



**DRAFT**

# **THE HIGH COST OF ADVERSE CHILDHOOD EXPERIENCES**



## Today's workshop will:

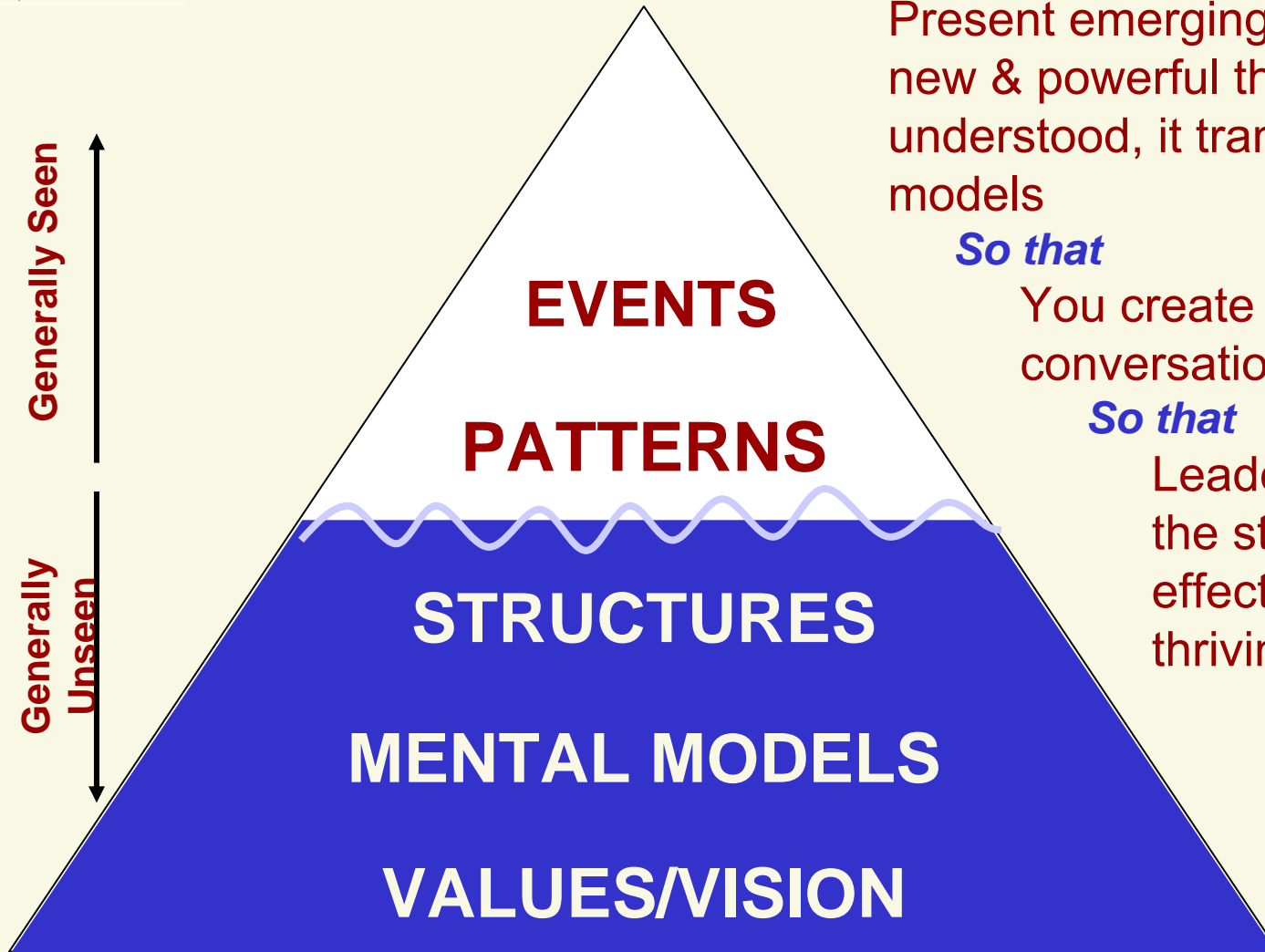
Present emerging research so new & powerful that, when understood, it transforms mental models

*So that*

You create transformative conversations

*So that*

Leaders throughout the state act most effectively to support thriving families



# UNDERSTANDING SCIENTIFIC DISCOVERIES

SOMETIMES REQUIRES

# UNLEARNING WHAT WE ONCE BELIEVED TO BE TRUE

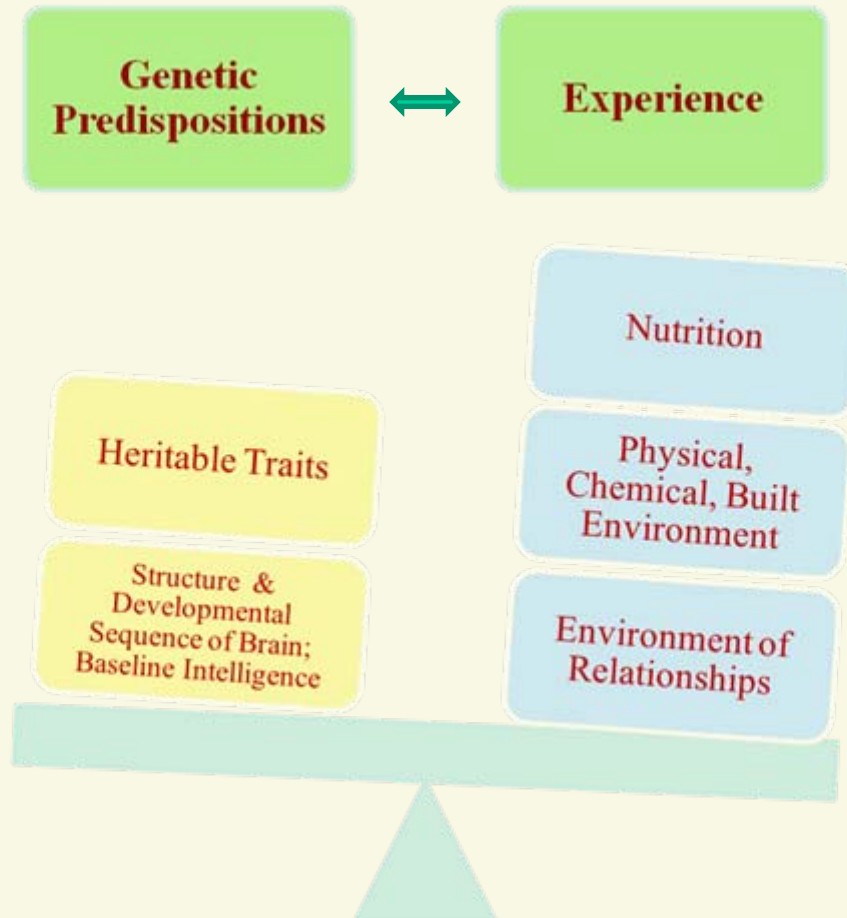




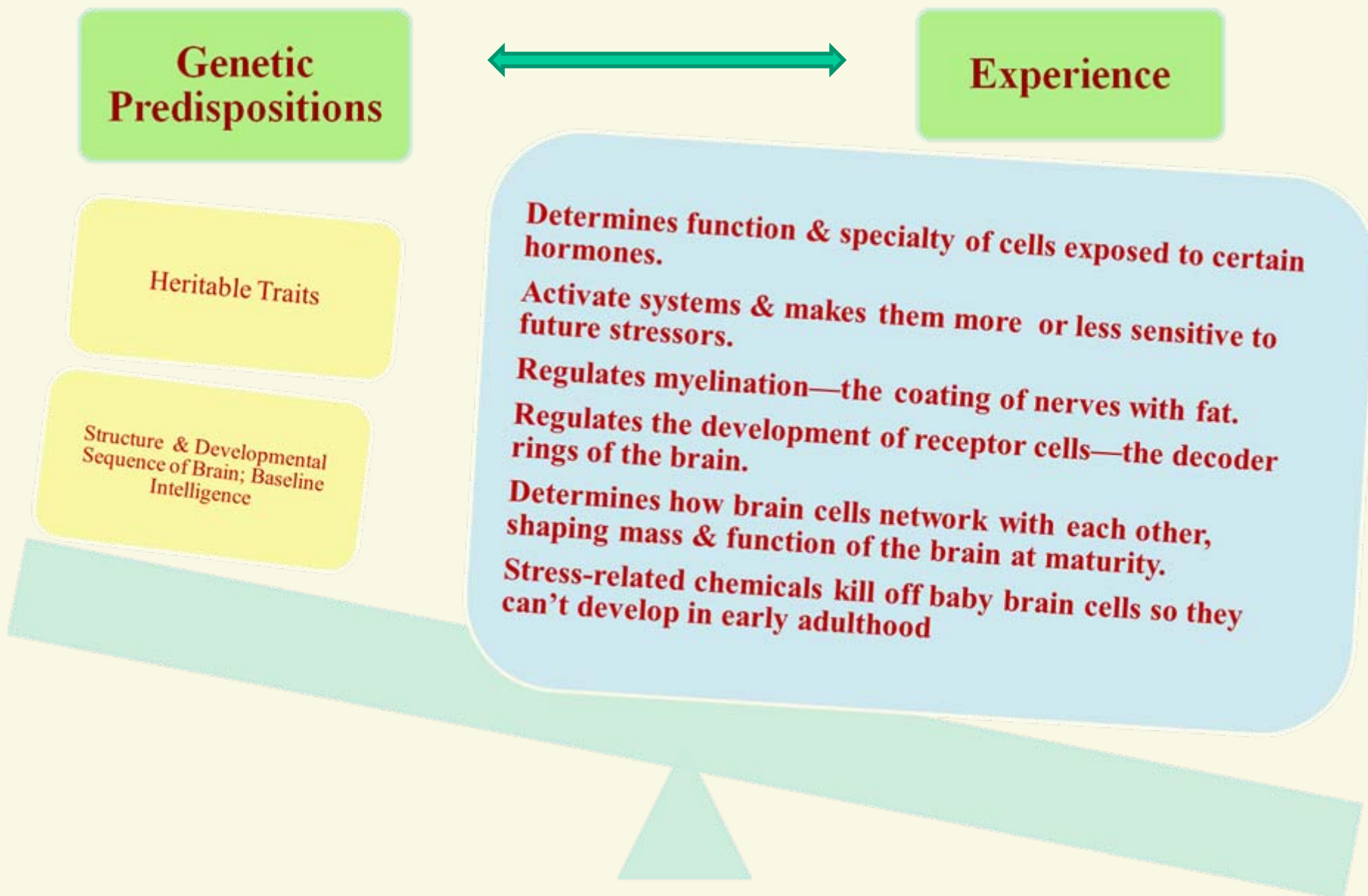
To ensure the best match between the individual & the conditions he/she will face, the brain adapts to experience. Adaptation is fundamental to the brain's design.



## FOUNDATIONS OF HEALTHY DEVELOPMENT



# EXPERIENCE DRIVES DEVELOPMENT



## BRAIN RESEARCH

See for example: Teicher, M et al. “Neurobiological & Behavioral Consequences of Exposure to Childhood Traumatic Stress,” *Stress in Health and Disease*, BB Arnetz & R Ekman (eds). 2006.

Teicher, M. “Scars that Won’t Heal: The Neurobiology of Child Abuse,” *Scientific American*, March, 2002, pp. 68-75.



## EPIDEMIOLOGICAL RESEARCH

See for Example: Felitti, VJ, Anda, RF et al. “Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults.” *American Journal of Preventive Medicine*. 1998. (14:4)

For a full list of publications, see <http://www.cdc.gov/nccdphp/ace/publications.htm>

## RESILIENCY RESEARCH

Masten, AS. “Ordinary Magic: Resilience Process in Development.” *American Psychologist*. March, 2001 (56:3), pp. 227-238.

Luthar, SS (ed). *Resilience and Vulnerability: Adaptation in the Context of Childhood Adversities*. Cambridge University Press: New York. 2003.

# INTEGRATING BRAIN & EPIDEMIOLOGY RESEARCH

## *Brain Research Findings*

**Maltreatment, trauma & Adverse Childhood Experiences**

**Predictable adaptation during brain development cause cognitive, social, & behavioral traits**

**Cognitive, social, behavioral & health outcomes**  
*(Brain Research & Epidemiological Findings)*

## *Epidemiology Findings*

**Poor health & excessive use of healthcare systems**

**Early Death**



# BRAIN RESEARCH: THE NEUROBIOLOGY OF MALTREATMENT

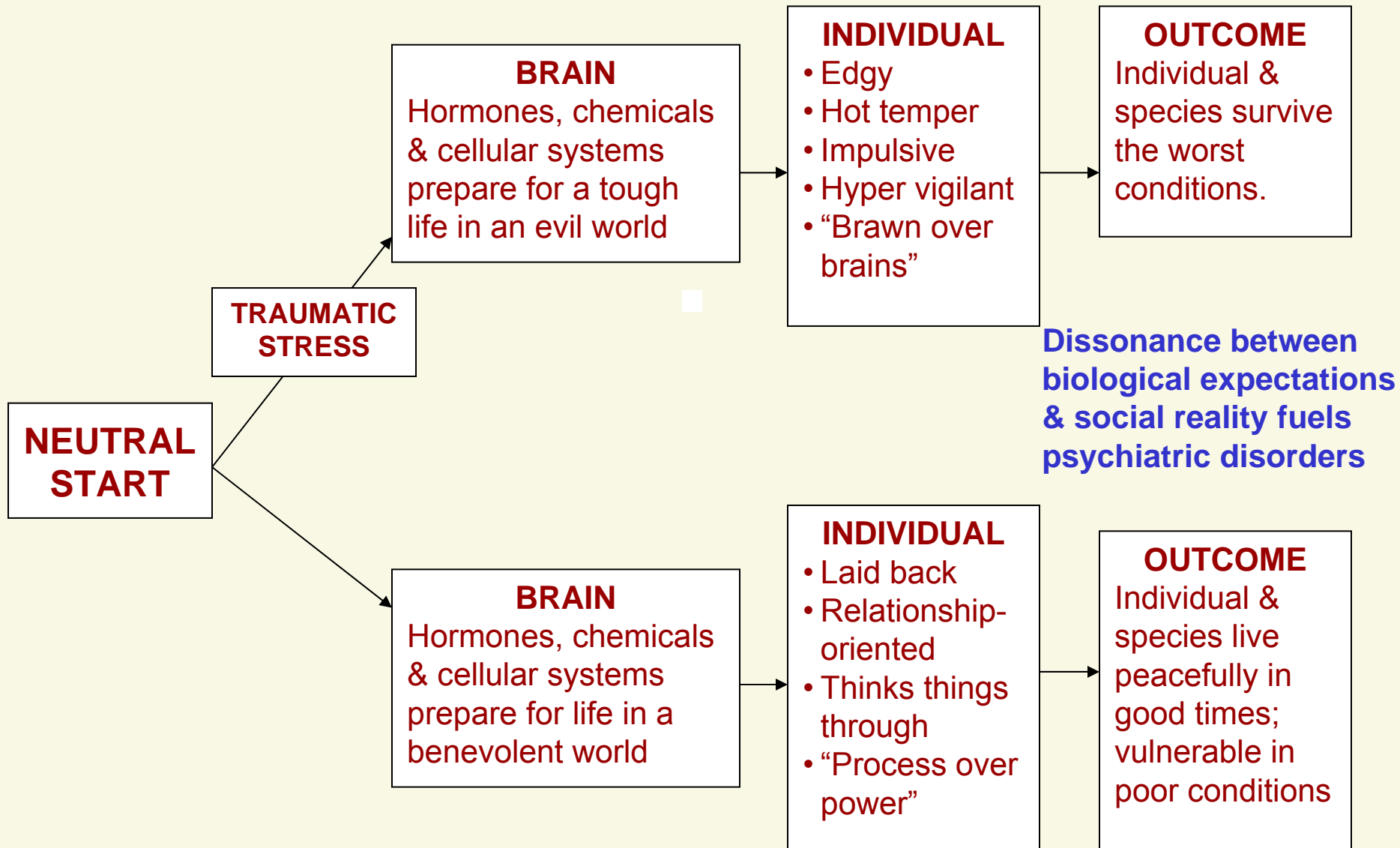


See for example: “Neurobiological and Behavioral Consequences of Exposure to Childhood Traumatic Stress,” *Stress in Health and Disease*, BB Arnetz and R Ekman (eds). 2006. Martin Teicher, Jacqueline Samson, Akemi Tomoda, Majed Ashy, and Susan Anderson

Teicher, M. “Scars that Won’t Heal: The Neurobiology of Child Abuse,” *Scientific American*, March, 2002, pp. 68-75.

## BRAIN DEVELOPMENT PATTERNS

*Adapted from the research of Martin Teicher, MD, Ph.D*



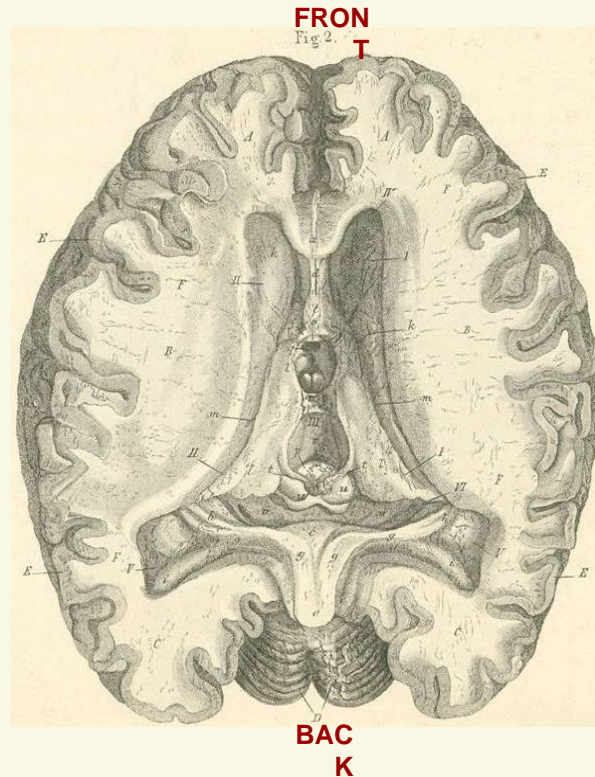
- In your experience, how do our major social services, health, justice, education and/or mental health systems respond to young people who act on “brawn over brains”?
- How do these systems’ responses work for children and families?
- What are some of the more successful system responses you have seen?



## KEY VARIABLES IN BRAIN OUTCOMES

### CRITICAL TIME: AGE OF MALTREATMENT

The brain develops over time. The effects of maltreatment correspond to the region and/or function that is developing at the time of maltreatment.



### GENDER

Although both boys & girls are affected by maltreatment the effects of sexual abuse are more profound in girls while the effects of neglect are more profound in boys.

### TYPE OF ABUSE

Different types of maltreatment activate different processes that shape the brain, such as chemicals & hormones, electrical activity, cell growth, & specialization of cells.

## BIOLOGICAL EFFECTS OF ABUSE & NEGLECT

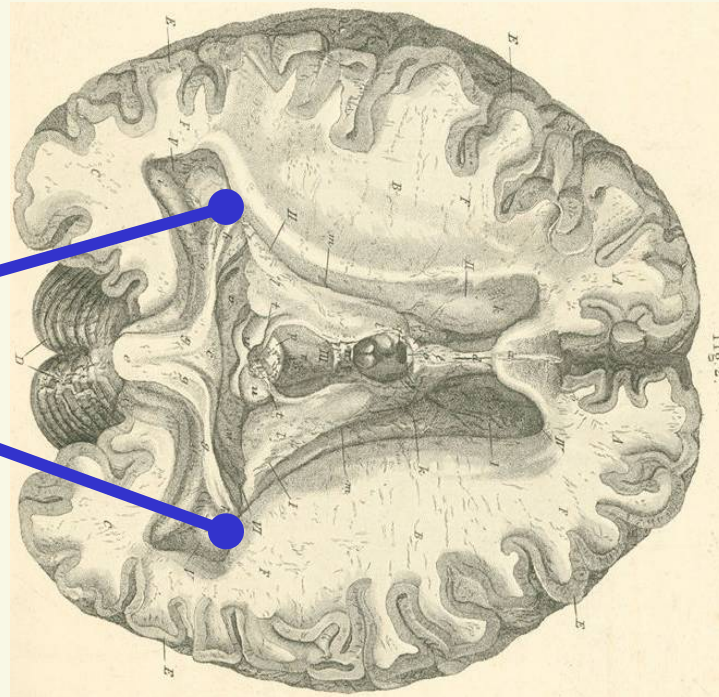
### HIPPOCAMPUS

The center for:

- Controlling emotional reactions
- Constructing verbal memory
- Constructing spatial memory

### VULNERABLE TO:

All forms of maltreatment in the first 2-3 years of life.



## BIOLOGICAL EFFECTS OF ABUSE & NEGLECT

### CORPUS CALLOSUM

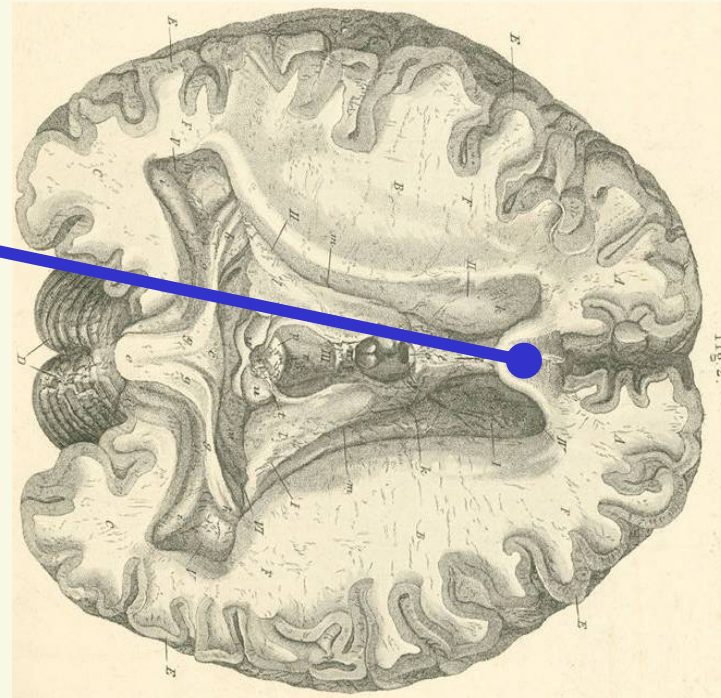
Integrates hemispheres & facilitates:

- Language development
- Proficiency in math
- Processing of social cues, such as facial expression

### VULNERABLE TO:

Neglect in infancy.

Sexual abuse in the elementary school years.



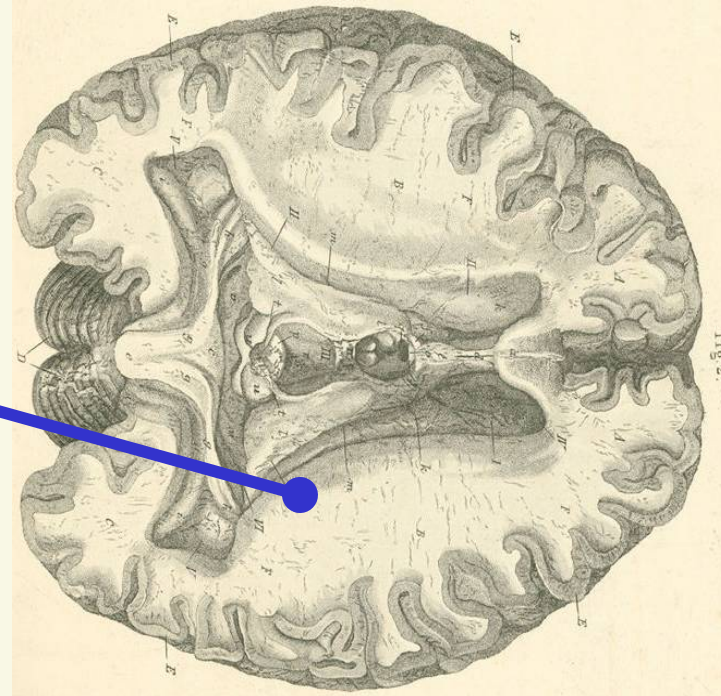
## BIOLOGICAL EFFECTS OF ABUSE & NEGLECT

### RIGHT TEMPORAL GYRUS

Center for spoken language.

### VULNERABLE TO:

Emotional abuse, especially between ages 7 and 9.



## BIOLOGICAL EFFECTS OF ABUSE & NEGLECT

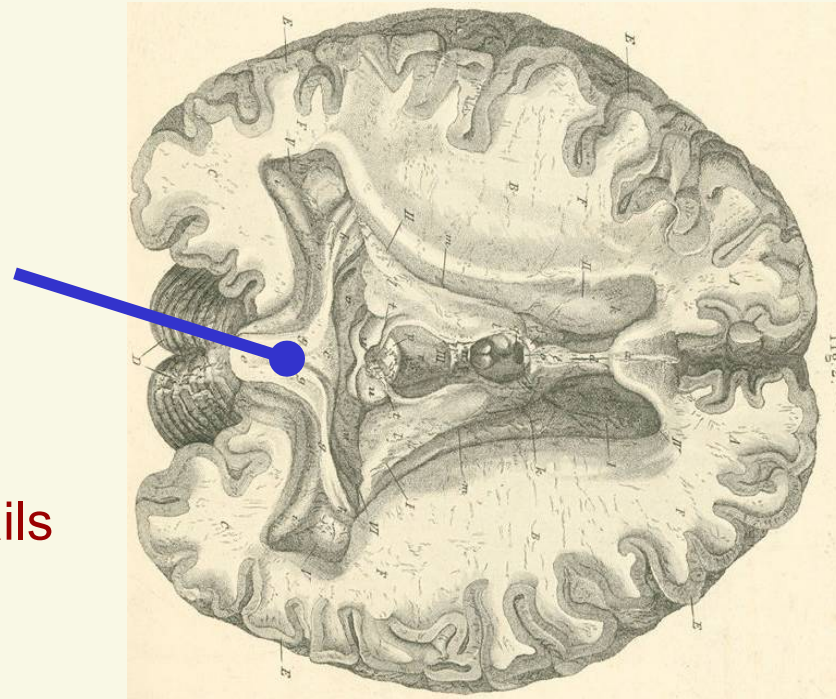
### CEREBELLAR VERMIS

Center for:

- Regulating mental health
- Regulating movement through the physical environment
- Reacting to peripheral details in the world around us

### VULNERABLE TO:

High levels of cortisol prior to puberty.



## BIOLOGICAL EFFECTS OF ABUSE & NEGLECT

### CORTEX

Center for:

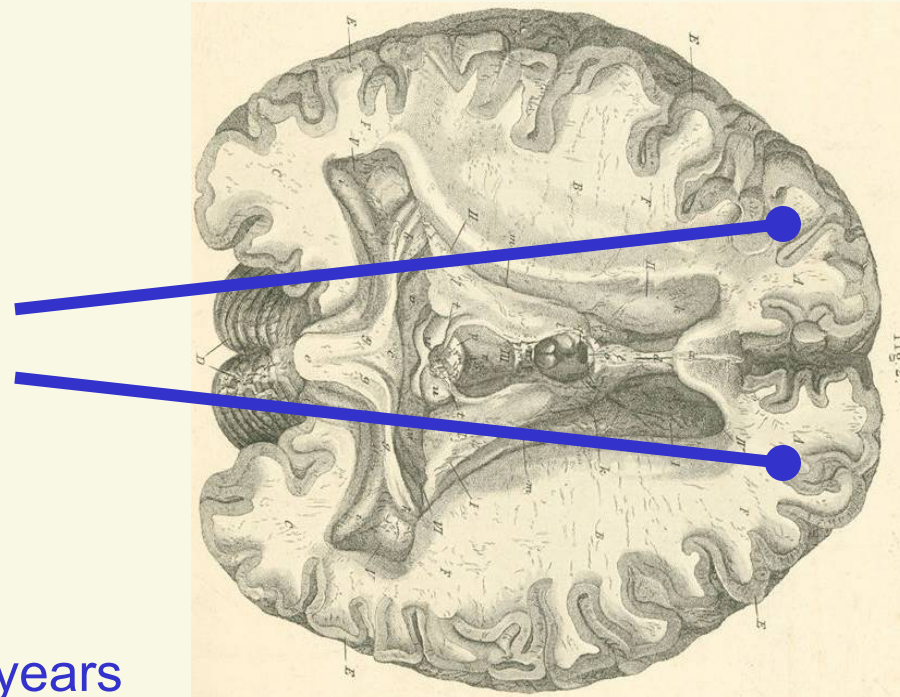
- Thinking & judgment
- Executive function
- Long term memory
- Vision

### VULNERABLE TO:

Trauma in the first several years of life affecting pre-frontal cortex.

Witnessing domestic violence in the elementary school years affecting visual cortex.

Sexual abuse at 15-16 affecting executive function.



## BRAIN EFFECTS BY CRITICAL PERIODS

CRITICAL TIME	BRAIN REGION	FUNCTION	AFFECTED BY
First 3 years  Ages 3-5	<b>HIPPOCAMPUS</b>	Emotional regulation Verbal memory Spatial memory With the <b>AMYGDALA</b> , Manages fear, panic, emotional understanding Regulates emotionally-appropriate responses Puts the brakes on outbursts & tantrums	All maltreatment  Sexual abuse
Infancy  Age 8-10	<b>CORPUS CALLOSUM</b>	Cross-brain function Language & math proficiency Social cues	Neglect  Sexual abuse
Age 7-9	<b>RT TEMPORAL GYRUS</b>	Spoken language	Emotional abuse
Prior to puberty	<b>CEREBELLAR VERMIS</b>	Center for mental health Navigation through space Track periphery	All maltreatment
First 2-3 yrs Age 8-10  Age 15-16	<b>CORTEX</b>	Thinking and judgment Vision Executive function Long-term memory	All maltreatment Witnessing Family Violence Sexual abuse

## CONSEQUENCES OF BIOLOGICAL OUTCOMES

### **COGNITIVE**

- Slowed language development
- Attention problems (ADD/ADHD)
- Speech delay
- Poor verbal memory/recall
- Loss of brain matter/IQ

### **SOCIAL**

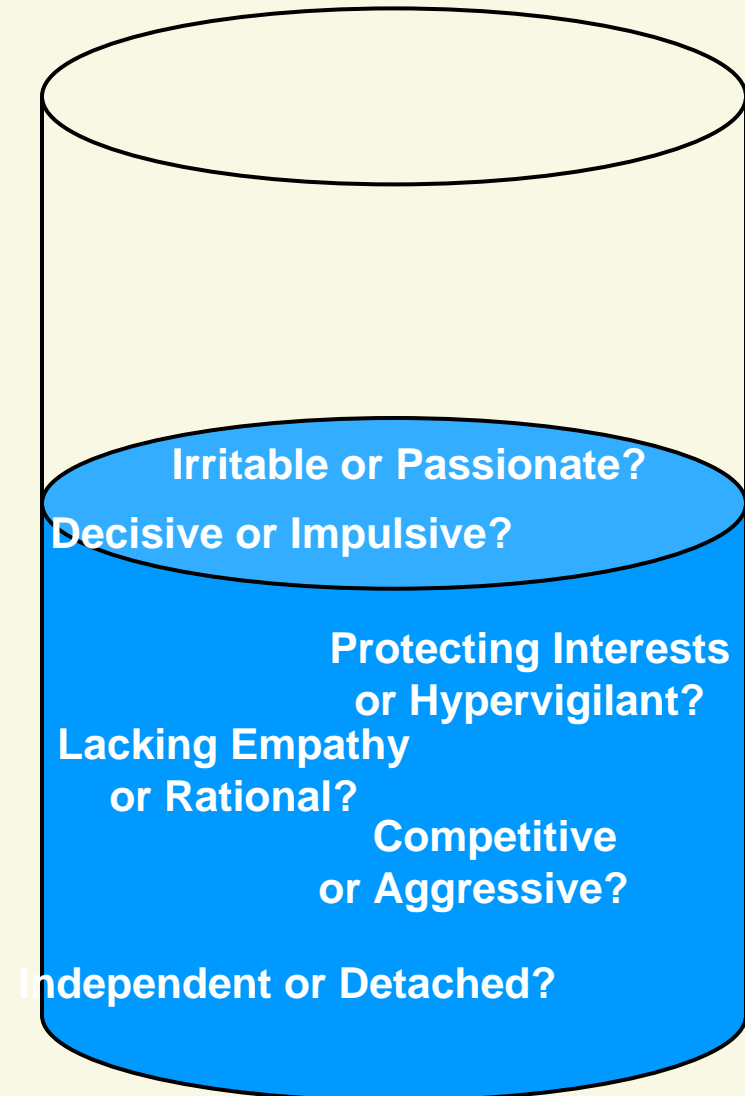
- Aggression & violent outbursts
- Poor self-control of emotion
- Can't modify behavior in response to social cues
- Social isolation—can't navigate friendship

### **MENTAL HEALTH**

- Poor social/emotional development
- Alcohol, tobacco & other drug abuse—vulnerable to early initiation
- Adolescent & adult mental health disorders—especially depression, suicide, dissociative disorder, borderline personality disorder, PTSD

## HALF FULL OR HALF EMPTY?

- How might we systematically build on the strengths of children affected by early maltreatment?
- What academic supports might we reasonably provide?
- How might we support pathways to vocational success?
- What do we know about mitigating the effects? How might we learn more?





# ADVERSE CHILDHOOD EXPERIENCES STUDY

# INTEGRATING BRAIN & EPIDEMIOLOGICAL RESEARCH



## WHAT ARE THE ADVERSE CHILDHOOD EXPERIENCES (ACEs)?

1. Child physical abuse
2. Child sexual abuse
3. Child emotional abuse
4. Neglect
5. Mentally ill, depressed or suicidal person in the home
6. Drug addicted or alcoholic family member
7. Witnessing domestic violence against the mother
8. Loss of a parent to death or abandonment, including abandonment by divorce
9. Incarceration of any family member



**ACES ARE HIGHLY  
INTERRELATED,  
SELF PERPETUATING,  
& HAVE A CUMULATIVE  
STRESSOR EFFECT**



The number of different categories of ACEs (ACE score) was found to determine health outcomes, not the intensity or frequency of a single category.

The evidence suggests that ACEs are a causal agent for many health challenges, as the study findings meet all nine of Sir Bradford Hill's criterion for causal inference in epidemiology.

Without interruption, ACEs escalate across generations

# A SIGNIFICANT PORTION OF DISEASE ACROSS THE POPULATION IS ATTRIBUTABLE TO ACES

54% of depression,

58% of suicide attempts

39% of ever smoking,

26% of current smoking

65% of alcoholism,

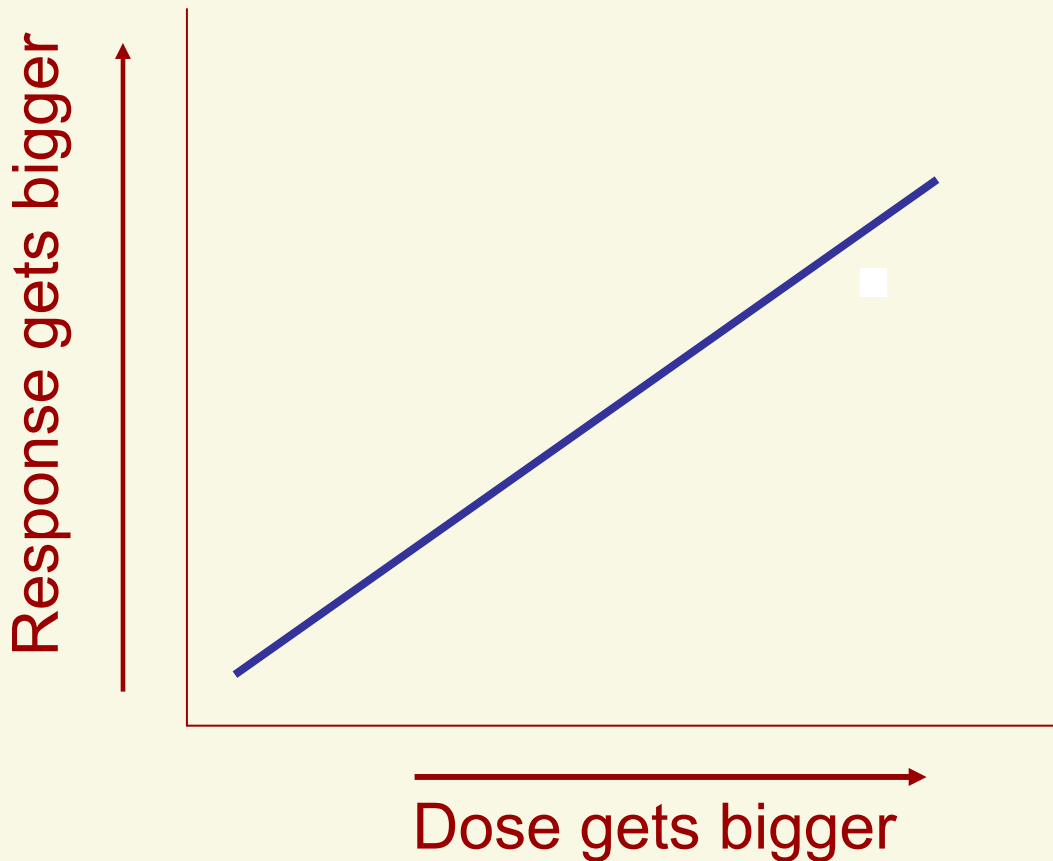
50% of drug abuse

78% of IV drug use is attributable to ACEs

48% of promiscuity (having more than 50 sexual partners)

...are attributable to ACEs

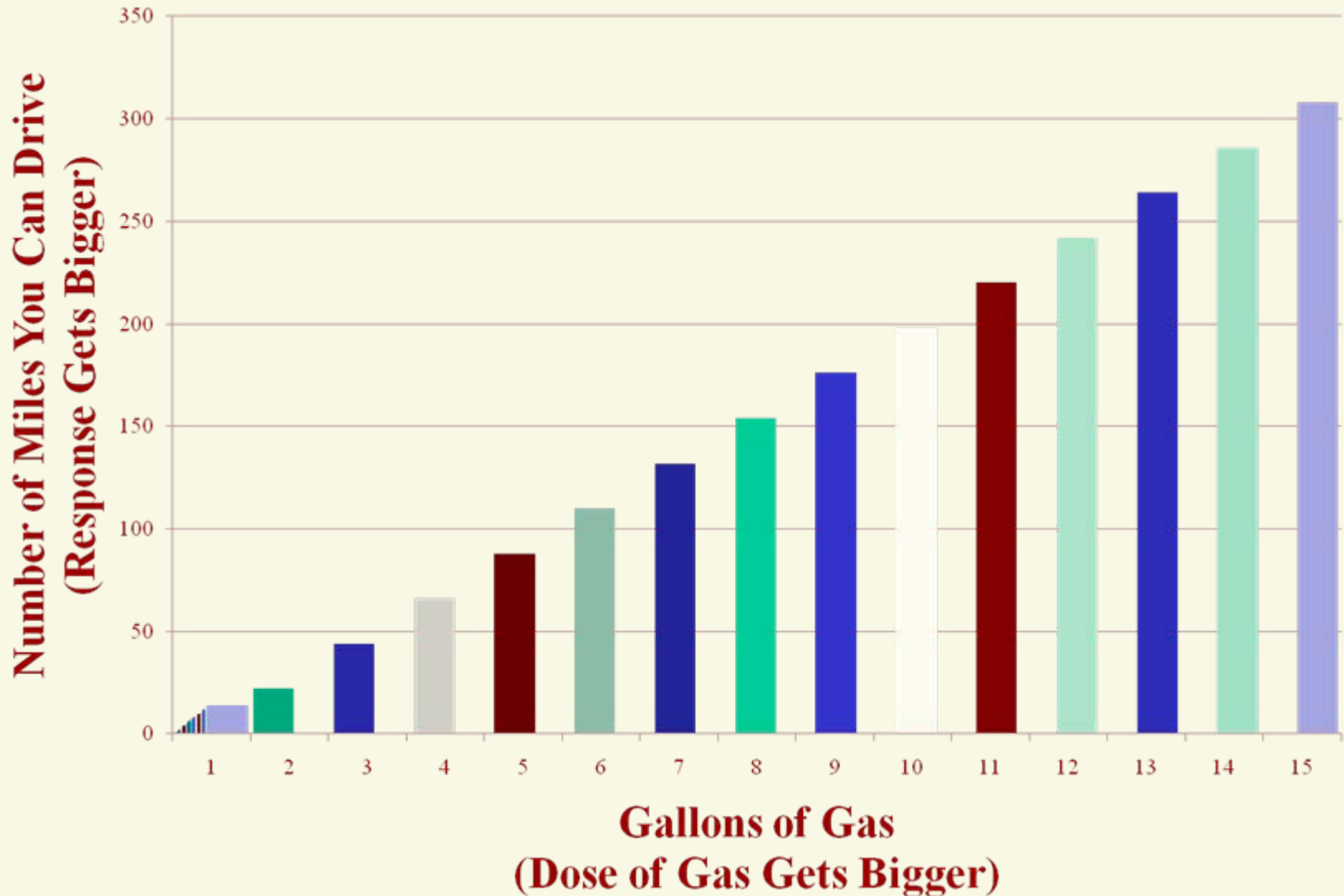
## A CLASSIC CAUSAL RELATIONSHIP MORE ACEs = MORE HEALTH PROBLEMS



*Dose-response* is a direct measure of cause & effect.

The “response”—in this case the occurrence of the health condition—is caused directly by the size of the “dose”—in this case, the number of ACEs.

# DOSE RESPONSE RELATIONSHIP MORE GAS = MORE MILES



## LIFE LONG PHYSICAL, MENTAL & BEHAVIORAL OUTCOMES OF ACEs

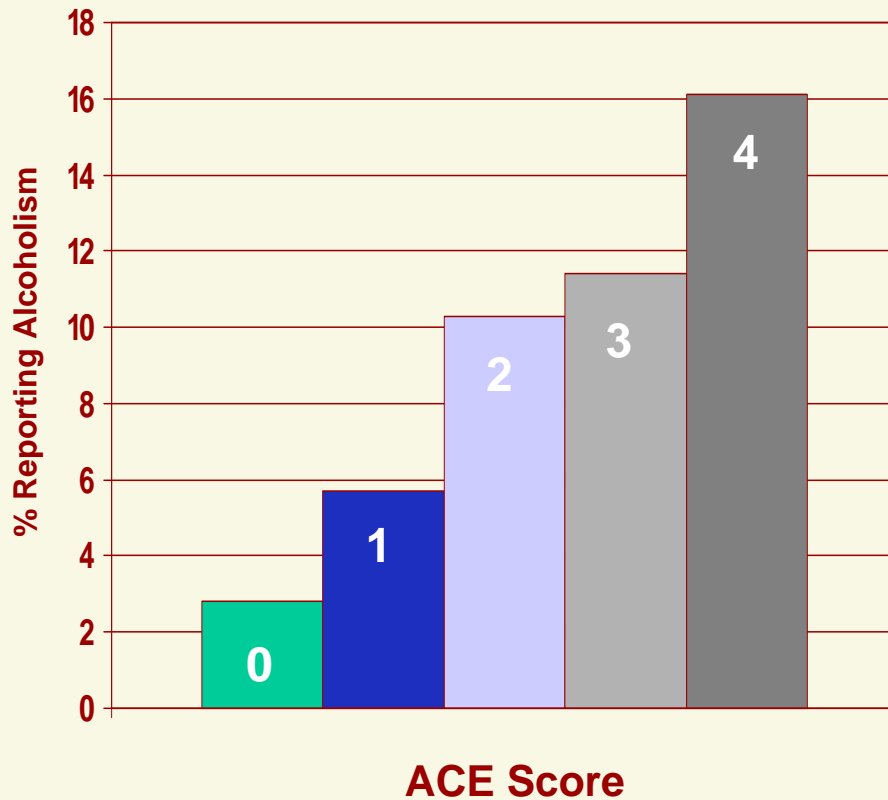
- Alcoholism & alcohol abuse
- Chronic obstructive pulmonary disease & ischemic heart disease
- Depression
- Fetal death
- High risk sexual activity
- Illicit drug use
- Intimate partner violence
- Liver disease
- Obesity
- Sexually transmitted disease
- Smoking
- Suicide attempts
- Unintended pregnancy



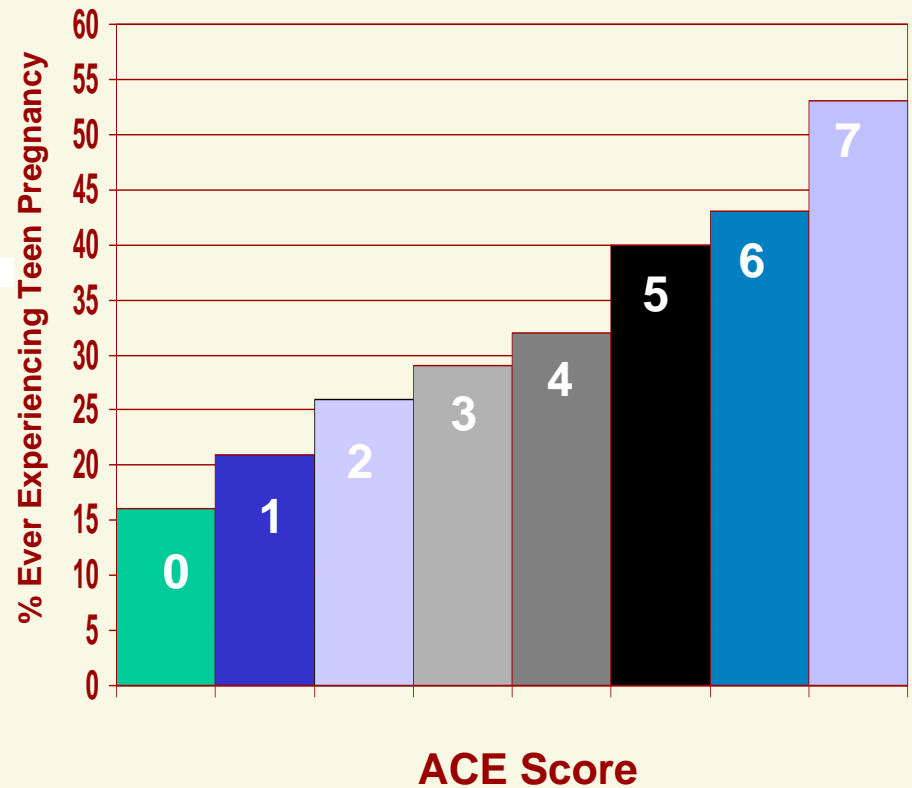
The higher the ACE Score, the greater the incidence of co-occurring conditions from this list.

# ACE STUDY DOSE-RESPONSE FINDINGS

## Adult Alcoholism

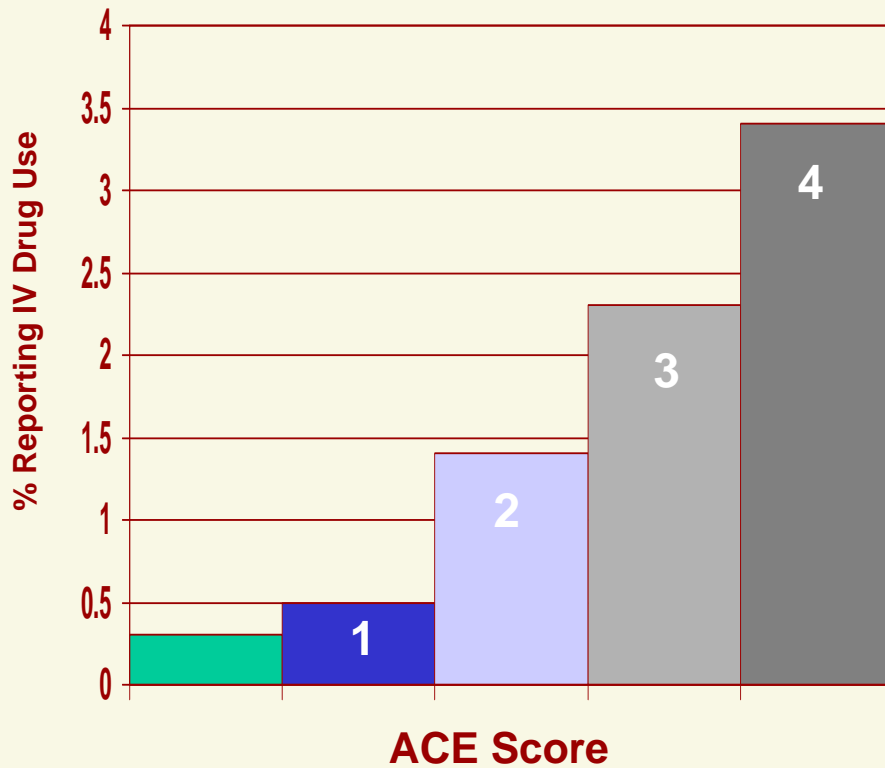


## Women & Teen Pregnancy

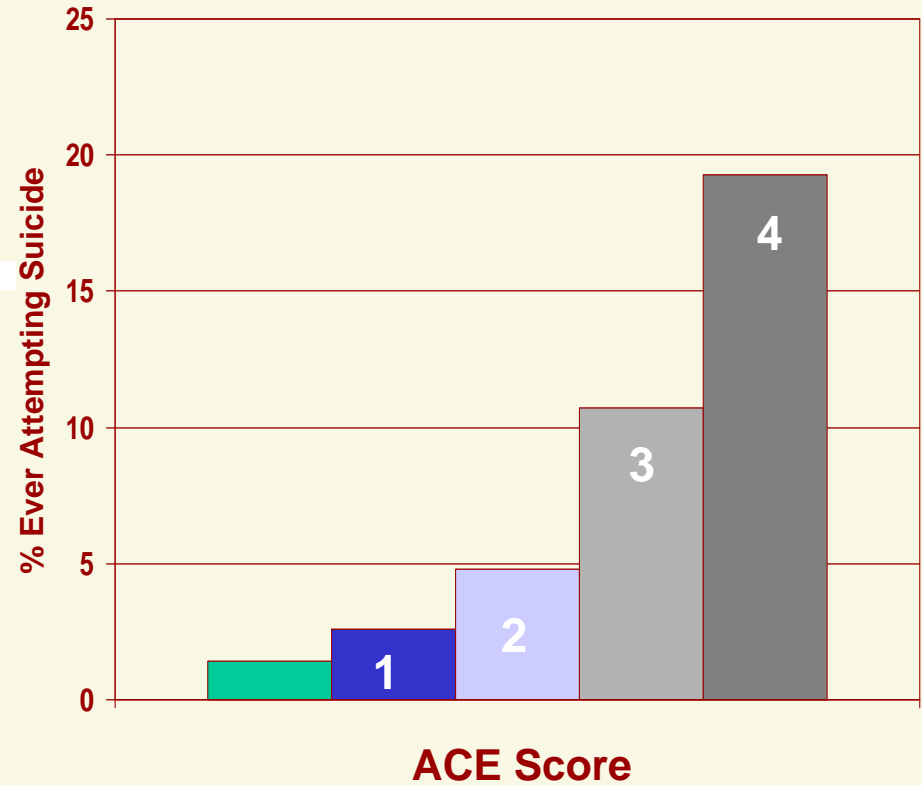


# ACE STUDY DOSE RESPONSE FINDINGS

## Intravenous Drug Use



## Attempted Suicide



## PROBABILITY OF SAMPLE OUTCOMES GIVEN 100 AMERICAN ADULTS

**33**  
**Report No ACEs**



**WITH 0 ACEs**  
**1 in 16 smokes**  
**1 in 69 are alcoholic**  
**1 in 480 uses IV drugs**  
**1 in 14 has heart disease**  
**1 in 96 attempts suicide**

**51**  
**Report 1-3 ACES**



**WITH 3 ACEs**  
**1 in 9 smokes**  
**1 in 9 are alcoholic**  
**1 in 43 uses IV drugs**  
**1 in 7 has heart disease**  
**1 in 10 attempts suicide**

**16**  
**Report 4-8 ACEs**



**WITH 7+ ACEs**  
**1 in 6 smokes**  
**1 in 6 are alcoholic**  
**1 in 30 use IV drugs**  
**1 in 6 has heart disease**  
**1 in 5 attempts suicide**

## High Public Cost of ACEs

The public costs of smoking, substance abuse and **chronic illness** are well documented.

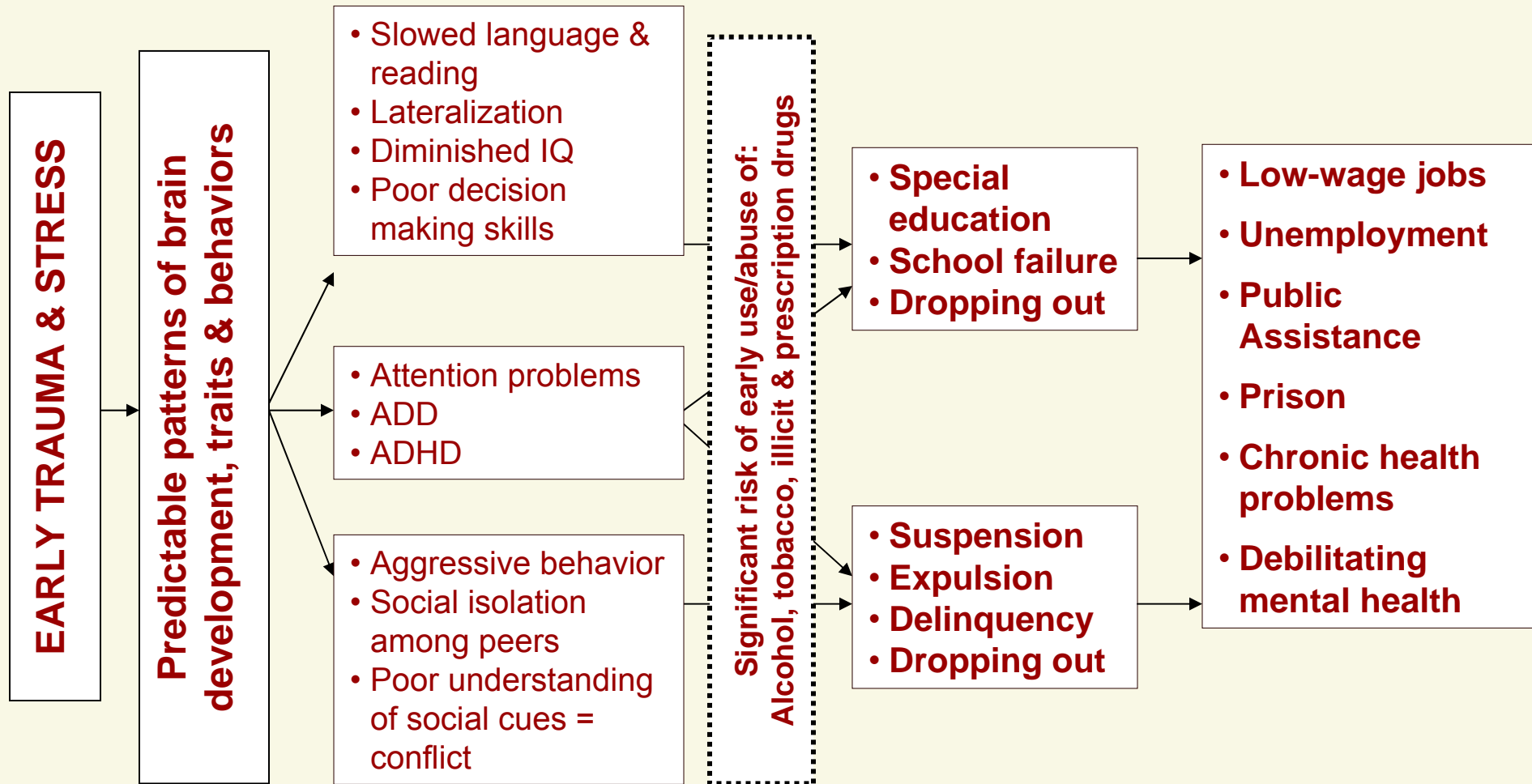
The study found disproportionate use of **prescription pharmaceuticals**, particularly those used to treat mental health issues, by the group with the highest ACE Scores. ■

The study also measured the effects of ACEs on **employment** stability, productivity and absenteeism. ACEs have negative effects on these business measures, suggesting significant, detrimental effects on **tax revenue**.

When combined with the most recent brain research, the ACE Study reveals heightened risk for three pathways resulting in life-long **poverty**.



# INTEGRATING SCIENTIFIC FINDINGS: THE FAST TRACK TO POVERTY



## DISCUSSION

- In what ways does this study affirm or challenge your professional understanding and experience of mental, behavioral & physical health outcomes?



# ACEs IN WASHINGTON



1. ACEs in **Young Children** & Academic, Behavioral and Health Challenges
2. ACEs in **High School** Sophomores and Seniors
3. ACEs in **Adjudicated Youth** - Pierce County Juvenile Court Improvement Project
4. ACEs in **Adults** – ACEs and Lifelong Health

**“Understanding Adverse Childhood Experiences isn’t to know one’s life path.**

**It is to open doors for the future you would like for yourself and for future generations.”**

**Dr. Ronald Voorhees, MD, PhD  
Chief Office of Epidemiology & Biostatistics  
Allegheny County Health Department**

# ACEs AND ELEMENTARY SCHOOL CHILDREN

- 2101 children, ages 5 to 12, from 9 schools; randomly selected; 50% of student population
- Four of the schools are non-Title- One schools, five are Title-One schools
- Adverse Events include: referral to child protective services, family violence, exposures to community violence, and residential instability (using a McKinney Vento definition)

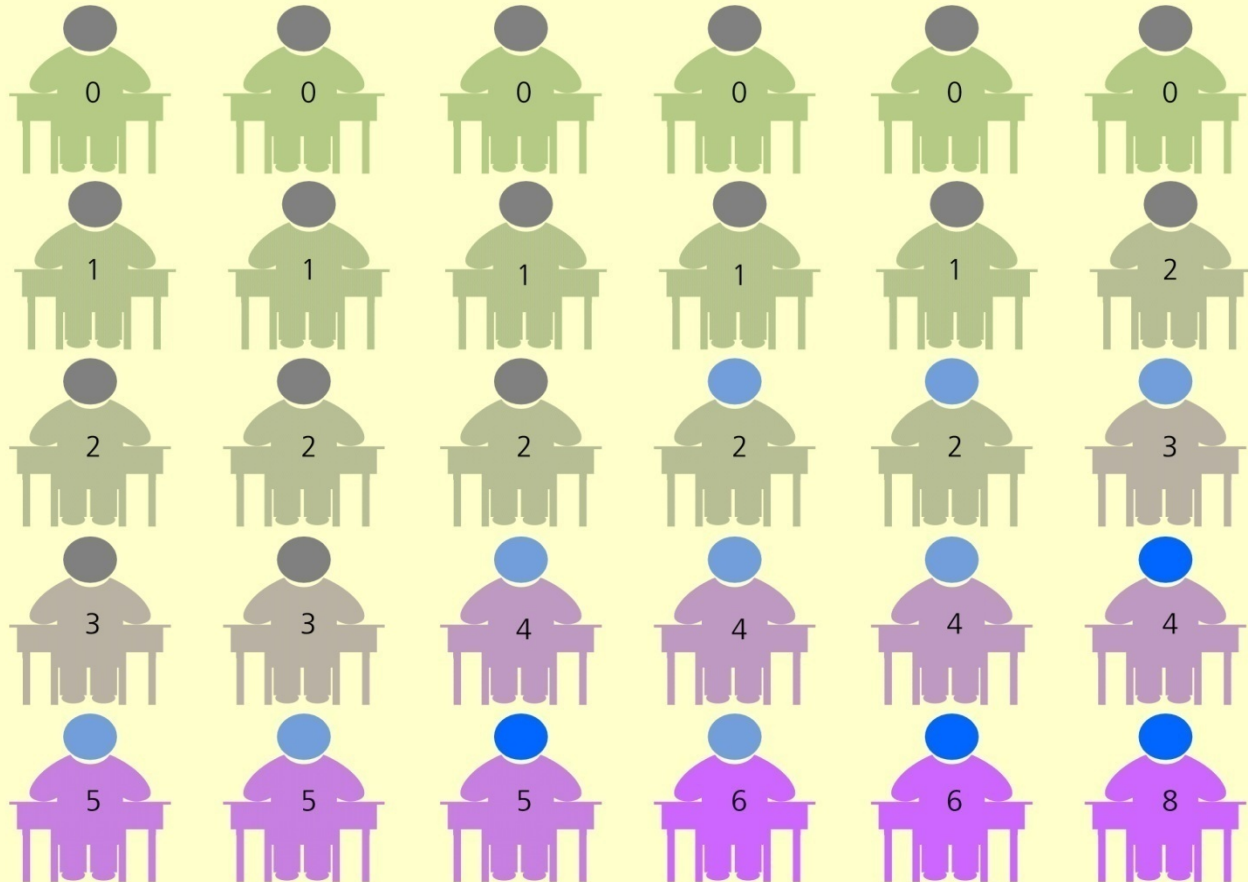
## FINDINGS:

- 1.Adverse Events are the greatest single predictor for health, attendance, and behavior
- 2.Adverse Events are the second strongest predictor, after special education status, for academic failure
- 3.The relationship between academic achievement and health status appears much less related to income than to AEs

## Washington School Classroom (30 Students) Adverse Childhood Experiences (ACEs)

6 students with no ACE  
 5 students with 1 ACE  
 6 students with 2 ACEs  
 3 students with 3 ACEs  
 7 students with 4 or 5 ACEs  
 3 students with 6 or more ACEs

58% (17) students with no exposure to physical abuse or adult to adult violence  
 29% (9) of students exposed to physical abuse or adult to adult violence  
 13% (4) of students exposed to physical abuse and adult to adult violence

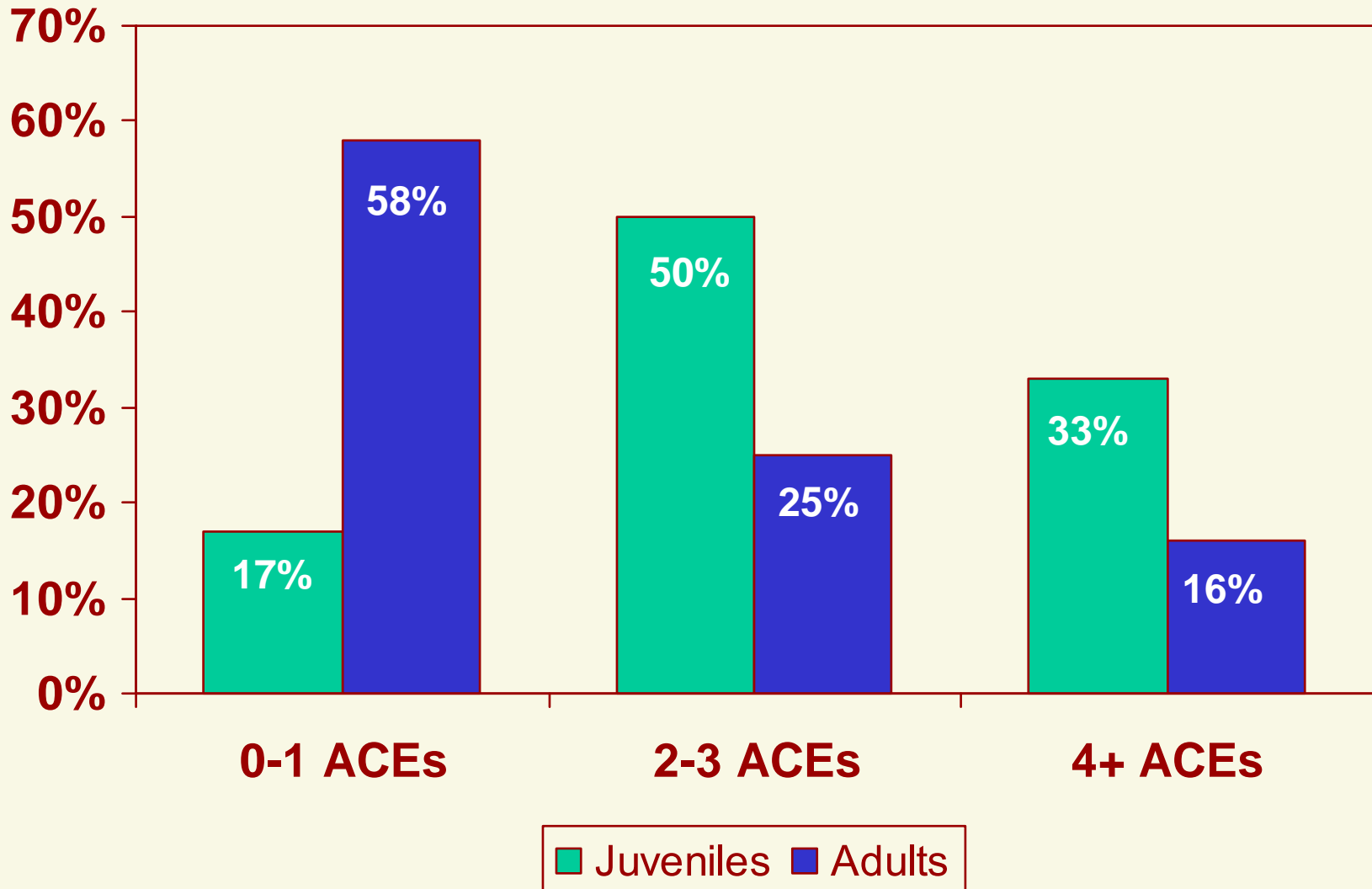


Population  
 Average



## **ACE DATA IN CONTEXT & ACTION:** *Pierce County Juvenile Court Improvement Project*

## PREVALENCE of ACEs COURT INVOLVED YOUTH vs. ADULTS IN ACE STUDY



## DISTRIBUTION OF ACEs AMONG JUVENILE OFFENDERS IN PIERCE COUNTY, WASHINGTON

**17 OFFENDERS  
Report 0-1 ACEs**

**OFFENDERS WITH  
1 ACE REPORT:**

- Loss of a parent

**50 OFFENDERS  
Report 2-3 ACEs**

**OFFENDERS WITH  
3 ACEs REPORT:**

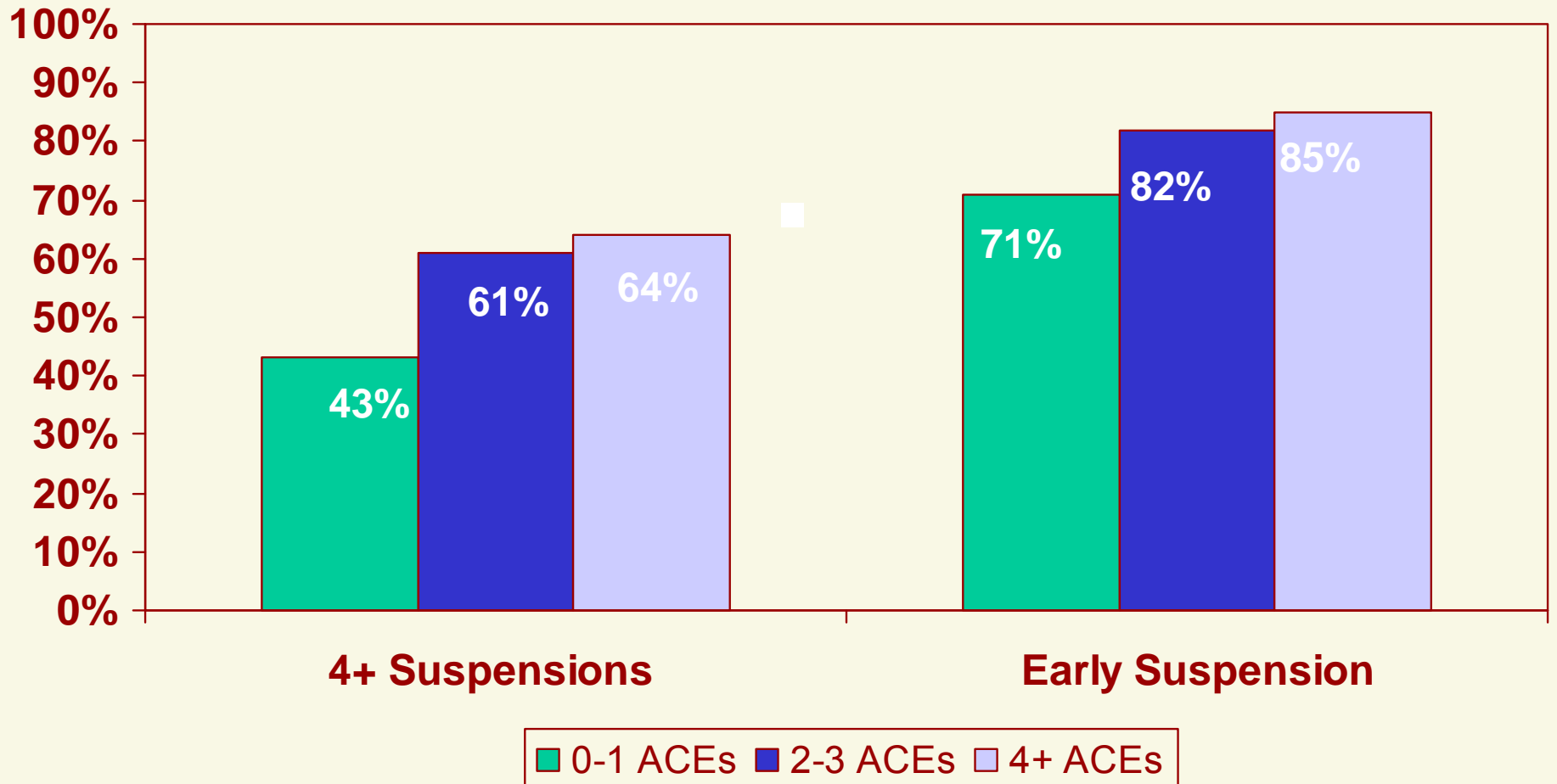
- Loss of a parent
- Incarcerated family member
- Threats/intimidation (Emotional abuse)

**33 OFFENDERS  
Report 4+ ACEs**

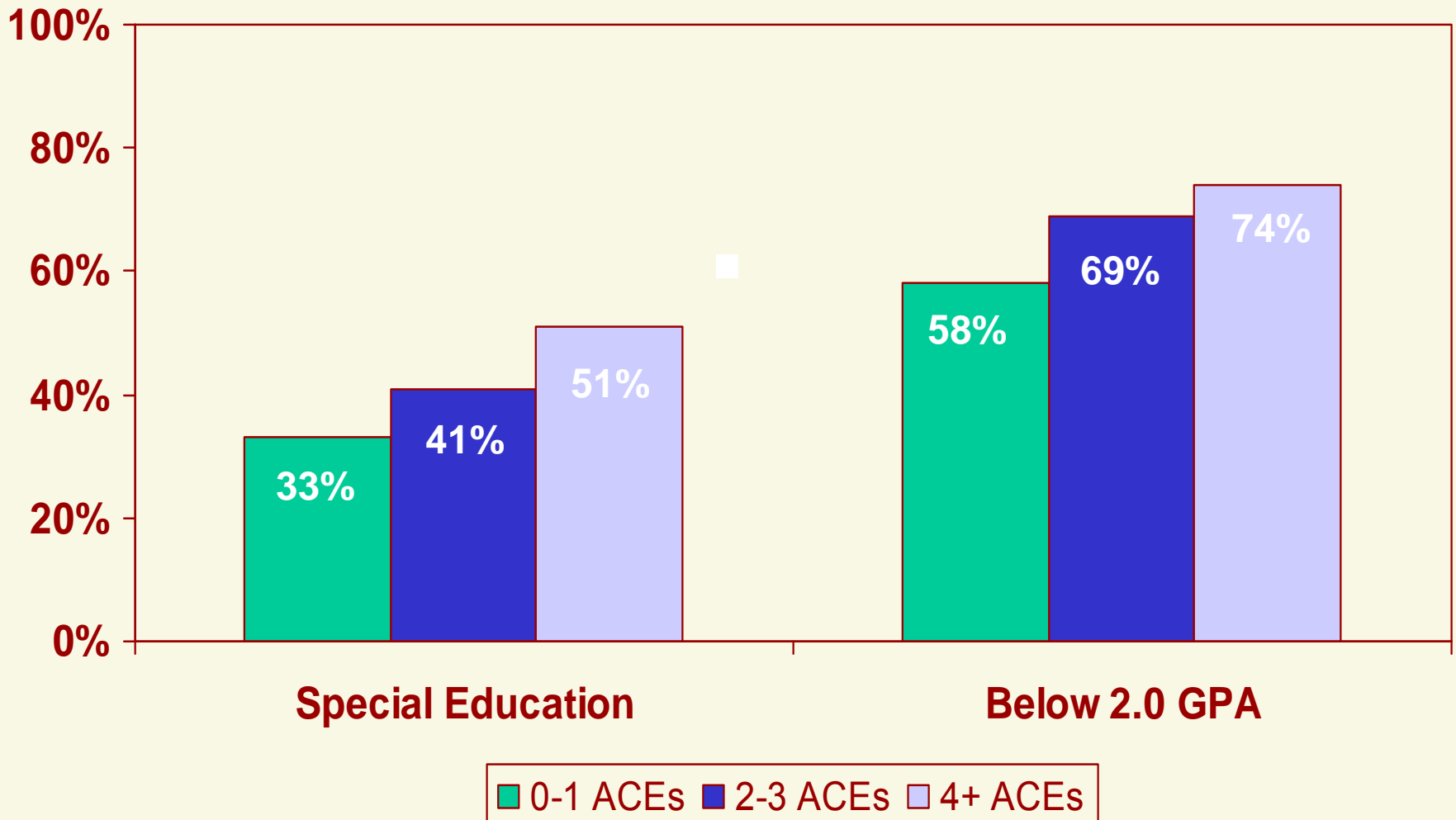
**OFFENDERS WITH  
5 ACEs REPORT:**

- Loss of a parent
- Threats/intimidation
- Incarcerated family member
- Substance abuse in the home
- Physically Abused

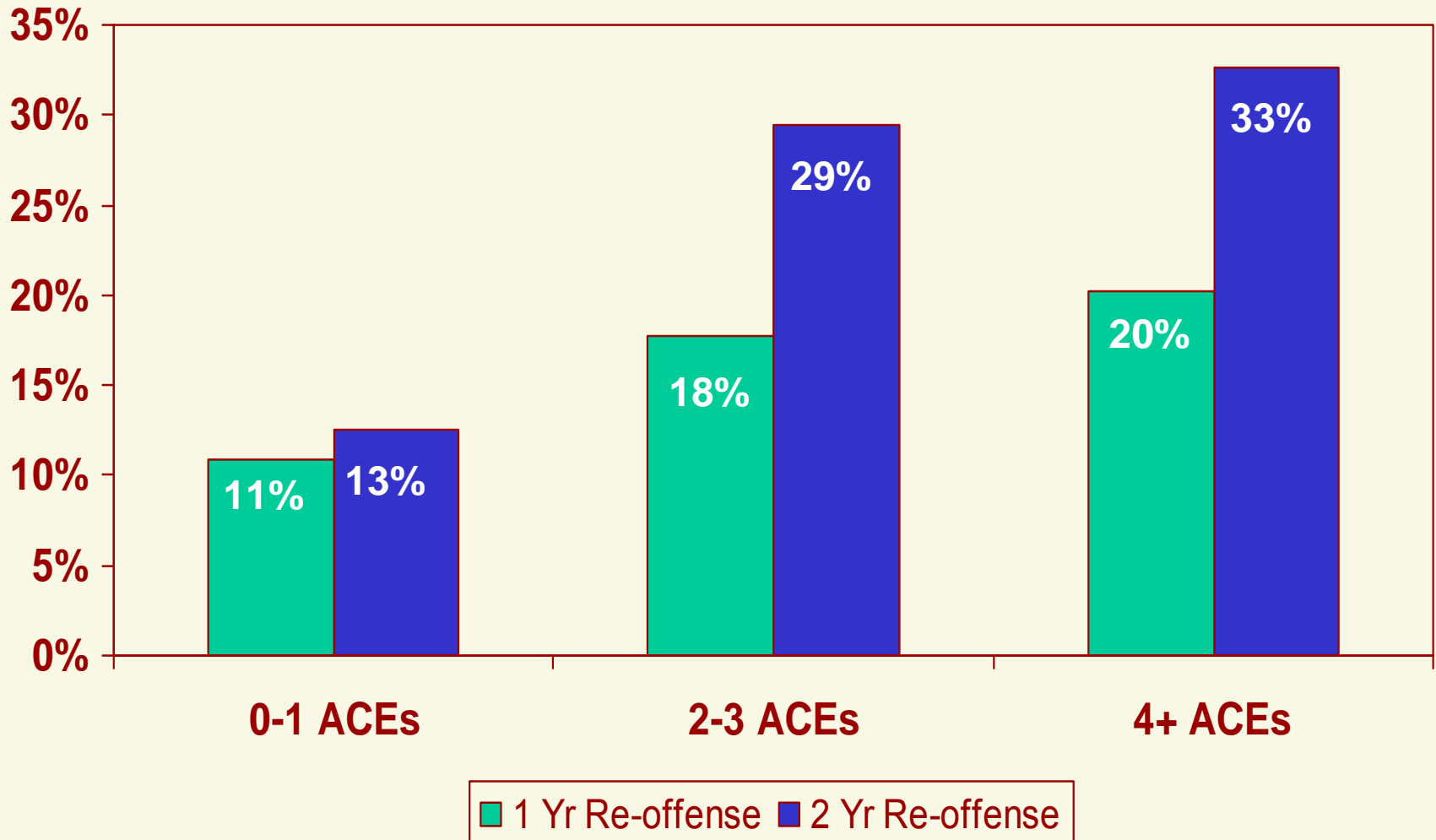
## JUVENILE OFFENDERS: ACES & SCHOOL EXPERIENCE



## JUVENILE OFFENDERS: ACES & SCHOOL EXPERIENCE



## FELONY RE-OFFENSE BY ACE CATEGORY (Males)



**ADVERSE CHILDHOOD EXPERIENCE DATA**  
from  
**WASHINGTON STATE**  
**BEHAVIORAL RISK FACTOR SURVEILLANCE SURVEY**

■  
Will Help Us:

Understand the Dynamics of Health Challenges

Invest More Wisely

Achieve Greater Impacts



## WHAT IS THE BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM (BRFSS)?



A state-based system of health surveys that generates information about health risk behaviors, clinical preventive practices, and health care access and use primarily related to chronic diseases and injury.

A cross-sectional telephone survey conducted by state health departments with technical and methodological assistance provided by the CDC.

## PREVIEW OF ACE FINDINGS FOR WASHINGTON ADULTS

ACEs are common in Washington

1.62% of adults have at least one ACE

2.17% of adults report physical abuse during childhood

3.17% of women and 7% of men report sexual abuse during childhood

4. One in four adults report parental separation or divorce during childhood

5. A third of adults grew up with substance abuse in the household

# ACES ADD UP—MORE IS WORSE

(As captured by the ACE Score)



One in four adults report three or more ACEs

5% of adults have six or more ACEs

# ACES TEND TO CO-OCCUR / CLUSTER

In the lives of Washingtonians

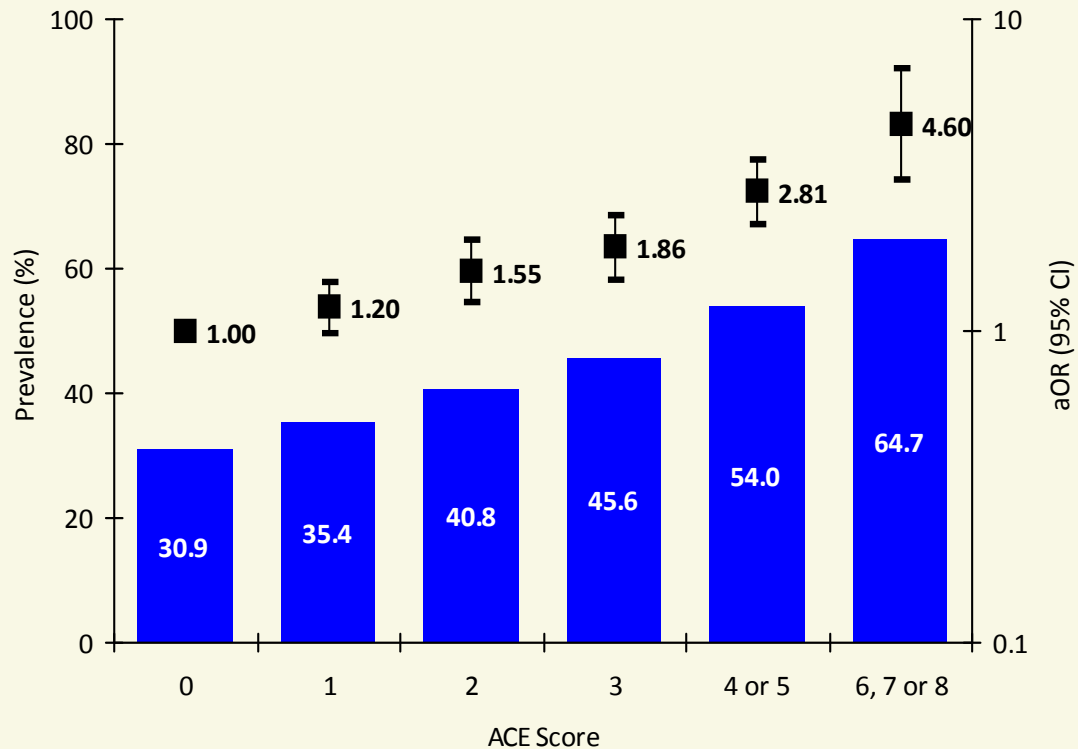


Among adults exposed to physical abuse,  
84% reported at least 2 additional ACEs

Among adults exposed to sexual abuse, 72%  
reported at least 2 additional ACEs

## AS THE ACE SCORE INCREASES RISK OF NUMEROUS HEALTH & SOCIAL PROBLEMS INCREASE DRAMATICALLY

**SMOKING**  
 Age-adjusted prevalence and multivariable-adjusted relative odds of smoking (ever) by ACE score



Compared to adults without exposure to ACEs, the risk of smoking – a risk factor for many chronic diseases – was increased:

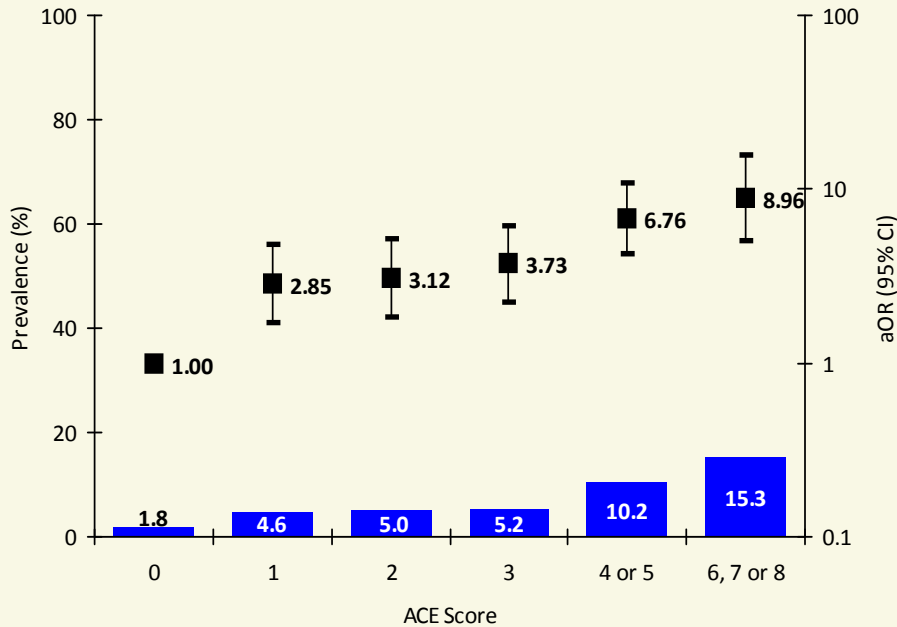
1.2 times for those with 1 ACE, \* 1.5 times with 2 ACEs, \* 1.9 times with 3 ACEs, \* 2.8 times with 4 or 5 ACEs, \* 4.6 times with 6 or more

ACEs

# AS THE ACE SCORE INCREASES RISK OF NUMEROUS HEALTH AND SOCIAL PROBLEMS INCREASE DRAMATICALLY

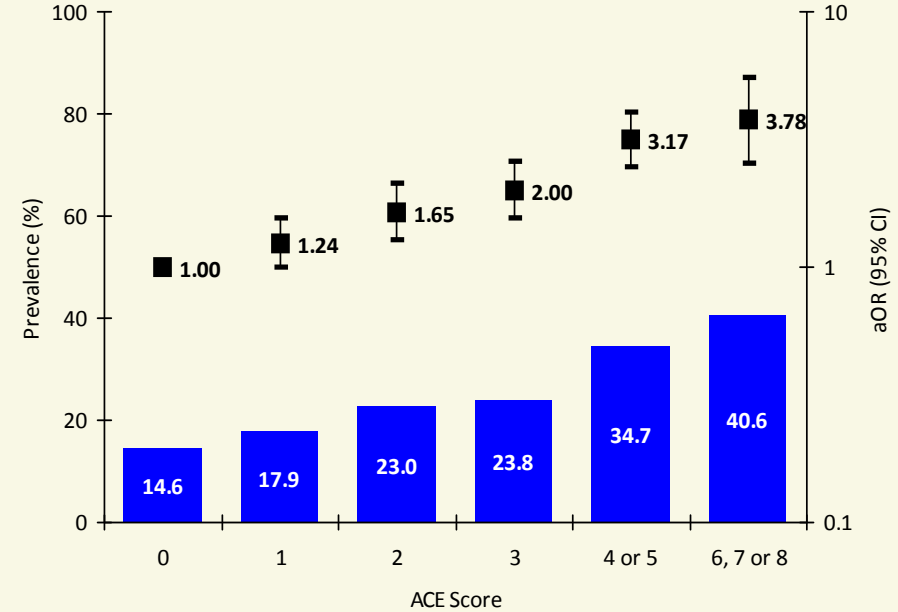
## LIFE DISSATISFACTION

Age-adjusted prevalence and multivariable-adjusted relative odds of low life satisfaction by ACE score



## ACTIVITY LIMITATION

Age-adjusted prevalence and multivariable-adjusted relative odds of activity limitation due to health problems by ACE score



The likelihood of life dissatisfaction – a risk factor for suicide – increased with increasing ACE score  
**adults with 6 or more ACEs 9 times more likely to report life dissatisfaction compared to those with an ACE score of zero**

# ACEs in WASHINGTON

HEALTH AND SOCIAL PROBLEMS SHOWN TO HAVE A GRADED RELATIONSHIP TO THE ACE SCORE IN THE 2009 WASHINGTON

## Type of Problem Experience

## Outcome Associated with Adverse Childhood

Prevalent Diseases

Cardiovascular disease, cancer, asthma

Risk Factors for Common Diseases/Poor Health

Smoking, heavy drinking, binge drinking, obesity, high perceived risk of AIDS, taking painkillers to get high, marijuana use

Poor Mental Health

Sleep disturbances, frequent mental distress, nervousness, mental health or emotional problem requiring medication, emotional problems that restrict activities

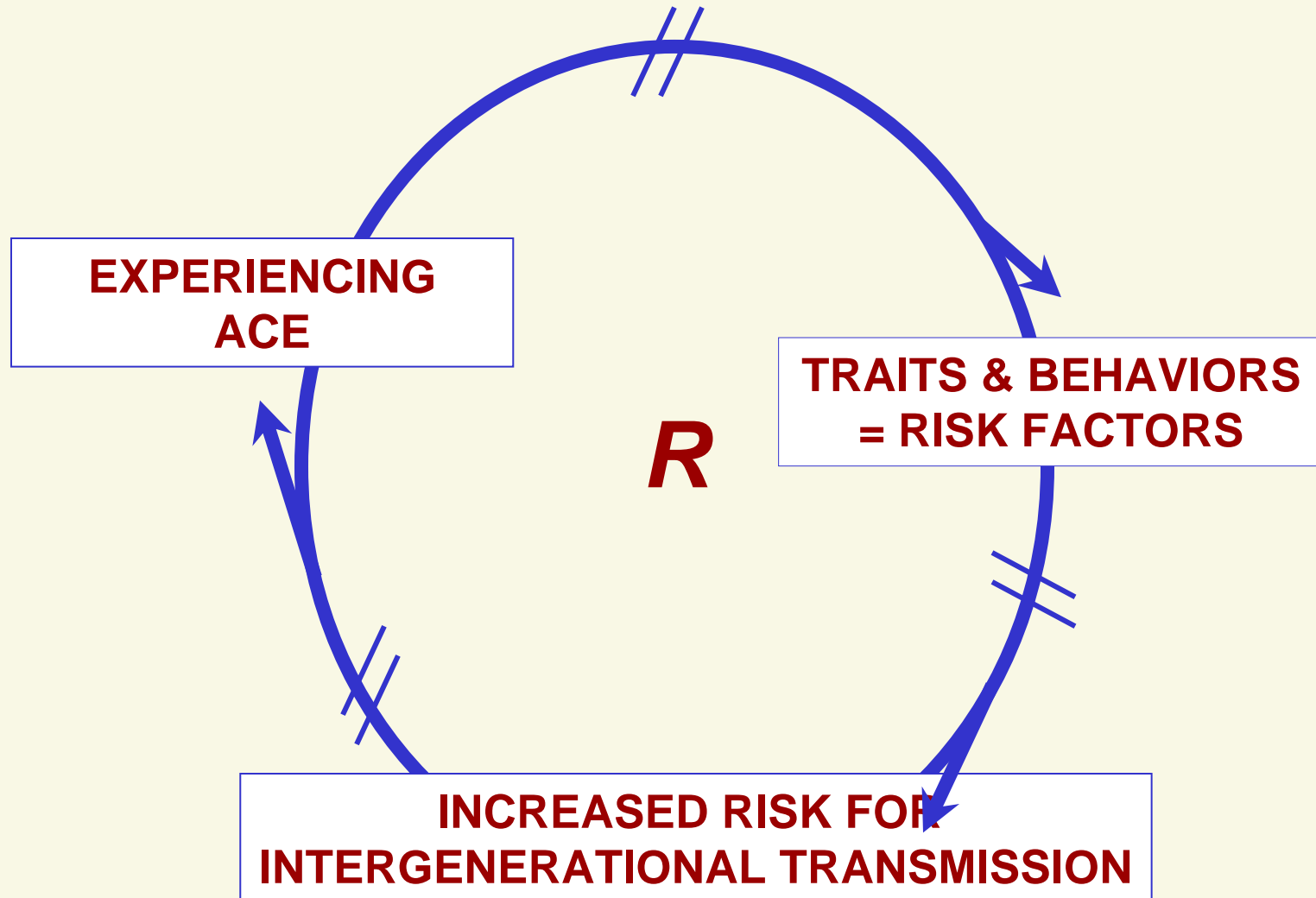
General Health and Social Problems

Fair or poor health, life dissatisfaction, health-related quality of life

Risk for Intergenerational Transmission

**Mental Illness:** depression, anxiety, emotional problems that restrict activities, medication for mental health conditions  
**Drugs and Alcohol:** Use of painkillers to get high, use of marijuana, smoking, heavy drinking, binge drinking  
**Loss of a Parent:** Divorced-widowed-separated

# ACEs CREATE INTERGENERATIONAL RISK





# POSITIVE ADAPTATION

Shifting from Deficit Oriented Models

to

Strengths, Health, & Thriving.

# RESILIENCE

## WHAT IS RESILIENCE?

“Resilience refers to a class of phenomena characterized by good outcomes in spite of serious threats to adaptation or development.”

*-Ann Masten, Ordinary Magic: Resilience Processes in Development*

“Resilience is the result not only of biologically given traits, but also of people’s embeddedness in complex and dynamic social contexts, contexts that are themselves more or less vulnerable to harm, more or less amenable to change, and apt focal points for intervention.”

*-Mary Harvey, Towards an Ecological Understanding of Resilience in Trauma Survivors*



## WHAT IS RESILIENCE?

The natural human capacity to navigate life well.

(HeavyRunner & Marshall, 2003)

### RESILIENCE OCCURS AT ALL LEVELS:

The capacity to absorb disturbance and re-organize while undergoing change, yet still retain essentially the same function, structure, identity, feedbacks.

(Walker et al., 2002)

The ability of an individual, system or organization to meet challenges, survive, and do well despite adversity.

(Kirmayer, 2009)



## PHASES IN RESILIENCE RESEARCH

**Descriptive** – What do resilient individuals have in common?

**Predictive** – How questions: identify and understand processes that might lead to resilience, including risk/protective factors.

**Contextual** – Why ages, stages, personal and family history, community context matter for promotion of resilience.

**Integrative** – Encompasses rapid advances in the study of genes, developmental neurobiology, neural plasticity, and the conditions, contexts, and processes that affect positive adaptation throughout the lifespan.

**“Resilience rests, fundamentally, on relationships”.**

Conclusion of Suniya Luthar, in: *Resilience in development: A synthesis of research across five decades.*  
(2006, p. 780)



## RESILIENCE AS A DEVELOPMENTAL PROCESS

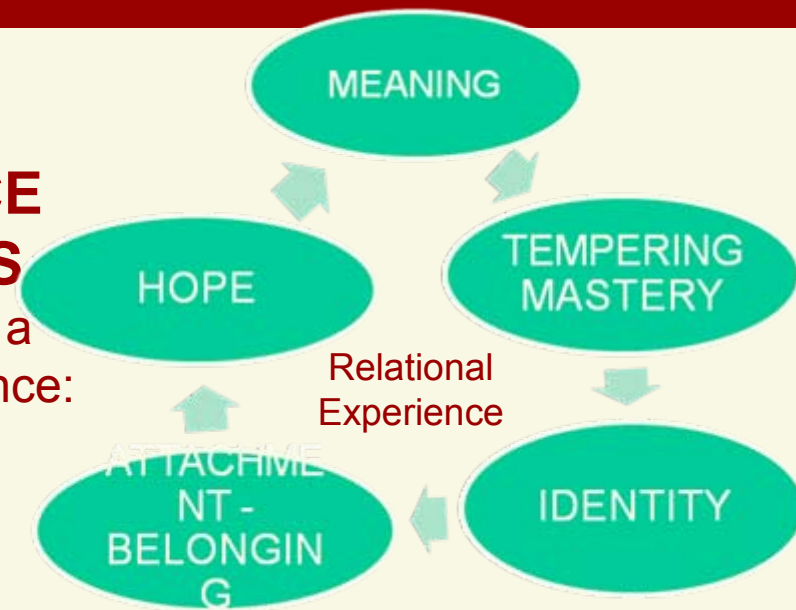
- We develop competencies & characteristics that prepare us to be effective in the world we're growing into.
- We develop the capacity to adapt in the face of challenges.
- None of us is perfect—we'll all have moments when we don't appear to be very well adapted to the conditions we're facing.
- Resilience is complex; it is possible to be resilient in one setting and pathological in another.

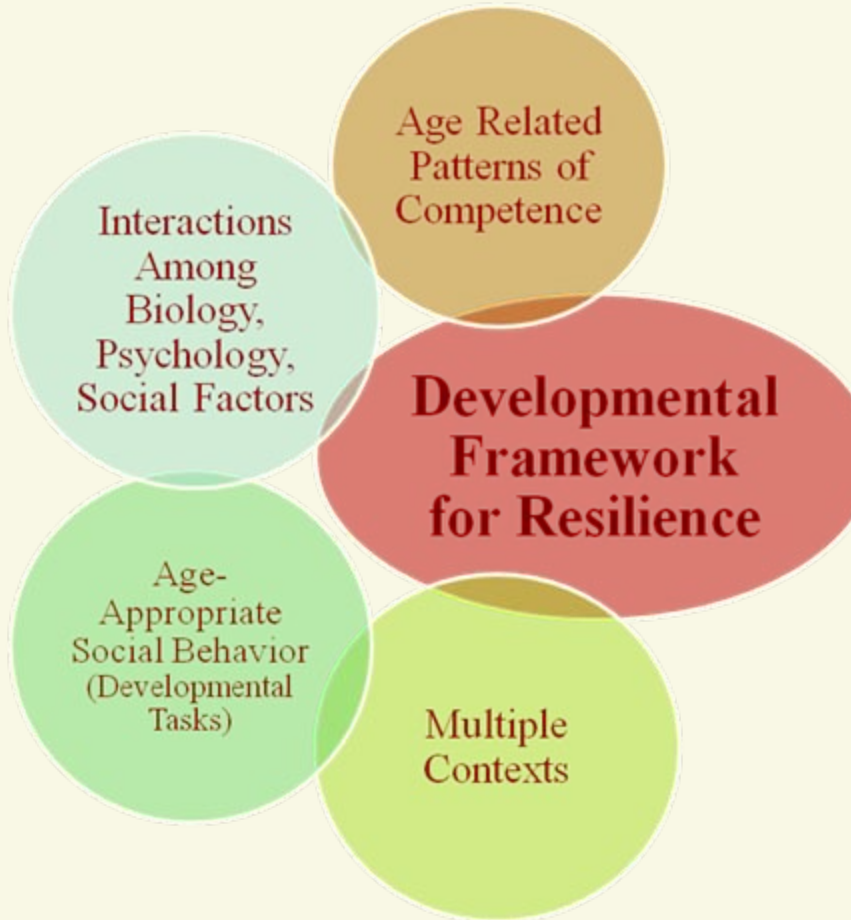


## KEY COMPONENTS OF RESILIENCE AS A DEVELOPMENTAL PROCESS

Recent studies with diverse approaches point to a short list of global factors associated with resilience:

- Cognitive & self-regulation skills
- Positive view of self
- Motivation/ability to be effective in the environment
- Connections/attachment to competent & caring adults in family & community
- Relational experience that supports the process of finding meaning from experience; tempering mastery to fit time & place; constructing identity; building hope
- Community context and functionality





# KEY COMPONENTS OF RESILIENCE



## CAPABILITY

- Intellectual & employable skills
- Self regulation – self control, executive function, flexible thinking
- Ability to direct & control attention, emotion, behavior
- Positive self view, efficacy

## ATTACHMENT & BELONGING

- Bonds with parents and/or caregivers
- Positive relationships with competent and nurturing adults
- Friends or romantic partners who provide a sense of security & belonging

## COMMUNITY, CULTURE, SPIRITUALITY

- Faith, hope, sense of meaning
- Engagement with effective orgs – schools, work, pro-social groups
- Network of supports/services & opportunity to help others
- Cultures providing positive standards, expectations, rituals, relationships & supports

# EXAMPLES OF PROGRAM & POLICY ACTIONS

**How is your community nurturing these three systems for resilience throughout the lifespan?**



- Intellectual & employable skills
- Self regulation – self control, executive function, flexible thinking
- Ability to direct & control attention, emotion, behavior
- Positive self view, efficacy



- Bonds with parents and/or caregivers
- Positive relationships with competent and nurturing adults
- Friends or romantic partners who provide a sense of security & belonging



- Faith, hope, sense of meaning
- Engagement with effective orgs – schools, work, pro-social groups
- Network of supports/services & opportunity to help others
- Cultures providing positive standards, expectations, rituals, relationships & supports

# CAUTIONS ABOUT THE RESILIENCE APPROACH



1. Expectation for Thriving Despite Oppression
  2. Strength Based  $\neq$  Solutions
3. Attending to Characteristics & Factors that Promote Resilience – Only Part of the Story

## PARAMETERS FOR INTERVENTION

- Neurobiology suggests there are critical periods to pay attention to.
- Resilience is best understood as both how we engage with other people, and how we interact with our environment (contextual).
- Whether initiated at the individual, community or societal level, interventions to promote & sustain resilience must enhance the relationship between person & context.
- Attention to cultural context is important to successful intervention.
- To have lasting effects, even the most successful interventions must become embedded in & familiar to social setting/community contexts. “Attention to the possibilities for ensuring lasting impact & enduring change are important features of intervention design & conduct.”



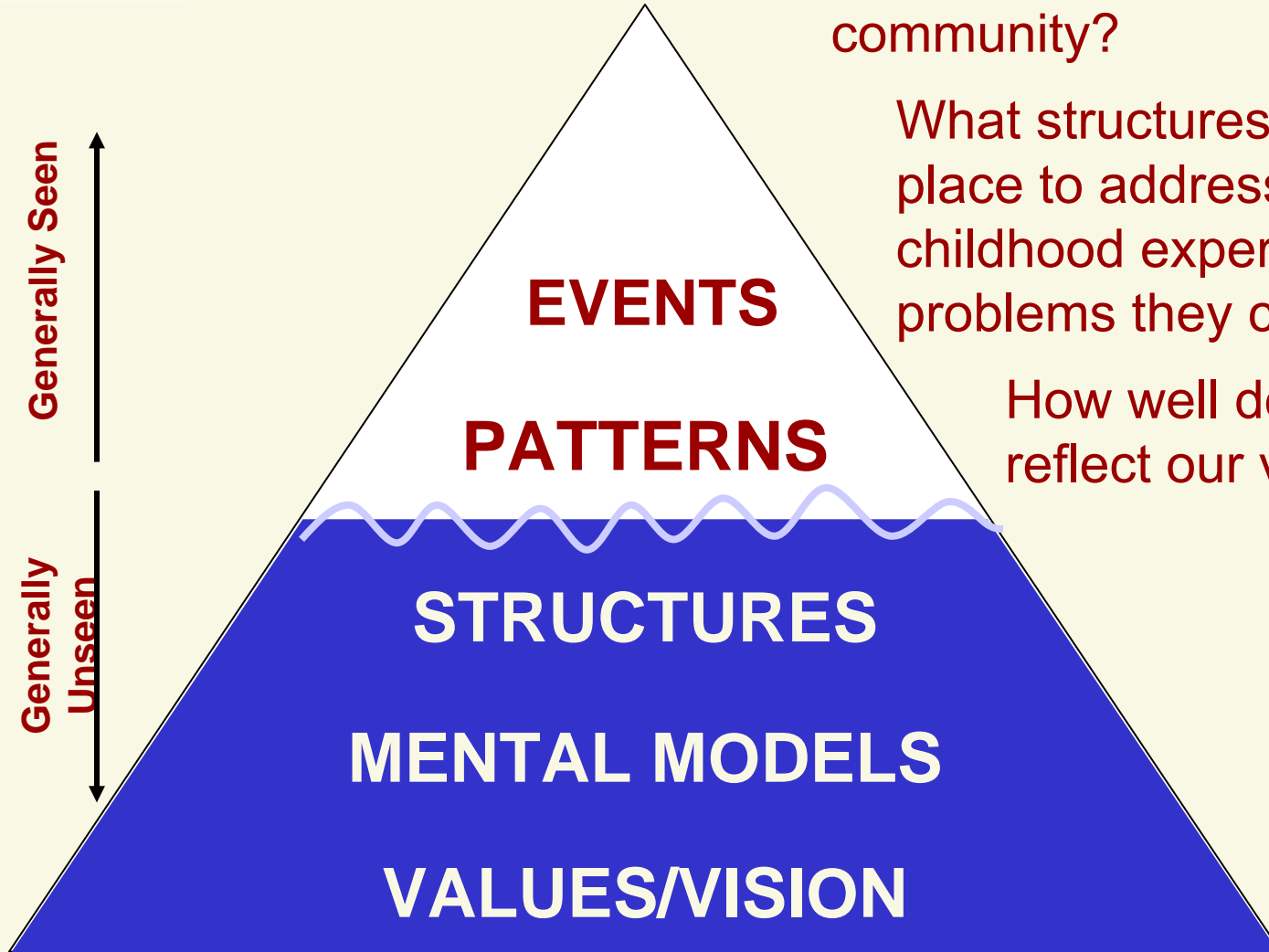
## DISCUSSION

- In what ways do the findings regarding resilience offer you hope or possibility for the future?
- The way we work with people, both adults and children, matters. What are some of the things you do already or could do that would help build resiliency in children and adults?





# NEXT CONVERSATIONS: NEXT STEPS



What do we value as a community?

What structures do we have in place to address adverse childhood experiences & the problems they cause?

How well do our structures reflect our values?

## THANK YOU!

If you or someone you are working with has already made changes to the way you interact with others, or provide services based on ACE & resilience research,

## We want to hear from you!

The Family Policy Council collects inventory of changes to practice, policy and neighborhood work that is consistent with brain science, the ACE Study, and Resilience research.

You can complete a short survey online at:

<http://www.fpc.wa.gov/>

## INVENTORY OF SERVICE CHANGE



Contact us at:

Washington State

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A Family, Community, State Partnership

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