Dissemination & Implementation
Science and Public Health:
An Ecological Perspective

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Presentation Goals

• Rationale for D & I research and brief review of its history in U.S.
• D & I core research processes: Social networks and organizational theory
• Misguided assumptions and need for public health and ecological approach
• New rules, final thoughts, and a favorite quote
TRANSLATIONAL SCIENCE AND THE VALLEYS OF DEATH
• Newest NIH Institute established in 2011 to transform the translational science process so that new treatments and cures for disease can be delivered to patients faster

• NIH Clinical and Translational Science Award (CTSA) program funds 62 centers to advance translational science
Pasteur’s Quadrant
Science Serves Society

Donald Stokes, 1997
Translational Science

Knowledge Integration

- Discovery
- Development of promising tests or interventions
- Population Health Impact
- Evidence based Recommendation or Policy
- Healthcare Systems & Prevention Programs

Translational Science

Adapted from: Khoury et al. Genetics in Med (2007)
Research to Practice?

The 17-year odyssey

- Priorities for research funding
- Peer review of grants
- Publication priorities and peer review
- Academic appointments, promotion, and tenure criteria
- Research synthesis
- Evidence-based medicine movement
- Guidelines for evidence-based practice

Practice
- Funding; population needs, demands; local practice circumstances; professional discretion; credibility and fit of the evidence.

Green et al. (2009)
Standard Research Model: From Bench to Bookcase

Babcock-Parziale & Glascow (2012)
**JASPA: Journal Associated Score of Personal Angst**

**J:** Are you ambivalent about renewing your JOURNAL subscriptions?

**A:** Do you feel ANGER towards prolific authors?

**S:** Do you ever use journals to help you SLEEP?

**P:** Are you surrounded by PILES of PERIODICALS?

**A:** Do you feel ANXIOUS when journals arrive?

YOUR SCORE? (0 TO 5)

0 (liar?)

1-3 (normal range)

>3 (sick)

*Modified from: BMJ 1995;311:1666-1668*
Problems with Efficacy Trials Taking *Fast Track* to Scale

![Bar chart showing percentages for different stages of Conduct Disorder treatment](chart.png)

- **Screened**: 17.5%
- **Treated**: 8.75%
- **Completed**: 4.38%
- **Successful**: 2.18%

*From Dodge (2009)*
ENTER DISSEMINATION AND IMPLEMENTATION RESEARCH
Dissemination and Implementation

**Dissemination** (from lat. *disseminare* "scattering seeds")

- The act of *spreading something*, esp. information, widely
- To broadcast a message *without direct feedback*

**Implementation** (from lat. *Implere* “fill up”)

- The process of *putting a decision or plan to effect*
- Moving an idea from concept to reality
• Reach
  – Broad, heterogeneous, & representative sample
• Effectiveness
  – Feasible interventions not requiring high expertise
• Adoption
  – Able to be adapted to fit setting
• Implementation
  – Implemented widely across staff or users
• Maintenance
  – Sustainability key issue for evaluation

*Glasgow et al. (1999)*
D & I: 61 Models to Choose From!
The Backbone of D & I

Diffusion of Innovation

ADOPTERS' CATEGORIES BASED ON INNOVATIVENESS

- Innovators: 2.5%
- Early Adopters: 13.5%
- Early Majority: 34%
- Late Majority: 34%
- Laggards: 16%

Everett Rogers
1931 - 2004
History of Diffusion Research in U.S.

• 1938 Bowers studied ham radio use in the U.S.
  – *First evidence that users rely more on personal feedback from other users than on mass media*

• 1943 Ryan & Gross studied hybrid seed corn use by Iowa farmers
  – *Adoption a result of (a) exposure to media to provide information and (b) interpersonal ties to model use*

• 1966 Coleman et al. studied effects of ads for use of new drug (Tetracycline) by physicians
  – *More interpersonal networks led to greater use*
Physician Network in Coleman et al. 1966

Chief of Staff

Valente & Fosados, 2006
Spread of Obesity over 32 Years

- Ongoing study of risk factors for heart disease
- Over 5,000 residents followed since 1948 (thru three generations)
- Framingham Risk Score predictive of heart disease
- NEJM study of social network effects on obesity

Christakis & Fowler (2007)
Social Network Effects

- Ego-perceived friend
- Mutual friend
- Alter-perceived friend
- Same-sex friend
- Opposite-sex friend
- Spouse
- Sibling
- Same-sex sibling
- Opposite-sex sibling
- Immediate neighbor

Increase in Risk of Obesity in Ego (%)

171%
HIV Risk Prevention

- 1991 Kelly et al. studied popular opinion leader influence on sexual risk taking in gay clubs in Southeast
- First experimental study of KOL as an intervention in behavioral health
Social Networks: Burt’s Two-Step Diffusion Theory

- **Step 1**
  - Information is spread via cohesion (direct relationships)

- **Step 2**
  - Adoption and use spread via structural similarity (similar roles)
Teacher KOL Influence Network:

Diffusion of Peer Assisted Learning

Cohesion
For each additional 1 use by teacher A this week, the target teacher is expected to use the strategy an additional 0.025 times in the next two weeks.

Structural Similarity
For each additional 1 use by teacher C this week, the target teacher is expected to use the strategy an additional 0.426 times in the next two weeks.

Watling-Neal et al. (2011). Social Development, 20, 376-393
Summary of KOL Influence: A Process not a Program

- KOLs are influential peers not intervention champions (unless you earn it)
- KOLs operate within a highly individualized social influence network (usually takes more than one)
- KOLs matter (for influence) but peers matter too (for adoption)
- Respect the laggards (they may know more than you think)
Charles Glisson
Organizational Social Processes

A Model of Organizational Social Context

Glisson (2002)
Culture and Climate
CG’s Greatest Hits

1998 - 32 social service agencies, 3 years, 250 children
  – Positive organizational climate predicted positive youth outcomes and quality of service

2001 - ER room social climate in four hospitals
  – Social support to families related to positive relations among staff and more positive work environments

2002 – 283 child welfare and juvenile justice case workers
  – Team-level climate and culture related to job satisfaction, service quality, and turnover
ARC: Availability, Responsiveness, & Continuity

RCT with 26 case management teams reduced turnover by two-thirds (2006) and showed differential effect of MST (2010)
Summary of Organizational Theory

- Culture and climate of organizations have large influences on use of practices
- Organizations can change to foster effective work environments
- This adds another dimension to understanding use of practices

People matter and the settings in which they work matter too. Can’t change one without the other?
Next issue: Dissemination and implementation of what to whom?
A Few Misguided Assumptions for D & I in Mental Health

• That we know what to disseminate
  – Faith based evidence based practices*
• That EBPs are appropriate for all communities
  – Of clients, providers, and settings?
• That we can overcome limitations of efficacy trials with new tricks
  – Efficacy - *noun* the ability to produce a *desired or intended result*

*Ed Trickett, Personal Communication*
750 Evidence Based Treatments for Youth!

• All these keys searching for locks*
• Do we need all these keys?
• Are there others we haven’t considered?
• **Who gets to decide?**

Clinical Representativeness
Child Intervention Research

Weisz et al., 2005
A. ‘Program Drift’

- Time: T₀ → T₁ → T₂ → Tₙ
- Evidence: Intervention X

B. ‘Voltage Drop’

- Research Stage: Efficacy Trial → Effectiveness Trial → D and I Trial
SO HOW CAN WE DO THIS BETTER?
Public Health Model

- Tertiary
  - Provide interventions for children experiencing maltreatment

- Secondary
  - Programs targeted at families in need to alleviate identified problems and prevent escalation

- Primary/Universal
  - Programs targeted at entire population in order to provide support and education before problems occur

The Public Health Model

1. Define the problem
2. Identify causes
3. Develop and test prevention strategies
4. Assure widespread adoption
Social Marketing
New Influenza A (H1N1),
Number of laboratory confirmed cases and deaths as reported to WHO

Status as of 11 May 2009
06:00 GMT

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Map produced: 11 May 2009 06:00 GMT
Swine Flu

Dirty Hands Spread Infection. Wash up.
National Focus on Children’s Mental Health

First ever Surgeon General report on mental health (1999)
• Children’s mental health a national priority
• Current system inadequate to meet needs

President’s New Freedom Commission on Mental Health (2003)
  Mental health services “fragmented, disconnected, and inadequate.”
Service Use by Sector
Great Smokey Mountain Study

Sole Source of Services (1 Year)

Percentage

None Mild High

Level of Need

Burns et al., 1995
Children’s Unmet Need for Mental Health Services Across 13 States

Sturm et al. (2003)
Mental Health Service Use for Children with Identified Disorder

National Health and Nutrition Examination Survey, 2014
Mental Health Service Use for Children with Identified Disorder

National Health and Nutrition Examination Survey, 2014
need for service
poverty gap

U.S. Mental Health Services, Children 4-17, 2004
Public Health Model
Building a Base

Mental health services

Universal

Targeted

Intensive
Institute of Medicine
Prevention of Children’s Mental Health Disorders

Preventing Mental, Emotional, and Behavioral Disorders Among Young People
Progress and Possibilities

2009
ECOLOGICAL THEORY: A RETURN TO OUR SENSES?
Ecological Theory

- Interacting nature of natural contexts and their impact on growth and development (1979)
- Communities are dynamic systems in which individuals adapt behavior to align with setting goals and mores (1966)
- Reciprocal relations among natural elements in an environment (Eternity)
Sustainability
noun

• Able to be maintained at a certain rate or level

• Conserving an ecological balance by avoiding depletion of natural resources

• Able to be upheld or defended (or explained)
Ecological Models

Intervention Implications

• Behavior is influenced by multiple levels of the ecological environment
  – *Behavior is understood as adaptive given specific contexts*

• Enhancing local resources and serving community development
  – *Interventions driven by local norms and values*

• Sustainability occurs when interventions are valued by those within a setting
  – *It’s not resistance if it doesn’t work for me*
Advantages of Ecological Models

• Accessible to families who do not normally receive services
• Redefine effectiveness to enhance functional outcomes (hint: we don’t get to decide)
• Sustainability enhanced if services matched to goals of persons and settings
• Redefine evidence base to focus on “who” and “how” and not just “what”
Mental Health in Context: New Rules for Intervention

• Start with an important setting and consider its primary mission as a mental health goal
  – Services support settings (not the other way)
• Align mental health resources to support setting goals before considering other goals
  – Ask not what schools can do for mental health . . .
• Always think sustainability (no shortcuts)
  – Their goals, their program, their data
Links to Learning Service Model

**KOL Teachers**
- Teachers
- Effective Instruction
- CR Management
- Parent Outreach

**MH Providers**

**Parents**
- Home-Based
- School-Linked

**Parent Advocates**

**School Behavior**

**Academic Achievement**

**Home Behavior**
Advancing Public Health for Mental Health: Taking Settings Seriously

• Expanded mental health workforce
  – From a limited number of trained professionals to include the people most important to children’s development

• Realigned mental health resources
  – To effect the key predictors that promote successful adaptation in important settings

• Prioritize settings over programs
  – Adaptation reflects setting priorities not deviations from fidelity

• A natural extension from prevention to intervention
  – To enhance natural setting goals and promote positive adaptation

Atkins & Frazier (2011)
Ecologically Valid D & I
End the Silos, Break Up the Academy!

• Programs don’t help kids – People help kids
• Mental health rivals NIH in the use of acronyms. Time to stop the flag waving!
• Mental Health is embedded in experiences – hospitals (and clinics) are not
• Big problems need team science – “The world has problems and universities have departments”*

*Brewer (1999)
Final Thoughts

Advances in D & I Science acknowledge a new appreciation for the complexity of behavior change and the need for science to serve society.

But consideration of the important public health concerns facing our nation suggests a reprioritization of research goals from programs to processes.

And a return to a realistic understanding that behavior is best understood in ecological context and functioning well is what matters most to children’s mental health and well-being.
So Too Mental Health?

“It is the pervading law of all things organic and inorganic,
Of all things physical and metaphysical,
Of all things human and all things super-human,
Of all true manifestations of the head,
Of the heart, of the soul,
That the life is recognizable in its
Expression, 
*That form ever follows function*.
This is the law.”

Louis Sullivan (1896)