The Role and Selection of Theoretical Frameworks in Implementation Research

Laura J. Damschroder, MS, MPH

Diabetes QUERI
Ann Arbor VA Center for Clinical Management Research

June 7, 2012
Acknowledgements

• Funded by QUERI in VA

• Invaluable collaboration over the years:
  – Brian Mittman
  – Cheryl Stetler
  – Teresa Damush
## Outline

- Why use theory?
- Applying Theory in QUERI Step 3
- Approach for selecting and applying theory
  - With example case study
- Resources and help
Session Objectives

• Understand the role & value of theory in implementation research
• Equip you with an approach for applying theory in your work
  – Study design & conduct
  – Grant writing
A word on THEORY

• A generalized, loose definition of theory in science will sometimes be used today
  – “A set of statements or principles devised to explain a group of facts or phenomena”¹

• May be embodied in a framework, model, or specific hypothesis

• The literature is rife with inconsistent use of terms
  – Frameworks, models, theories

My favorite working definitions

• **Framework**
  – A conceptual framework that identifies a set of variables and relationships that should be examined to explain [implementation]
  – Need not ID direction of relationships nor critical hypotheses

• **Theory**
  – Denser and logically coherent set of relationships that can offer explanations and may or may not ID causal relationships

• **Model**
  – Precise assumptions about a limited set of parameters and variables
  – Usually multiple models are compatible with frameworks and theories

WE'RE GOING TO USE CMMI. IT'S A MODEL FOR DEVELOPING A PROCESS TO CREATE A FRAMEWORK.

OR IT MIGHT BE A PROCESS FOR CREATING A FRAMEWORK TO MAKE A MODEL.

THERE'S NO BUDGET FOR TRAINING, SO WE'LL BE RELYING ON GUESSING MORE THAN USUAL.
Theory in a Clinical Intervention

• Example
  – Weight Loss Intervention: ASPIRE-VA
    • Social Cognitive Theory
    • Self-Regulation Theory
    • Problem-solving Theory
    • Small change Theory
Clinical Intervention Conceptual Model

Motivation Level and Intention

Baseline Behaviors (e.g. daily step count)

Demographic & Environmental Variables

Self-Monitoring

Goal Setting
- Anchor/Guide
- Relative to Baseline
- Small
- Self-Selected

Small Changes & Maintain New Behavior

Satisfaction

Self-Efficacy

Deprivation

Intervention Effectiveness: Short-term & Long-term weight loss

ASPIRE-VA Grant #IBB 09-034
Theory in Implementation

- Organizational Climate Theory
- Theory of conformity
- Other psychological & organizational theories
Conceptual Model for Implementation


Pulling it Together

Implementation Effectiveness

- Champion(s)
- Innovation-Values Fit
- Resources
- Management Support
- Implementation Policy & Practices
- Implementation Climate

Intervention Effectiveness

Program Outcomes
Type III Errors

• Incorrect conclusions about effectiveness of the intervention may result when
  – No treatment or too little treatment was actually provided
  – The wrong treatment was provided
  – Treatment is nonstandard, uncontrolled, or varies across settings/population

• …all resulting from inadequate implementation
Objectives of Implementation Research

- **Replicate** successful implementation
  - Core components
  - Rationale
- **Generalize** knowledge about how to implement and sustain interventions
- **Navigate** complex implementations
- **Improve** prospects for **sustainability**

*Theory-driven implementation enables us to accomplish these objectives*
State of the Literature - 1

- Systematic reviews of interventions consistently show
  - Some work some of the time
  - None work all of the time
  - More research needed to figure out what works where and why
State of the Literature – 2

- Largely atheoretical
  - Related to implementation\(^1\)
  - ...and, by the way, too often, for interventions as well

- Theory used only as heuristic\(^2\)
  - Dropped after the introduction
  - Used to organize discussion of findings
State of the Literature - 3

• Inadequate descriptions of intervention(s), context, and implementation\textsuperscript{1-3}
  – Large majority of trials have no qualitative component
  – Implementation studies suffer from small samples
    • Example from very recent paper:\textsuperscript{4}
      – “Findings revealed limited information about attributes of successful and unsuccessful team initiatives, barriers and facilitators to team initiatives, unique or combined contribution of selected interventions, or how to effectively establish these teams.”
Theory as a Way Forward

• “‘Generalization through theory’ potentially offers a more efficient and appropriate method of generalization than study replication in many possible settings” (p 2)
  • International panel convened by AHRQ to improve the design, evaluation, and reporting of research for patient safety practices

– Build knowledge through strengthened confidence in the usefulness of a theory
– Identify factors that predict likelihood of success
– Guide adaptation of the intervention and tailoring of implementation
  • Through knowledge of determinants – or levers – of change
Case Example: \textit{MOVE!}®

- **Step 1:** Prevention is high priority (now T-21) issue
  - Obesity prevalence is high among Veterans
- **Step 2:** Disseminate the MOVE! Weight Management Program in January 2006
- **Step 3A:** Many facilities not reporting MOVE! Workload
- **Step 3D:** ID barriers and facilitators of MOVE! implementation\(^2\)
  - Embedded mixed methods cross-sectional study\(^1\)
  - Purposive sample of 5 sites
    - Maximize variation with respect to program volume
      » Indicator of implementation effectiveness
  - Semi-structured interviews with 24 stakeholders
    - 83\% of those contacted and invited, participated in the study

Guiding Theories

- Types of theories
  - Explanatory Theories
  - Organizational-level theories

- Consolidated Framework for Implementation Research (CFIR)
  - Guided qualitative data collection & analyses

- Model of Implementation Effectiveness
  - Guided quantitative data collection & analyses
  - Qualitative confirmation
CFIR

– [www.wiki.cfirwiki.net](http://www.wiki.cfirwiki.net)

– Comprehensive framework to promote consistent use of constructs, terminology, and definitions

  • Consolidates existing models and frameworks
  • Comprehensive in scope
  • Tailor its use to the study

– *Guided Qualitative Data Collection & Analyses*

CFIR: 5 Major Domains

- **Intervention**
  - 8 Constructs (e.g., evidence strength & quality, complexity)

- **Outer Setting**
  - 4 Constructs (e.g., patient needs & resources)

- **Inner Setting**
  - 14 constructs (e.g., leadership engagement, available resources)

- **Individuals Involved**
  - 5 Constructs (e.g., knowledge, self-efficacy)

- **Process**
  - 8 Constructs (e.g., plan, engage, champions)
### Additional File 3: Short Definitions

Ref: [http://www.implementationscience.com/content/4/1/50](http://www.implementationscience.com/content/4/1/50)

<table>
<thead>
<tr>
<th>Topic/Description</th>
<th>Short Description</th>
</tr>
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<tbody>
<tr>
<td><strong>I. INTERVENTION CHARACTERISTICS</strong></td>
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</tr>
<tr>
<td>A  Intervention Source</td>
<td>Perception of key stakeholders about whether the intervention is externally or internally developed.</td>
</tr>
<tr>
<td>B  Evidence Strength &amp; Quality</td>
<td>Stakeholders’ perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.</td>
</tr>
<tr>
<td>C  Relative advantage</td>
<td>Stakeholders’ perception of the advantage of implementing the intervention versus an alternative solution.</td>
</tr>
<tr>
<td>D  Adaptability</td>
<td>The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.</td>
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<tr>
<td>E  Trialability</td>
<td>The ability to test the intervention on a small scale in the organization [8], and to be able to reverse course (undo implementation) if warranted.</td>
</tr>
<tr>
<td>F  Complexity</td>
<td>Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement</td>
</tr>
<tr>
<td>G  Design Quality and Packaging</td>
<td>Perceived excellence in how the intervention is bundled, presented, and assembled</td>
</tr>
<tr>
<td>H  Cost</td>
<td>Costs of the intervention and costs associated with implementing that intervention including investment, supply, and opportunity costs.</td>
</tr>
</tbody>
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| **II. OUTER SETTING**        |                                                                                                                                                  |
| A  Patient Needs & Resources | The extent to which patient needs, as well as barriers and facilitators to meet those needs are accurately known and prioritized by the organization.    |
| B  Cosmopolitanism           | The degree to which an organization is networked with other external organizations.                                                            |
| C  Peer Pressure             | Mimetic or competitive pressure to implement an intervention; typically because most or other key peer or competing organizations have already implemented or in a bid for a competitive edge. |
Model of Implementation Effectiveness

- Implementation Framework for Complex Innovations – *Quantitative Data Collection*

  - Resources
  - Champion(s)
  - Innovation-Values Fit
  - Management Support
  - Implementation Policy & Practices
  - Implementation Climate
  - Implementation Effectiveness

Quantitative Results

![Bar chart showing average summary scores for facilities with low and high implementation effectiveness across various categories: Management Support, Sufficient Time, Resources, MOVE! Communications, Implementation, Climate.]

- **Problem of sample size:** n=4 (one facility was in transition)

- **Facilities with Low Implementation Effectiveness**
- **Facilities with High Implementation Effectiveness**
Qualitative Results

• Importance of Champions was mixed
  – Appointed but largely absent in one low and one high implementation site

• Innovations-values fit is important
  – I would say 99.99%...of the providers recognize that [obesity] is in some way hindering their success in managing diabetes or managing blood pressures or managing hyperlipidemia...So everyone is very receptive...to refer the patients to MOVE! [MOVE! Coordinator]
  – Lack of fit at 2 low implementation sites
Theoretical Framework

• Implementation Framework for Complex Innovations

- Resources
- Champion(s)
- Innovation-Values Fit

- Management Support
- Implementation Policy & Practices
- Implementation Climate

Implementation Effectiveness
Were the theories useful?

- Implementation Framework for Complex Innovations

Were the Theories Useful?

• Champions’ influence was mixed

• Additional insights & constructs were identified through CFIR. E.g.,
  – “Teamness” mattered: the degree to which MOVE! teams coalesced
  – Perception of intervention characteristics
    • Strength & Quality of evidence
    • Relative Advantage
  – Perception of patient needs & resources

• Not all CFIR constructs were salient
### Types of Theories

- **Multiple theories often needed**
  - **Explanatory theories** *(aka descriptive, impact)*
    - Hypotheses and assumptions about how implementation activities will facilitate a desired change, as well as the facilitators and barriers for success
  - **Process theories** *(aka prescriptive, planned action)*
    - How implementation should be planned, organized and scheduled
  - **Mixed theories**
    - Elements of both
Process:
“4E’s” Translation Model

- Summarize the Evidence
- ID Local Barriers to Implementation
- Measure Performance
  
  Ensure all patients receive the intervention
  
  Engage
  Evaluate
  Educate
  Execute


*Used in the Michigan Keystone Project:*


Mixed Model

Promoting Action on Research Implementation in Health Services (PARIHS)

• Successful Implementation =

\[ f(\text{Evidence}, \text{Context}, \text{Facilitation}) \]


• Quantitative Measurement
  • Organizational Readiness for Change Assessment (ORCA) tool

  • Alberta Context Tool

Choosing Theory

1. Consider nature of the theory
   - Process v. explanatory
   - Context (e.g., policy, organization)
   - Discipline (e.g., social science, psychology)

2. Consider level at which it will be applied
   - Individuals
   - Teams
   - Organization
   - System

3. Previous findings, experience

4. Greatest potential for adding to the knowledge-base
Choosing Theory
Looking Forward from Step 3 Case Study

1. Consider nature of the theory
   – Used 2 Explanatory Theories

2. Future work: develop implementation strategy
   – Consider level at which theory will be applied
     • Organization
       – Develop organizational strategy to implement MOVE!
     • Teams
       – Importance of coalescing teams ("teamness")
     • Individuals
       – Physician Champion
       – Formally appointed implementation leader
     • System
       – System-wide performance measurement
Conducting Theory-based Step 4 Implementation Studies

1. Assess targeted EBP change and context

Use theory to guide assessment

Conducting Theory-based Implementation Studies

1. Assess targeted EBP change and context
2. Select targeted theory(s) & provide rationale
QUERI Step 4
Implementation Research

• Example Study:

• Step 1: Preventable blindness in diabetes patients
• Step 2: Early detection and timely laser therapy
• Step 3: Lack of close follow-up
• Step 4: Implement strategies to improve follow-up
  – System level: Change performance measures
  – Local organization: Progressive Reminder & Scheduling System (PRSS)
Organization-level Theory

Figure 1

- Create tension for change
- Identify effective alternatives
- Develop social support
- Change
- Build supporting infrastructure
- Develop skills

Intention to change
Conducting Theory-based Implementation Studies

1. Assess targeted EBP change and context
2. Select targeted theory(s) & provide rationale
Conducting Theory-based Implementation Studies

1. Assess targeted EBP change and context
2. Select targeted theory(s) & provide rationale
3. Develop tailored implementation strategy
Conducting Theory-based Implementation Studies

1. Assess targeted EBP change and context
   - Who needs to do what differently?
   - Which barriers & facilitators need to be addressed?

2. Select targeted theory(s) & provide rationale
   - How can behavior (and org) change be measured and understood?
   - What behavior change techniques (and org strategies) could overcome B&Fs?

3. Develop tailored implementation strategy

Conducting Theory-based Implementation Studies

1. Assess targeted EBP change and context
   - Providers need to document follow-up visit timeframe
   - Scheduler needs to schedule appointment
   - Heighten Tension for Change
   - Tools/processes for following up with patients

2. Select targeted theory(s) & provide rationale
   - Mailed Survey
   - Semi-structure Interviews
   - Policy level advocacy
   - PRSS Tool

3. Develop tailored implementation strategy

Conducting Theory-based Implementation Studies

1. Assess targeted EBP change and context
2. Select targeted theory(s) & provide rationale
3. Develop tailored implementation strategy
Checkout form/template for information on risk status and recommended follow-up interval

- Low risk
- High risk + follow-up interval
- Early disease

Letter/postcard to those with no eye clinic visit in more than 2 years

Electronic Clinical Information: e.g., encounters, prescriptions, diagnoses

Access Database **PRSS**

The information will be shared with the clinic/scheduler

Scheduling System for appointment information

Data extraction
Resources

• Selecting theories
  – Sharepoint site
    • Classification of Theories
    • Example Theory Diagrams
  – Process Theories

• Selecting techniques/strategies
  – Organizational-level
  – Individual-level
Using Theory: A Few Notes

• “All models are wrong...must be alert to what is importantly wrong”
  – There are no right or completely wrong theories

• There are better fitting theories that explain why a specific strategy or mechanism causes the intended change

• Implementation strategy(s) need to be operationalized from theoretical concepts
Conducting Theory-based Implementation Studies

1. Assess targeted EBP change and context
2. Select targeted theory(s) & provide rationale
3. Develop tailored implementation strategy
4. Execute tailored implementation strategy

Concurrent monitoring and refinement
Conducting Theory-based Implementation Studies

1. Assess targeted EBP change and context
2. Select targeted theory(s) & provide rationale
3. Develop tailored implementation strategy
4. Execute tailored implementation strategy
5. Evaluate effectiveness of implementation strategy
Case Study: Effectiveness of Implementation Strategy

• It took 5 years to get the performance measure changed
  – 2 years longer than planned
  – Near the end of the study

• Mixed commitment and loss over time
  – Pressure exerted by existing performance measure
  – Technical issues with PRSS integration/use
  – Local priorities and feuds

• Lessons learned!
Conducting Theory-based Implementation

1. Assess targeted EBP change and context

2. Select targeted theory(s) & provide rationale

3. Develop tailored implementation strategy

4. Execute tailored implementation strategy

5. Evaluate effectiveness of implementation strategy

6. Assess fit of findings with initial theory

Don’t skip this step
Conducting Theory-based Implementation

1. Assess targeted EBP change and context
2. Select targeted theory(s) & provide rationale
3. Develop tailored implementation strategy
4. Execute tailored implementation strategy
5. Evaluate effectiveness of implementation strategy
6. Assess fit of findings with initial theory

Add to the knowledge-base
Assess Theory

• Was it useful?
  – Does theory still apply?
• Modifications/refinements needed?
• Building validity of theory(s)
  – Quantitative theory testing
    • Test hypotheses
    • Path analyses
  – Qualitative theory testing
    • Is terminology/language coherent?
    • Does it promote comparison of results across settings and studies over time?
    • Does it stimulate new theoretical developments?
Key Points

• Use pre-implementation work to inform implementation approach
• Do use theory
• Provide clear rationale for theory selection
• Clearly define implementation strategy for replication beyond your specific efforts
  – Internal validity
  – External validity
• Evaluate usefulness of theory(s) used
Session Objectives

• Understand the role & value of theory in implementation research

• Equip you with an approach for applying theory in your work
  – Study design & conduct
  – Grant writing
The field is ripe

• Implementation Science is relatively new
  – What is the dependent variable?
  – How to measure?
  – What is success?
  – Sustainability

• Mutable v. immutable variables
Help

• References in this presentation
• CIPRS
• QUERI Centers
• Your EIS mentors

You are not alone
Addtional References


State of the Literature – 2 Slides:

State of the Literature – 3 Slides:

Theory as a Way Forward Slide:

More on mixed methods: OBSSR Best Practices for conducting mixed methods research in Health Sciences:

Types of Theories Slide:

Selecting Evidence-based Implementation Strategies
Cochrane’s Effective Practice and Organization of Care (EPOC): http://epoc.cochrane.org/
AHRQ’s Evidence-based Practice Centers: http://www.ahrq.gov/clinic/epc/
# A Classification of Theories

<table>
<thead>
<tr>
<th>Types of Theory</th>
<th>Sample Implementation-Related Theories</th>
<th>Relevant/Sample Citations</th>
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<table>
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<tr>
<th><strong>TYPES OF THEORY</strong></th>
<th><strong>SAMPLE IMPLEMENTATION-RELATED THEORIES</strong></th>
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• Gask L, et al. Dissemination and implementation of suicide prevention training in one Scottish region. BMC Health Serv Res. 2008 Dec 3;8:246. |
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<td>MIXED:</td>
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<tr>
<td></td>
<td>✐ Reflect both process/planned action and descriptive/explanatory types of theories</td>
<td></td>
</tr>
<tr>
<td>LEVELS OF THEORY$^{3,4}$</td>
<td>SAMPLE IMPLEMENTATION-RELATED THEORIES</td>
<td>RELEVANT/SAMPLE CITATIONS</td>
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<td>---------------------------</td>
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<tr>
<td><strong>INDIVIDUAL LEVEL CHANGE:</strong></td>
<td></td>
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• Soumerai SB, Avorn J. Principles of educational outreach ('academic detailing') to improve clinical decision making. JAMA. 1990 Jan 26;263(4):549-56. |


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<td><strong>Individual level change (cont’d)</strong></td>
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<tr>
<td>Levels of Theory(^6,7)</td>
<td>Sample Implementation-related Theories</td>
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<tr>
<td><strong>Health Care System/Organization:</strong></td>
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<tr>
<td>- &quot;Organisational: theories to explain change at a higher order social and systems&quot; (Michie et al., 2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- As applied at multiple levels; e.g., team, unit, facility, or VISN</td>
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<td></td>
</tr>
<tr>
<td>1. Diffusion theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Social networking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Complexity and systems theory</td>
<td></td>
<td></td>
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<tr>
<td>- <a href="http://www.istheory.yorku.ca/socialnetworktheory.htm">www.istheory.yorku.ca/socialnetworktheory.htm</a></td>
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<td>----------------------------------------</td>
<td>---------------------------</td>
</tr>
</tbody>
</table>
| | 9. Group dynamics & Team learning | • Group Dynamics: Theory, Research, and Practice. APA PsychNET (*Journal*)  
Additional Theories
• Promoting Action on Research Implementation in Health Services (PARIHS)*

\[ SI = f (E, C, F) \]

• Organizational Readiness for Change Assessment (ORCA) tool


Figure 9. The PRECEDE-PROCEED Model

PRECEDE

STEP 5  Administration and Policy Diagnosis

STEP 4  Educational and Ecological Assessment

STEP 3  Behavioral and Environmental Assessment

STEP 2  Epidemiological Assessment

STEP 1  Social Assessment

Health Promotion

- Predisposing factors
- Reinforcing factors
- Enabling factors

Health education

- Behavior and lifestyle
- Environment

Policy regulation organization

- Health
- Quality of life

PROCEED

STEP 6  Implementation

STEP 7  Process Evaluation

STEP 8  Impact Evaluation

STEP 9  Outcome Evaluation


Process Theory

STETLER MODEL©: STEPS of RESEARCH UTILIZATION to FACILITATE EBP

Phase I: Preparation
- Search, Sort & Select Sources of Evidence
  - Consider Influential Factors
  - Assess Priority
  - Describe Issue/Catalyst

Phase II: Validation
- Perform Utilization Critique, Analysis & Prioritization, if applicable, summary statement/table

Phase III: Comparative Evaluation/Decision Making
- Fit of setting
- Feasibility (r, e, t)
- Substantiating evidence
- Current practice

Phase IV: Translation/Application
- A. Confirm Type, Level & Method of Use
  - Dynamic evaluation:
    - Identify goal for each “use”
    - Identify alternative sources of evidence
    - Use this evidence for iterative goal achievement

B. USE:
  - Review operational details/how to use findings
  - Formally: Define/design evidence-based document; package for dissemination; develop E-B change plan

B’. CONSIDER USE:
  - Informally: obtain targeted practice information; evaluate
  - Formally: plan/implement pilot project; do formal details as in Bi; per baseline/evolve reject or accept and extend, with or without modification

Phase V: Evaluation

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Mixed Theory

The Practical, Robust Implementation and Sustainability Model (PRISM)

MixedTheory

Theory of Planned Behavior

Behavioral Beliefs → Attitude Toward the Behavior

Normative Beliefs → Subjective Norm

Control Beliefs → Perceived Behavioral Control

Intention → Behavior

Actual Behavioral Control

http://people.umass.edu/ajzen/tpb.diag.htm
## Individual Level Change

### Table 3. Stages of Change Model

<table>
<thead>
<tr>
<th>Stage</th>
<th>Definition</th>
<th>Potential Change Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precontemplation</td>
<td>Has no intention of taking action within the next six months</td>
<td>Increase awareness of need for change; personalize information about risks and benefits</td>
</tr>
<tr>
<td>Contemplation</td>
<td>Intends to take action in the next six months</td>
<td>Motivate; encourage making specific plans</td>
</tr>
<tr>
<td>Preparation</td>
<td>Intends to take action within the next thirty days and has taken some behavioral steps in this direction</td>
<td>Assist with developing and implementing concrete action plans; help set gradual goals</td>
</tr>
<tr>
<td>Action</td>
<td>Has changed behavior for less than six months</td>
<td>Assist with feedback, problem solving, social support, and reinforcement</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Has changed behavior for more than six months</td>
<td>Assist with coping, reminders, finding alternatives, avoiding slips/relapses (as applicable)</td>
</tr>
</tbody>
</table>

Healthcare System/Organization

Social Network Theory

http://www.istheory.yorku.ca/socialnetworktheory.htm
*Based on Rogers’ model of Diffusion of Innovation

EIS- Intro Program Session 3: The Role and Selection of Theoretical Frameworks in Implementation Research

Thursday, June 7, 2012 2:00 PM - 3:00 PM EDT

Strong encouragement to read:


Extra reading:
