Setting the Stage for Understanding Mechanisms of Implementation

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March 22, 2019

AHRQ Grant Number: 1R13HS025632
How we’ll set the stage

**Part 1**
Where have we been & where are we going?

**Part 2**
What are implementation mechanisms & why do they matter?

**Part 3**
What do we know about implementation mechanisms?

**Part 4**
What are we going to do to inform the study of implementation mechanisms?
Part 1:
- Progress
- Time for the next step...
Evidence-based health practices, programs, and interventions
Implementation research from 2000-

What went wrong?

COME ON,
WE CAN DO BETTER THAN THIS

“I think you should be more explicit here in step two.”
Theories, frameworks, and models

<table>
<thead>
<tr>
<th>Diffusion of Innovations</th>
<th>Exploration</th>
<th>Adoption/Preparation</th>
<th>Implementation</th>
<th>Sustainment</th>
<th>Interactive Systems Framework</th>
<th>Consolidated Framework for Implementation Research</th>
</tr>
</thead>
</table>

N = 61

http://dissemination-implementation.org/

Tabak et al., 2012
Measurement: Toward standardization & harmonization

Society for Implementation Research Collaboration

- Instrument Review Project
  - http://www.societyforimplementationresearchcollaboration.org/sirc-projects/sirc-instrument-project/

Grid-Enabled Measures

- Developed by the National Cancer Institute

Rabin et al. Measurement Resources:
Part 2:
What are implementation mechanisms & why do they matter?
Implementation mechanisms

2/3 of implementation efforts fail

Nearly 1/2 have no effect on outcomes of interest

Why do they matter?

Need to tailor strategies to diverse contexts

Cost and complexity are increasing
Key terms & definitions

- Implementation outcomes
- Determinants of practice
- Implementation strategies
- Moderator
- Mediator
- Mechanism
The effects of deliberate and purposive actions to implement new treatments, practices, and services.

**Implementation outcomes**
- Acceptability
- Adoption
- Appropriateness
- Costs
- Feasibility
- Fidelity
- Penetration
- Sustainability

**Service outcomes**
- Efficiency
- Safety
- Effectiveness
- Equity
- Patient-centeredness
- Timeliness

**Client outcomes**
- Satisfaction
- Function
- Symptomatology

Proctor et al., 2011
Factors that obstruct or enable changes in targeted professional behaviors or healthcare delivery processes.

Krause et al., 2014
Methods or techniques used to enhance the adoption, implementation, and sustainability of clinical program or practice.

**Plan strategies**
- Needs assessment
- Site visits

**Educate strategies**
- Educational meetings
- Make training dynamic

**Finance strategies**
- Use capitate payment
- Alter incentives

**Restructure strategies**
- Change systems
- Revise roles

**Quality mgmt. strategies**
- Audit & feedback
- Use advisory boards

**Policy context strategies**
- Change requirements
- Change liability laws

*Proctor, Powell & McMillen, 2013; Powell et al., 2012*
Third variable that changes the relationship between two other variables such that the relationship between them differs depending on the level of the moderator variable.

McKinnon & Luecken, 2008
An intervening variable that may account (statistically) for the relationship between the independent and dependent variable.

Kazdin, 2007
Mechanisms

The reasons why change occurred or how change came about.

Kazdin, 2007

Knowledge deficit

Training  

Adoption of EBP
The reasons why change occurred or how change came about.

Mechanisms

Knowledge acquisition

Training

Adoption of EBP

Kazdin, 2007
### How it all fits together

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Implementation Strategy</th>
<th>Mechanism</th>
<th>Implementation Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provider knowledge deficit</td>
<td>Education (provision of information)</td>
<td>Awareness-building, knowledge-acquisition</td>
<td>Feasibility, acceptability, appropriateness, adoption</td>
</tr>
<tr>
<td>Provider skill deficit</td>
<td>Training (teaching &amp; practice with corrective feedback)</td>
<td>Skill acquisition, refinement, mastery</td>
<td>Fidelity to EBP</td>
</tr>
<tr>
<td>Turnover</td>
<td>Train-the-trainer</td>
<td>Continuous on-site expertise available for consultation</td>
<td>Sustainability</td>
</tr>
<tr>
<td>Provider engagement</td>
<td>Clinical champion-led implementation team</td>
<td>Organizational culture, climate</td>
<td>Feasibility, acceptability, appropriateness</td>
</tr>
</tbody>
</table>
Part 3: What do we know about implementation mechanisms?
Systematic Reviews: Two approaches to “What do we know?”

**Williams, 2016**

Targeted review of implementation RCTs

- RCTs that used an implementation strategy to manipulate a potential mechanism and tested the mechanism via mediation analysis
- Catalogue, identify, recommend

**Lewis et al., in prep**

Broad survey of the field

- DI studies that address mechanisms in all areas of health using any methodology
- Describe, illustrate, assess
Overview of Williams, 2016

1,309 records screened on title/abstract

88 RCTs located & full texts reviewed

9 RCTs tested implementation mechanisms via mediation analysis

Abstract A step toward the development of optimally effective, efficient, and feasible implementation strategies that increase evidence-based treatment integration in mental health services involves identification of the multilevel mechanisms through which these strategies influence implementation outcomes. This article (a) provides an orientation to, and rationale for, consideration of multilevel mediating mechanisms in implementation trials, and (b) systematically reviews randomized controlled trials that examined mediators of implementation strategies in mental health. Nine trials were located. Mediation-related methodological deficiencies were prevalent, and no trials supported a hypothesized mediator. The most common reason was failure to engage the mediation target. Discussion focuses on directions to accelerate implementation strategy development in mental health.

Keywords Mechanism - Mediation - Multilevel - Implementation strategy - Mental health - Systematic review

deficits result in unnecessary disease burden for millions of youth and adults who experience mental illnesses each year and waste limited resources that could otherwise be allocated to effective care (Kessler et al. 2009; Seal et al. 2014). In response, the National Institute of Mental Health and the Institute of Medicine have prioritized research on implementation strategies designed to increase the adoption and integration of EBTs into mental health service systems (Seal 2009; Institute of Medicine 2001). Investigators have responded to these calls with hundreds of studies that describe barriers and facilitators to EBT implementation as well as scores of randomized controlled trials (RCT’s) testing implementation strategies in mental health settings (Chaudoir et al. 2013; Greenhalgh et al. 2004; Nosco et al. 2013). Randomized trials have tested a variety of implementation strategies with multiple components and multiple targeted outcomes at multiple system levels (Powell et al. 2014). However, despite the proliferation of research, the accumulating body of evidence offers little information regarding how and why effective implementation strategies facilitate EBT adoption and integration. Multilevel mediating candidate mechanisms may...
Two types of mechanisms examined

1. **strategy** → **determinant** of practice → **implementation** outcome

   Did the strategy engage the mediator?

   Did the mediator influence the outcome?

2. **strategy** → **implementation outcome** → **clinical** outcome
Inner setting characteristics tested as mechanisms

4 RCTs

1. strategy → determinant → implementation

Inner setting characteristics

• Leader support
• Job-related barriers
• Org. climate
• Agency supportive practices
• Resources

No inner setting characteristics were supported as mechanisms
Individual characteristics tested as mechanisms

3 RCTs

1. strategy → determinant → implementation

No individual characteristics were supported as mechanisms.
Features of the implementation process tested as mechanisms

2 RCTs

Implementation process
- External change agent contact/support
- Peer opinion leader support

1. strategy → determinant → implementation

Peer opinion leader support was (partially) supported as a mechanism!
Implementation outcomes tested as mediators

2. strategy → implementation → clinical

4 RCTs

Implementation outcome

- Fidelity
- # of sessions
- # objectives completed
- Engagement with clients

No implementation outcomes were supported as mechanisms
Summary of implementation trials testing mechanisms in mental health

9 Randomized trials + 16 Mechanisms tested + 1 Mechanism (partially) supported = Lots of work to do!
Overview of Lewis et al.

1979 records screened on title/abstract

204 full-text records assessed for eligibility

50 studies included for data extraction (6 overlap with Williams, 2016)
Characterizing the landscape of mechanism-focused D&I research

- Qualitative: 12%
- Quantitative Randomized: 26%
- Quantitative Non-randomized: 48%
- Mixed Methods: 14%

March 22, 2019
What is the quality of studies attempting to identify mechanisms?

Illustrating approaches to understanding mechanisms

1. Implementation strategy
2. Determinant of practice
3. Clinical outcome
4. Mediator
5. Implementation outcome
6. Clinical outcome
7. Mediator
8. Implementation outcome
9. Moderator
Criteria for establishing mechanisms

7 criteria for building a strong case for a mechanism

- Strong association
- Specificity
- Consistency
- Experimental manipulation
- Timeline
- Gradient
- Plausibility or coherence

Which criteria are D&I studies using to identify mechanisms?

% of studies meeting criteria

- Plausibility: N=45 (90%)
- Association: N=23 (51%)
- Timeline: N=21 (46%)
- Consistency: N=18 (40%)
- Manipulation: N=13 (33%)
- Specificity: N=8 (18%)
- Gradient: N=1 (4%)
Part 4: What are we going to do to inform the study of implementation mechanisms?
Advancing Mechanisms of Implementation to Accelerate Sustainable Evidence-Based Practice Integration

AIMS:

1. To generate research, policy, and practice priorities for a research agenda to guide the study of implementation mechanisms.

2. To actively disseminate the research agenda to research, policy, and practice audiences.

https://societyforimplementationresearchcollaboration.org/mechanisms-network-of-expertise/
Advancing Mechanisms of Implementation to Accelerate Sustainable Evidence-Based Practice Integration

We need your input:

• **Research priorities**
  – What are the pressing research questions or gaps? What keeps you from studying implementation mechanisms?

• **Policy priorities**
  – What implementation strategies do you think are worth funding? How do you expect systems should measure or monitor policy implementation?

• **Practice priorities**
  – How do you choose which strategies to use to support implementation of a new practice? How do you know if it was an implementation failure versus an intervention failure?
Advancing Mechanisms of Implementation to Accelerate Sustainable Evidence-Based Practice Integration

**Workgroup Key Issues and Co-Leads**

<table>
<thead>
<tr>
<th>Design &amp; Analysis</th>
<th>Measurement</th>
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<tr>
<td><strong>Definition:</strong> Research designs and analytic methods (e.g., qualitative, multilevel modeling) for isolating strategies and mechanisms.</td>
<td><strong>Definition:</strong> Methods, administration, and qualities of measures used for testing mechanisms.</td>
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<tr>
<td><em>Aaron Lyon &amp; Greg Aarons</em></td>
<td><em>Bryan Weiner &amp; Cara Lewis</em></td>
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<th>Strategy→Mechanism→Outcome</th>
<th>Causal Theory &amp; Context</th>
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<tr>
<td><strong>Definition:</strong> Implementation strategy, putative mechanism(s) on which it has an effect, and both proximal and distal outcomes</td>
<td><strong>Definition:</strong> Frameworks, theories, models, and the role of contextual factors as targets for strategy-mechanism pairings</td>
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<td><em>Brian Mittman &amp; Byron Powell</em></td>
<td><em>Rinad Beidas &amp; Nate Williams</em></td>
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Advancing Mechanisms of Implementation to Accelerate Sustainable Evidence-Based Practice Integration

Mechanisms Network of Expertise (MNoE)

**Principal Investigator**
Cara C. Lewis, PhD

**MNoE Investigative Team**
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Jonathan Tobin, Ph.D.
Shannon Wiltsey Stirman, Ph.D.
Katie Witkiewitz, Ph.D.

Plan to Grow Internationally
# MNoE Key Activities

## 3-Year Workplan

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<th>Quarterly Web-Based Meetings</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<td></td>
<td>Q1: Webinar</td>
<td>Q1: Partner Interviews</td>
<td>Q1: Assign Dissemination Products</td>
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<td>Q2: Matrix Mapping</td>
<td>Q2: Prep for Concept Mapping</td>
<td>Q2: Prep Workshops &amp; Talks</td>
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<td>Q3: Conference Coding</td>
<td>Q3: Finalize Research Agenda</td>
<td>Q3: Present at SIRC</td>
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<td>Q4: Roadmaps</td>
<td>Q4: Prep Manuscripts</td>
<td>Q4: Complete Dissemination Products</td>
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<td>Face-to-Face</td>
<td>SIRC 2019</td>
<td>Deep Dive 2020</td>
<td>SIRC 2021</td>
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5th Biennial Conference of the Society for Implementation Research Collaboration

September 12-14, 2019
Seattle, WA, USA
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Now Accepting Manuscripts

International, peer-reviewed, open access, online-only journal providing rapid publication of interdisciplinary research that advances the implementation in diverse contexts of effective approaches to assess, prevent, and treat mental health, substance use, or other addictive behaviors, or their co-occurrence, in the general population or among those at-risk or suffering from these disorders.

March 22, 2019
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