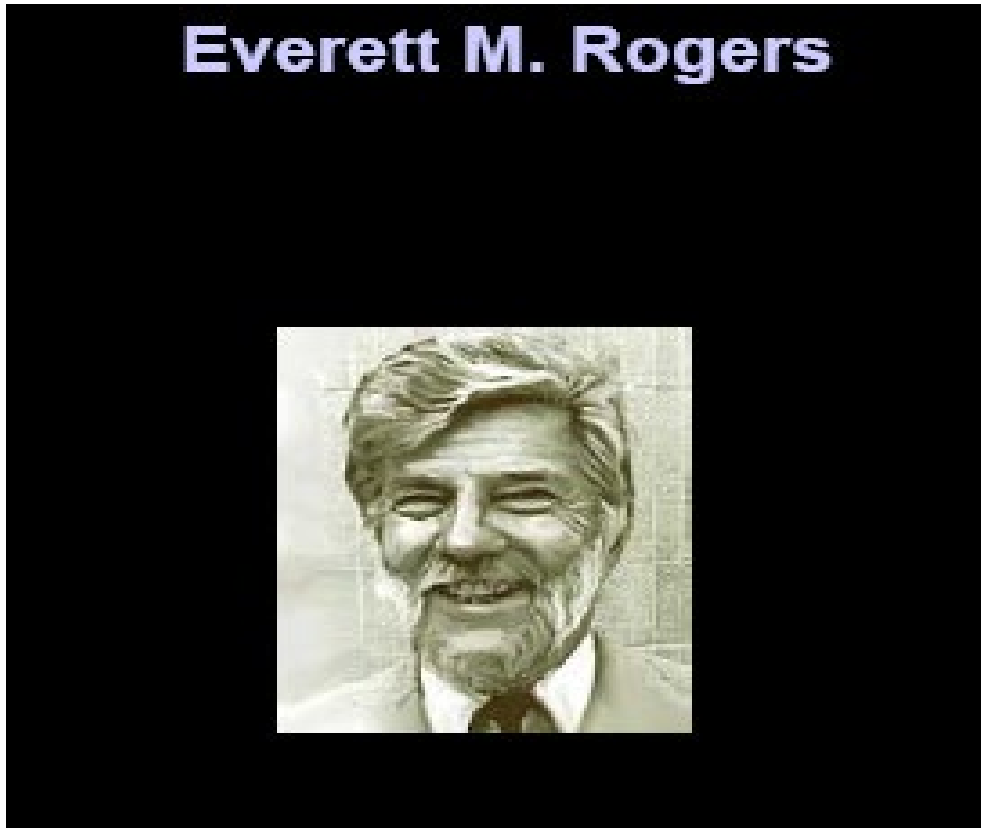
- Selecting a study design
- Selecting outcomes
- Finding resources (writing grants)
- Designing instruments

Slide adapted from Dr. Lane-Fall

Diffusion of Innovation Theory

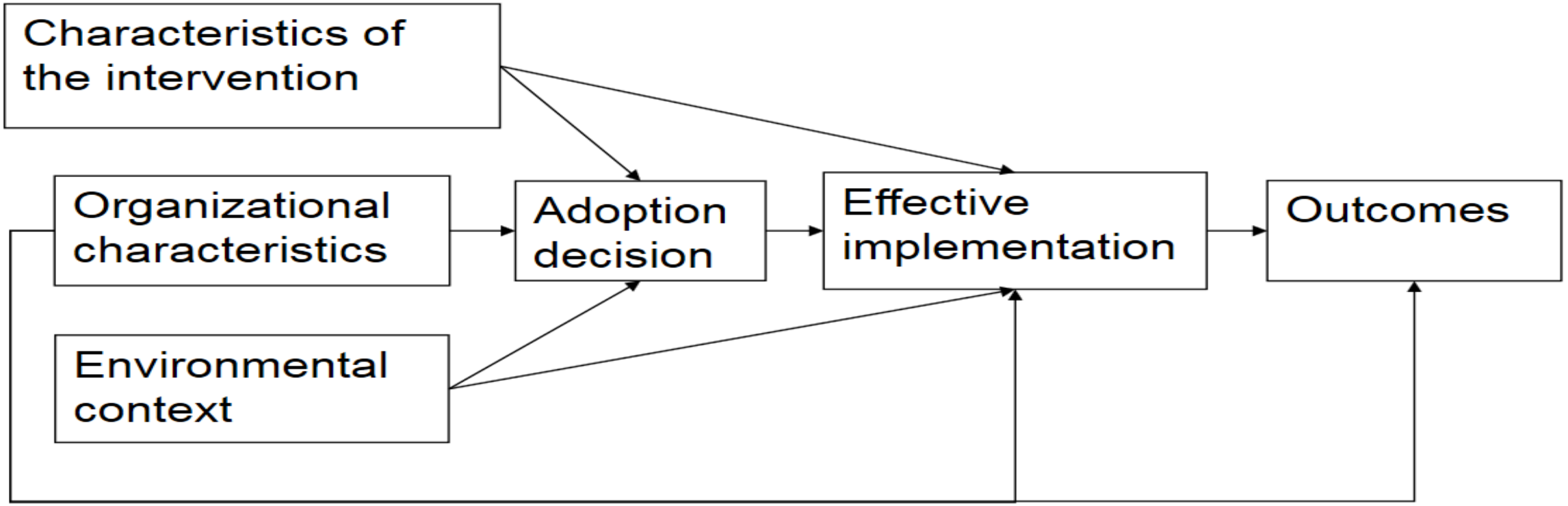
The process of communicating innovation through certain channels over time through members of a social system.

- How new ideas, products, and behaviors become norms
- All levels: individual, interpersonal, community, and organizational
- Success determined by: nature of innovation, communication channels, adoption time, social system



Source: Everett M. Rogers, *Diffusion of Innovations*, 4th ed. (New York: The Free Press, 1995).

Rogers's Theory of Diffusion of Innovations



CIPRS: Stetler & Damschroder Theoretical Frameworks

Krein SL, Olmsted RN, Hofer TP, Kowalski C, Forman J, Banaszak-Holl J, et al. Translating infection prevention evidence into practice using quantitative and qualitative research. *Am. J. Infect. Control* 2006;34(8):507-12.

Adapted from : David Chambers, DPhil Associate Director, NIMH D&I Research
American College of Epidemiology D&I Research Workshop 2014

Diffusion of Innovation: Innovation Characteristics

Why do certain innovations spread more quickly than others?

- Relative advantage
  - Degree of benefit the innovation may provide the individual and it perceived superiority over previous products
- Compatibility
  - Degree the innovation matches the values, beliefs, and needs of the adopters
- Complexity
  - the perceived difficulty of obtaining and using the innovation
- Observability of the results
  - The ability of demonstrating the benefits of the innovation to potential adopters
- Impact on social relations
  - Will this intervention disrupt our social environment in a negative way ?
- Reversibility
  - Can we stop the intervention if we want ?
- Communicability
  - Is it easy to explain what the intervention is?
- Required time and commitment
  - Can we do the intervention without taking a great deal of time?
- Risk and uncertainty
  - Can we implement the intervention with little risk or uncertainty?
- Ability to be modified
  - Xan we adapt the intervention to our needs and setting?

Oldenburg, et al., 1997; Rogers, 1995

Characteristics of individual adopters

- Innovators

  venturesome; shortest time between

  awareness and adoption

- Early adopters

  opinion leaders

- Early majority

  deliberators (swayed by opinions of individuals in their environment)

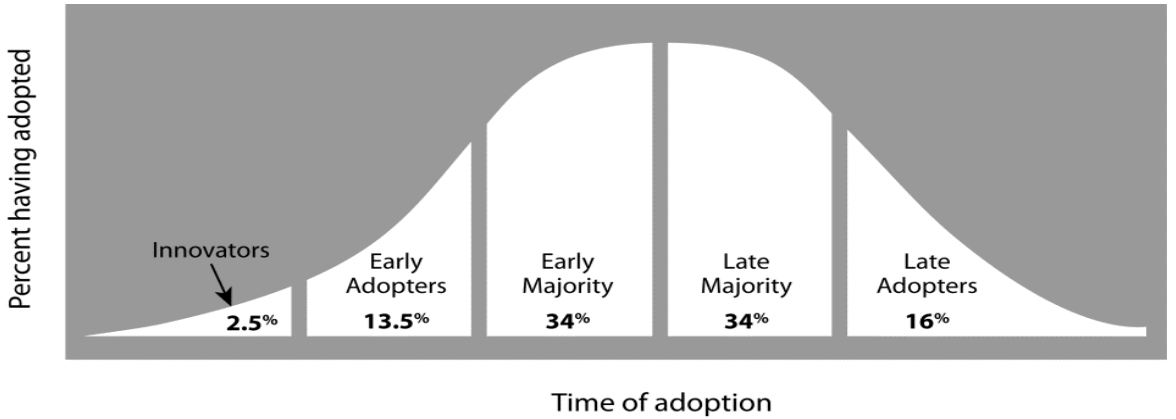
- Late majority

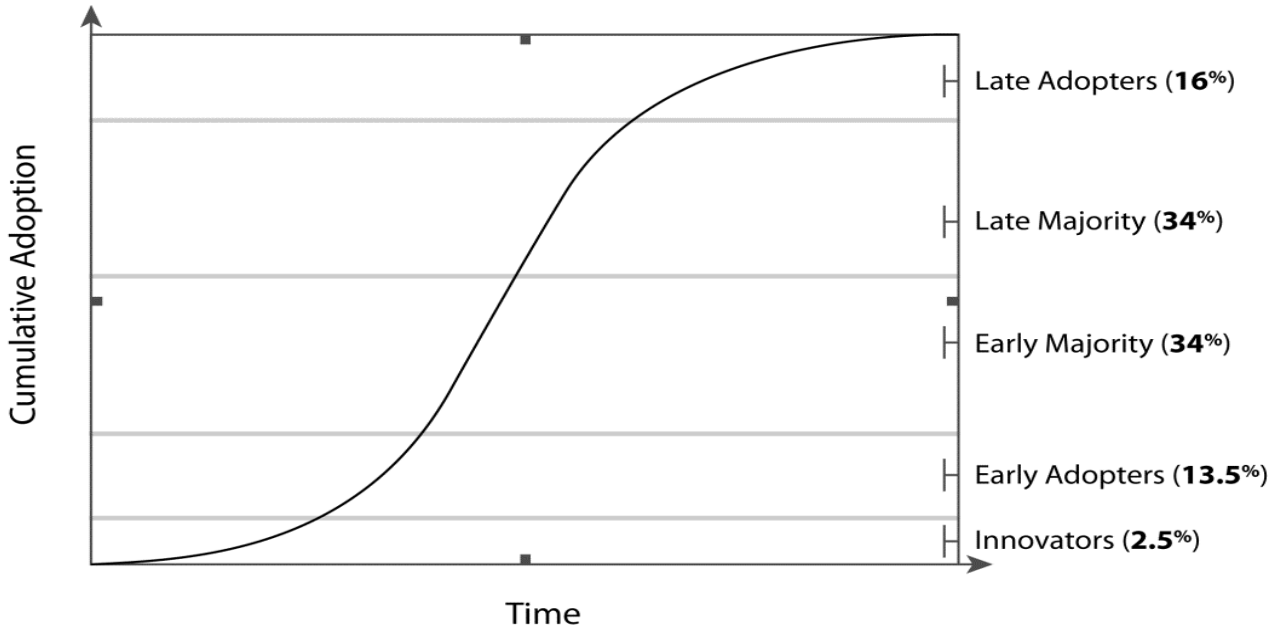
  skeptical (need more info to be convinced)

- Laggards

  traditional; need more potent

  outreach and incentives





Diffusion of Innovation

Agents of the Diffusion Process

- Change Agents –
  - Primarily seek to connect with opinion leaders and innovators in order to influence their opinions
  - Main tasks are to advocate, provide information, and offer support for implementation
- Opinion Leaders
  - Perceived as respectable and trustworthy
  - Usually conservative about adopting an innovation and tend to trust info that does not depart from their usual practice
  - Strongly influence others' decisions to reject or implement an innovation

- Communication channels
  - Mass media (enhanced by listening groups, call-in opportunities, and face-to-face approaches)
  - Peers
  - Respected leaders

Diffusion of Innovation

Organizational Characteristics

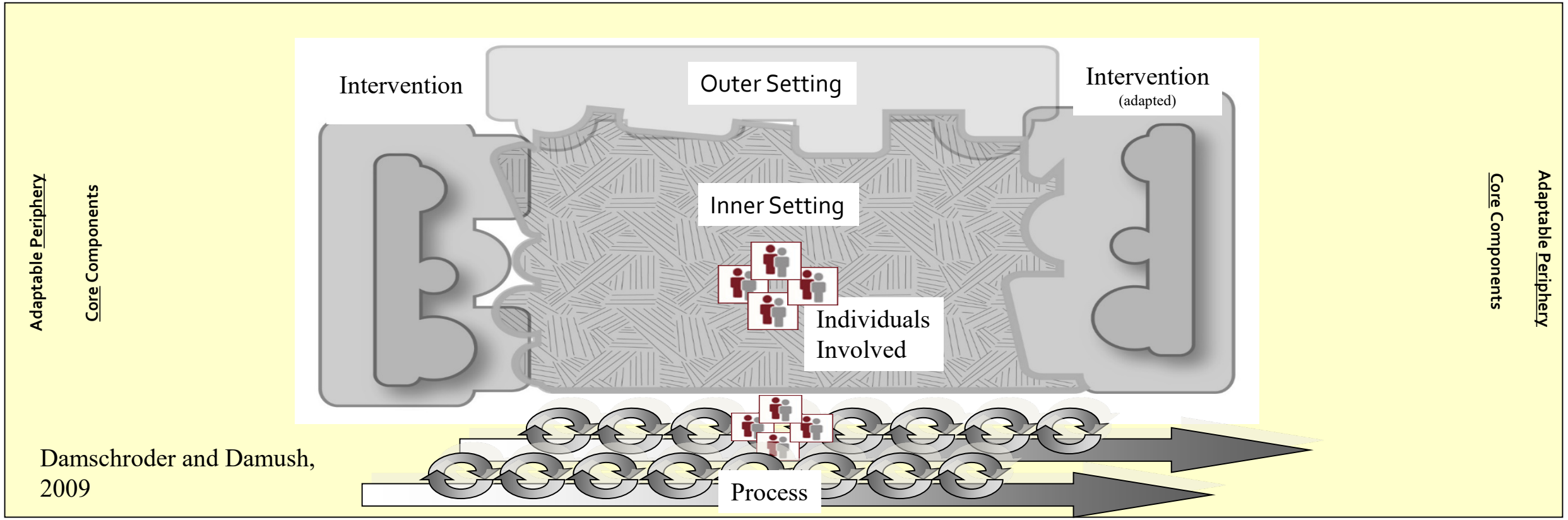
Other influences on developing active diffusion must take into account the organization's

1) Goals
2) Authority structure
3) Roles, rules & regulations
4) Informal norms and relationships

External Influences

- Policies
- Financial Incentives
- Regulations

Consolidated Framework for Implementation Research (CFIR)



Source: Damschroder, L.J., Aron, D.C., Keith, R.E., Kirsh, S.R., Alexander, J.A., Lowery, J.C "Fostering Implementation of Health Services Research Findings into Practice: A Consolidated Framework for Advancing Implementation Science" Implement Sci 4(50):1-15, 2009. PMID: 19664226 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2736161/pdf/1748-5908-4-50.pdf

Adapted from : David Chambers, DPhil Associate Director, NIMH D&I Research; American College of Epidemiology D&I Research Workshop 2014

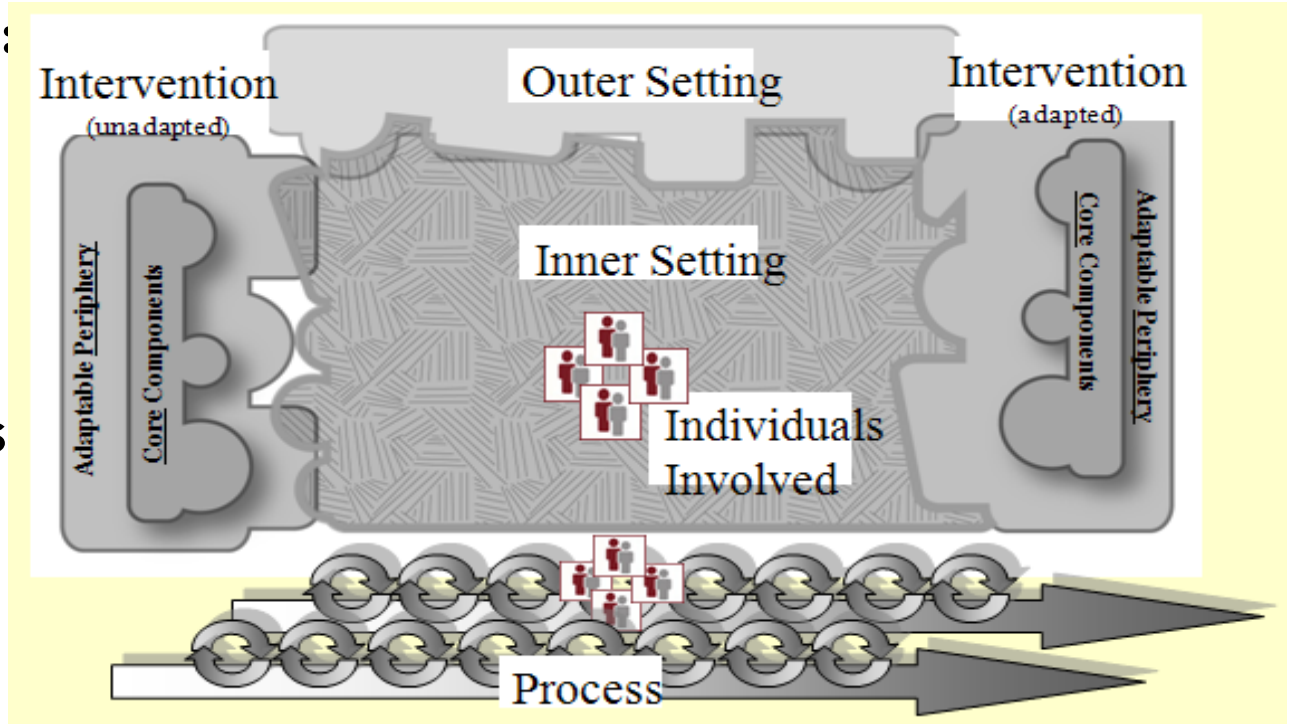
Consolidated Framework for Implementation Research (CFIR)

- "An overarching typology to promote implementation theory development"
- Builds on Greenhalgh et al.'s synthesis of 500 sources, plus newer articles
- Combines Greenhalgh's conceptual model with 18 new models
- "Meta-theoretical" – a synthesis of existing theories, no depiction of inter-relationships, ecologic levels or hypotheses

Damschroder L, Aron D, Keith R, Kirsh S, Alexander J, Lowery J. Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science* 2009; 4:50.

Consolidated Framework for Implementation Research (CFIR)

- Composed of 5 major domains:
  - Intervention characteristics
  - Outer setting
  - Inner setting
  - Characteristics of the individuals involved
  - Process of implementation



Damschroder L, Aron D, Keith R, Kirsh S, Alexander J, Lowery J.: Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci* 2009, 4(1):50.

Characteristics of the Intervention

Constructs

- Intervention source
- Evidence strength & quality
- Relative advantage
- Adaptability
- Trialability
- Complexity
- Design quality and packaging
- Cost

Inner Setting

Constructs

- Structural characteristics – age, maturity, and size
- Networks & communication – nature and quality of social networks, formal, and informal communication w/in an org
- Culture – norms, values, and basic assumptions
- Implementation climate – capacity for change, shared receptivity to an intervention, extent the intervention will be supported
- Readiness for implementation – tangible and immediate indicators of organization commitment

Outer Setting

Constructs

- Patient needs and resources – extent needs, barriers, and facilitators are prioritized
- Cosmopolitanism – degree to which an org is networked with other external orgs
- Peer pressure – competitive pressure to implement
- External policy & incentives

Characteristics of Individuals

Constructs

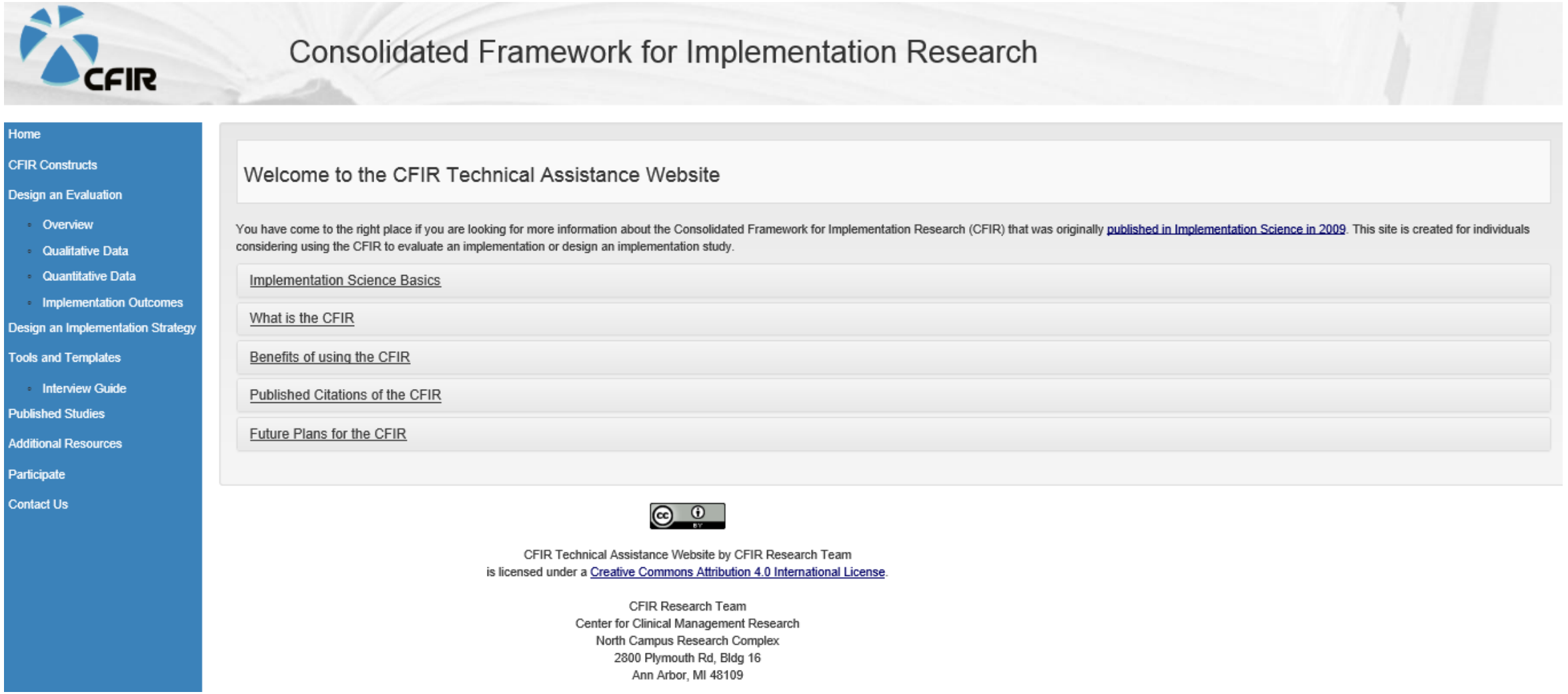
- Knowledge & beliefs about the intervention
- Self-efficacy
- Individual stage of change
- Individual identification with the organization – how individuals perceive the org and their relationship/commitment with that org
- Other personal attributes

Process of Implementation

Constructs

- Planning
- Engaging
- Executing
- Reflecting & evaluating

WWW.CFIRGUIDE.ORG



D&I Models and the Executing Phase

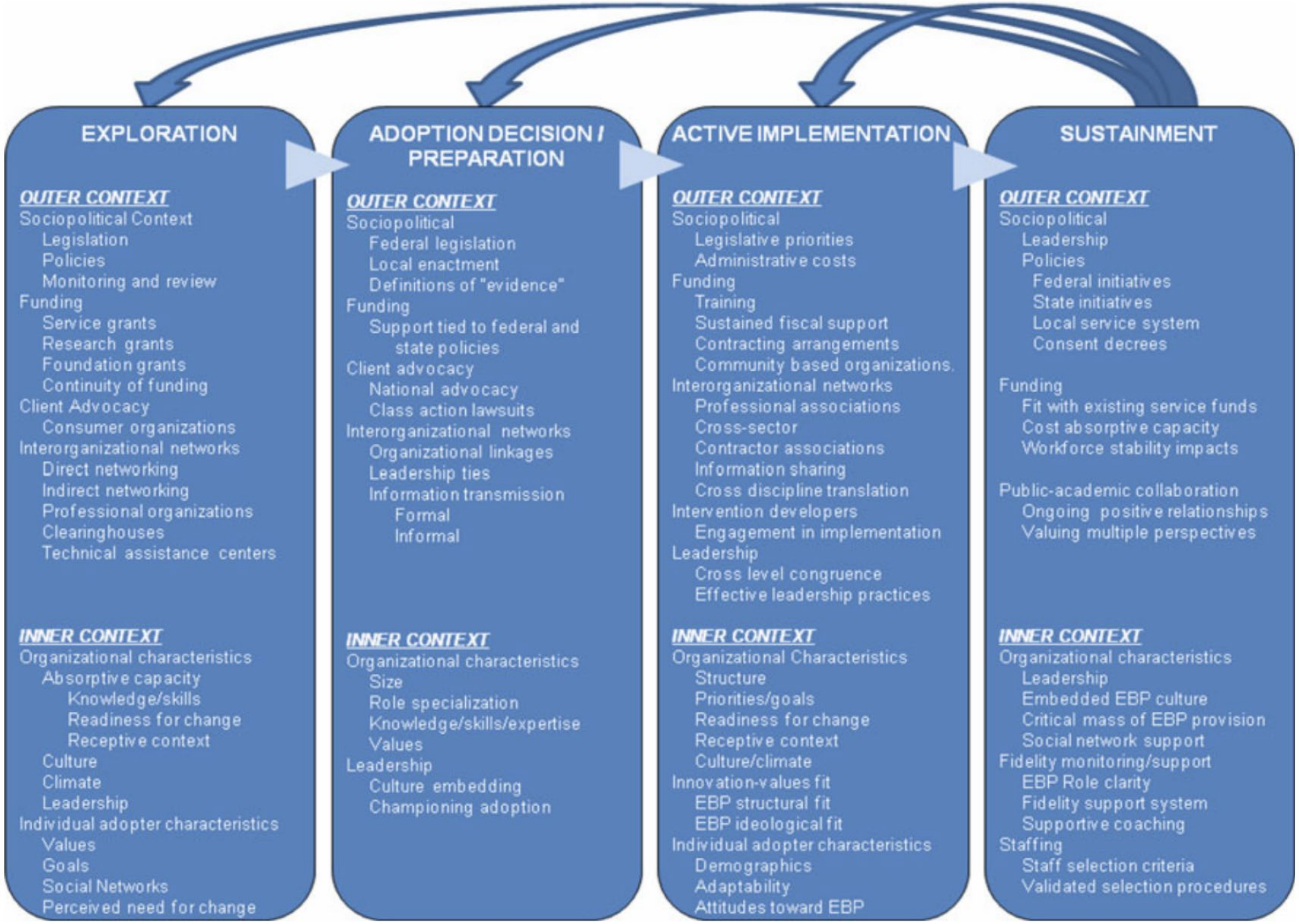
The executing phase of research includes:

- Collecting data
- Carrying out implementation strategies

Slide adapted from Dr. Lane-Fall

EPIS Framework

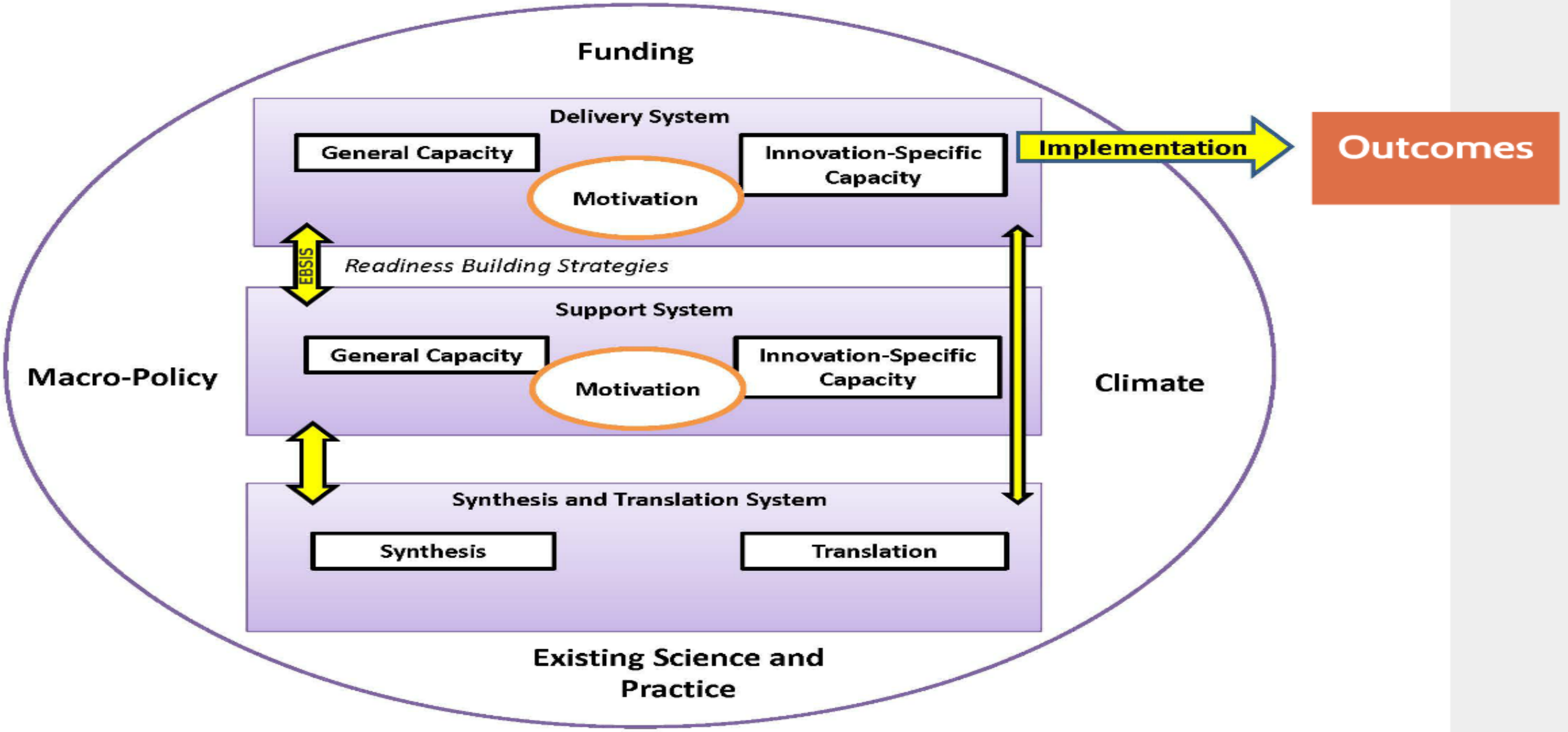
Aarons, GA (2011) Advancing a conceptual model of evidence-based practice implementation in public service sectors. Adm Policy Ment Health. 38(1):4-23



Interactive Systems Framework Development

- Developed by Wandersman et al. (2008)
  - CDC's Division of Violence Prevention (DVP) noted gap applying available knowledge to prevention of child maltreatment
  - ISF was developed to address this gap
    - developers synthesized information across dissemination and implementation models to fill gaps associated with existing approaches

Interactive Systems Framework



ISF Systems: Prevention Synthesis and Translation System

- Primary functions
  - To distill information, generated through research, about scientific innovations
  - To prepare the information for implementation by *end users* (e.g., practitioners)
- Primary activities
  - Synthesize existing research and translate it for use by practitioners
    - Synthesis methods: 1. evidence synthesis 2. systematic review 3. integrative review 4. meta-analysis 5. review of literature 6. state of the science review
    - Goal of synthesis: identify key characteristics and core elements of programs, processes, principles, or policies
    - Note: While developers of an innovation play a major role in its translation, it is important to work collaboratively with the intended audience in order to develop a more useful product for the end-user

ISF Systems: Prevention Support System

- Primary functions
  - Innovation-specific capacity-building: assistance related to using a specific innovation
    - Example 1: providing information about an innovation before an organization decides if it wants to adopt
    - Example 2: providing training in how to carry out an innovation before it implements
    - Example 3: providing technical assistance (training, technical assistance, coaching) once the innovation is in use
  - General capacity-building: intended to enhance infrastructure, skills, and motivation of an organization
    - not focused on a specific innovation and does not directly assist with adoption of specific innovations
    - Activities to help stabilize the infrastructure of an organization (e.g., writing by-laws, grant writing, creating strong partnerships, developing leadership skills)

ISF Systems: Prevention Delivery System

- Primary function: carry out the activities necessary for implementation
- Activities
  - Application or use of general and innovation-specific capacities to aid in implementation
    - General capacity:
      - activities related to maintaining a functioning organization (e.g., maintaining sufficient staffing, developing organizational leadership)
      - connecting with other organizations

General Capacities

Types of General Capacities (non-exhaustive)	Authors
Culture	Drzensky et al., 2012; Glisson, 2007; Glisson & Schoenwald, 2005; Hemmelgarn et al., 2006
Climate	Aarons et al., 2011; Beidas et al., 2013; Damschroder et al., 2009; Glisson, 2007; Greenhalgh et al., 2004, Hall & Hord, 2010; Lehman et al., 2002
Organizational Innovativeness	Damschroder et al., 2009; Fetterman & Wandersman, 2005; Greenhalgh et al., 2004; Klein & Knight, 2005; Rafferty et al., 2013; Rogers, 2003
Resource Utilization	Armstrong et al., 2006; Greenhalgh et al., 2004; Klein et al., 2001; Rogers, 2003; Simpson, 2002
Leadership	Aarons & Sommerfield, 2012; Becan, Knight, & Flynn, 2012; Beidas et al., 2013; Fixsen et al., 2005; Grant, 2013; Rafferty et al., 2013; Simpson et al., 2002
Structure	Damschroder et al., 2009; Flaspohler et al., 2008; Greenhalgh et al., 2004, Lehman et al., 2002; Rafferty et al., 2013; Rogers, 2003
Staff Capacity	Flaspohler et al., 2008; McShane & Van Glinow, 2009; Simpson et al., 2002

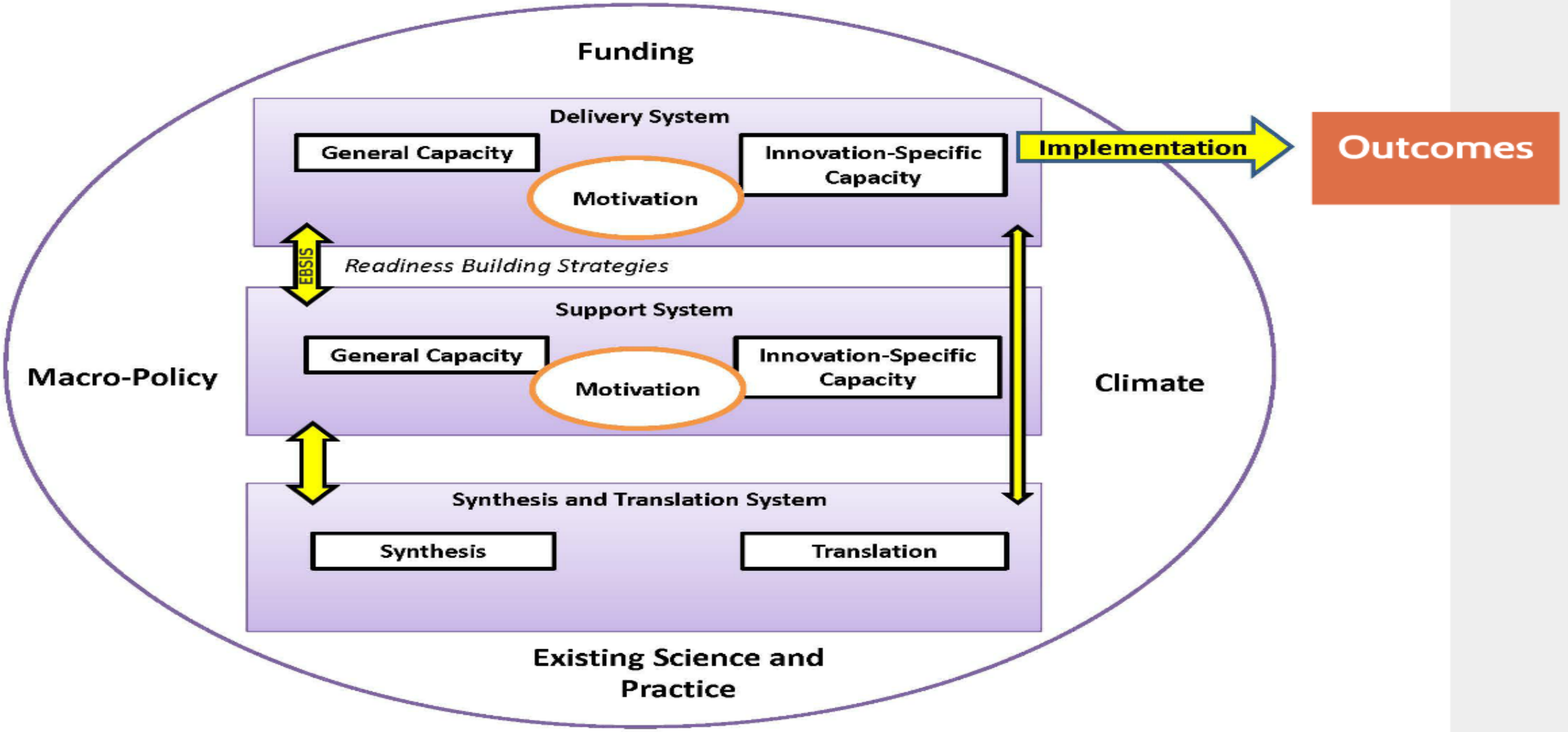
ISF Systems: Prevention Delivery System

- Primary function: carry out the activities necessary for implementation
- Activities
  - Application or use of general and innovation-specific capacities to aid in implementation
    - General capacity:
      - activities related to maintaining a functioning organization (e.g., maintaining sufficient staffing, developing organizational leadership)
      - connecting with other organizations
    - Innovation-specific capacity:
      - Activities such as: 1. gathering information about possible innovations to put in place 2. choosing which innovations to use 3. taking steps to implement an innovation and continue its use over time

Innovation-Specific Capacities

Types of Innovation-Specific Capacities; (non-exhaustive)	Authors
Innovation-Specific knowledge, skills, and abilities	Wandersman, Chien, & Katz, 2012; Fixsen et al., 2005; Greenhalgh et al., 2004; Simpson, 2002
Program Champion	Atkins et al., 2008; Damshroder et al., 2009; Greenhalgh et al., 2004; Gladwell, 2002; Grant, 2013; Rafferty et al., 2013; Rogers, 2003
Specific Implementation Supports	Aarons et al., 2011; Beidas et al., 2013; Damshroder et al., 2009; Fetterman & Wandersman, 2005; Greenhalgh et al., 2004; Hall & Hord, 2010; Rogers, 2003; Schoenwald & Hoagwood, 2001; Weiner et al., 2008.
Interorganizational Relationships	Aarons et al., 2011; Flaspohler et al., 2004; Powell et al., 2012

Interactive Systems Framework



Motivation for Innovation

Types of Motivations (non-exhaustive)	Authors
Relative Advantage	Armenakis et al., 1993; Damschroder et al., 2009; Hall & Hord, 2010; Rafferty et al., 2013; Rogers, 2003; Weiner, 2009
Compatibility	Chinman et al., 2004; Durlak & Dupre, 2008; Fetterman & Wandersman, 2005; Greenhalgh et al., 2004; Rogers, 2003; Simpson, 2002
Complexity	Damschroder & Hagedorn, 2011; Fixsen et al., 2005; Greenhalgh et al., 2004; Meyers, Durlak & Wandersman, 2012; Wandersman et al., 2008.
Trialability	Armenakis et al., 1993; Greenhalgh et al., 2004; Rapkin et al., 2012; Rogers, 2003
Observability	Beutler, 2001; Chinman et al., 2004; Damschroder et al., 2009; Ford et al., 2008; Rossi, Lipsey, & Freeman, 2004
Priority	Armenakis & Harris, 2009; Greenhalgh et al., 2004; Flaspohler et al., 2008

A Heuristic

***R**eadiness*$_i$ =

***M**otivation*$_i$ x *General **C**apacity* x

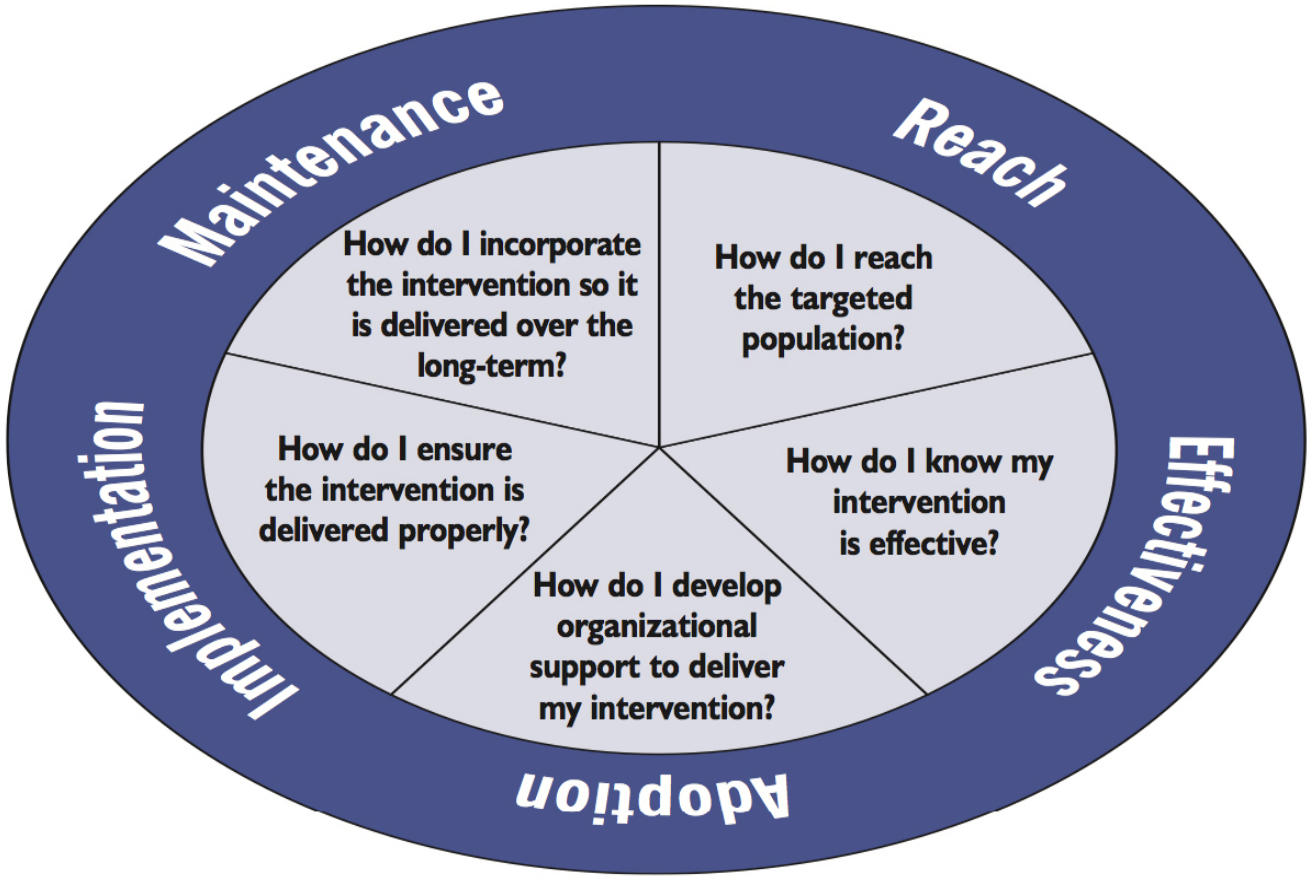
*Innovation-Specific **C**apacity*$_i$

$R = MC_2$

- Scaccia, J.P., Cook, B.S., Lamont, A., Wandersman, A., Castellow, J., Katz, J., & Beidas, R. (2015). A practical implementation science heuristic for organizational readiness: R=MC2. *Journal of Community Psychology* Vol. 43, No. 4, 484–501.
- Wandersman, A., Duffy, J., Flaspohler, P., Noonan, R., Lubell, K., Stillman, L., et al. (2008). Bridging the gap between prevention research and practice: The Interactive Systems Framework for Dissemination and Implementation. American Journal of Community Psychology, 41, 171-181.

RE-AIM

FIGURE 1. Elements of the RE-AIM Framework



Glasgow et al, RE-AIM.net, 2011

What is RE-AIM

- **RE-AIM is an acronym that consists of five elements, or dimensions, that relate health behavior interventions:**
  - **Reach the target population**
  - **Efficacy or effectiveness**
  - **Adoption by target settings or institutions**
  - **Implementation - consistency of delivery of intervention**
  - **Maintenance of intervention effects in individuals and populations over time**

How do elements relate to planning?

- As you design, plan, or evaluate a health behavior intervention, there are questions that you should ask yourself.
  - **Reach**: HOW DO I REACH THE TARGETED POPULATION FOR INTERVENTION?
  - **Efficacy** or effectiveness: HOW DO I KNOW THAT MY INTERVENTION IS EFFECTIVE?
  - **Adoption** HOW DO I DEVELOP ORGANIZATIONAL SUPPORT TO DELIVERY THE INTERVENTION?

How do elements relate to planning?

- As you design, plan, or evaluate a health behavior intervention, there are questions that you should ask yourself.
  - **Implementation**: HOW DO I ENSURE THE INTERVENTION IS DELIVERED PROPERLY?
  - **Maintenance**: HOW DO I INCOPROATE THE INTERVENTION SO IT IS DELIVERED OVER THE LONG TERM?

www.re-aim.org

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RE-AIM

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Search ...

SEARCH

WHAT'S NEW

August 2020 Frontiers Publication Spotlight-5

Pragmatic Trial to Enhance Medication Adherence: Protocol for the NUDGE Trial.

D&I Models and the Processing Phase

The processing phase of research includes:

- Data analysis
- Data interpretation

Slide adapted from Dr. Lane-Fall

Bronfenbrenner's Social Ecological Model

D&I Models and the Sharing Phase

The sharing phase of research includes:

- Presenting research findings
  - Stakeholders
  - Colleagues, collaborators
  - Funding agencies
- Publishing findings

Consider what your audience knows and is familiar with

Slide adapted from Dr. Lane-Fall

Selecting a Model: Questions to Consider

- What is/are the research questions I'm seeking to answer?
- What level(s) of change am I seeking to explain?
- What characteristics of context are relevant to the research questions?
- What is the timeframe?
- Are measures available?
- Does the study need to be related to a single model?
- Are there specific theories/frameworks/models that relate to the project?
- Are there specific implementation outcomes you would want to have collected?

Adapted from Chambers, 2014 (Chapter Two) in Beidas & Kendall (eds), OUP.

Online Resources

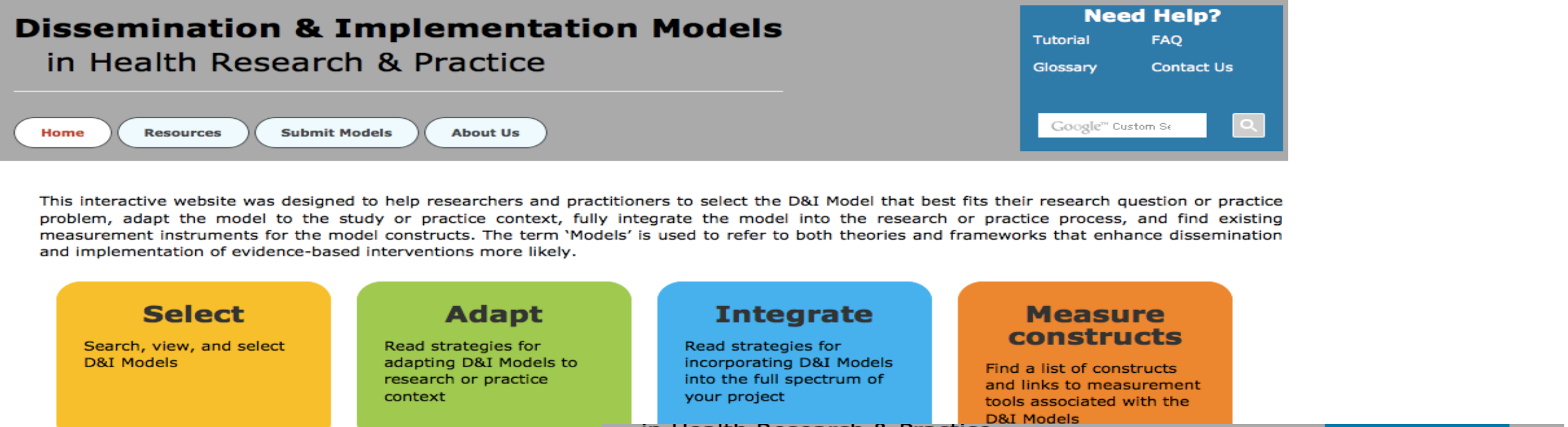
Where to start? There are so many!

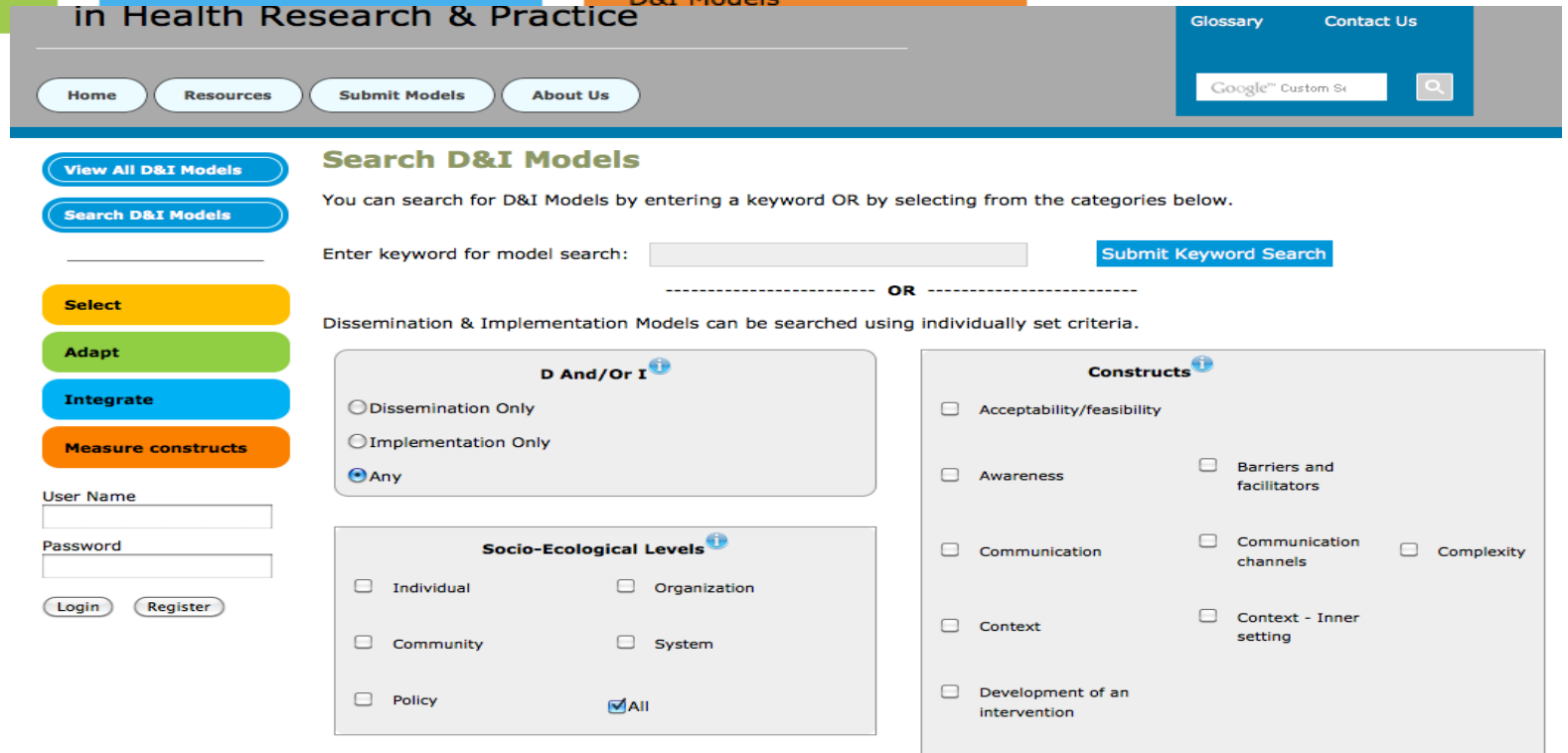
One of the cornerstones of implementation science is the use of theory.

Unfortunately, the vast number of theories, models, and frameworks available in the implementation science toolkit can make it difficult to determine which is the most

Doing Research

Frame Your Question





http://dissemination-implementation.org/index.aspx

Summary

- You need to choose something!
- Ask yourself what you are trying to accomplish
- Try to work with existing models
- Explore the many resources available online (forums, networks, wikis, etc.)

Slide adapted from Dr. Lane-Fall

Using the Selected Model - Resources

- More detailed guidance on how to use a selected model to inform a D&I study
  - Veteran Affairs' Quality Enhancement Research Initiative
    - http://www.queri.research.va.gov/for_researchers.cfm
  - National Cancer Institute's Implementation Science Team
    - http://cancercontrol.cancer.gov/is/
  - Training Institute for Dissemination and Implementation Research in Health
    - http://conferences.thehillgroup.com/OBSSRinstitutes/TIDIRH2014/
  - Canadian Knowledge Translation Clearinghouse website
    - http://ktclearinghouse.ca