Dissemination and Implementation Science in Health Promotion

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UNC CENTER FOR HEALTH PROMOTION AND DISEASE PREVENTION

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Dissemination and Implementation ("D&I") Research in Health – Why do We Need it?

- We spend billions of dollars on health-related research each year
- It takes an average of 14-17 years for scientific discoveries to have a positive impact on the health of the general population
- Many intervention programs that are tested work well in the research setting but not in the real world

Why do we need it? (cont.)

- Often institutions and organizations are not able to integrate the tested programs into their daily operation:
  - Cost
  - Staffing
  - Time demands
- Many tested interventions don’t reach the highest risk populations
- Most tested programs and interventions don’t last after the research funding ends.

AND NOBODY USES IT…

DOES IT STILL MAKE AN IMPACT?

Russ Glasgow

What if we could develop and prove effective the “Ultimate Diet Pill?”

- No adverse side effects
- Easy to swallow – just one pill a day
- Causes rapid weight loss
- Affordable

Would we cure obesity??

Impact of Ultimate Diet Pill

Dissemination Step	Concept	% Impacted
50% of Communities Use	Adoption	50%
50% of Practitioners Prescribe	Adoption	25%
50% of residents see practitioner	Reach	12.5%
50% Follow Regimen Correctly	Implementation	6.2%
50% of Those Taking Correctly Benefit	Effectiveness	3.2%
50% Continue to Benefit After 6 Months	Maintenance	1.6%

Definitions

Implementation:

- Execution/Embracing of an intervention
- Research to practice ->“real world”
- Adaptation to the local context
- Need to have a deep understanding of:
  - “Target”/intended population – patients, policy makers
  - Intervention delivery systems and people – providers, policies, organizations

Dissemination:

- “To scatter widely, as in sewing seed”
  - BUT, you must prepare the soil well and make sure the farmer is trained and well/efficiently equipped
- Works best if you have carefully attended to implementation
- Implies that you start with something that is “evidence-based”
- Many similarities to translation

It’s all About Partnerships!!
“Town and Gown”

Collaboration is Essential

Gown

- Theories to guide change
- Study design
- Measurement strategies
- Identifying evidence-based interventions
- Balancing research and practice
- Research funding!

Town

- Identify key “assets” of the community
- Knowing the context
- What is realistic given culture and climate?
- What is practical given resources available?
- Community-based funding!

If a health-related intervention is to be useful, and be used it must:

- Be based on the best available evidence
- Be integrated with the health care system
- Be cost efficient
- Blend with the regional culture or nudge it in the desired direction
- Make the healthy choice the easy choice

Study design to test a diabetes intervention

Which is better? Why?

Choice A

- Randomization of health depts. with similar characteristics
- Compares innovative new intervention to usual care
- Excludes participants with co-morbid conditions that might impact A1c
- Outcome measures are A1c, fasting blood glucose, BMI

Choice B

- Randomization of a diverse set of health departments re size, location, staffing
- Compares evidence-based group-based intervention model to individual counseling
- All clinic participants eligible
- Outcome measures are A1c, fasting blood glucose, BMI, HTN, stress, depression

To D&I, Fewer Exclusions Allow for a Broader Subset of Settings, Staff and Participants

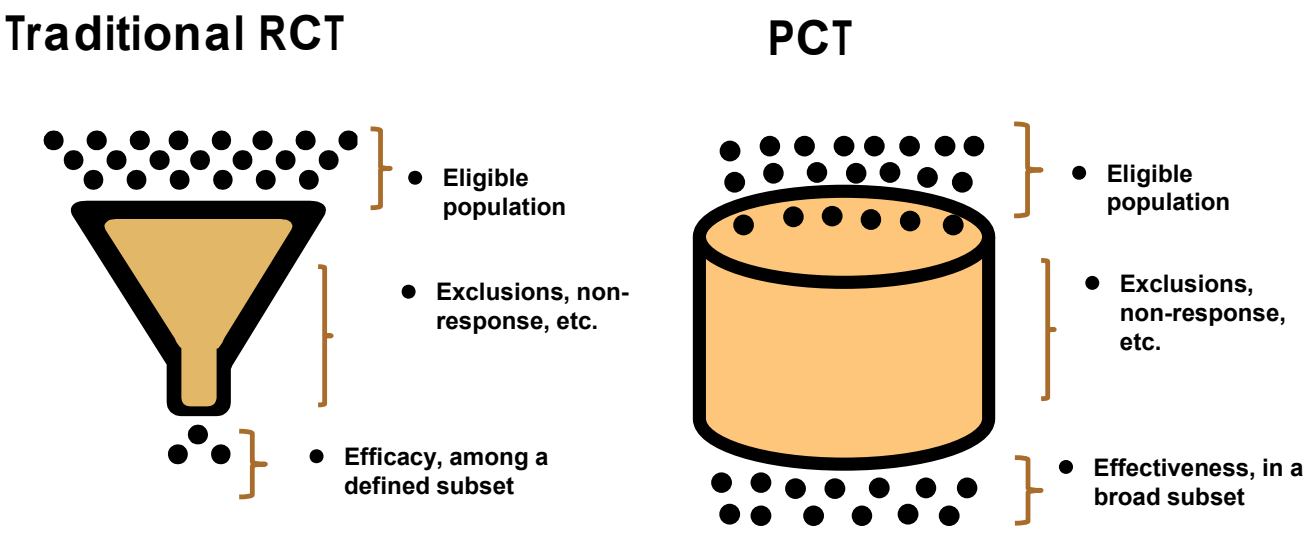
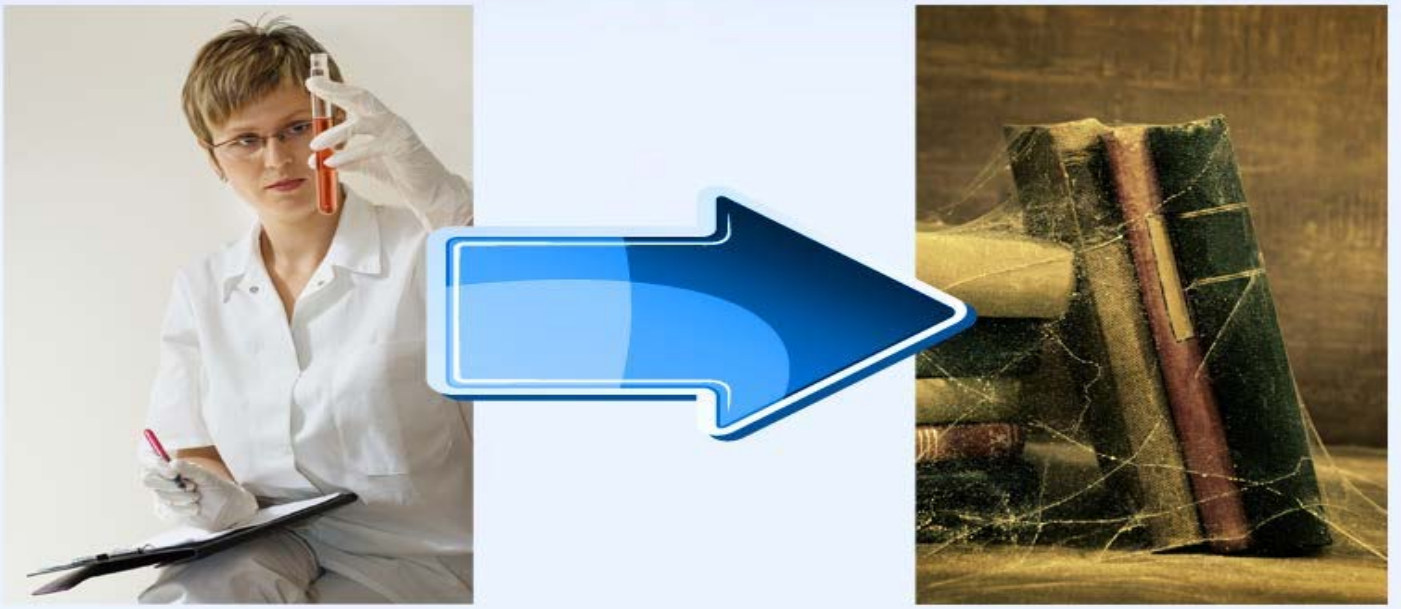


Figure provided by Gloria Coronado, PhD, Kaiser Permanente Center for Health Research

RE-AIM

Bench to Bookshelf



So how important is the “evidence-based” piece?

Very important, but beware of the “tyranny” of demands for evidence-based programs/interventions without considering context of the:

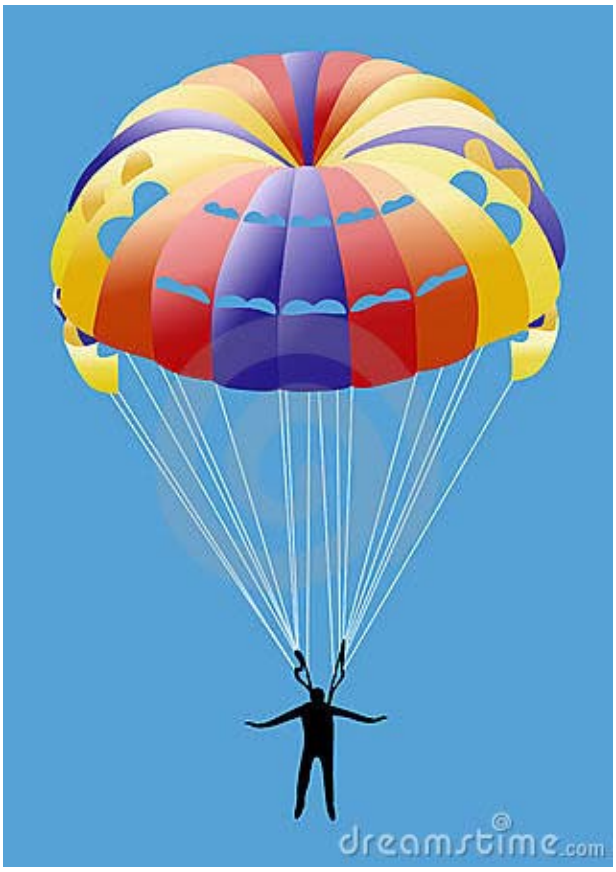
- original study
- implementation setting/site

Sometimes the severity or urgency of a health –related problem requires us to act even if we don’t have excellent evidence-based solutions

© 2010 Union of Concerned Scientists

“The effectiveness of parachutes has not been subjected to rigorous evaluation by using randomised controlled trials…. “

“We think that everyone might benefit if the most radical protagonists of evidence based medicine organised and participated in a double blind, randomised, placebo controlled, crossover trial of the parachute.”



Smith and Pell, BMJ, 2004

"The more complex, ecological approaches needed to reverse the childhood obesity epidemic must involve large-scale organizational and community actions, programs, and policies, ideally orchestrated with changes in parent, practitioner and teacher behavior at the home, clinical, and school levels, and with statewide and national regulatory changes and enforcement of new regulations."

"Where did the field get the idea that evidence of an intervention's efficacy from carefully controlled trials could be generalized as THE best practice for widely varied populations and settings?"

Larry Green

Application of the Evidence-Based methodology to Pharmacologic Interventions

	Target Population	Intervention	Intervention Implementation	Measure of Health Outcome
Pharmacologic Intervention	Individuals w/ a specific health concern	Pill	No. of times per day	Reduction in symptoms

.. vs. behavior change interventions

	Target Population	Intervention	Intervention Implementation	Measure of Health Outcome
Pharmacologic Intervention	Individuals w/ a specific health concern	Pill	No. of times per day	Reduction in symptoms
Dietary Intervention	Populations with widely varying health status	Counseling Posters Taste-Testing Self-Monitoring Workbooks Tailored messages Etc. Etc. Etc	Individual Groups Multi-media Self-Help Telephone Computer Schools Worksite Clinic Etc. Etc. Etc.	**Diet Assess** - F &V - Fats - Food prep practices (skin off chicken, season. vegetables) Etc. Etc. **Biomarkers**

Application in a community context

What does **MARCH MADNESS** have to do with evidence???

… where "any team can beat any other team on any given day."

The evidence suggests that a number 1 seed will beat a number 9 seed

- But, contextual factors to consider:
  - Player health – injury, illness
  - Protective face equipment
  - Coaching behavior… technicals?
  - Referee bias
  - Home court
  - Presence of player's parents in the crowd
  - Nerves, adrenalin, associated with playoffs

BEHAVIORAL INTERVENTION MADNESS:

Where any given implementation team can achieve strong effect sizes…or not… in any given environment, with any given intervention.

Context, Context, Context…..

Traditional focus on efficacy and internal validity fails to account for..

- REACH: numbers affected, particularly those who can benefit most
- ADOPTION by institutions and organizations that can deliver intervention and sustain over time
- IMPLEMENTATION by staff who are similar to those who would be responsible in the “real world”
- MAINTENANCE of program adoption, implementation, and impact

External Validity

- Frequently neglected by researchers, funders, journals, and evidence reviewers
- Determines the potential for translation and dissemination
- Addresses intersecting systems and contexts
- Informed by knowledge of practice setting

"If we want more evidence-based practice, we need more practice-based evidence"

Larry Green

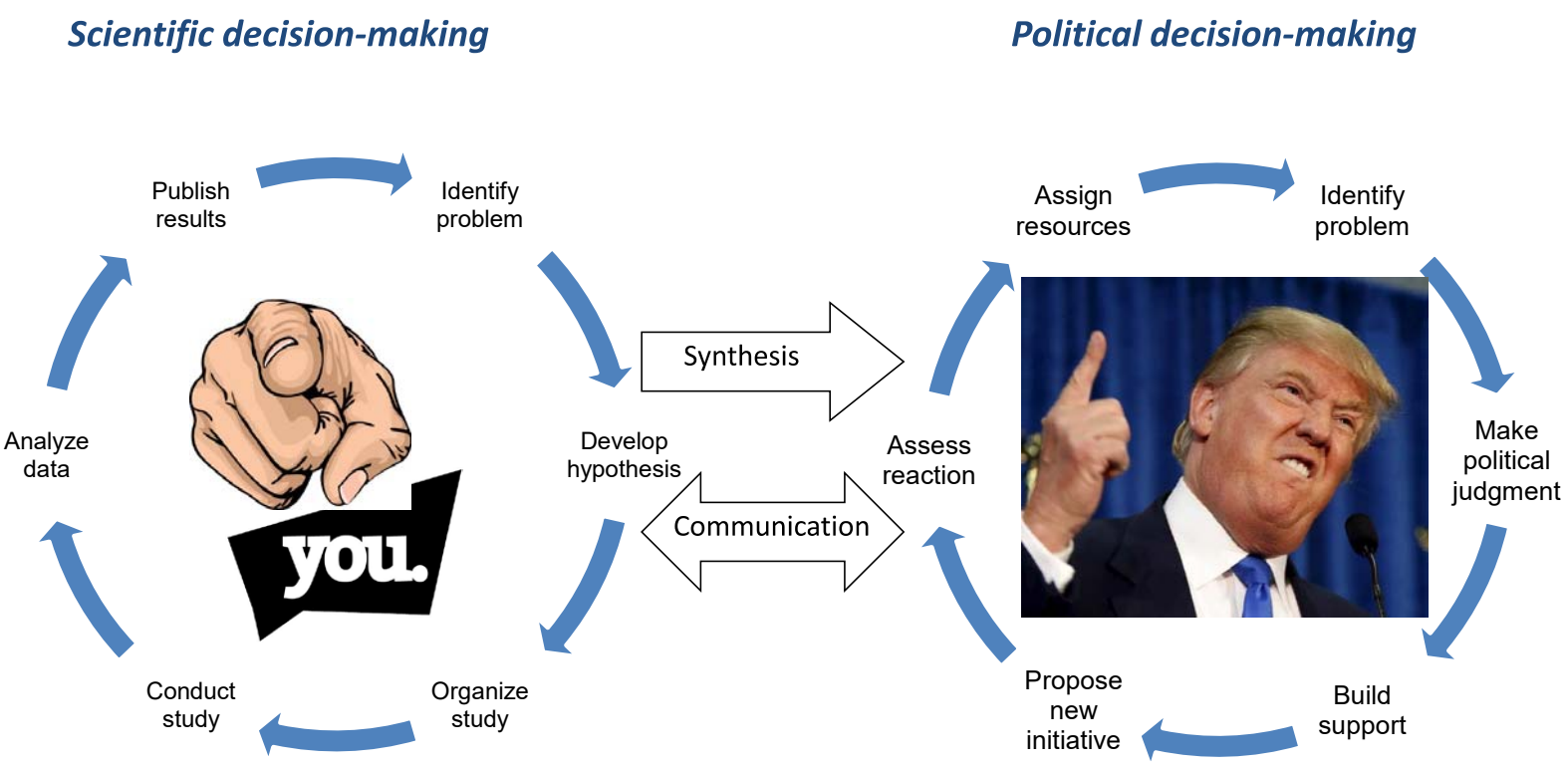
Policy and D&I

- “Policy happens” therefore
  - It’s hard to control
  - It’s hard to study

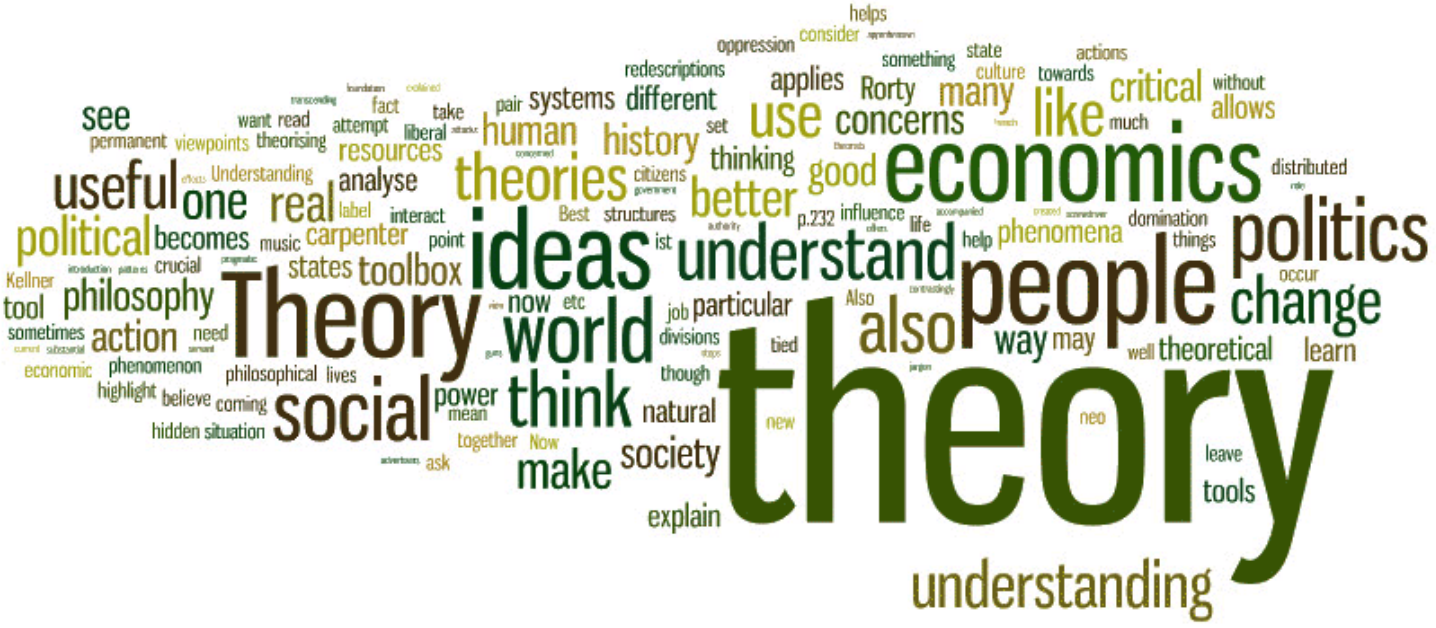
Problem

- Intervention research (generally RCTs) generates evidence-based interventions, but:
  - Policy/decision makers often don't feel they have the information they need to make decisions

Researchers and Policy Makers - Clash of cultures



Ross Brownson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Bridging Research and Practice
Models for Dissemination and Implementation Research

Rachel G. Tabak, PhD, Elaine C. Khoong, BS, David A. Chambers, DPhil, Ross C. Brownson, PhD

Context: Theories and frameworks (hereafter called models) enhance dissemin… mentation (D&I) research by making the spread of evidence-based interven… work organizes and synthesizes these models by (1) developing an inv… research; (2) synthesizing this information; and (3) providing g… to inform study design and execution.

Evidence acquisition: This review began wi… odel developers and used snowball sampling to collect model… nal articles, presentations, and books. All models were an… based on three author-defined variables: construct flexibil… of implementation activities (D/I), and the socioecologic fra… ales were used to rate construct flexibility from broad to oper… issemination-focused to implementation-focused. All SEF… anization, and individual) applicable to a model were also ex… policy activities were noted.

Evidence synthesis: Sixty-one models were included in this review. Each of the five categories in …ibility and D/I scales had at least four models. Models were distributed across all …e SEF; the fewest models (n=8) addressed policy activities. To assist researchers in …ting and utilizing a model throughout the research process, the authors present and explain examples of how models have been used.

Conclusions: These findings may enable researchers to better identify and select models to inform their D&I work.

(Am J Prev Med 2012;43(3):337–350) © 2012 American Journal of Preventive Medicine

61 Models for D&I Research

Table 2. Categorization of D&I models for use in research studies

Model	Dissemination and/or implementation	Construct flexibility: broad to operational	Socioecologic Level					References
			System	Community	Organization	Individual	Policy	
Diffusion of Innovation	D-only	1		x	x	x		21
RAND Model of Persuasive Communication and Diffusion of Medical Innovation	D-only	1		x	x	x		22
Effective Dissemination Strategies	D-only	2		x	x	x		23
Model for Locally Based Research Transfer Development	D-only	2		x	x			24
Streams of Policy Process	D-only	2	x	x	x		x	25, 26
A Conceptual Model of Knowledge Utilization	D-only	3	x	x			x	27
Conceptual Framework for Research Knowledge Transfer and Utilization	D-only	3			x			28
Conceptualizing Dissemination Research and Activity: Canadian Heart Health Initiative	D-only	3		x	x			29, 30
Policy Framework for Increasing Diffusion of Evidence-Based Physical Activity Interventions	D-only	3	x	x	x		x	31
Blueprint for Dissemination	D-only	4		x	x			32
Framework for Knowledge Translation	D-only	5		x	x	x		33
A Framework for Analyzing Adoption of Complex Health Innovations	D > I	2	x	x	x	x		34, 35
A Framework for Spread	D > I	2		x	x			36, 37

What is RE-AIM

The goal of RE-AIM is to encourage program planners, evaluators, readers of journal articles, funders, and policy-makers to pay more attention to essential program elements including external validity that can improve the sustainable adoption and implementation of effective, generalizable, evidence-based interventions.

The five steps to translate research into action are:

- **Reach** the target population
- **Effectiveness** or efficacy
- **Adoption** by target staff, settings, or institutions
- **Implementation** consistency, costs and adaptions made during delivery
- **Maintenance** of intervention effects in individuals and settings over time

RE-AIM Training Module

http://centertrt.org/

RE-AIM Online Module

This web-based module provides instruction and case examples to illustrate the five dimensions of the RE-AIM framework: **R**each, **E**ffectiveness or efficacy, **A**doption, **I**mplementation, and **M**aintenance. The RE-AIM framework is useful for planning new interventions, adapting existing interventions, and designing evaluations that assess the potential public health impact of interventions. The module provides users examples of real-life application to policy/environmental change interventions.

Click here to register for a username and password to access this training.

Consolidated Framework for Implementation Research

- Home
- CFIR Constructs
- Design an Evaluation
  - Overview
  - Qualitative Data
  - Quantitative Data
  - Implementation Outcomes
- Design an Implementation Strategy
- Tools and Templates
  - Interview Guide
- Published Studies
- Additional Resources
- Participate

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 the CFIR
- Benefits of using the CFIR
- Published Citations of the CFIR
- Future Plans for the CFIR

What is the CFIR?

- A menu of constructs associated with effective implementation
- Pulled from many D&I relevant theories
- Alternative to the attempt to “find the perfect theory”
- Practical guide for systematically assessing potential barriers and facilitators in preparation for implementing an innovation
- Theory-based constructs for developing context-specific logic models

Construct		Short Description
I. INTERVENTION CHARACTERISTICS		
A.	Intervention Source	Perception of key stakeholders about whether the intervention is externally or internally developed.
B.	Evidence Strength & Quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.
C.	Relative Advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.
D.	Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.
E.	Trialability	The ability to test the intervention on a small scale in the organization, and to be able to reverse course (undo implementation) if warranted.
F.	Complexity	Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement.
G.	Design Quality & Packaging	Perceived excellence in how the intervention is bundled, presented, and assembled.
H.	Cost	Costs of the intervention and costs associated with implementing the intervention including investment, supply, and opportunity costs.

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 are in a bid for a competitive edge.
D.	External Policy & Incentives	A broad construct that includes external strategies to spread interventions including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.

III. INNER SETTING		
A.	Structural Characteristics	The social architecture, age, maturity, and size of an organization.
B.	Networks & Communications	The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization.
C.	Culture	Norms, values, and basic assumptions of a given organization.
D.	Implementation Climate	The absorptive capacity for change, shared receptivity of involved individuals to an intervention, and the extent to which use of that intervention will be rewarded, supported, and expected within their organization.
1.	Tension for Change	The degree to which stakeholders perceive the current situation as intolerable or needing change.
2.	Compatability	The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.
3.	Relative Priority	Individuals' shared perception of the importance of the implementation within the organization.
4.	Organizational Incentives & Rewards	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary, and less tangible incentives such as increased stature or respect.
5.	Goals & Feedback	The degree to which goals are clearly communicated, acted upon, and fed back to staff, and alignment of that feedback with goals.
6.	Learning Climate	A climate in which: a) leaders express their own fallibility and need for team members' assistance and input; b) team members feel that they are essential, valued, and knowledgeable partners in the change process; c) individuals feel psychologically safe to try new methods; and d) there is sufficient time and space for reflective thinking and evaluation.

E.	Readiness for Implementation	Tangible and immediate indicators of organizational commitment to its decision to implement an intervention.
1.	Leadership Engagement	Commitment, involvement, and accountability of leaders and managers with the implementation.
2.	Available Resources	The level of resources dedicated for implementation and on-going operations, including money, training, education, physical space, and time.
3.	Access to Knowledge & Information	Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.

IV. CHARACTERISTICS OF INDIVIDUALS		
A.	Knowledge & Beliefs about the Intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.
B.	Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals.
C.	Individual Stage of Change	Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention.
D.	Individual Identification with Organization	A broad construct related to how individuals perceive the organization, and their relationship and degree of commitment with that organization.
E.	Other Personal Attributes	A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.

IV. PROCESS		
A.	Planning	The degree to which a scheme or method of behavior and tasks for implementing an intervention are developed in advance, and the quality of those schemes or methods.
B.	Engaging	Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role modeling, training, and other similar activities.
1.	Opinion Leaders	Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention.
2.	Formally Appointed Internal Implementation Leaders	Individuals from within the organization who have been formally appointed with responsibility for implementing an intervention as coordinator, project manager, team leader, or other similar role.
3.	Champions	Individuals who dedicate themselves to supporting, marketing, and 'driving through' an implementation, overcoming indifference or resistance that the intervention may provoke in an organization.
4.	External Change Agents	Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.

C.	Executing	Carrying out or accomplishing the implementation according to plan.
D.	Reflecting & Evaluating	Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.

Evidence-based intervention: Children who eat federally provided school lunch in the US consume a more nutritious diet. BUT.. With new healthier guidelines, they are not eating the school lunch as often.

Taste Texting: Using Technology and D&I strategies to Increase Participation in the School Lunch Program

School Lunch Challenges – *High school student* perspective

- Short lunch period
- Long lines
- Lunch period is needed for extracurriculars, homework
- “Healthy” not a priority

TASTE TEXTING

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School Lunch Challenges – *School Food Service perspective*

- Increasing demand for healthy school lunch
- New federal standards require healthier foods – not all kids are loving it
- Healthier menu items can be more expensive
- Fewer school lunch customers at high school level

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Is it possible to…?

- Encourage students to buy healthy school lunch options?
- Make school lunch more convenient for students?
  - Increase participation in school lunch?

Now that school lunch is healthier…

.. AND the only options for text ordered meals are healthier…

The outcome of interest becomes PARTICIPATION in the school lunch program

Taste Texting

Text/Web system to pre-order school lunch

- Students prompted via text message to pre-order lunch
- Only healthiest menu options available for pre-order
- Students text their lunch choice
- Pre-ordered lunches pick up at a separate kiosk

TASTE TEXTING

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Taste Texting

Text/Web system to pre-order school lunch

- Uses Behavioral economics principles
  - Incentivizing with convenience
  - Less distracted context for lunch decision
  - Pre-selection

Cornell Center for Behavioral Economics in Child Nutrition Programs

TASTE TEXTING

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Implementation Challenges

- There is a lot of “push-back” by parents ad kids about healthier school lunch requirements
- Putting together combinations that qualify for reimbursable meals – required nutrients
- Negotiating with school food vendor about which menu options to offer

Dissemination Challenges and Opportunities

- How to scale up? Can the software handle hundreds of schools? Will all kids have access?
- Can it be sustained without the research infrastructure
- Who are the stakeholders and what are their vested interests that might help with dissemination?

OVERALL - Keys to success

- Think creatively about study design and measures
- Look behind the “evidence” of evidence-based
- Learn to appreciate the value of “process measures”
- Use D&I principles to do good formative/community engaged work and good research will follow
- Be creative and entrepreneurial, seize the opportunities
- As with all things – have a sense of humor!

Questions??

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