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 (Merriam-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
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

Making sense of implementation theories, models and frameworks

Per Nilsen
Which D&I Model to Use?

Damschroder, L.J. (2020)
Which D&I Model to Use and When?

Exploring

Sharing

Planning

Processing

Executing

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
Enola Proctor’s Conceptual Model

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

Rogers’s Theory of Diffusion of Innovations

CIPRS: Stetler & Damschroder Theoretical Frameworks

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 its 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
  - Can 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
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
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)

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

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

Characteristics of the Intervention

- 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 within 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

- **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
Welcome to the CFIR Technical Assistance Website

You have come to the right place if you are looking for more information about the Consolidated Framework for Implementation Research (CFIR) that was originally published in Implementation Science in 2009. This site is created for individuals considering using the CFIR to evaluate an implementation or design an implementation study.

- Implementation Science Basics
- What is CFIR
- Benefits of using the CFIR
- Published Citations of the CFIR
- Future Plans for the CFIR

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D&I Models and the Executing Phase

The executing phase of research includes:

- Collecting data
- Carrying out implementation strategies
EPIS Framework

Aarons, GA (2011)
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
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

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

- **Primary function:** carry out the activities necessary for implementation

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    - **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

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

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

$$R_{readiness_i} = \text{Motivation}_i \times \text{General Capacity} \times \text{Innovation-Specific Capacity}_i$$

$$R = MC^2$$


FIGURE 1. Elements of the RE-AIM Framework

- How do I incorporate the intervention so it is delivered over the long-term?
- How do I ensure the intervention is delivered properly?
- How do I develop organizational support to deliver my intervention?
- How do I reach the targeted population?
- How do I know my intervention is effective?

Glasgow et al, RE-AIM.net, 2011
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 INTEGRATE THE INTERVENTION SO IT IS DELIVERED OVER THE LONG TERM?
D&I Models and the Processing Phase

The processing phase of research includes:

- Data analysis
- Data interpretation
Bronfenbrenner’s Social Ecological Model

- Public Policy: national, state, local laws and regulations
- Community: relationships between organizations
- Organizational: organizations, social institutions
- Interpersonal: families, friends, social networks
- Individual: knowledge, attitudes, skills
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
This interactive website was designed to help researchers and practitioners to select the D&I Model that best fits their research question or practice problem, adapt the model to the study or practice context, fully integrate the model into the research or practice process, and find existing measurement instruments for the model constructs. The term ‘Models’ is used to refer to both theories and frameworks that enhance dissemination and implementation of evidence-based interventions more likely.

**Select**
Search, view, and select D&I Models

**Adapt**
Read strategies for adapting D&I Models to research or practice context

**Integrate**
Read strategies for incorporating D&I Models into the full spectrum of your project

**Measure constructs**
Find a list of constructs and links to measurement tools associated with the D&I Models

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.)
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](http://www.queri.research.va.gov/for_researchers.cfm)

- National Cancer Institute’s Implementation Science Team
  - [http://cancercontrol.cancer.gov/is/](http://cancercontrol.cancer.gov/is/)

- Training Institute for Dissemination and Implementation Research in Health

- Canadian Knowledge Translation Clearinghouse website
  - [http://ktclearinghouse.ca](http://ktclearinghouse.ca)