## Dissemination & Implementation Science and Public Health: An Ecological Perspective

NCRE II Annual Conference University of Colorado Denver September 18, 2014 Marc S. Atkins, Ph.D.
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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

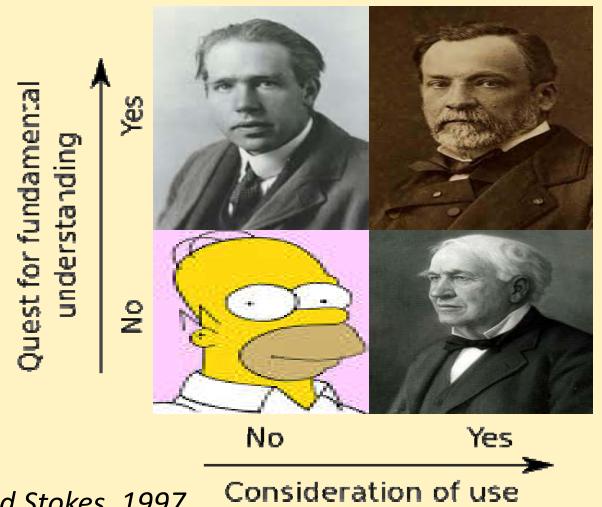
# TRANSLATIONAL SCIENCE AND THE VALLEYS OF **DEATH**



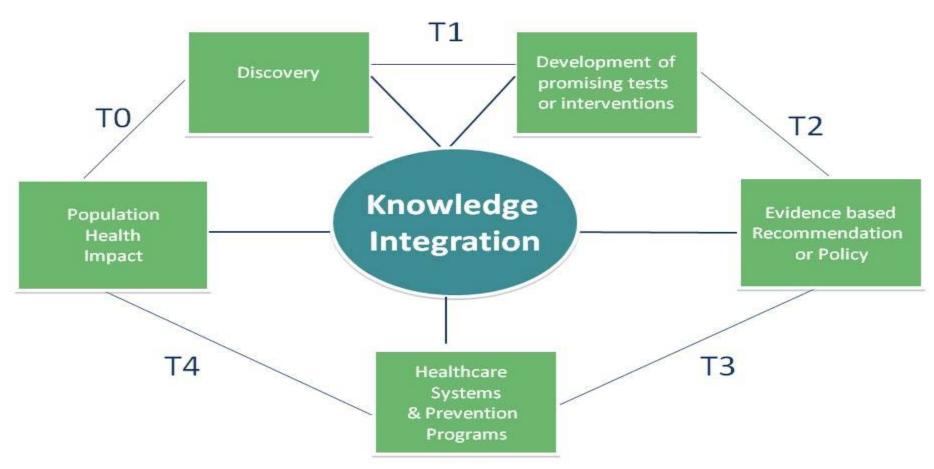


- Newest NIH Institute established in 2011 to transform the translational science process so that new treatments and cures for disease can be delivered to patients faster
- NIH Clinical and Translational Science Award (CTSA) program funds 62 centers to advance translational science

#### Pasteur's Quadrant Science Serves Society

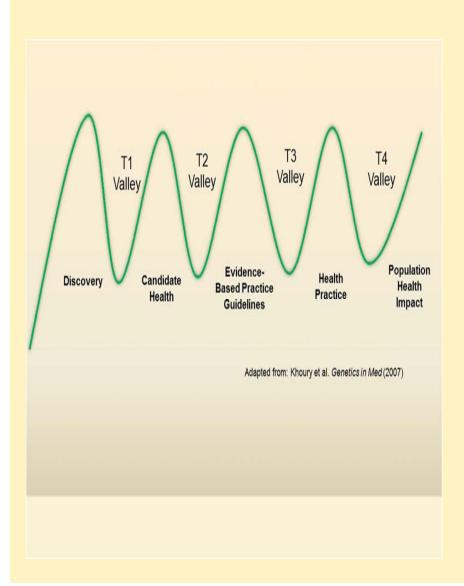


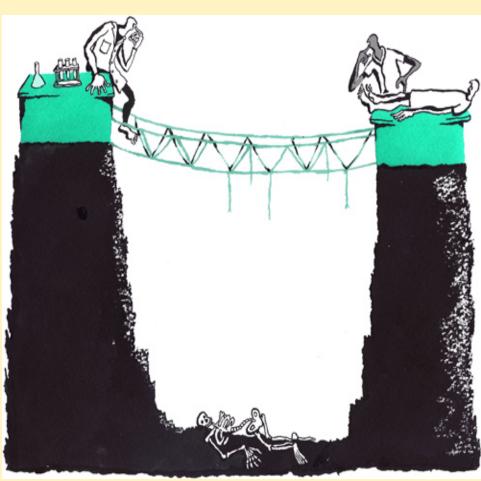
#### **Translational Science**



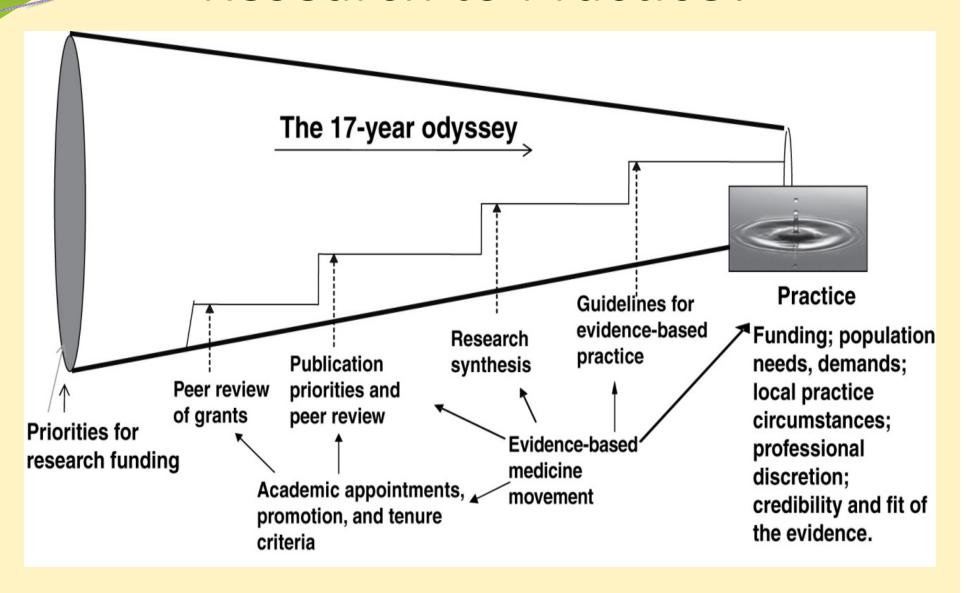
Modified from Khoury M et al. 2007. Genetics in Medicine.

#### **Translational Science**



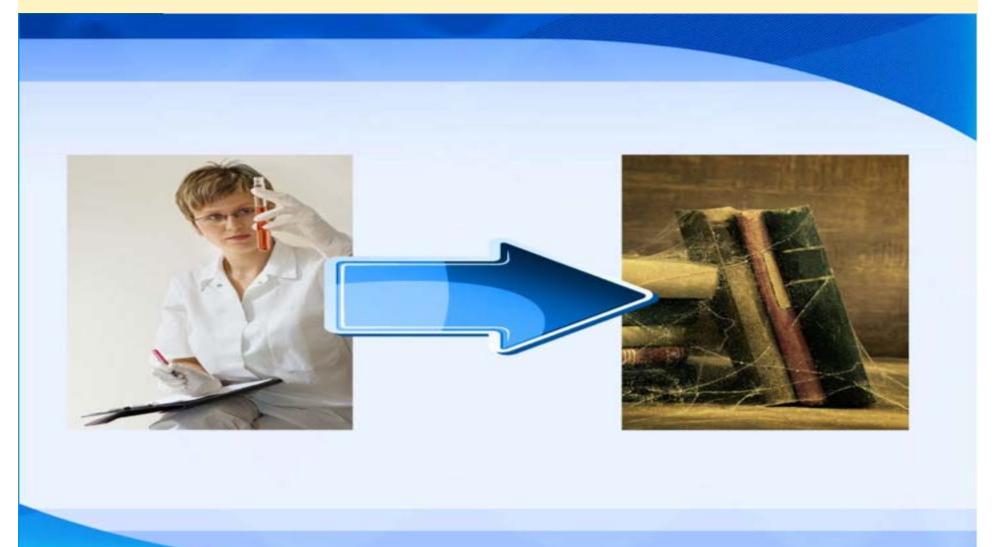


#### Research to Practice?



Green et al. (2009)

#### Standard Research Model: From Bench to Bookcase



#### JASPA: Journal Associated Score of Personal Angst

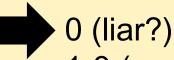
J: Are you ambivalent about renewing your JOURNAL subscriptions?

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

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

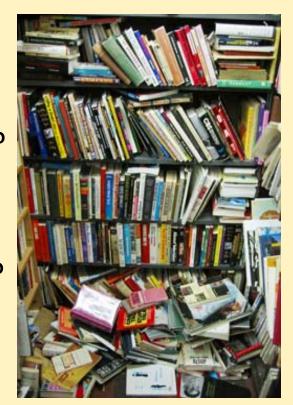
P: Are you surrounded by PILES of PERIODICALS?

**A:** Do you feel **ANXIOUS** when journals arrive? YOUR SCORE? (0 TO 5)



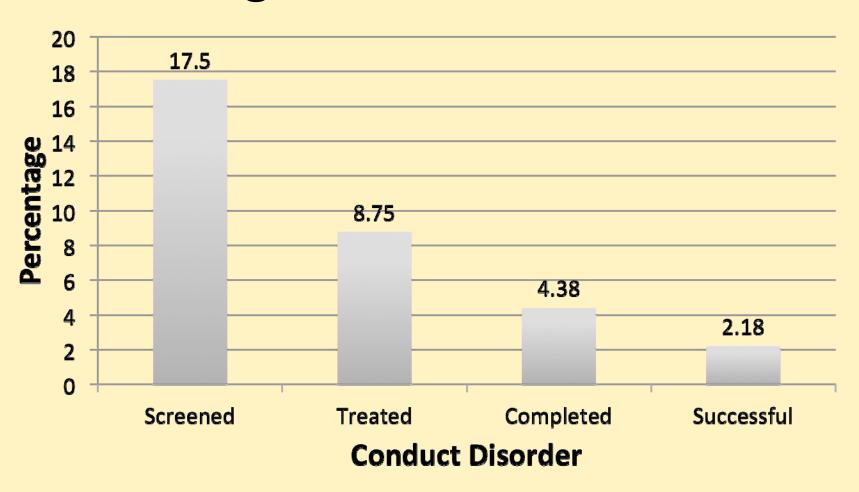
1-3 (normal range)

>3 (sick)



Modified from: BMJ 1995;311:1666-1668

## Problems with Efficacy Trials Taking *Fast Track* to Scale



# **ENTER DISSEMINATION** AND IMPLEMENTATION **RESEARCH**

#### Dissemination and Implementation

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

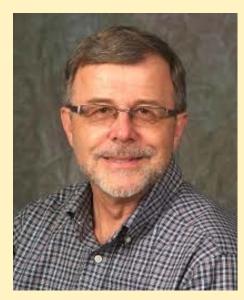
- The act of spreading something, esp. information, widely
- To broadcast a message without direct feedback

Implementation (from lat. Implere "fill up")

- The process of putting a decision or plan to effect
- Moving an idea from concept to reality

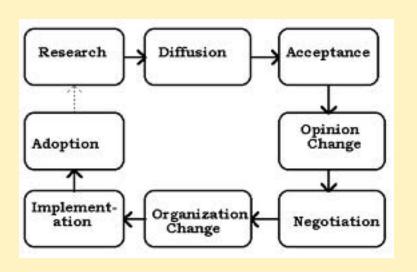


- Reach
  - Broad, heterogeneous, & representative sample
- Effectiveness
  - Feasible interventions not requiring high expertise
- Adoption
  - Able to be adapted to fit setting
- Implementation
  - Implemented widely across staff or users
- Maintenance
  - Sustainability key issue for evaluation

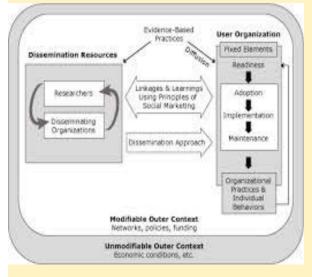


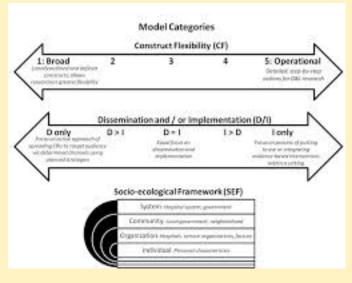
Russell Glasgow

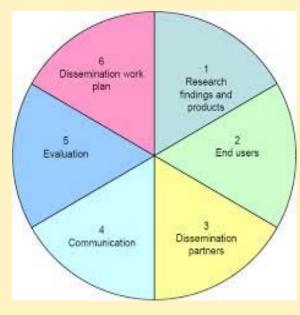
#### D & I: 61 Models to Choose From!



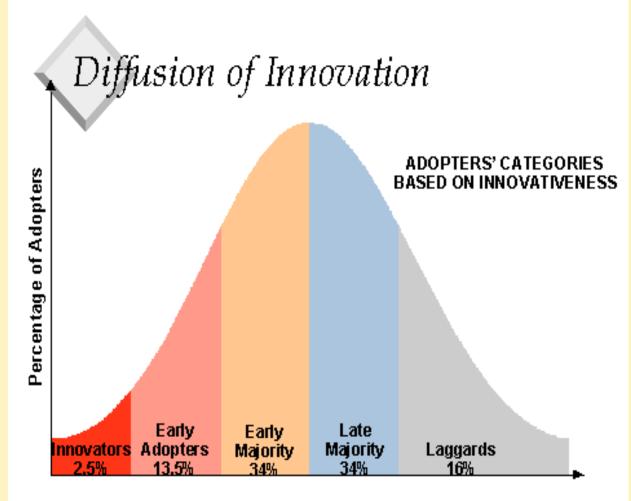


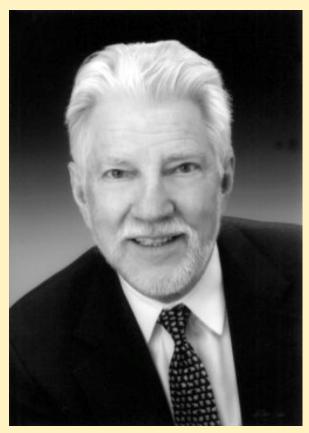






#### The Backbone of D & I



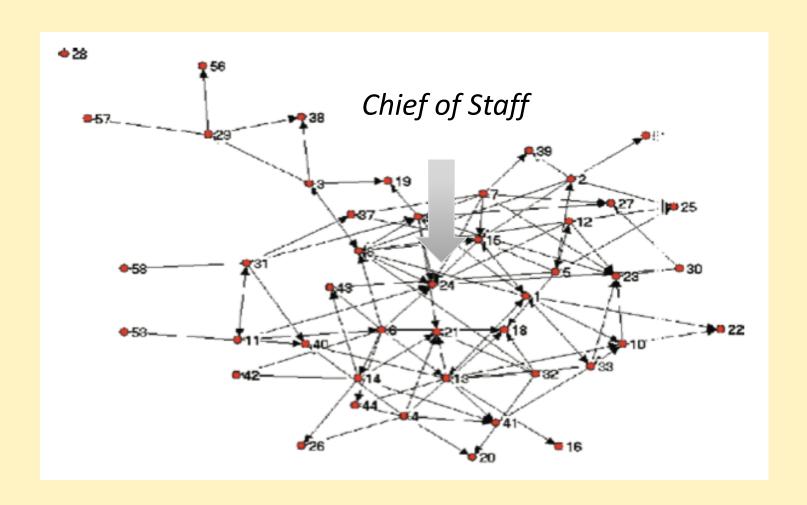


Everett Rogers 1931 - 2004

#### History of Diffusion Research in U.S.

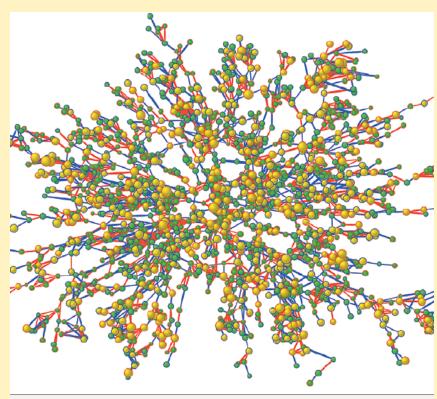
- 1938 Bowers studied ham radio use in the U.S.
  - First evidence that users rely more on personal feedback from other users than on mass media
- 1943 Ryan & Gross studied hybrid seed corn use by lowa farmers
  - Adoption a result of (a) exposure to media to provide information and (b) interpersonal 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



Valente & Fosados, 2006

#### Spread of Obesity over 32 Years

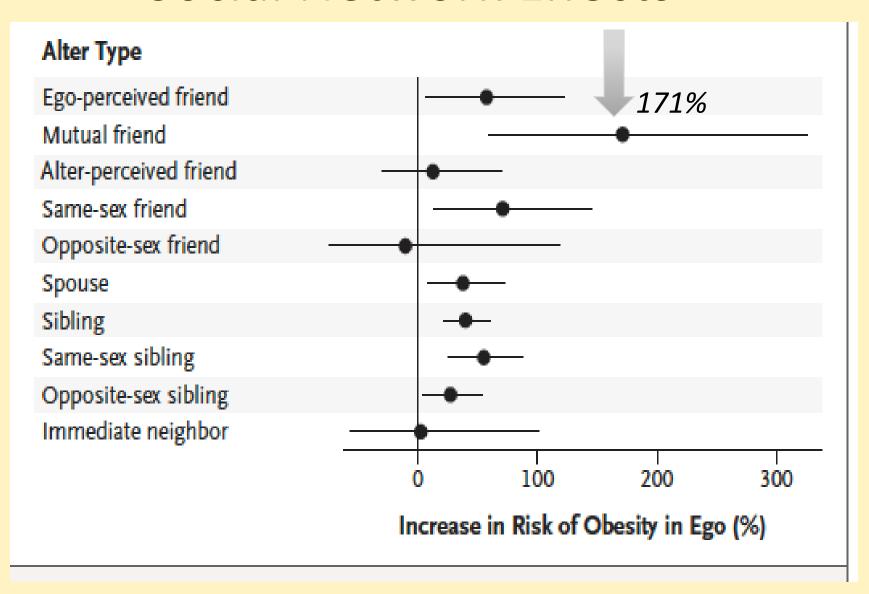


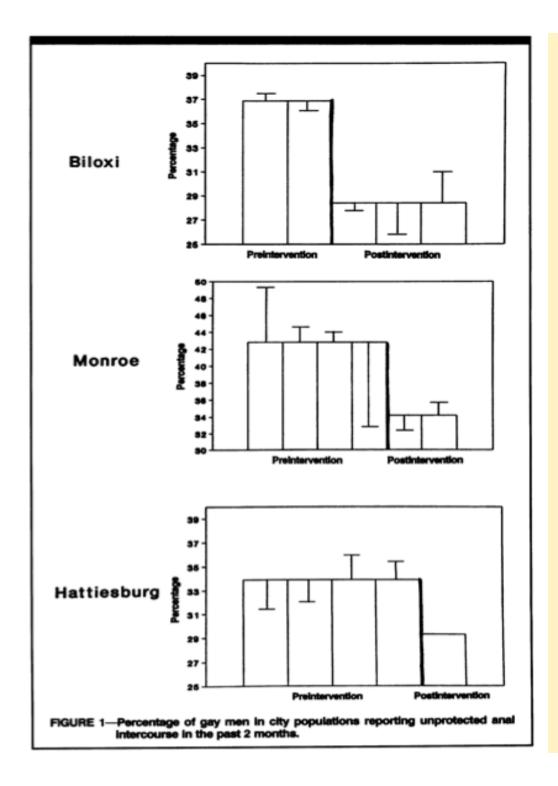
est Connected Subcomponent of the Social Network in the Framingham Heart Study in the ode) represents one person in the data set. There are 2200 persons in this subcomponent les with red borders denote women, and circles with blue borders denote men. The size on the person's body-mass index. The interior color of the circles indicates the person's obsides an obese person (body-mass index, ≥30) and green denotes a nonobese person. The color the nodes indicate the relationship between them: purple denotes a friendship or marital timilial tie.

- 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





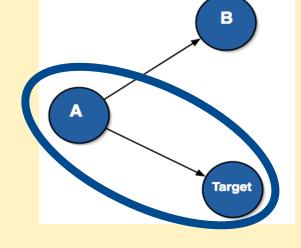
## HIV Risk Prevention

- 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

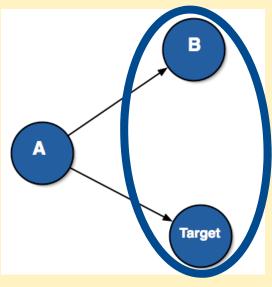
#### Step 1

 Information is spread via cohesion (direct relationships)

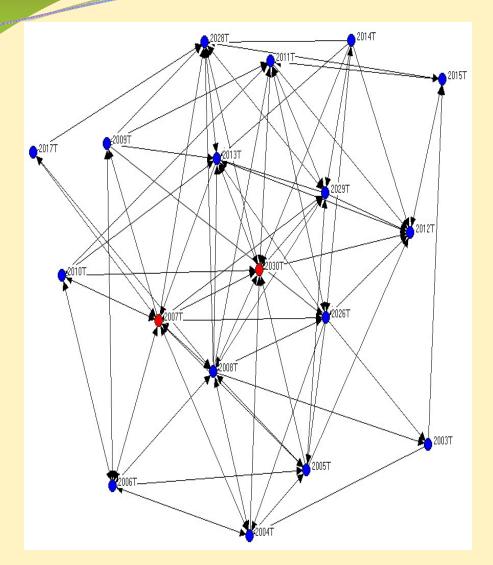


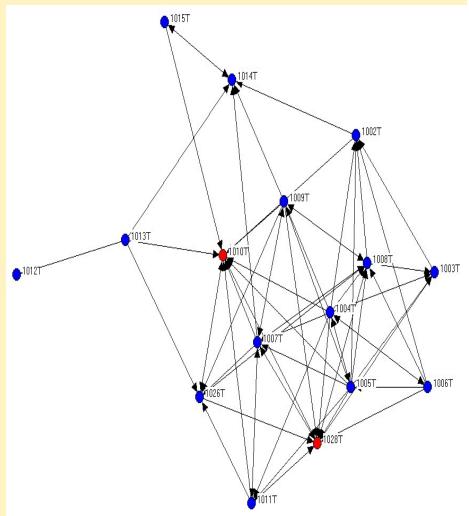
#### Step 2

 Adoption and use spread via structural similarity (similar roles)



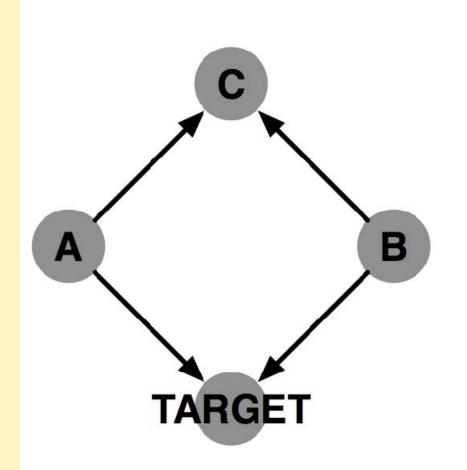
#### **Teacher KOL Influence Network:**





Watling-Neal et al. (2011). AJCP, 47, 277-286.

#### **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 .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 .426 times in the next two weeks.

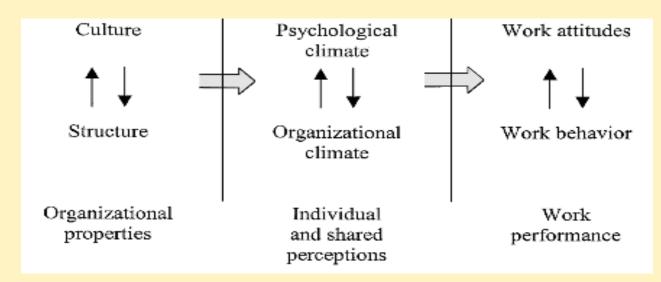
Watling-Neal et al. (2011). Social Development, 20, 376-393

#### 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





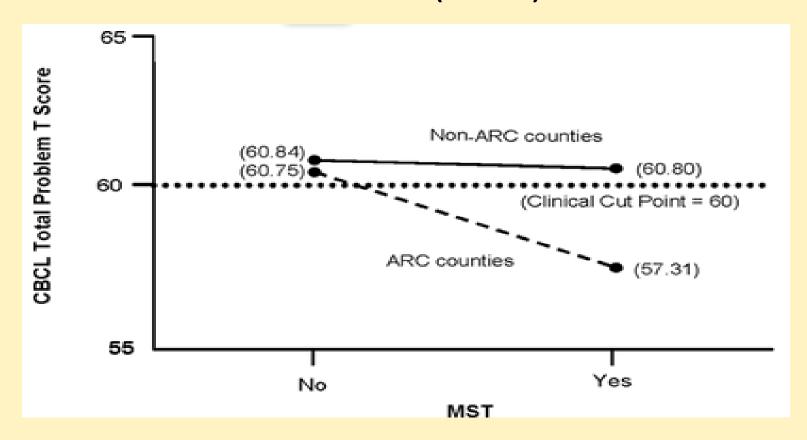
Glisson (2002)

## 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?



## 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

<sup>\*</sup>Ed Trickett, Personal Communication

## 750 Evidence Based Treatments for Youth!

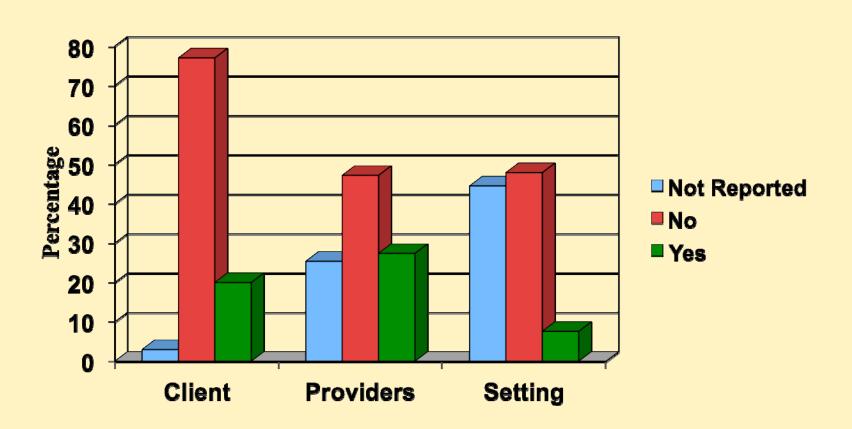
- All these keys searching for locks\*
- Do we need all these keys?
- Are there others we haven't considered?
- Who gets to decide?



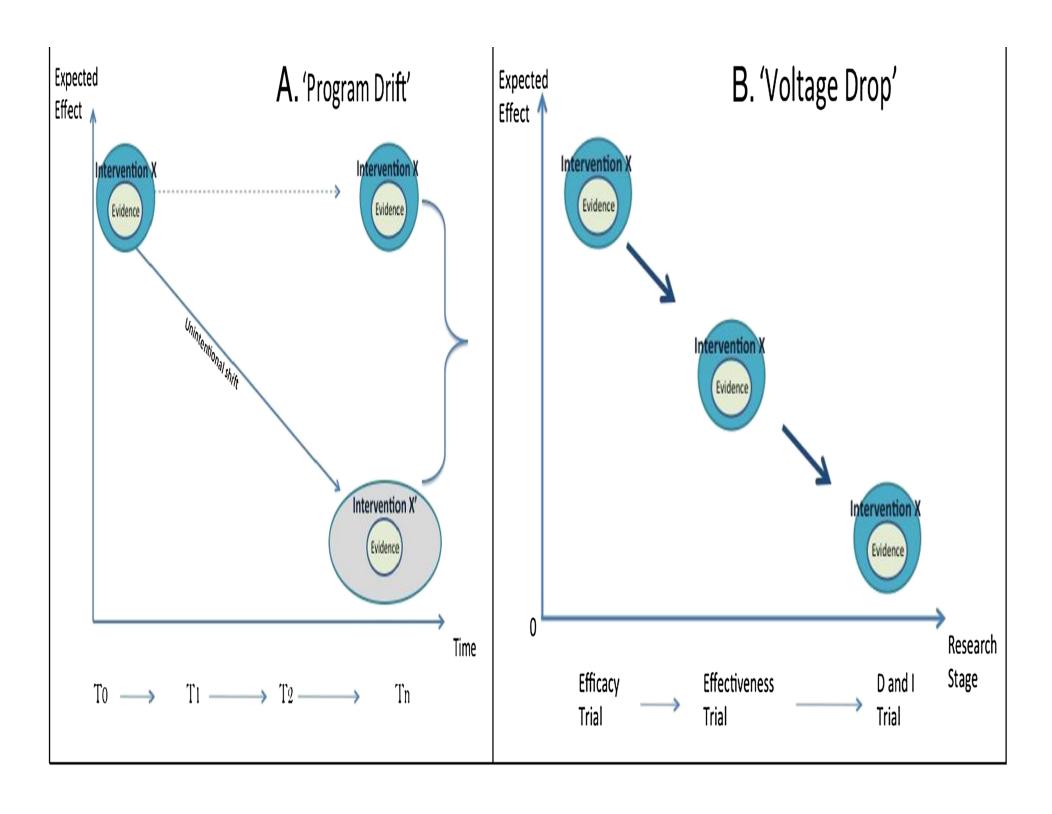


\*Bruce Chorpita (2013). ABCT Annual Meeting. Chorpita et al. (2011)

## Clinical Representativeness Child Intervention Research

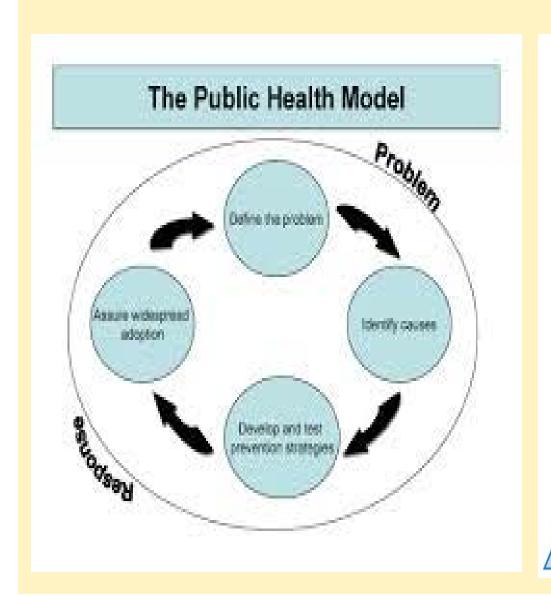


Weisz et al., 2005



# 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

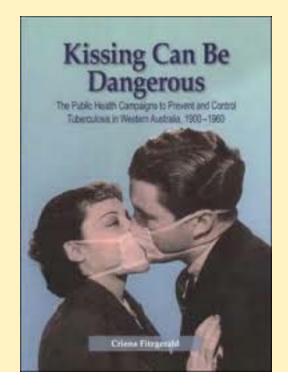
#### Primary/Universal

Programs targeted at entire population in order to provide support and education before problems occur

## Social Marketing





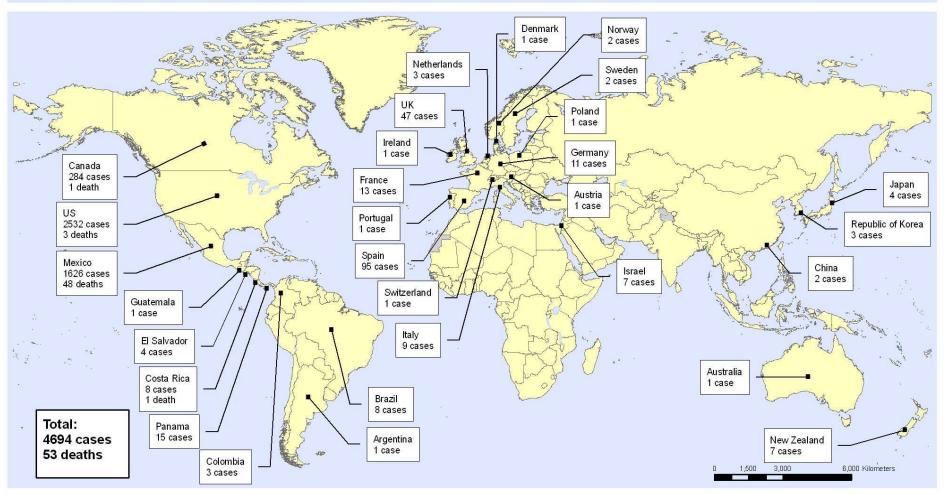






#### New Influenza A (H1N1), Number of laboratory confirmed cases and deaths as reported to WHO

#### 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.

Data Source: World Health Organization Map Production: Public Health Information and Geographic Information Systems (GIS) World Health Organization



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Map produced: 11 May 2009 06:00 GMT

#### Swine Flu













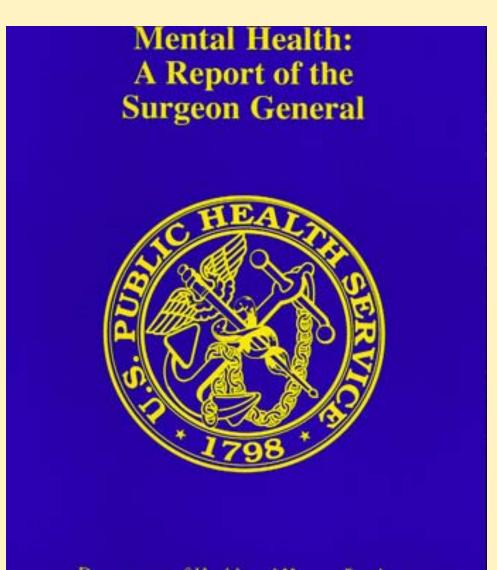
National Focus on Children's Mental Health

First ever Surgeon General report on mental health (1999)

- Children's mental health a national priority
- •Current system inadequate to meet needs

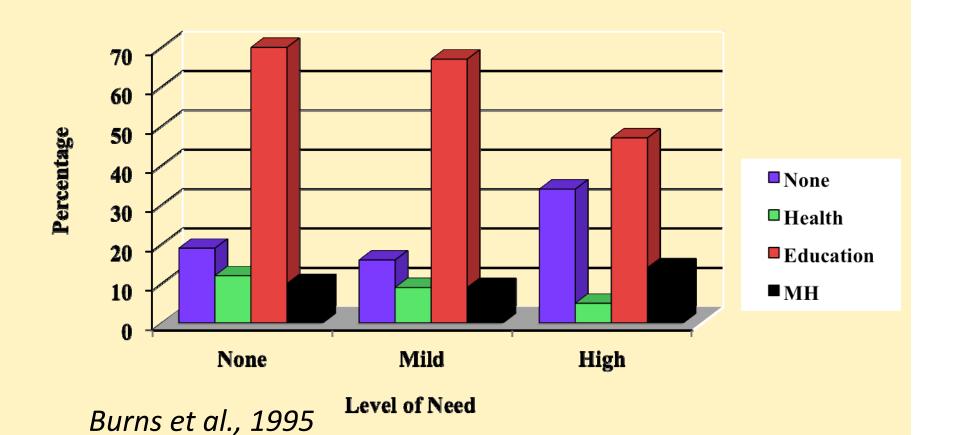
President's New Freedom Commission on Mental Health (2003)

Mental health services "fragmented, disconnected, and inadequate."

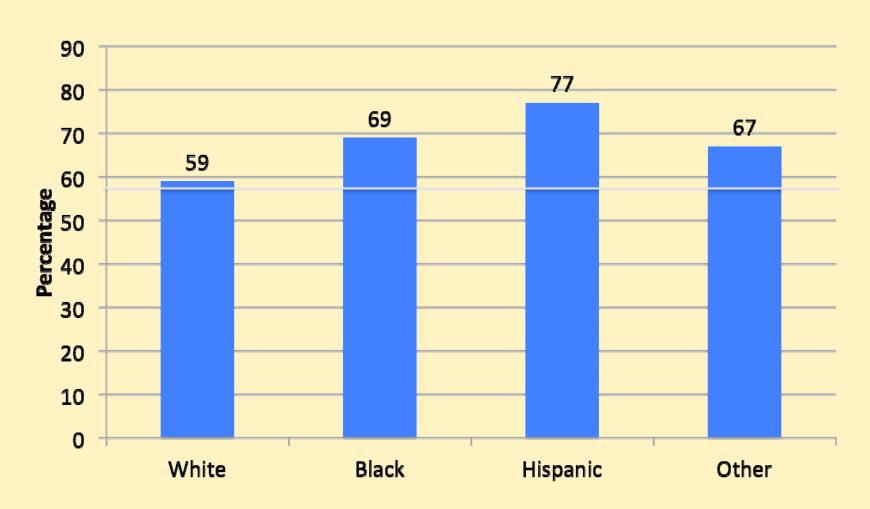


## Service Use by Sector Great Smokey Mountain Study

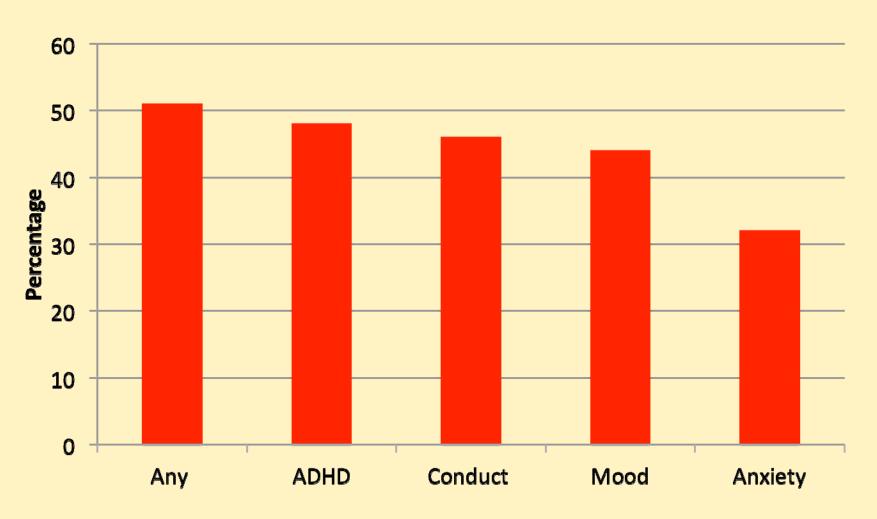
Sole Source of Services (1 Year)



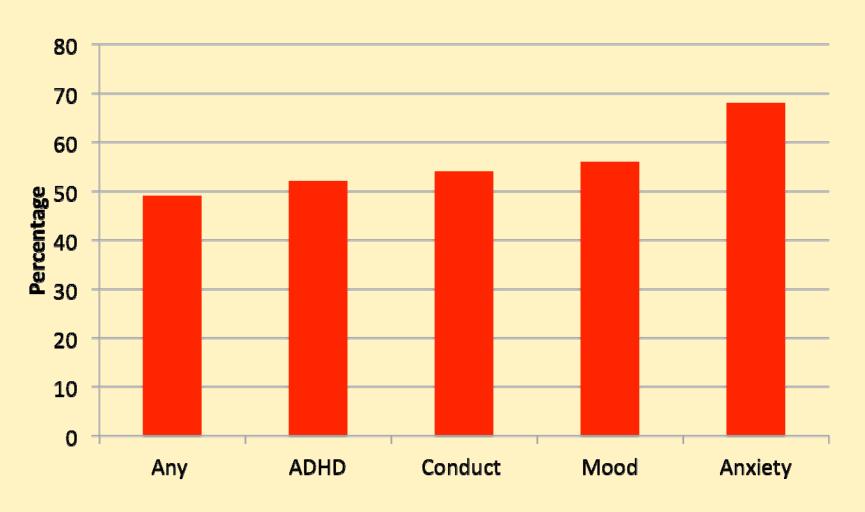
# Children's Unmet Need for Mental Health Services Across 13 States



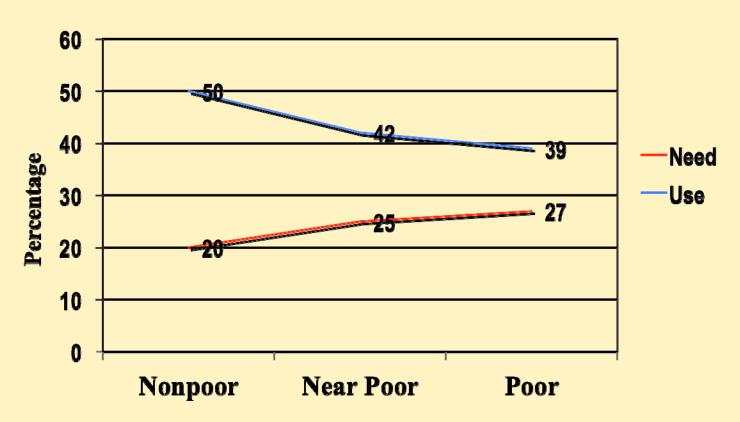
# Mental Health Service Use for Children with Identified Disorder



# Mental Health Service Use for Children with Identified Disorder

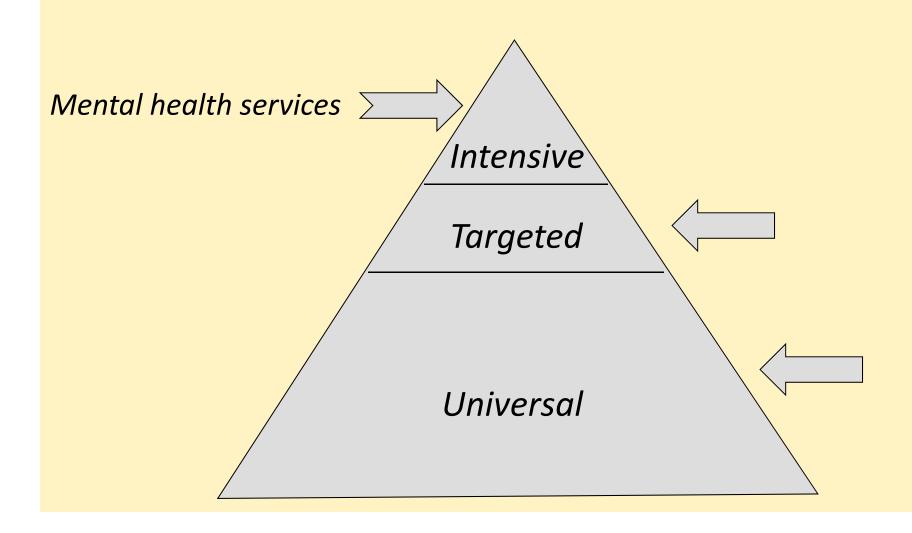


## Need For Service Poverty Gap

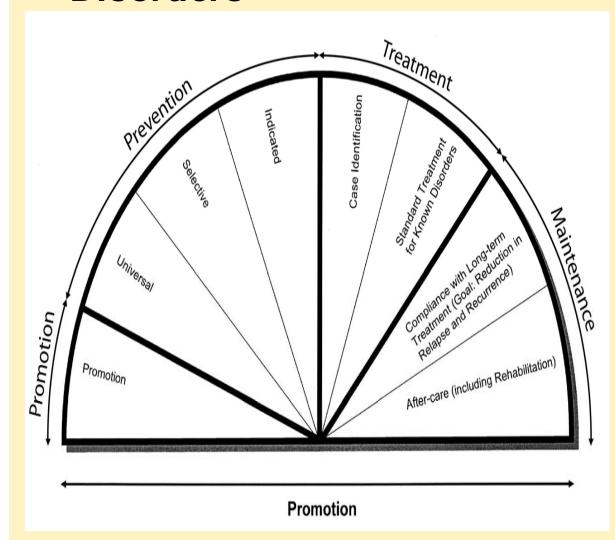


U.S. Mental Health Services, Children 4-17, 2004

## Public Health Model Building a Base

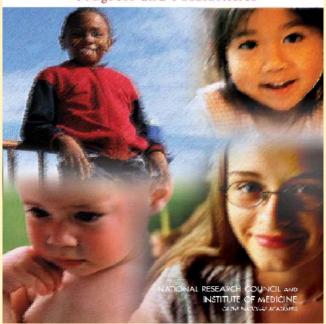


# Institute of Medicine Prevention of Children's Mental Health Disorders



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"

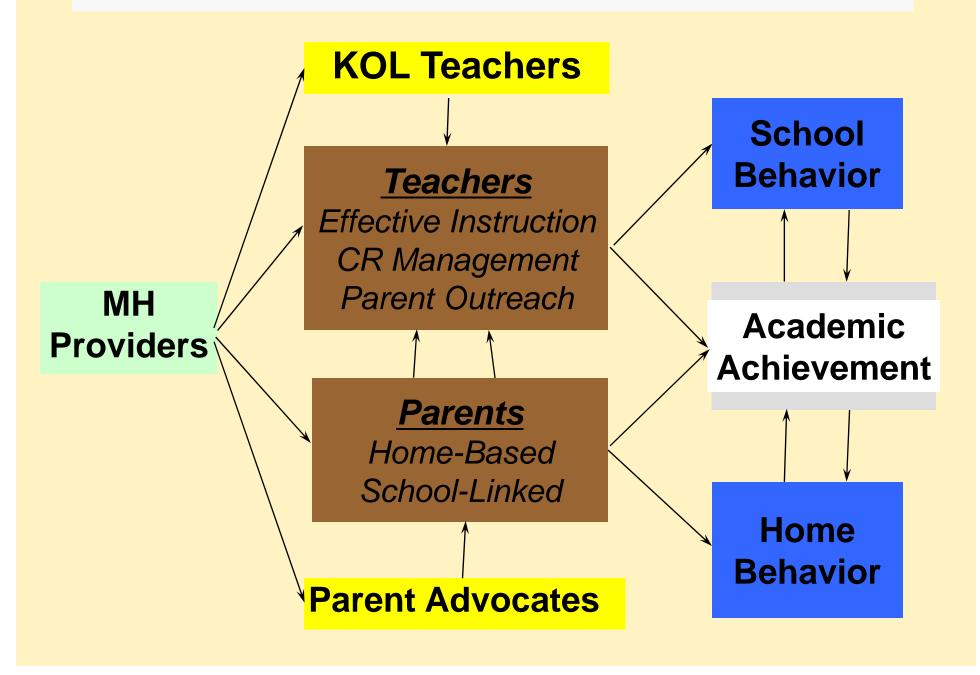


#### Mental Health in Context:

#### 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



## 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"\*



## **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)

