

PREVENTION SCIENCE

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What is Prevention?

- **Primary Prevention** promotes the health and safety of individuals and communities. It focuses on preventing or delaying the onset of behavioral health problems (i.e. substance use disorders, mental health diagnoses, delinquency, problem gambling)
- **Primary Prevention Services** are planned sequence of culturally appropriate, science-driven strategies intended to facilitate attitude and behavioral change for individuals and/or communities (These services do not include clinical assessment, treatment or recovery support services.)
- **Secondary & Tertiary Prevention:** Interventions that are provided after serious risk factors have already been discovered or early in disease progression soon after diagnosis are categorized as secondary prevention or early intervention. The goal is to halt or slow the progress of disease in its earliest stages. Recovery support or tertiary prevention focuses on helping people manage complicated, long-term, diagnosed health problems such as substance abuse disorders, mental illness, diabetes, etc. The goal is to prevent further physical deterioration and maximizing quality of life.

What is Science?

Science is . . .

- Observing the world.
- Watching and listening
- Observing and recording.

Science is **curiosity in thoughtful action** about the world and how it behaves.

Anyone can have an idea about how nature works. Some people think their idea is correct because "it seems right" or "it makes sense." But for a scientist (who could be you!), this is not enough. A scientist will test the idea in the real world. An idea that predicts how the world works is called a **hypothesis**.

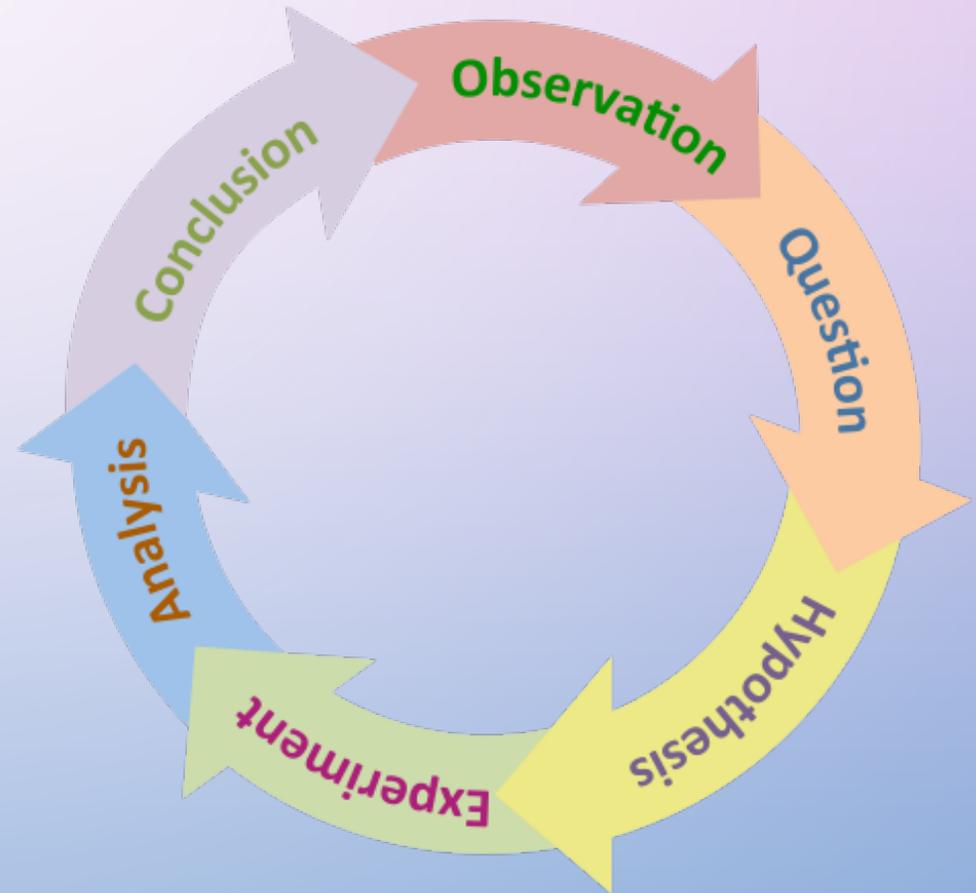
If an idea, or hypothesis, correctly predicts how something will behave, we call it a **theory**. If an idea explains all the facts, or evidence, that we have found, we also call it a **theory**.

"Scientific method" usually means a series of steps that scientists follow to discover how nature works.

Anyone can think like a scientist.



Hmmm. Is my hypothesis correct?



Elements of Prevention Science



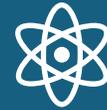
Theory



Practice



Implementation



Basic
Research



Evaluation



Fidelity

We made Wikipedia!

- “Prevention science[1] is the application of a scientific methodology that seeks to prevent or moderate major human dysfunctions before they occur. Regardless of the type of issue on hand, the factors that lead to the problem must be identified and addressed. Prevention research is thus focused primarily on the systematic study of these potential precursors of dysfunction, also known as risk factors; as well as components or circumstances that reduces the probability of problem development in the presence of risk, also known as protective factors. Preventive interventions aim to counteract risk factors and reinforce protective factors in order to disrupt processes or situations that give rise to human or social dysfunction.”

“Components of prevention science^[2][\[edit\]](#)

Epidemiology

The prevalence, distribution, and determinants of the problem in time and space. Epidemiological investigations can be carried out through surveillance and descriptive studies to determine its extent.

Etiology

The causes of such positive or negative outcomes, with an emphasis on risk and protective factors. Also known as the Theory of Causation.

Efficacy trials

Scientific experiments that test the preventive intervention programs ability to prevent the problem under favorable conditions. Under these optimal conditions, the researcher has control over the intervention and how it is delivered. If the test finds significant desirable effects, the intervention program is considered to be efficacious.

Effectiveness trials

Scientific experiments that test the preventive intervention programs ability to prevent the problem under real world conditions. The setting and the kinds of people in the experiment should be very similar to the actual targeted population in a particular location.

Dissemination research

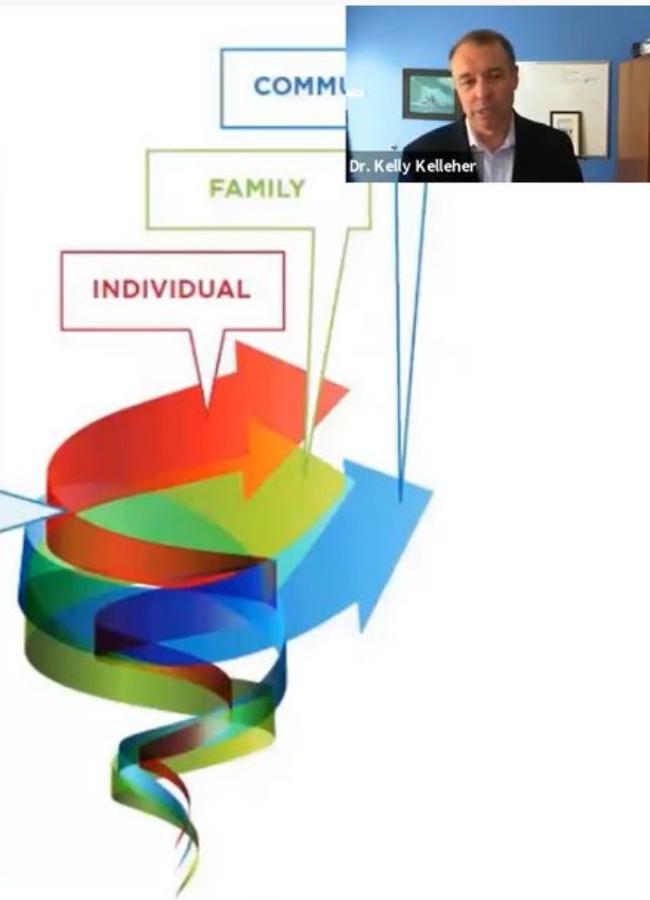
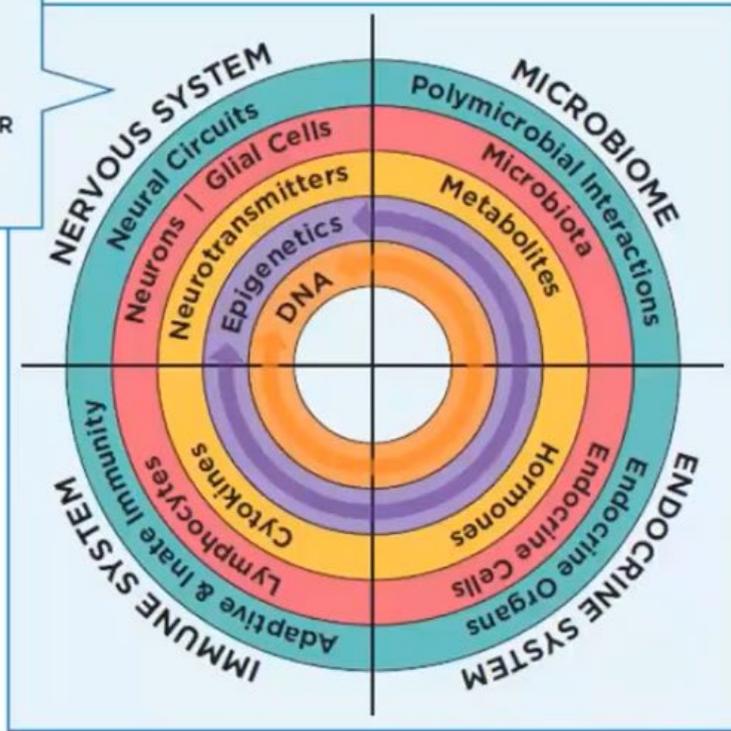
Analyzes how tested and effective prevention intervention programs may be spread to reduce problems at a larger scale.”

Theories & Models

(Interdisciplinary about Human/Brain Development, Human Behavior & Implementation)

- Risk & Protective Factors (1980s and 90s)
- Lifestyle Risk Reduction Model
- Social Learning Theory
- General Systems Theory
- Social Cognitive Theory
- Theory of Reasoned Action/Planned Behavior
- Broken Windows Theory
- Social Ecological Model (1960s)
- Strategic Prevention Framework
- CSAP's 6 Prevention Strategies
- Public Health Model
- Social Development Model
- Health Belief Model
- Stages of Change Model (Transtheoretical Model)
- And many more...

- NETWORK
- CELLULAR
- CHEMICAL
- MOLECULAR
- GENOMIC



Factors influencing individual risk & protection

The National Academies of

National Academies of Sciences, Engineering, and Medicine 2019. *Fostering Healthy Mental, Emotional, and Behavioral Development in Children and Youth: A National Agenda*. Washington, DC: The National Academies Press.
<https://doi.org/10.17226/25201>.

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Fostering Emotional and Behavioral Health in Children

Unlisted

10 views • Jul 1, 2020



The Higher Education Center for Alcohol and Drug Misuse Prevention and Recovery
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This presentation will address a new report from the National Academy of Medicine that calls for

Risk Factor

A characteristic at the biological, psychological, family, community, or cultural level that precedes and is associated with a higher likelihood of problem outcomes¹⁸

YOUTH AT RISK		Problem behaviors				
		Substance abuse	Delinquency	Teen pregnancy	School drop-out	Violence
Community	Availability of drugs & firearms	✓				✓
	Community norms & laws favorable toward drug use	✓				
	Transitions & mobility	✓	✓		✓	
	Low neighborhood attachment & commun. disorganization	✓	✓			✓
	Extreme economic & social deprivation	✓	✓	✓	✓	✓
Family	Family history of high risk behavior	✓	✓	✓	✓	
	Family management problems	✓	✓	✓	✓	✓
	Family conflict	✓	✓	✓	✓	✓
	Favorable parental attitudes & involvement in the problem behavior	✓	✓			✓
School	Early & persistent antisocial behavior	✓	✓	✓	✓	✓
	Academic failure in elementary school	✓	✓	✓	✓	✓
	Lack of commitment to school	✓	✓	✓	✓	
Individual/ peer	Alienation & rebelliousness	✓	✓		✓	
	Friends who engage in a problem behavior	✓	✓	✓	✓	✓
	Favorable attitudes toward the problem behavior	✓	✓	✓	✓	
	Early initiation of the problem behavior	✓	✓	✓	✓	✓

A (✓) indicates that at least two longitudinal studies have found the risk factor to predict the problem behavior.

Protective Factor

A characteristic at the individual, family or community level that is associated with a lower likelihood of problem outcomes²⁰

SHARED RISK & PROTECTIVE FACTORS

BY RESEARCHERS AT THE UNIVERSITY OF WASHINGTON – HAWKINS & CATALANO



WHY ARE THEY IMPORTANT TO PREVENTION?



Guide the selection and implementation of prevention and intervention strategies

Help us understand the needs of the populations we serve to select effective education strategies
Help us understand the needs of our communities to select effective environmental strategies



Help us see short-term results



Help us understand why strategies may not be working



What else?



How do we know what works today?

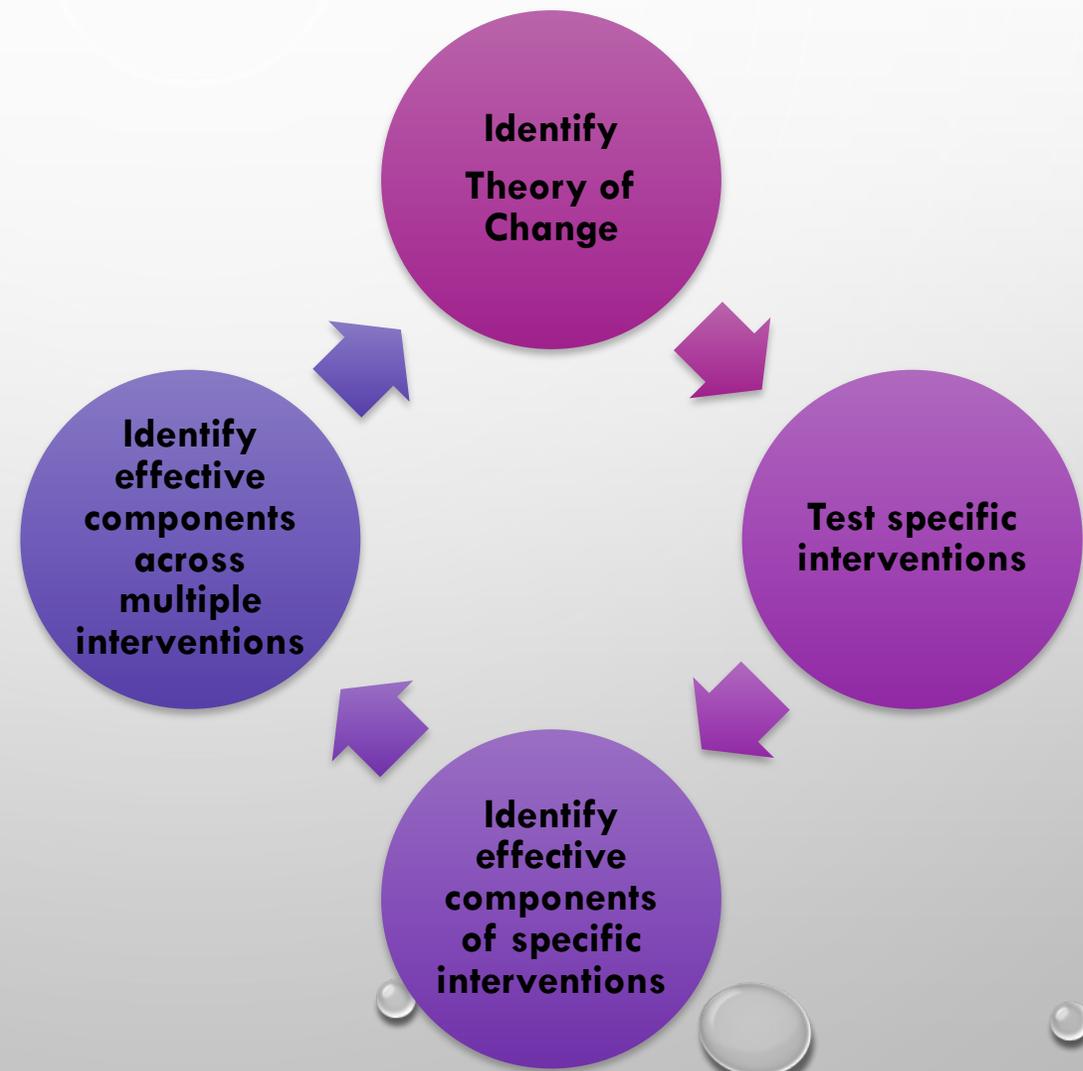


Table 2
Overview of Practice Element Codes

Code	Frequency ^a	κ^b
1 Activity scheduling	15	.74
· Assertiveness training	23	.79
· Attending	19	.85
· Behavioral contracting	27	.84
· Biofeedback, neurofeedback	3	1.00
· Cognitive	89	.85
· Commands	34	.84
· Communication skills	50	.73
· Differential reinforcement	33	1.00
10 Educational support	15	1.00
· Exposure	81	1.00
· Family engagement	10	.75 ^c
· Family therapy	18	1.00
· Goal setting	46	.84
· Guided imagery	17	1.00
· Insight building	14	1.00
· Maintenance/relapse prevention	53	.68
· Marital therapy	8	1.00
· Modeling	81	.80
20 Monitoring	38	.93
· Natural and logical consequences	19	.66
· Parent coping	18	.72 ^c
· Physical exercise	4	1.00
· Praise	62	.77
· Problem solving	75	.83
· Psychoeducational-child	60	.88
· Psychoeducational-parent	65	.90
· Relaxation	66	.95
· Response cost	28	.92
30 Response prevention	4	.66 ^c
· Self-monitoring	52	.81
· Self-reward/self-praise	37	1.00
· Self-verbalization	4	1.00
· Social skills training	45	.80
· Stimulus control or antecedent management	26	.74
· Talent or skill building	15	1.00
· Tangible rewards	66	.84
· Therapist praise/rewards	60	.82
· Time out	43	.92
40 Discrete trial training	3	1.00
41 Personal safety skills	3	1.00

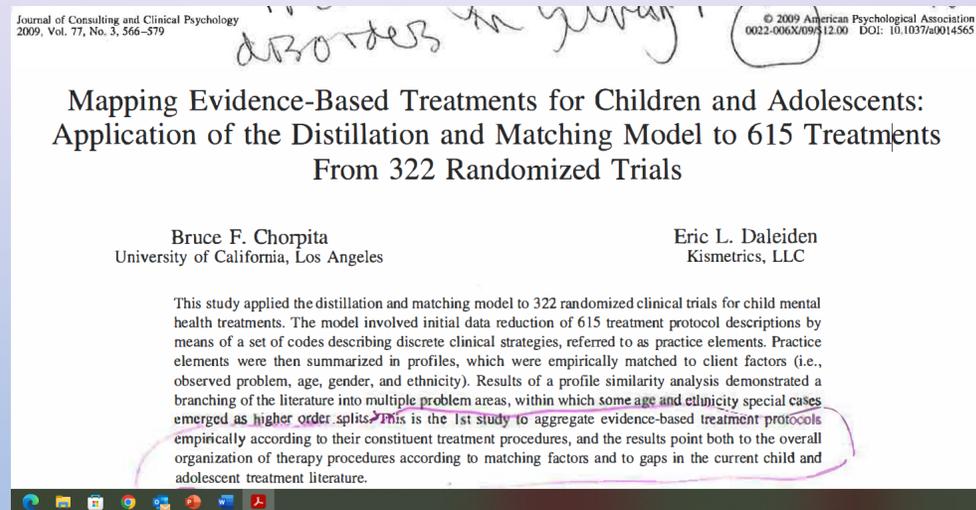
^a $N = 232$. ^b $n = 54$. ^c Base rates for these codes were too low to allow estimation in the 20% random sample, so reliability was estimated with the agreement between initial raters (prior to validation) across all winning study groups.

EVIDENCE-BASED PRACTICE ELEMENTS

Fundamental units of behavioral influence underlie effective prevention and treatment for children, adults, and families. **Dr. Chorpita calls them Practice Elements. Dr Embry calls them kernels.**

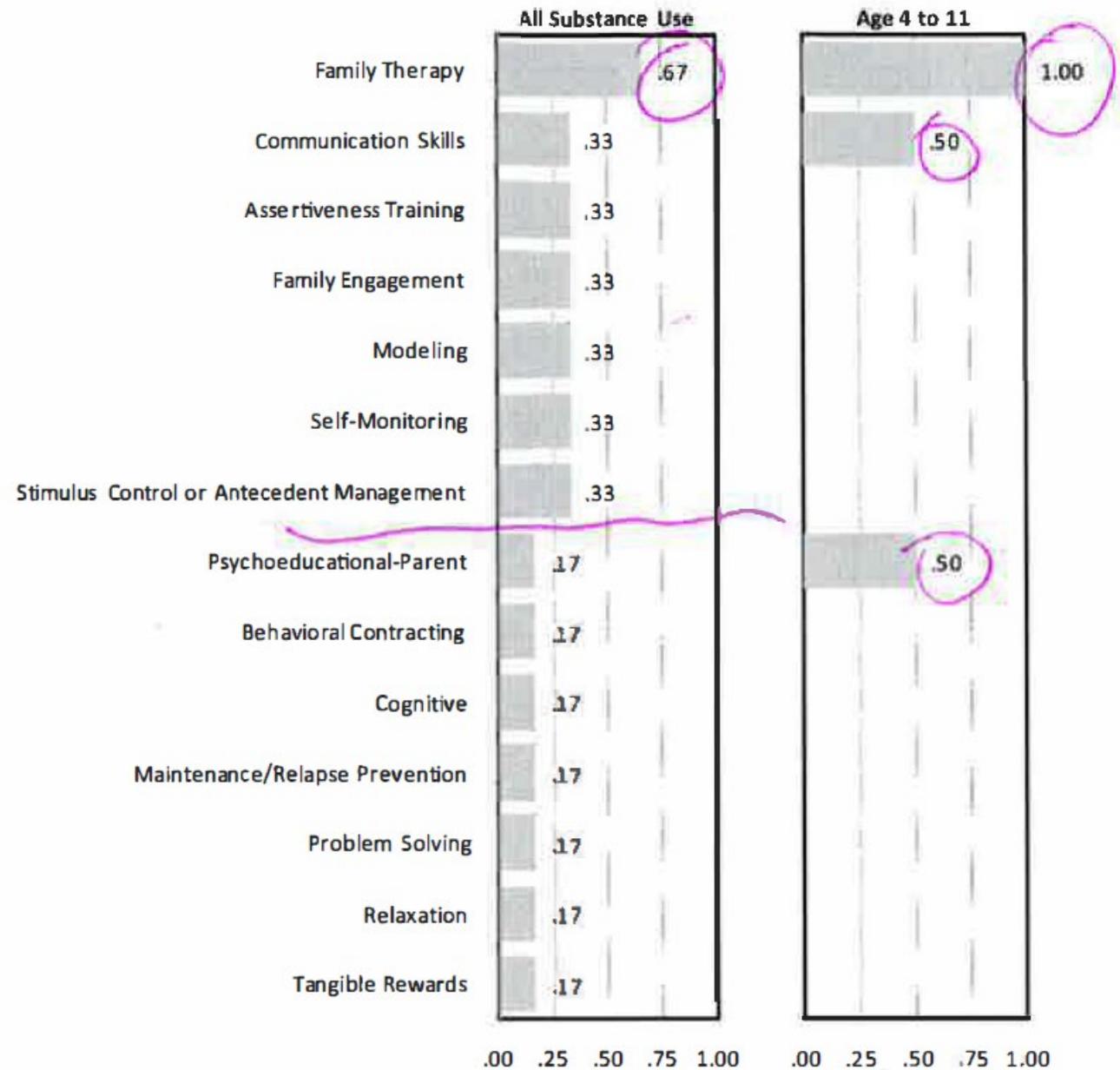
A kernel is a behavior-influence procedure shown through experimental analysis to affect a specific behavior and that is indivisible in the sense that removing any of its components would render it inert

Kernels involve one or more of the following mechanisms of behavior influence: reinforcement, altering antecedents, changing verbal relational responding, or changing physiological states directly.



<https://www.ncbi.nlm.nih.gov/pubmed/19485596>

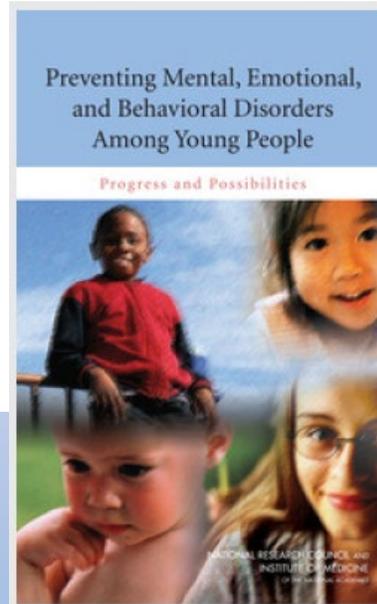
<http://evolution.binghamton.edu/evos/wp-content/uploads/2008/11/EmbryKernels.pdf>



Meta Analysis

TABLE 4-1 Factors That Affect Healthy Development

	Individual	Family	School and Community
Infancy and Early Childhood	<p>NRC and IOM (2000)</p> <ul style="list-style-type: none"> -Self-regulation -Attention regulation -Appropriate emotional inhibitions and expression -Early mastery and intrinsic motivation -Executive functioning, planning, and problem solving -Secure attachment <p>Communication and learning</p> <ul style="list-style-type: none"> -Functional language -School attendance and appropriate conduct <p>Making friends and getting along with peers</p> <ul style="list-style-type: none"> -Initiating interactions and appropriate conduct -Understanding of self and others' emotions <p>Adequate birth weight</p>	<p>NRC and IOM (2000)</p> <ul style="list-style-type: none"> -Healthy physical environment -Adequate prenatal and postnatal health care -Adequate prenatal and postnatal nutrition <p>Nurturing relationships with caregiver including:</p> <ul style="list-style-type: none"> -Reliable support and discipline from caregiver -Responsiveness -Protection from harms and fears -Affection -Opportunities to resolve conflict -Support for development of new skills -Reciprocal interactions -Experience of being respected -Stability and consistency in caregiver relationship <p>Socioeconomic resources for the family</p> <ul style="list-style-type: none"> -Adequate income -Ability to provide adequate nutrition, child care, safe housing, health care -Higher parental education -Cognitive stimulation in the home -Parental low economic stress 	<p>NRC and IOM (2000)</p> <ul style="list-style-type: none"> -Availability of high-quality child care -Nurturance -Support for early learning -Access to supplemental services, such as feeding, screening for vision and hearing, support for working parents -Stable secure attachment to child care provider -Low ratio of caregivers to children -Regulatory systems that support high quality of care



BOX 4-1 Promising Components Identified In the Systematic Review, by Optimal Health Domain

Physical Health

Substance use:

- Universal programs
- Being school based
- Beginning in childhood
- Combining social competence and social influence approaches

Sexual behavior:

- Beginning in childhood
- Creating a supportive and inclusive culture in p
- Including diverse youth and their communities in mentation, and evaluation efforts
- Promoting skills based on social-emotional learning as a complement to inclusive sex education

Emotional Health

- Universal programs
- Being school based
- Including in-person meetings
- Multiple sessions over longer periods of time
- Incorporating cognitive-behavioral therapy techniques

Intellectual Health

- Providing programs in schools or a combination
- Promoting supportive school culture and access

Multiple Optimal Health Domains

- Promoting competencies based on social-emotional learning and positive youth development
- Starting interventions in childhood
- Being sequenced, active, focused, and explicit



Cost-Benefit Analysis

January 2014

Inventory of Evidence-Based, Research-Based, and Promising Practices

For Prevention and Intervention Services for Children and Juveniles in Child Welfare, Juvenile Justice, and Mental Health Systems

Budget Area	Program/Intervention	Manual	Current Definitions	Suggested Definitions	Cost-beneficial	Reason Program Does Not Meet Suggested Evidence-Based Criteria (see full definitions below)	Percent Minority
General Prevention	Communities that Care	Yes	●	●	Yes (92%)		33%
	Coping and Support Training	Yes	P	P	N/A	No rigorous evaluation measuring outcome of interest	49%
	Fast Track Prevention Program	Yes	⊙	⊙	No (0%)	Benefit-cost/Heterogeneity/Single evaluation	0%
	Good Behavior Game	Yes	●	●	Yes (92%)		49%
	Guiding Good Choices	Yes	⊙	⊙	Yes (78%)	Heterogeneity/Single evaluation	1%
	Quantum Opportunities Program	Yes	●	⊙	No (59%)	Benefit-cost	N/A
	Reconnecting Youth	Yes	P	P	N/A	No rigorous evaluation measuring outcome of interest	N/A
	Seattle Social Development Project	Yes	⊙	⊙	No (59%)	Benefit-cost	56%
	Strengthening Multi-Ethnic Families and Communities	Yes	P	P	N/A	No rigorous evaluation measuring outcome of interest	N/A
	Strengthening Families for Parents and Youth 10-14	Yes	⊙	⊙	No (12%)	Benefit-cost/Heterogeneity/Single evaluation	4%
	Youth Mentoring Programs	Varies*	●	⊙	No (57%)	Benefit-cost	N/A
	4Results Mentoring	Yes	P	P	N/A	No rigorous evaluation measuring outcome of interest	N/A
	Big Brothers Big Sisters	Yes	●	●	N/A		60%
Other Mentoring Programs	Varies*	⊙	⊙	N/A	Weight of evidence	N/A	
Substance Abuse	Adolescent Assertive Continuing Care	Yes	⊙	⊙	N/A	Heterogeneity	26%
	Adolescent Community Reinforcement Approach	Yes	⊙	⊙	N/A	Single evaluation	59%
	Life Skills Training	Yes	●	●	Yes (99%)		33%
	Matrix Model Substance Abuse Treatment for Adolescents	Yes	P	P	N/A	No rigorous evaluation measuring outcome of interest	N/A
	Multidimensional Family Therapy for substance abusing juvenile offenders	Yes	⊙	⊙	No (74%)	Benefit-cost/Single evaluation	100%
	Multisystemic Therapy (MST) for substance-abusing juvenile offenders	Yes	●	⊙	No (71%)	Benefit-cost	63%
	Project ALERT	Yes	⊖	⊖	No (2%)	Weight of evidence/Heterogeneity	N/A
	Project STAR	Yes	●	⊙	No (1%)	Benefit-cost/Heterogeneity	21%
	Project Toward No Drug Abuse	Yes	●	●	Yes (66%)		69%
	Recovery Support Services	Yes	P	P		No rigorous evaluation measuring outcome of interest	N/A
	Seven Challenges	Yes	P	P	N/A	No rigorous evaluation measuring outcome of interest	N/A
	Therapeutic communities for substance abusing juvenile offenders	Varies*	⊙	⊙	Yes (64%)	Benefit-cost	58%

Key:

- Evidence-based
- ⊙ Research-based
- P Promising
- ⊖ Produces null or poor outcomes

See definitions and notes on page 6.

<http://www.wsipp.wa.gov/BenefitCost>



What is an Example of a Social Influence Approach?

Positive Youth Development

- Focus on youth strengths instead of deficits. The need to serve all youth and not just at-risk youth. Establishment of the community being responsible for youth development (Logwood & Thomas, 2017).
- Another definition by the Interagency Working Group on Youth Programs (2017) details PYD as “an intentional prosocial approach that engages youth within their communities, schools, organizations, peer groups, and families in a manner that is productive and constructive; recognizes, utilizes, and enhances young people’s strengths, and promotes positive outcomes for young people by providing opportunities, fostering positive relationships, and furnishing the support needed to build on their leadership strength.”

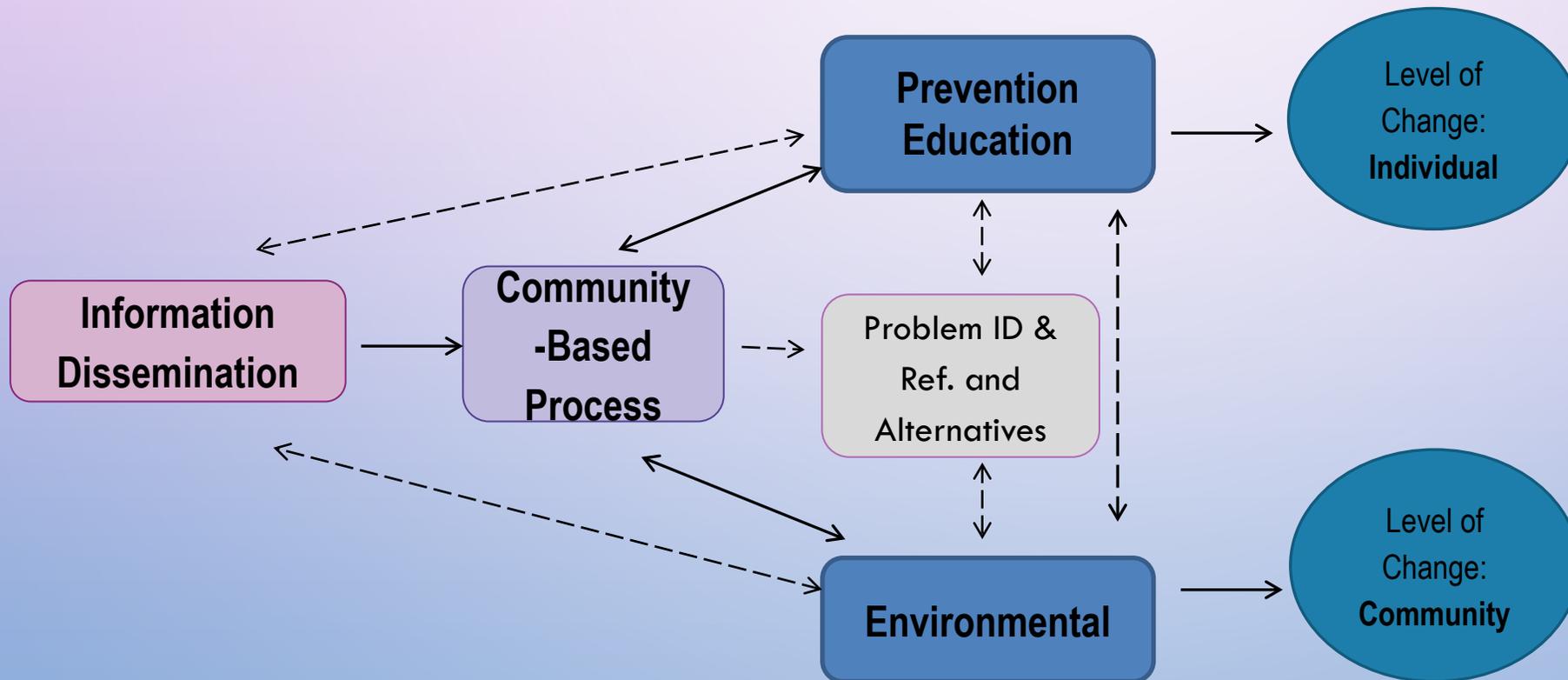
Youth Empowerment

- Young people in communities can serve as a catalyst for change when given the platform, opportunity, and resources. Youth serving as change agents in the community rather than mere participants of the environment is known as youth empowerment (Snavelly & Rigby, 2017).
- Applying this empowerment approach to youth prevention programs develops social and political awareness in youth which enhances their skills in driving positive change within the community (Zimmerman, 2000).
- Youth empowerment shifts the perspective of young people from being a collection of problems to being resources to the community (Holden, 2004).

Youth-Led Prevention

- Prevention in general and youth-led prevention specifically is rooted in PYD and embraces the notion of youth voice and empowerment through involvement in engaging community models (Logwood & Thomas, 2017).
- Pairing a framework that emphasizes youth empowerment facilitated by adult allies, also known as Youth Empowerment Conceptual Framework (YECF) (Holden, et al., 2004), with a framework rooted in prevention education, such as the Strategic Prevention Framework (SPF), can inform youth prevention practice that can bring about sustainable and purposeful change in the community (Brown, Crosby, & Hampton, 2019).

CSAP's Prevention Strategies



Strategies employed depend on desired results





So, with all this science,
why do we still use ineffective interventions?

- **Inhibitors** (Fences/Walls/Mountains)

- **Facilitators** (Doors/Bridges/Tunnels)



Continuum Crosswalk

Prevention

(Population or Community Intervention)

Assessment & Capacity

Planning

**Implementation & Evidence-Based
Prevention Approaches**

Evaluation

Sustainability

Treatment

(Individual or Group Intervention)

Intake/Bio-psychosocial Assessment

Treatment Planning

Treatment Modality & Evidence-Based
Treatment Approaches

Evaluation

Recovery

Cultural Competence

A continuous learning process that builds knowledge, awareness, skills and capacity to identify, understand and respect the unique beliefs, values, customs, languages, abilities and traditions of all Ohioans to develop policies to promote effective programs and services.