Sustainability research: A review of concepts, methods, and findings

Shannon Wiltsey Stirman, PhD

VA National Center for PTSD and Boston University; VA Center for Organization, Leadership, & Management Research

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Collaborators:

Martin Charns, D.B.A.

John Kimberly, Ph.D

Amber Calloway, B.A.

Sarah Beehler, PhD

Frank Castro, Ph.D.

Natasha Cook, B.A.

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Poll Question #1

- What is your primary role?
  - Student, trainee, or fellow
  - Clinician
  - Researcher
  - Manager or policy-maker
  - other

Poll Question #2

What is your experience with implementation/sustainability projects or research?

-Current/prior implementation (not sustainability) research

-Current/prior research on sustainability

-Planning to conduct research on sustainability

-Involved in an implementation project (non-research)

-None of the above

Sustainability as a key implementation construct

- Successful implementation doesn't guarantee that a program or intervention will be sustained
- Policymakers who invest in implementation expect that effective practices will be sustained
- There has been relatively little emphasis on sustainability in the implementation literature
- To date, we know very little about how to promote sustainability
- The study of sustainability presents numerous challenges (conceptual and methodological)

Overview

- Background and considerations
- What do existing conceptualizations tell us about critical elements for sustainability?
- What methods have been used to study sustainability?
- What influences on sustainability have been identified in the research and conceptual literatures?
- How do the research findings overlap with existing conceptualizations?

Defining sustainability

- A very basic definition: the continuation of programs, practices, or interventions after initial implementation efforts or funding have ended

- A program or intervention can be considered to be sustained after initial implementation support has been withdrawn if
  - Core elements are recognizable, or delivered at a sufficient level of fidelity or intensity to yield desired benefits
  - Adequate capacity for continuation of these elements is maintained

Sustainability outcomes

- Continued fidelity to core elements
- Sustaining program activities
- Maintenance of desired health benefits
- The extent, nature, and impact of modifications to core and peripheral elements
- Maintenance of capacity to function at the required level to maintain desired health benefits

Stakeholder goals for sustainability

- What are the “bottom line” goals of stakeholders at different levels?
- Is maintenance at the same level acceptable, or must outcomes be improved upon?
- Is implementation fidelity valued?
- Would continuation of some components but not others be acceptable?
- Is adaptation required?
- Under what circumstances is discontinuation or implementation of a new practice desirable?

Conceptualizations of sustainability: A consolidation and synthesis

Rationale

- Existing conceptualizations are designed for particular innovations or fields
- Variations in terms and categorization of concepts
- All contain some related, overlapping concepts, but none include all identified concepts
- Consolidation and synthesis can promote a shared understanding and guide research and implementation efforts

Method

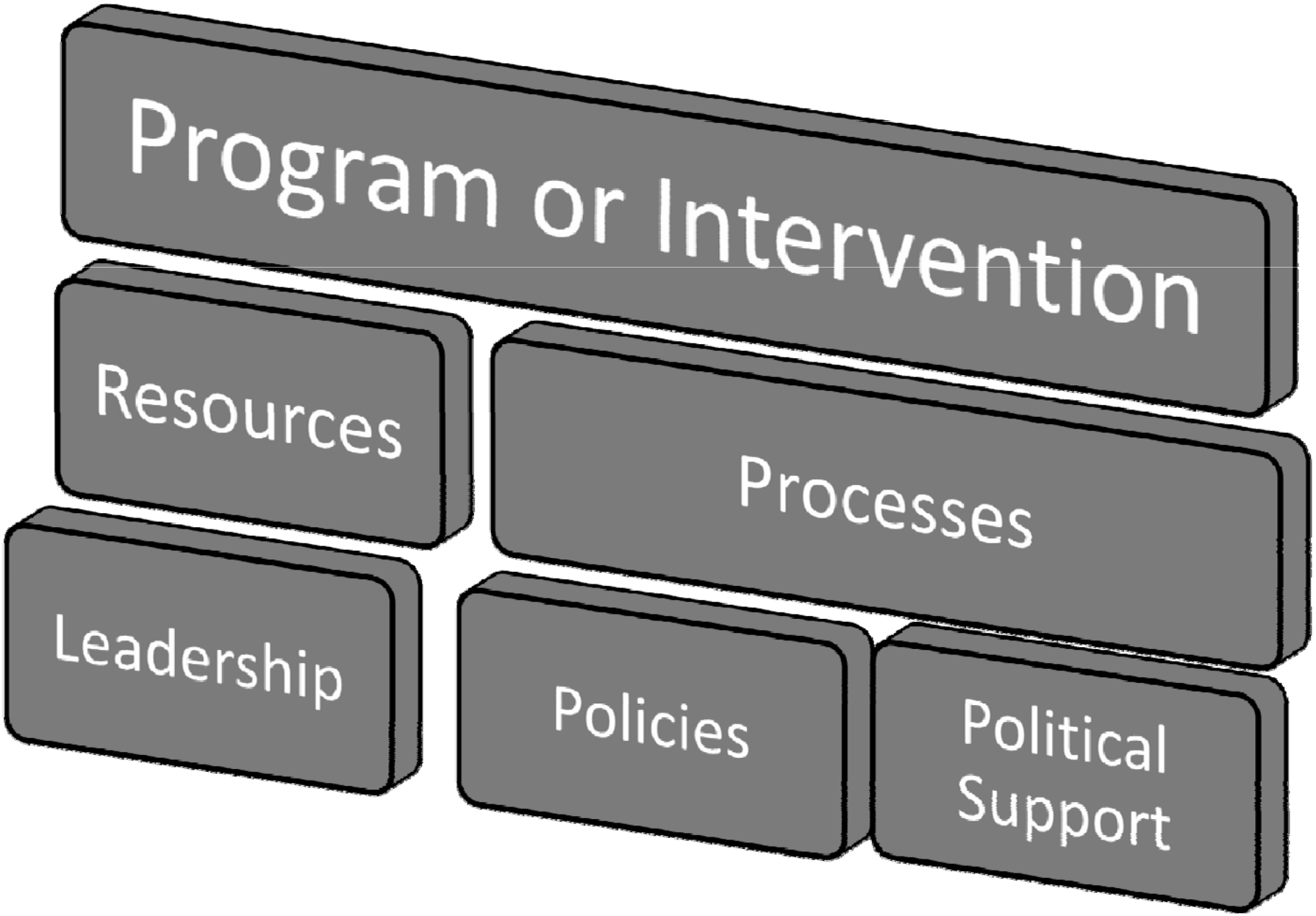
- 27 conceptualizations found through a literature review
- Each unique element was identified from each conceptualization
- Elements were sorted into groupings of similar concepts
- Concepts were grouped into broad categories

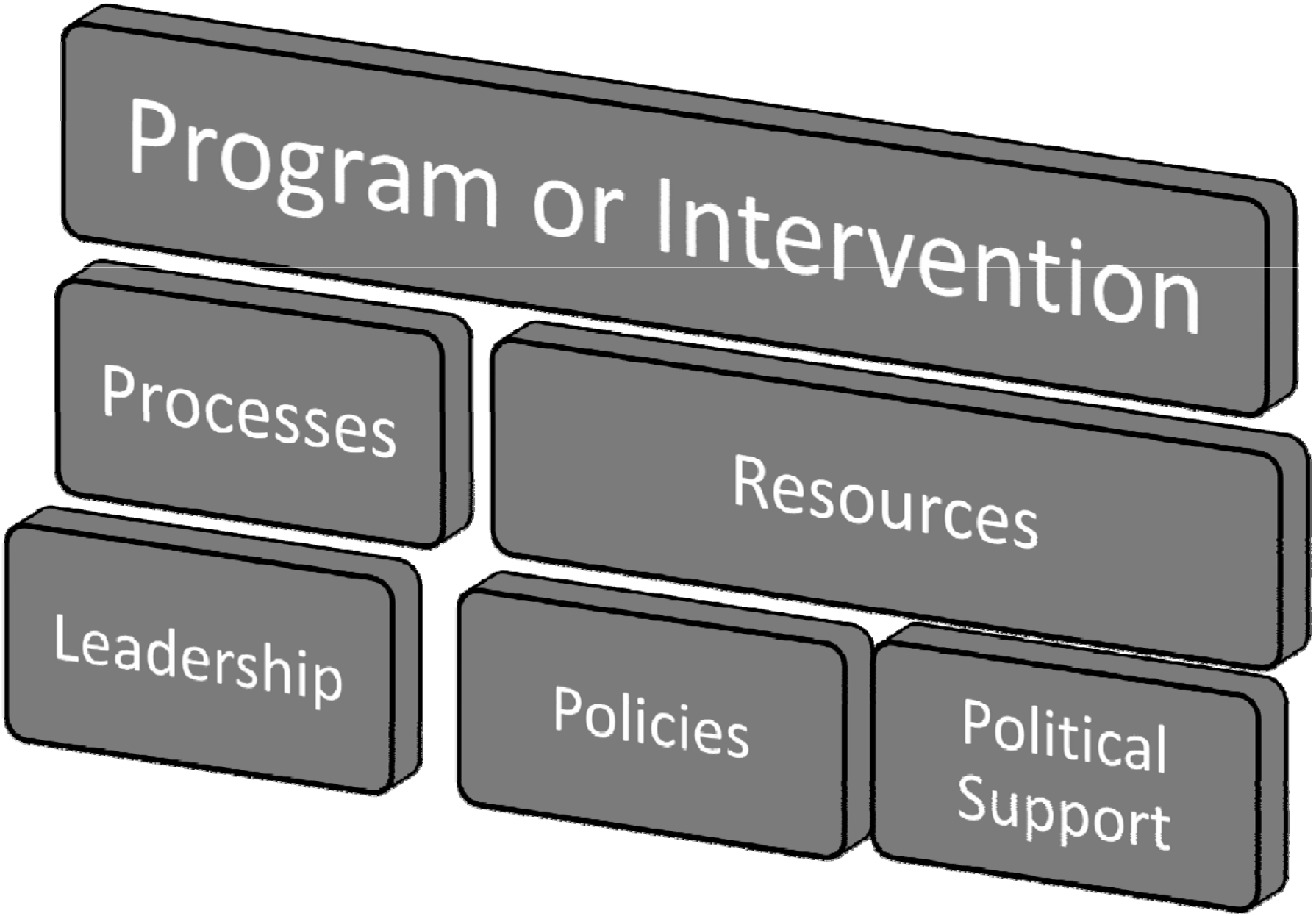
Preliminary findings

- Five Broad Categories:
  - Outer context (e.g., policies, system support)
  - Internal conditions (e.g., leadership support, climate)
  - Resources (e.g., Funding, workforce)
  - Processes (e.g., training, feedback, adaptation)
  - Intervention characteristics (e.g., fit, effectiveness)

Remaining questions

- Do the identified influences impact sustainability differently than they impact implementation?
- How do these influences interact with one another over time, and how does this impact sustainability?
- Which are most critical?
- Can some compensate for deficits in others?


Program or Intervention
Resources
Processes
Leadership
Policies
Political Support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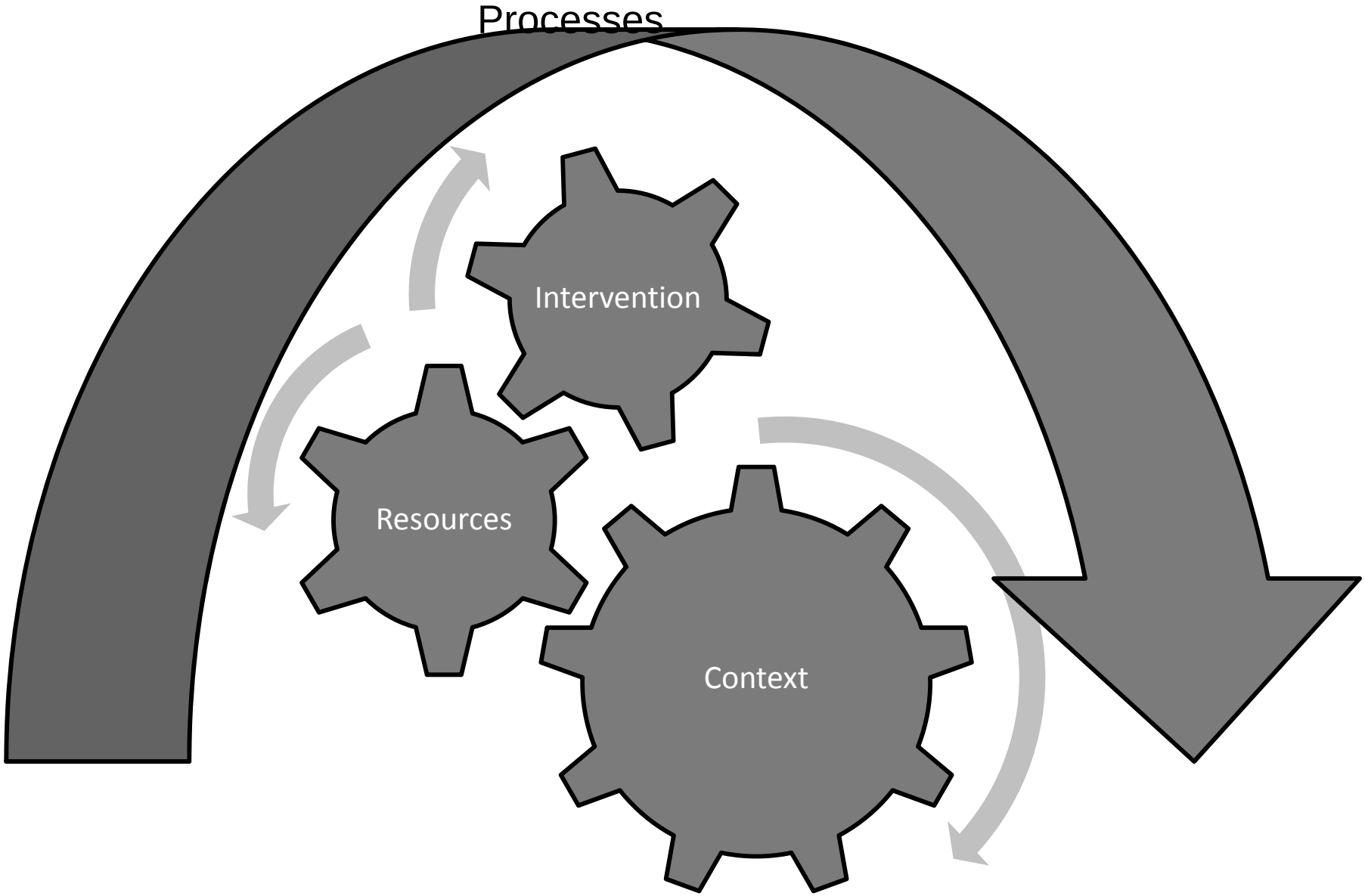

Processes
Intervention
Resources
Context

Challenges in Research on Sustainability

- Definitions: Multiple ways of conceptualizing sustainability
- Variability of innovations: A study on electronic medical records may look different from the study of a mental health treatment
- Funding for research: Without planning, funding can end after research on implementation is completed
- Measurement: How do we assess sustainability? No measures of key constructs

Challenges in Research on Sustainability

- Timing: Retrospective studies often lack appropriate prospective measures. When does implementation end and sustainment begin?
- Dynamic Systems : Potential influences may change over time and can't always be accurately characterized at a single timepoint
- Interrelated Constructs: Potential influences are interrelated and may mutually influence one another
- Interpreting Results: What are the implications of partial sustainability? To what do we attribute success/failure?

Initial Review of Sustainability Research

- To understand the “state of the science”

- To describe:
  - The methods used to examine sustainability thus far
  - The way authors have defined sustainability
  - The types of outcomes reported
  - Findings related to influences on sustainability

- To develop recommendations for future research

Method-Search Procedure

- Searched databases, employed a snowballing strategy to search the literature in healthcare, mental health, prevention and health promotion, education, and business
- Inclusion criteria:
  - Identified a post-implementation outcome or examined factors associated with sustainability
  - Peer reviewed research (no “lessons learned” reports)
  - No longer receiving funding/support from original source
  - Sufficient information to determine timeframe, funding status

Search Procedure and Results

- One coder identified potentially relevant papers and searched full text
- 70% were independently screened by two coders; 96% agreement on inclusion
- 460 potentially relevant studies
  - 301 excluded
    - Focused on implementation
    - Insufficient information
    - Narrative/Lessons learned
    - Timeframe unclear
- 125 studies reviewed

Coding procedure

- Initial coding scheme based on conceptualizations of implementation and sustainability
- Additional codes generated deductively
- Related constructs identified and collapsed into general categories
- 65% of papers coded by two raters
- Cohen's kappa .85-1 for broad categories, .61-1 for more specific categories
- Disagreements resolved by consensus, consultation with other authors where necessary

Results-Definitions and terms

- **Focused on sustainability**
  - Yes-102
  - No-23
- **Defined sustainability**
  - Yes-36
  - No-80
  - Cited multiple definitions; didn't specify an operational definition-9
- **Term used:**
  - Sustainability-77
  - Long-term/follow-up implementation-12
  - Institutionalization-6
  - Durability-3
  - Discontinuation-1
  - De-adoption-1
  - Maintenance-1
  - Sustained/continued implementation-1
  - Routinization-0
- **Definition cited**
  - Created definitions-8
  - Scheirer -6
  - Shediac-Rizkallah and Bone-4
  - Glasgow et al. -2
  - Pluye et al.-2
  - Goodman and Steckler -2
  - Other -12

Results-Timeframe

Coded for last post-implementation time period reported:

- 64% at 2 years or more
- 16% at 12 months
- 12% at 12-23 months
- 6% at less than 12 months

Results-Area of Study

33% medical interventions/healthcare
34% public health or health promotion programs
27% mental health treatments
9% school based interventions
7% educational interventions

72% examined either programs or multi-component interventions

Results-Methods and Design

54 % Quantitative

22 % Qualitative

23 % Mixed

6 % Experiments (e.g., training conditions)

94 % Naturalistic (generally post-hoc)

7% Followed up on implementation after clinical trials

43 % Self-report

40 % Interviews

43 % Observation

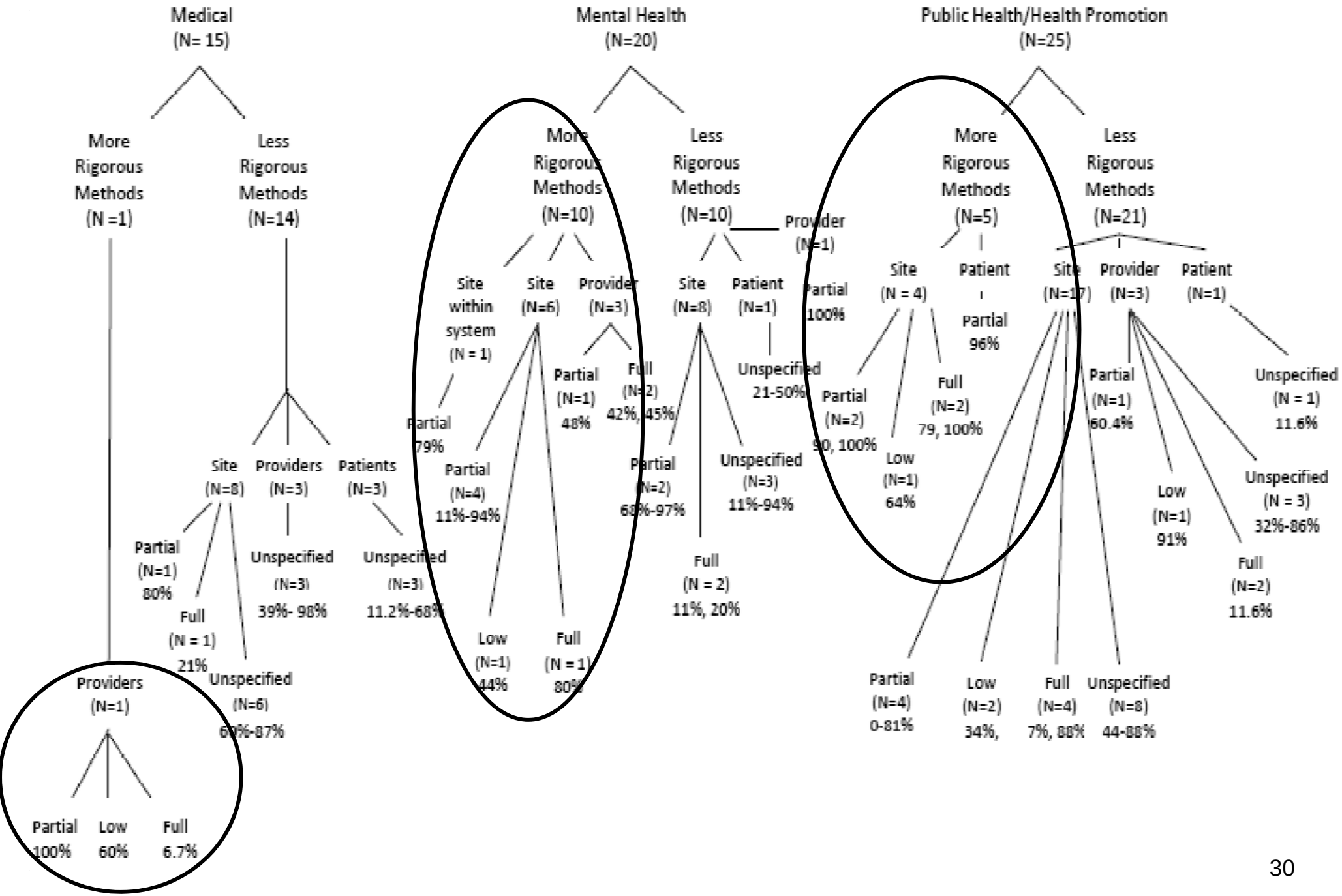
19 % Fidelity monitoring

Results-Unit of Analysis

54 % Multiple implementation sites
16 % Within systems/communities
12 % Provider level
9 % Single site
6 % Providers within site
4 % Team-level

Results-Outcomes Reported

-Continuation/Discontinuation
-Presence/absence of indicators
(e.g., key positions staffed; space allocated)
-Fidelity or integrity
-Full implementation vs. components
-Sustained impact/effectiveness


Medical
(N= 15)
More Rigorous Methods (N =1)
Less Rigorous Methods (N=14)
Providers (N=1)
Partial 100%
Low 60%
Full 6.7%
Site (N=8)
Providers (N=3)
Patients (N=3)
Partial (N=1) 80%
Full (N = 1) 21%
Unspecified (N=6) 60%-87%
Unspecified (N=3) 39%- 98%
Unspecified (N=3) 11.2%-68%
Mental Health
(N=20)
More Rigorous Methods (N=10)
Less Rigorous Methods (N=10)
Site within system (N = 1)
Site (N=6)
Provider (N=3)
Partial 79%
Partial (N=4) 11%-94%
Low (N=1) 44%
Full (N = 1) 80%
Partial (N=1) 48%
Full (N=2) 42%, 45%
Site (N=8)
Patient (N=1)
Provider (N=1)
Partial (N=2) 68%-97%
Unspecified (N=3) 11%-94%
Full (N = 2) 11%, 20%
Unspecified 21-50%
Public Health/Health Promotion
(N=25)
More Rigorous Methods (N=5)
Less Rigorous Methods (N=21)
Partial 100%
Site (N = 4)
Patient (N=1)
Partial (N=2) 50, 100%
Low (N=1) 64%
Full (N=2) 79, 100%
Partial 96%
Site (N=17)
Provider (N=3)
Patient (N=1)
Partial (N=4) 0-81%
Low (N=2) 34%,
Full (N=4) 7%, 88%
Unspecified (N=8) 44-88%
Partial (N=1) 60.4%
Low (N=1) 91%
Full (N=2) 11.6%
Unspecified (N = 1) 11.6%
Unspecified (N = 3) 32%-86%

Results-Associated Factors

- 68 studies
- Most were not guided by a model

- Four broad categories of influences
  - Characteristics of the Innovation
  - Factors related to the Organization/Context
  - Capacity (Internal and External)
  - Processes that facilitate sustainability

- Qualitative studies identified processes most commonly
- Quantitative studies identified capacity most commonly

Findings from review of research

Table 2: Influences on sustainability

	Overall			Health-related field-specific findings	
	Number of quantitative findings (n = 30 studies)	Number of qualitative findings (n = 36 studies)	Number of medical intervention findings (n = 19)	Number of public health/health-promotion findings (n = 27)	Number of mental health findings (n = 22)
Innovation characteristics	**11**	**18**	**7**	**12**	**10**
Fit	5	5	2	3	5
Ability to be modified/modifications made	4	7	2	5	4
Effectiveness or benefit	4	5	3	4	2
Ability to maintain fidelity/integrity	2	0	0	1	1
Context	**14**	**13**	**7**	**10**	**10**
Climate	0	2	1	0	1
Culture	2	1	2	1	0
Leadership	5	12	3	8	6
Setting characteristics (structure; policies)	11	2	4	4	5
System/policy change	2	5	3	3	1
Capacity	**15**	**23**	**11**	**14**	**12**
Champions (internal or external)	5	6	4	3	4
Funding	5	8	3	8	2
Workforce (staffing, attributes)	10	12	4	10	7
Resources	2	7	4	3	3
Community/stakeholder support /involvement	6	10	5	9	2
Processes and interactions	**8**	**27**	**10**	**16**	**8**
Engagement/relationship building	2	7	0	7	2
Shared decision making among stakeholders	3	2	2	2	1
Adaptation/alignment	2	5	2	5	0
Integration of rules/policies	3	10	4	6	2
Evaluation and feedback	2	6	1	4	2
Training and education	4	8	3	3	5
Collaboration/partnership	1	11	3	7	2
Navigating competing demands	0	4	1	2	1
Ongoing support	4	11	4	4	6
Planning	0	1	0	1	0

Findings from review of conceptualizations

Construct	n
Outer context/external conditions	
Policy/environmental context (system supports policy)*	13
Inner context/internal conditions	
Leadership support*	17
Alignment/Integration (program-need/priority alignment)*	12
Organization/community structure/procedures/policies*	11
Climate/culture/social context*	10
Role clarity	9
Readiness	6
Motivation	6
Lack of opposition	2
Resources	
Resources (human); workforce (low turnover, stable, low burnout); workforce (qualified, competent, self-efficacy); champions*	17
Funding*	16
Resources (general, material)*	14
IT systems/ongoing support	8
Allocated time	3

Construct	n
Processes	
Collaboration between key stakeholders (support/commitment/participation) *	18
Training/HR development*	14
Evaluation (outcome)*	11
Planning for sustainability	10
Monitoring/fidelity (performance)*	9
Communication*	8
Feedback (employees/communities; researchers; staff reinforcement)	8
Adaptation (of intervention)*	7
Publicize results	4
Developing local expertise	2
Intervention attributes	
Intervention effective*	9
Fit/compatibility*	8
Adds value/cost effective	8
Flexible	7
Complexity/added burden	3

*Findings from this review comparable to those from Stirman et al. (2012).

Recommendations

- Identify a working definition of sustainability
- Define key sustainability outcomes
- When studying determinants of sustainability, identify a multilevel model
- Assess at multiple timepoints
- Observation or fidelity ratings
- Study both fidelity and adaptation/modification
- Consider a mixed-methods strategy

Limitations

- We cast a broad net
- May have missed studies due to variation in terms or reporting
- The sample was not limited to EBPs in healthcare
- Variety of methods used precluded the use of meta-analytic strategies
- Conclusions about the level of sustainability that can be expected were not possible due to variation

Key findings

- Fully sustaining interventions was not common
- Few studies examined influences at multiple levels of influence
- Relatively little research has been conducted on adaptation and how it impacts outcomes of interest
- Process-oriented findings were common in qualitative studies
- Both of the reviews identified similar influences on sustainability

Conclusions

- Sustainability has been defined, assessed, and reported in a number of ways
- Some of this variety is due to the variety of innovations
- We need better measurement, *use of models*, and standardization of terms to guide research
- There is still an important role for qualitative research
- Efforts to develop a consolidated conceptualization can facilitate standardized measurement, interpretation of findings and shared understanding of concepts

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- Questions?

Thank you!

Contact: sws@bu.edu or shannon.wiltsey-stirman@va.gov