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MPH, MSLIS, MD

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BOOKS BUILD BETTER BRAINS

A CRITICAL INTERVENTION
IN THE FIRST THOUSAND DAYS

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UW SCHOOL OF MEDICINE & PUBLIC HEALTH

SCHOOL OF LIBRARY AND INFORMATION STUDIES
UNIVERSITY OF WISCONSIN-MADISON

MEDICAL DIRECTOR, REACH OUT AND READ WISCONSIN



“Oh, that’s so nice...”
CRITICAL

A stroll through the Early Brain

Reading Reality

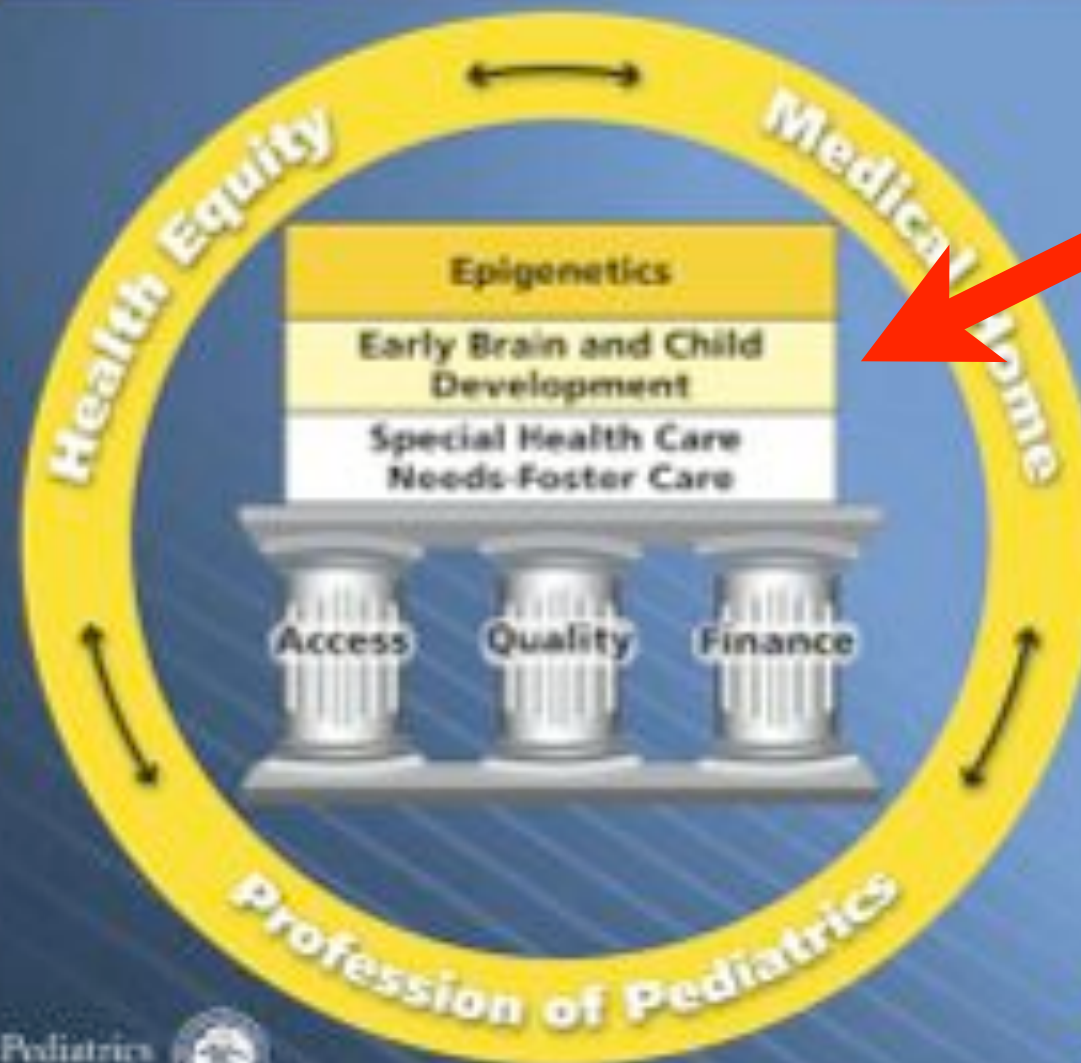
Reach Out and Read

Part One

A Stroll Through the Early Brain

AAP Agenda for Children 2011-2012

DEDICATED TO THE HEALTH OF ALL CHILDREN™



American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™



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■ Planning
■ Implementing
■ Integrating

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AMERICAN ACADEMY OF PEDIATRICS



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■ Integrating
■ Implementing
■ Planning

The background of the slide is a faded, semi-transparent version of Michelangelo's famous fresco, "The Creation of Adam". It depicts Adam lying on a rock on the left, reaching out towards God who is reclining on a cloud on the right. The title "EARLY BRAIN AND CHILD DEVELOPMENT" is overlaid in large, white, bold, sans-serif capital letters across the center of the image.

EARLY BRAIN AND CHILD DEVELOPMENT

from *The Science of Early Childhood Development*
National Scientific Council on the Developing Child, 2007

EARLY BRAIN AND CHILD DEVELOPMENT

1

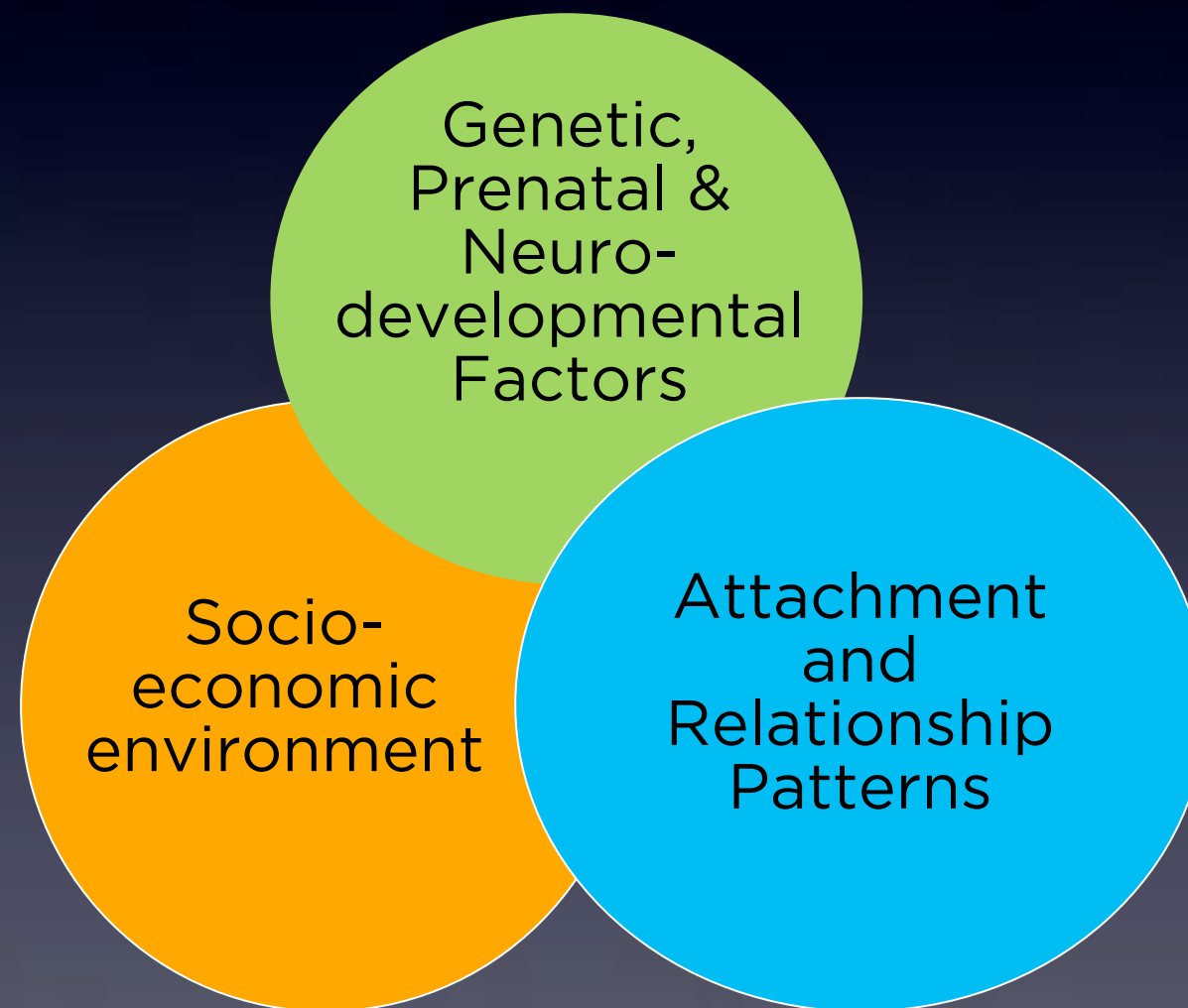
Child development is a foundation for **community** development and **economic** development, as capable children become the foundation of a prosperous and sustainable society.

2

Brains are built **over time**.

Creative Commons-licensed work by flickr user *Andrew Mace*—

The **3-legged stool** for developmental and health trajectories



EARLY BRAIN AND CHILD DEVELOPMENT

3

The interactive influences of genes and experience literally **shape** the architecture of the developing brain and the active ingredient is the “**serve and return**” nature of children’s engagement in relationships with their parents and other caregivers in their family or community.

The Face to Face Paradigm

Edward Z Tronick



Video from Zero to Three / UMass Boston. Accessible at <http://youtu.be/apzXGEbZht0>

EARLY BRAIN AND CHILD DEVELOPMENT

4

Both brain architecture and developing abilities are built “from the bottom up” with simple circuits and skills providing the **scaffolding** for more advanced circuits and skills over time.

EARLY BRAIN AND CHILD DEVELOPMENT

5

Toxic stress in early childhood is associated with **persistent** effects on the nervous system and stress hormone systems that can **damage developing brain architecture** and lead to lifelong problems in learning, behavior and both physical and mental health.

Creative Commons-licensed work by flickr user *Pedro Klien*

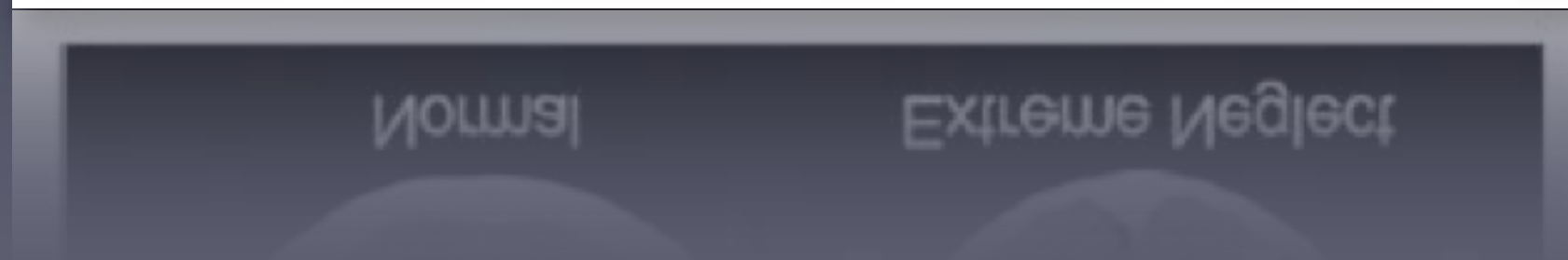
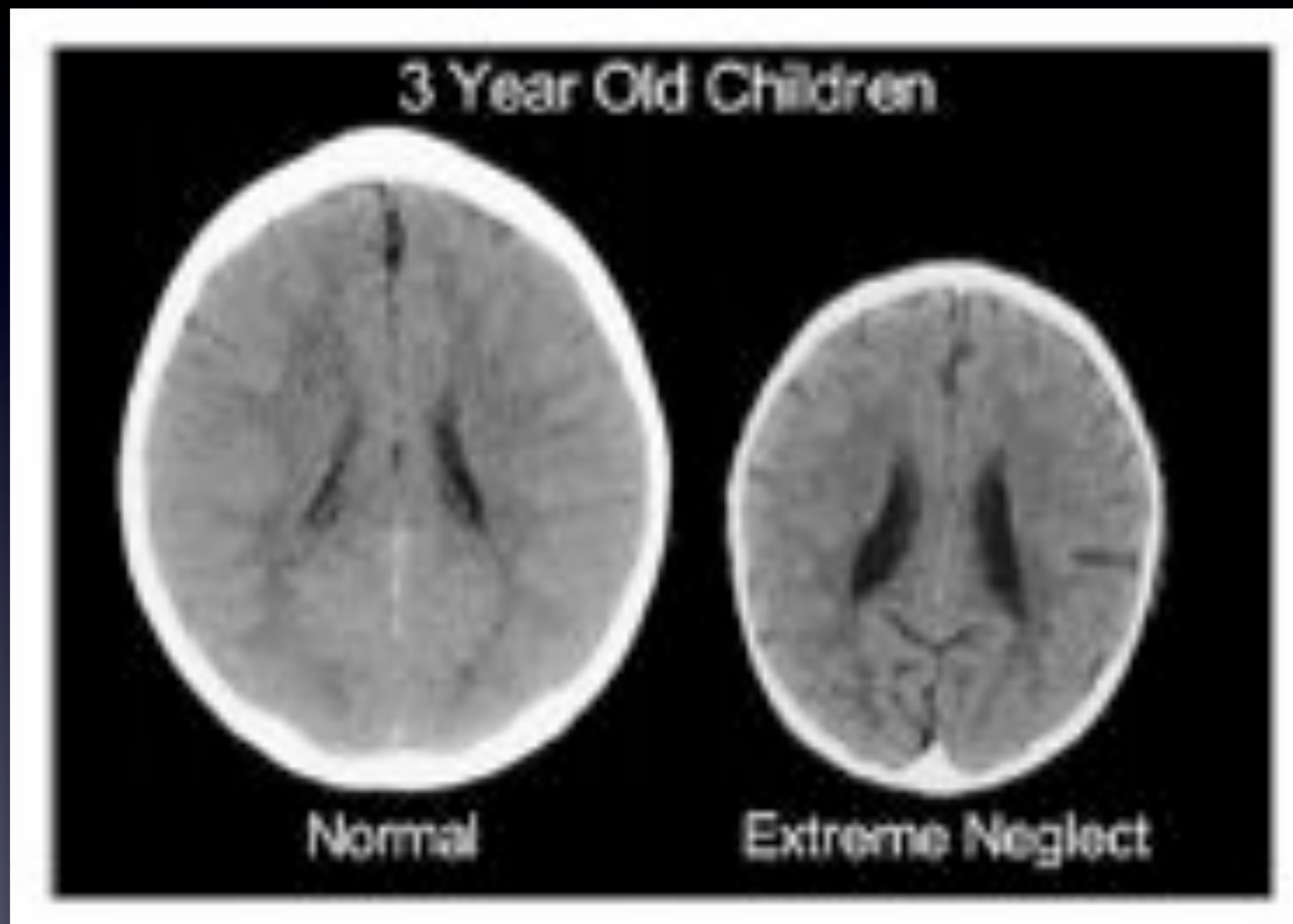


Image from Bruce Perry, MD, PhD, ChildTrauma Academy

THE STRESS RESPONSE:

increases in cortisol and epinephrine

Three Levels of Stress Response

Positive

Brief increases in heart rate,
mild elevations in stress hormone levels.

Tolerable

Serious, temporary stress responses,
buffered by supportive relationships.

Toxic

Prolonged activation of stress response systems
in the absence of protective relationships.

Source: Center on the Developing Child at Harvard University

POSITIVE STRESS

Child sees someone approaching
with their immunization syringe

Parent leaving on the first day of preschool

TOLERABLE STRESS

Death of a family member

Serious illness

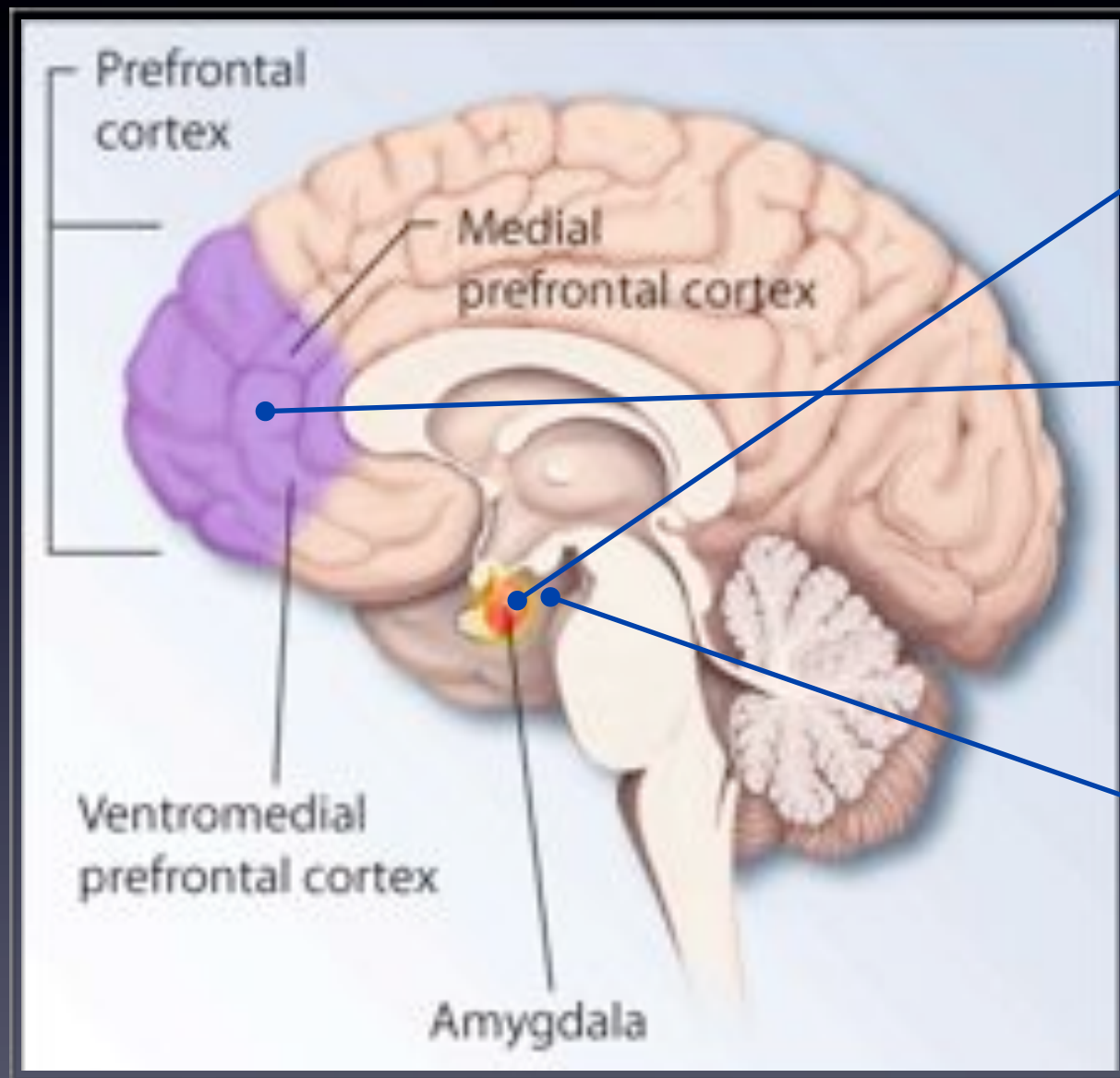
Natural disaster

What if it's worse?
What if there's no supportive relationships?

Child abuse
Parental substance abuse
Homelessness

TOXIC STRESS

What happens?



Amygdala:

activates the stress response

Toxic stress: enlargement

Prefrontal cortex:

usually a check to the amygdala

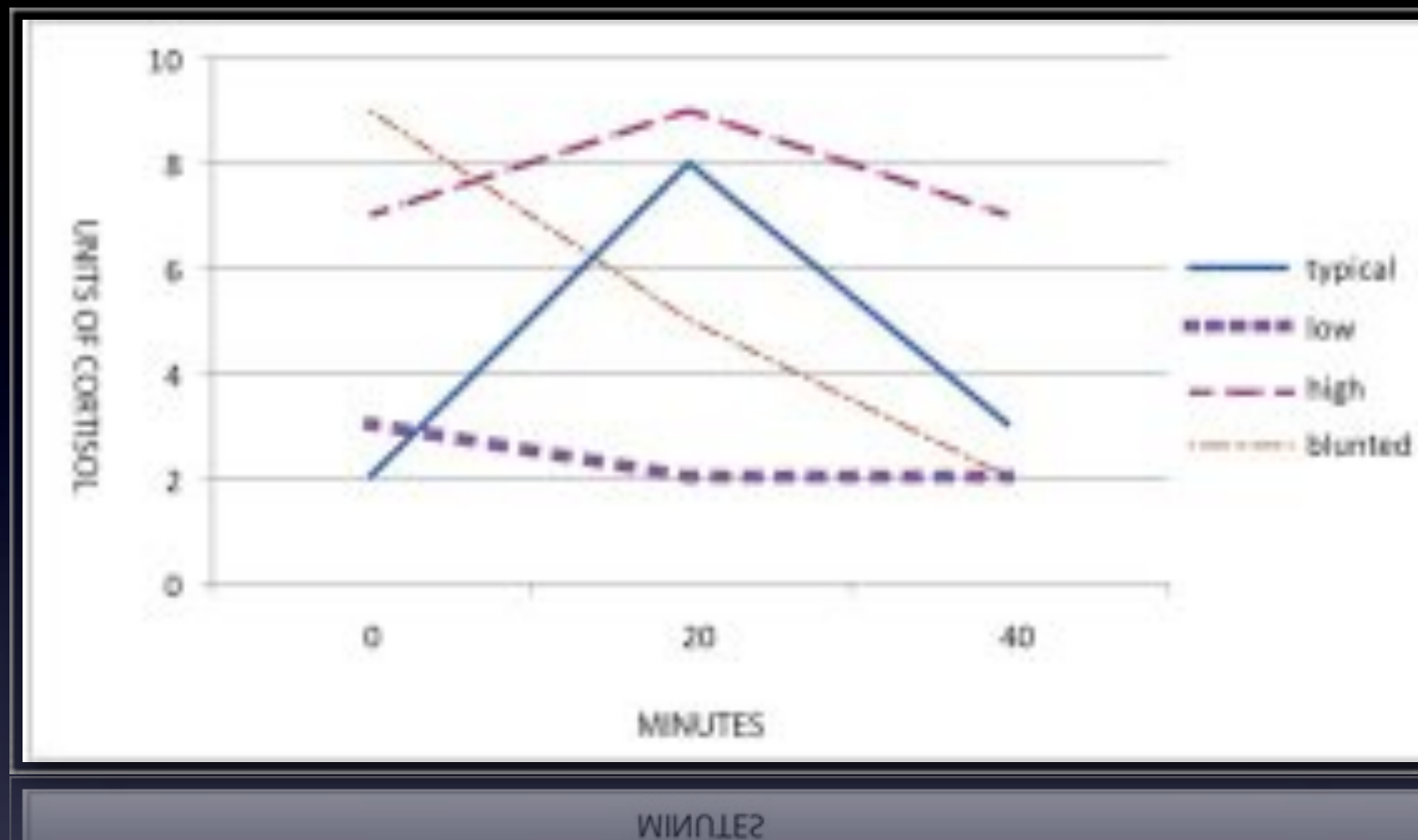
Toxic stress: loss of neurons, less able to function

Hippocampus:

major role in memory and mood

Toxic stress: impairment in understanding and emotion

POVERTY IS NEUROTOXIC



Children with “typical” cortisol response had **higher** executive function, and were rated as having **more** self-control in the classroom.

Those with a flat (high or low) or blunted response had **low** levels of executive function and were rated as having **poor** self-regulation.

POVERTY IS NEUROTOXIC

Next, children in a large (1200) study whose mothers engaged in “scaffolding” during play had lower cortisol levels and were more attentive.

Those who were more authoritative had higher cortisol levels and were found to be less attentive.

This was found at 7 months of age and again at 15 months.

They also found that the more impoverished the family, the less likely they were to engage in scaffolding.

THE ADVERSE CHILDHOOD EXPERIENCES STUDY

**The Most Important Study
You've (Probably) Never Heard Of.**

In 1985, Dr Vincent Felitti noticed many patients in his obesity treatment programs had prior history of abuse or trauma

The CDC worked with Kaiser Permanente and looked retrospectively at over 17,000 patients.

This was the first study to simultaneously assess childhood exposure to multiple types of abuse, neglect, domestic violence and serious household dysfunction.

THE ADVERSE CHILDHOOD EXPERIENCES STUDY

Study participants were middle-class Americans from San Diego, 80% white, 74% attended college, average age of 57, split evenly between men and women.

**Not exactly an impoverished,
“at-risk” population.**

THE ADVERSE CHILDHOOD EXPERIENCES STUDY

Emotional Abuse (10%)
Physical Abuse (26%)
Sexual Abuse (21%)

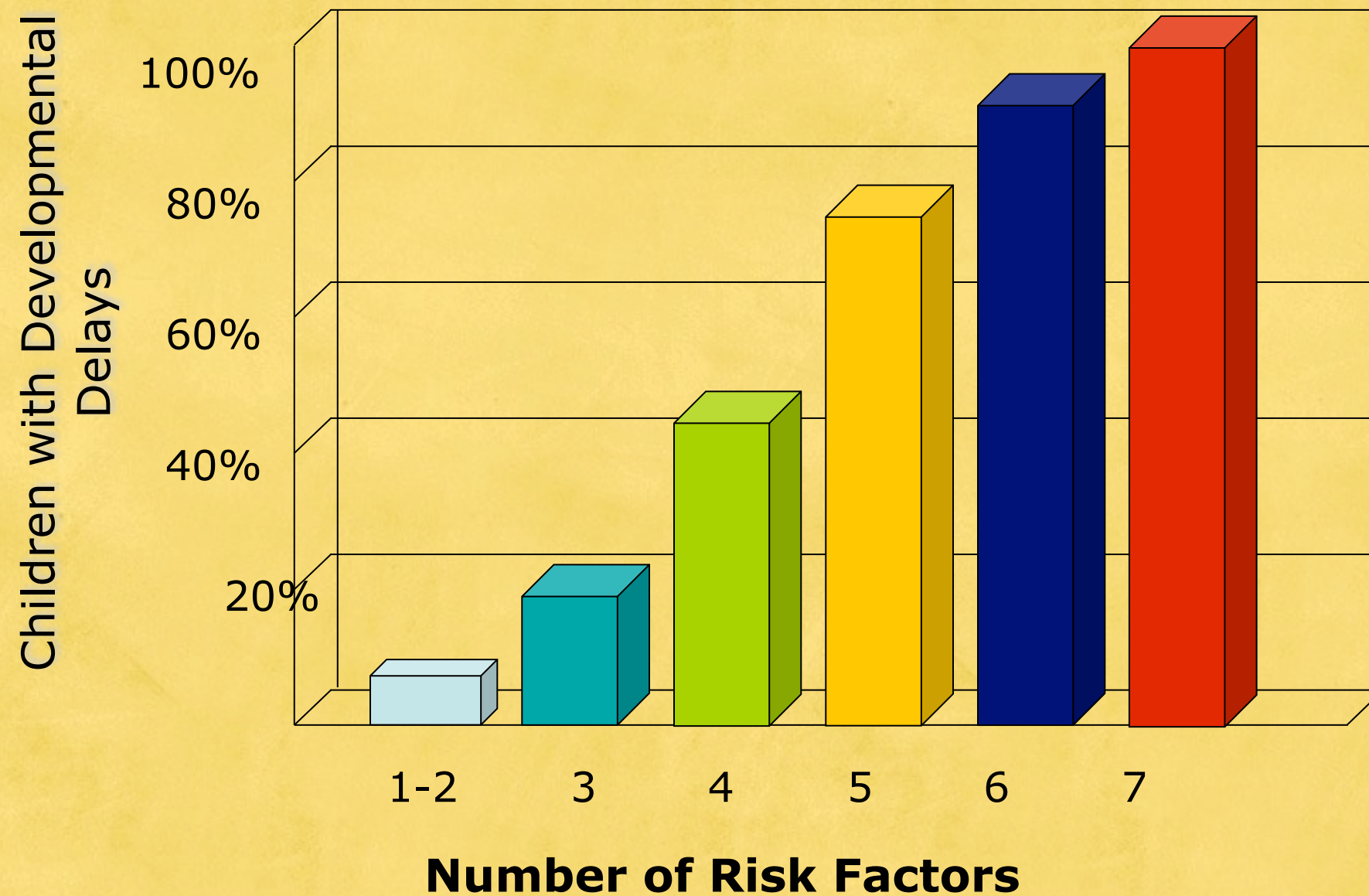
Emotional Neglect (15%)
Physical Neglect (10%)

Mother treated violently (13%)
Household substance abuse (28%)
Household mental illness (20%)
Parental separation or divorce (24%)
Incarcerated household member (6%)

ACE Score (one point for each category listed)	Prevalence in study
0	33%
1	26%
2	16%
3	10%
4	6%
5	5%
6	6%

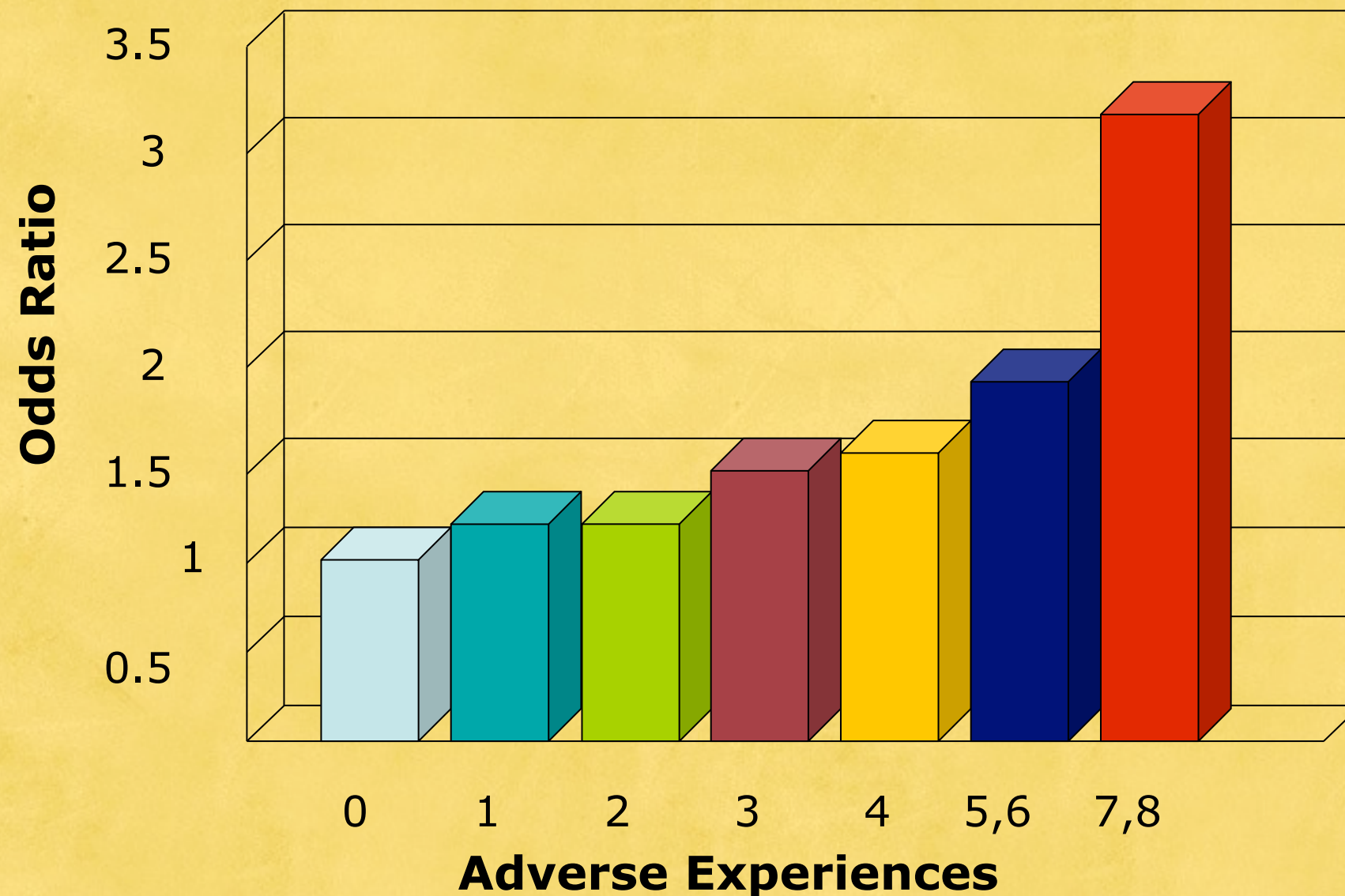
Not only are they unexpectedly common...
...their effects are **cumulative**.

Significant Adversity Impairs Development in the First Three Years



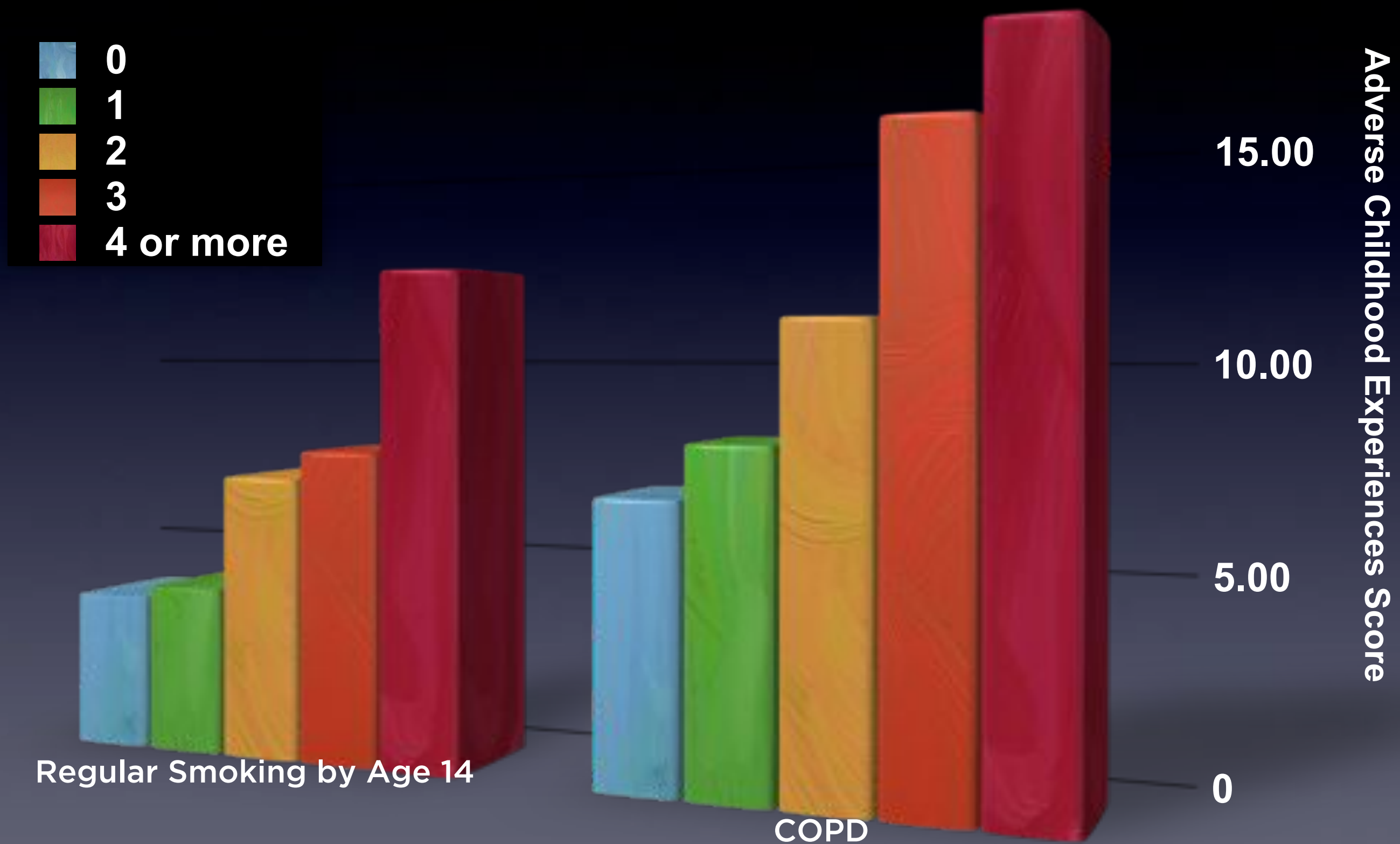
Source: Barth, et al. (2008) *via* Center on the Developing Child at Harvard University

Risk Factors for Adult Heart Disease are Embedded in Adverse Childhood Experiences

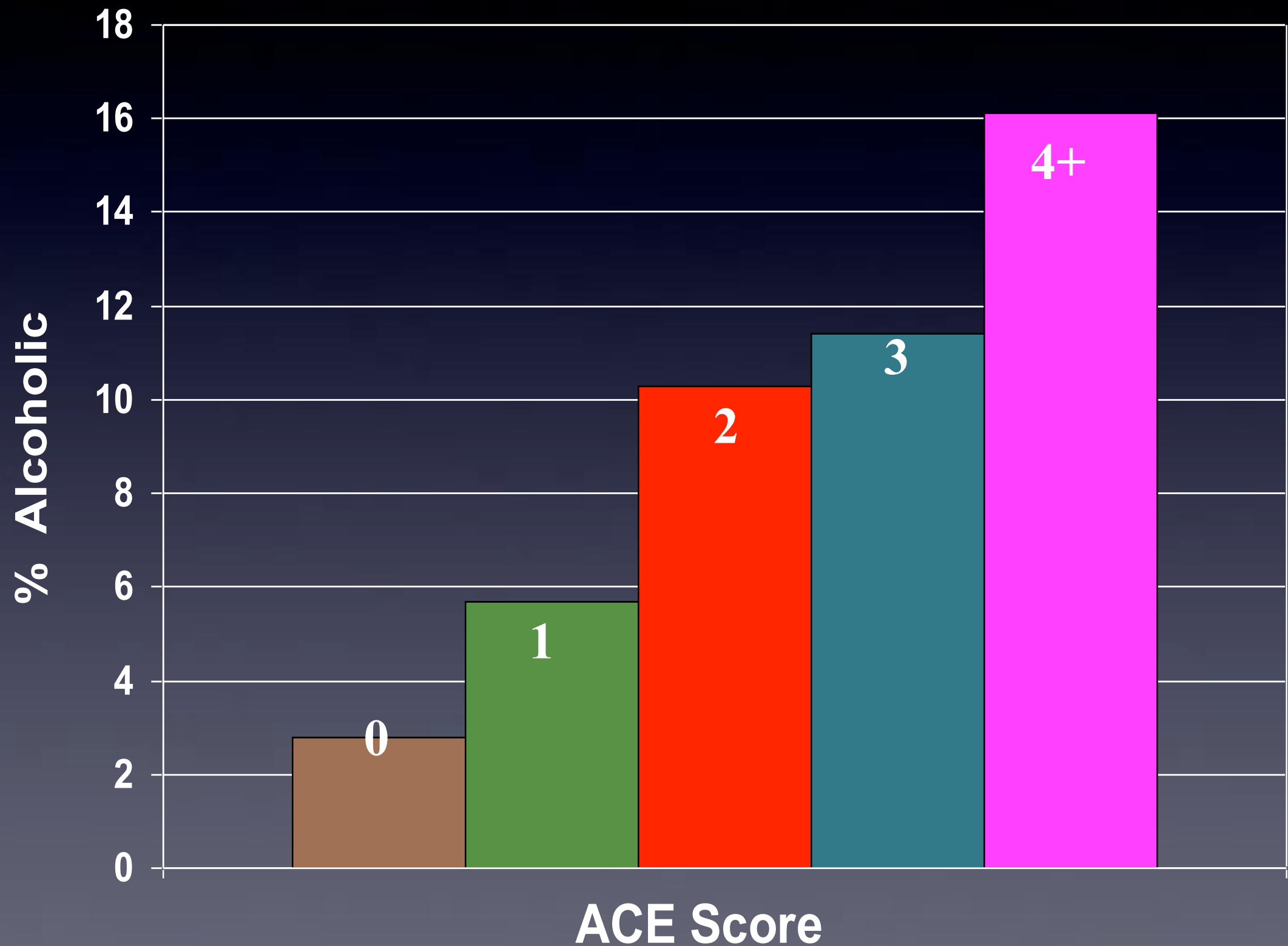


Source: Dong, et al. (2004) *via* Center on the Developing Child at Harvard University

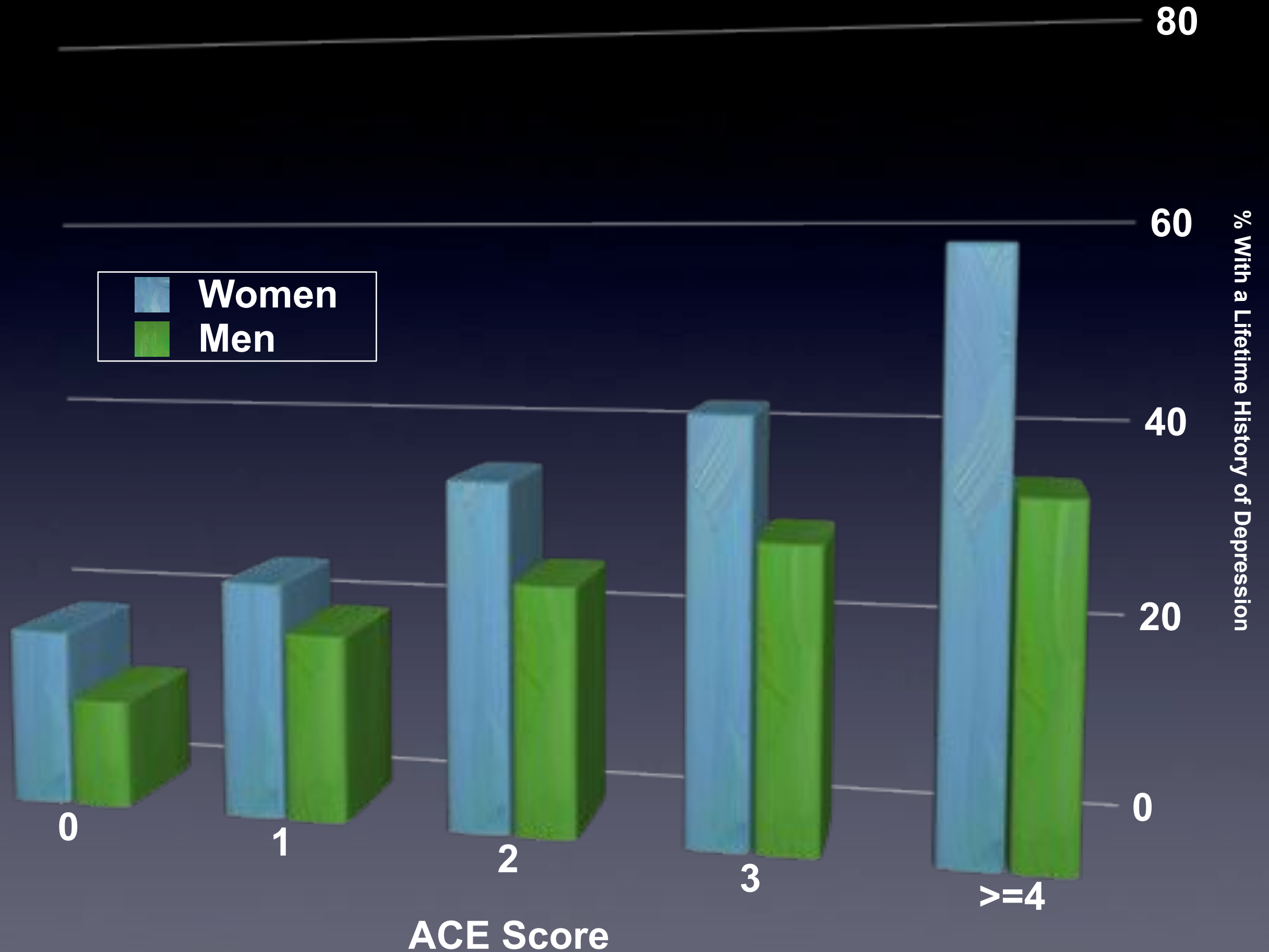
SMOKING & COPD



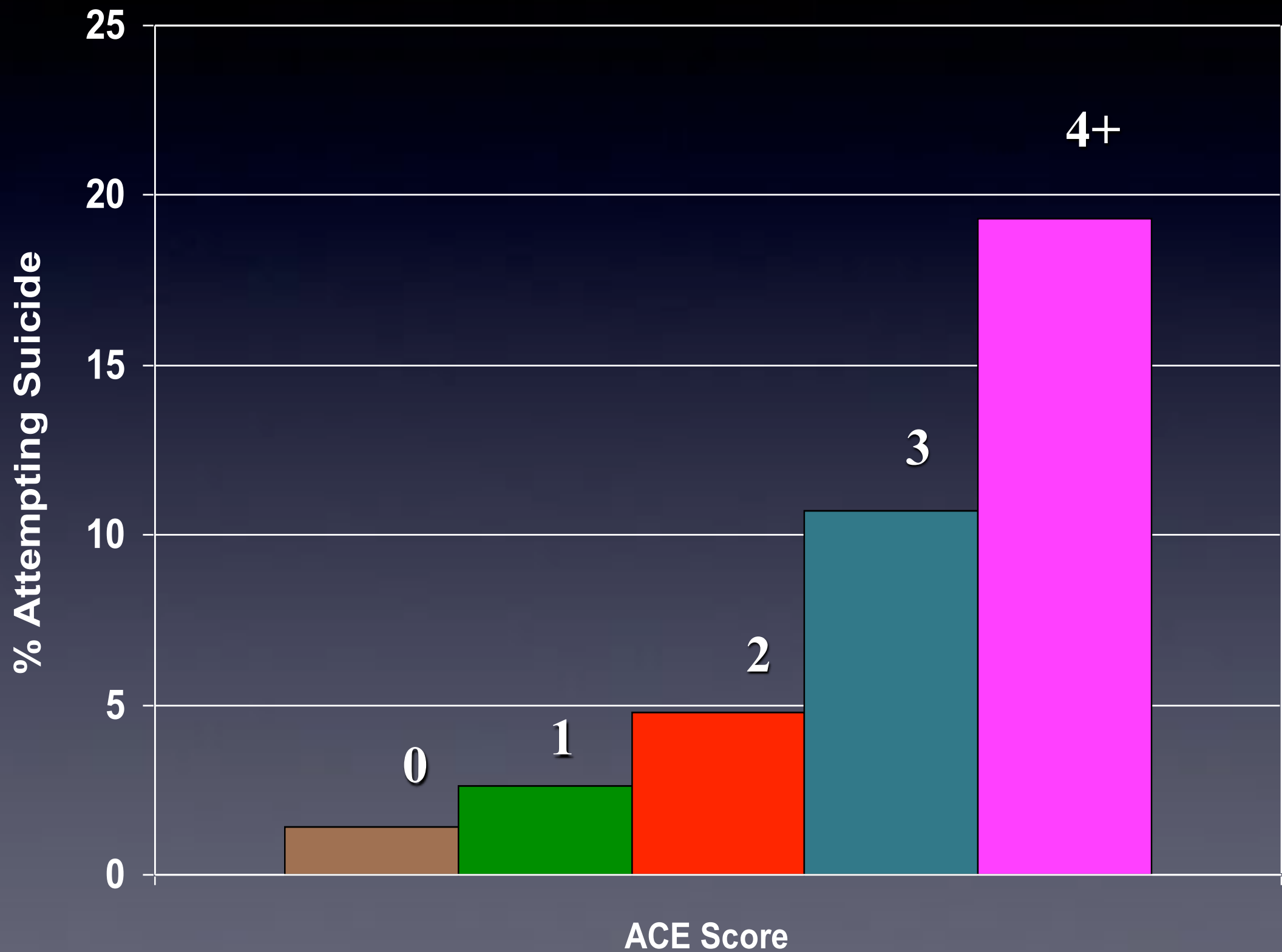
Childhood Experiences vs. Adult Alcoholism



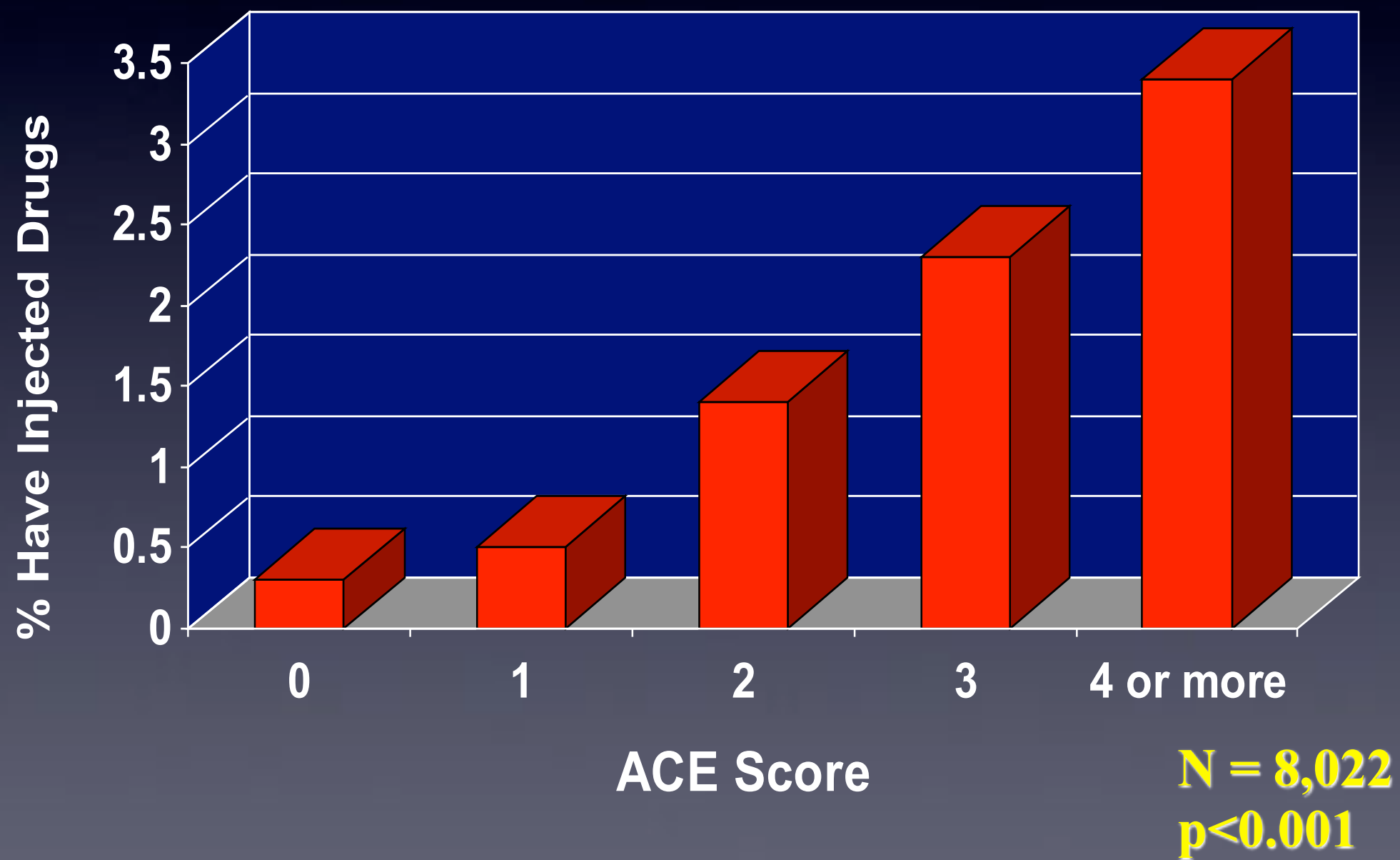
DEPRESSION



SUICIDE



IV DRUG USE



EARLY BRAIN AND CHILD DEVELOPMENT

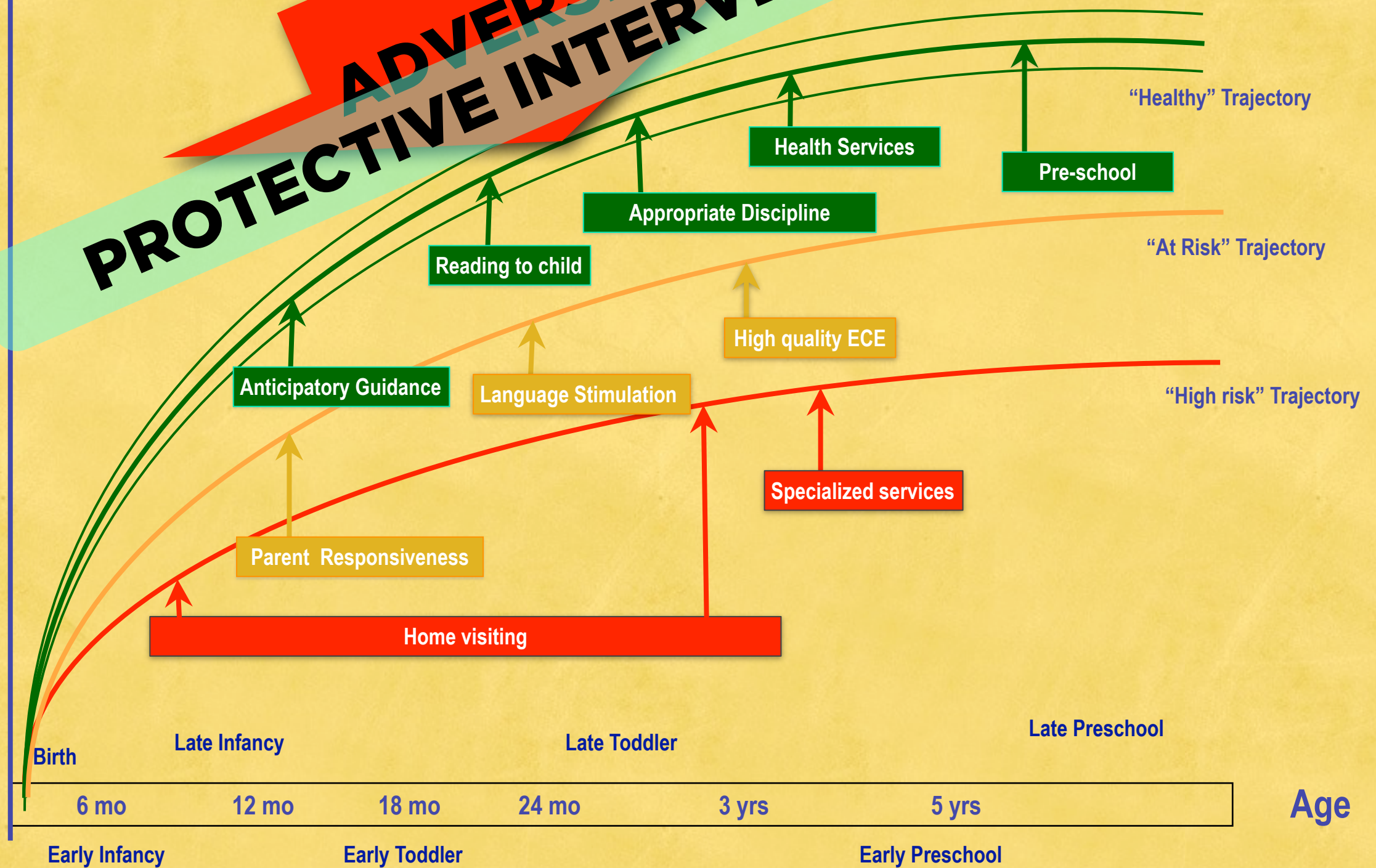
6

Creating the right conditions for early childhood development is likely to be **more effective and less costly** than addressing problems at a later age.

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Developmental Progress

ADVERSITY PROTECTIVE INTERVENTIONS



Using A Public Health Approach to Building Healthy Brains

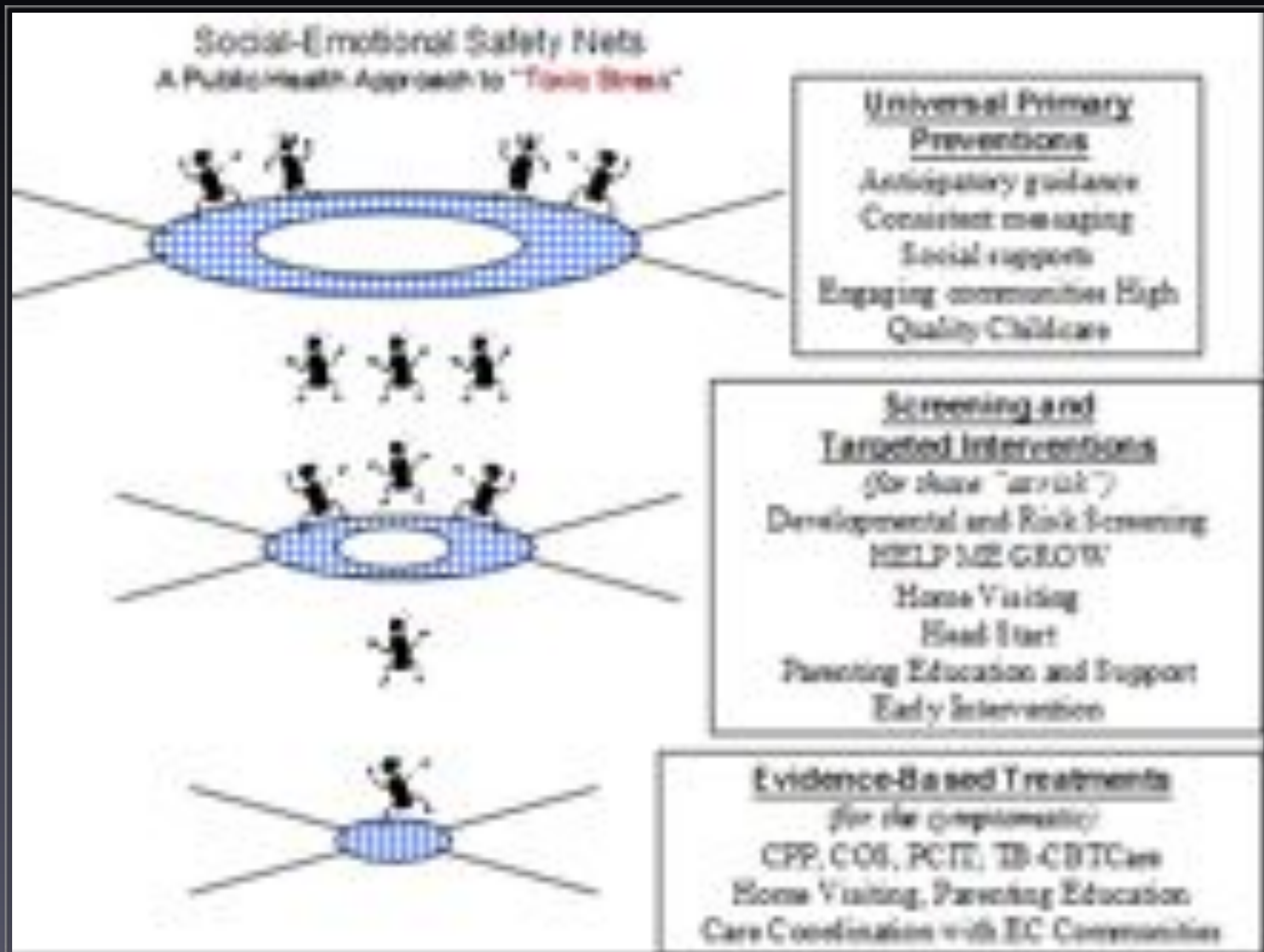
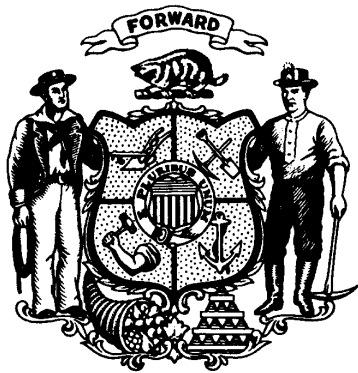


Image from Andy Garner, MD

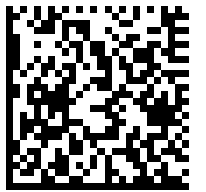
Public Investment in Children by Age





State of Wisconsin

2013 - 2014 LEGISLATURE



LRB-3486/1

SRM:eev:ev

2013 SENATE JOINT RESOLUTION 59

Resolved by the senate, the assembly concurring, That policy decisions enacted by the Wisconsin state legislature will acknowledge and take into account the principles of early childhood brain development and will, whenever possible, ~~November 4, 2013 of introduction by Senators, L. TAYLOR, RISSER and C. LARSON, cosponsored by Representatives~~ note the role of early intervention and investment in early childhood years as ~~BALEWEG, PASCH, KESTELL, SARGENT, MASON, JOHNSON, BARNES, WRIGHT, OHNSTAD, GOYKE, WACHS, SPIROS, KRUG and HULSEY. Referred to Committee on~~ important strategies to achieve a lasting foundation for a more prosperous and sustainable state through investing in human capital.

(END)

The Brave New World of Pediatrics:

DEVELOPMENTAL ASSURANCE

Building a healthy mind, brain and body
for social purpose.

NONE OF THIS IS TO SAY...

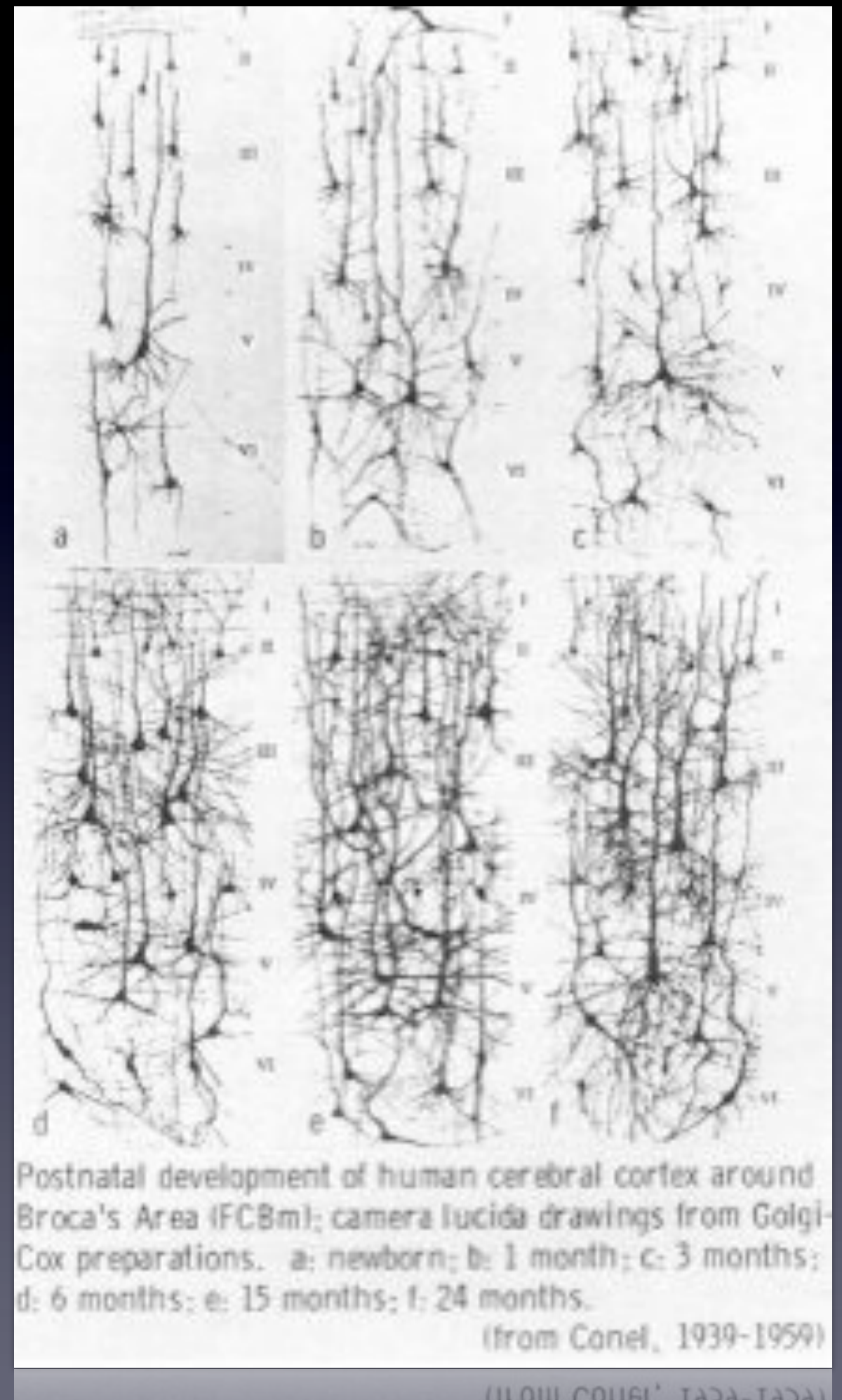
...that children should be engaged constantly

...that “bad things” are necessarily a long-term negative

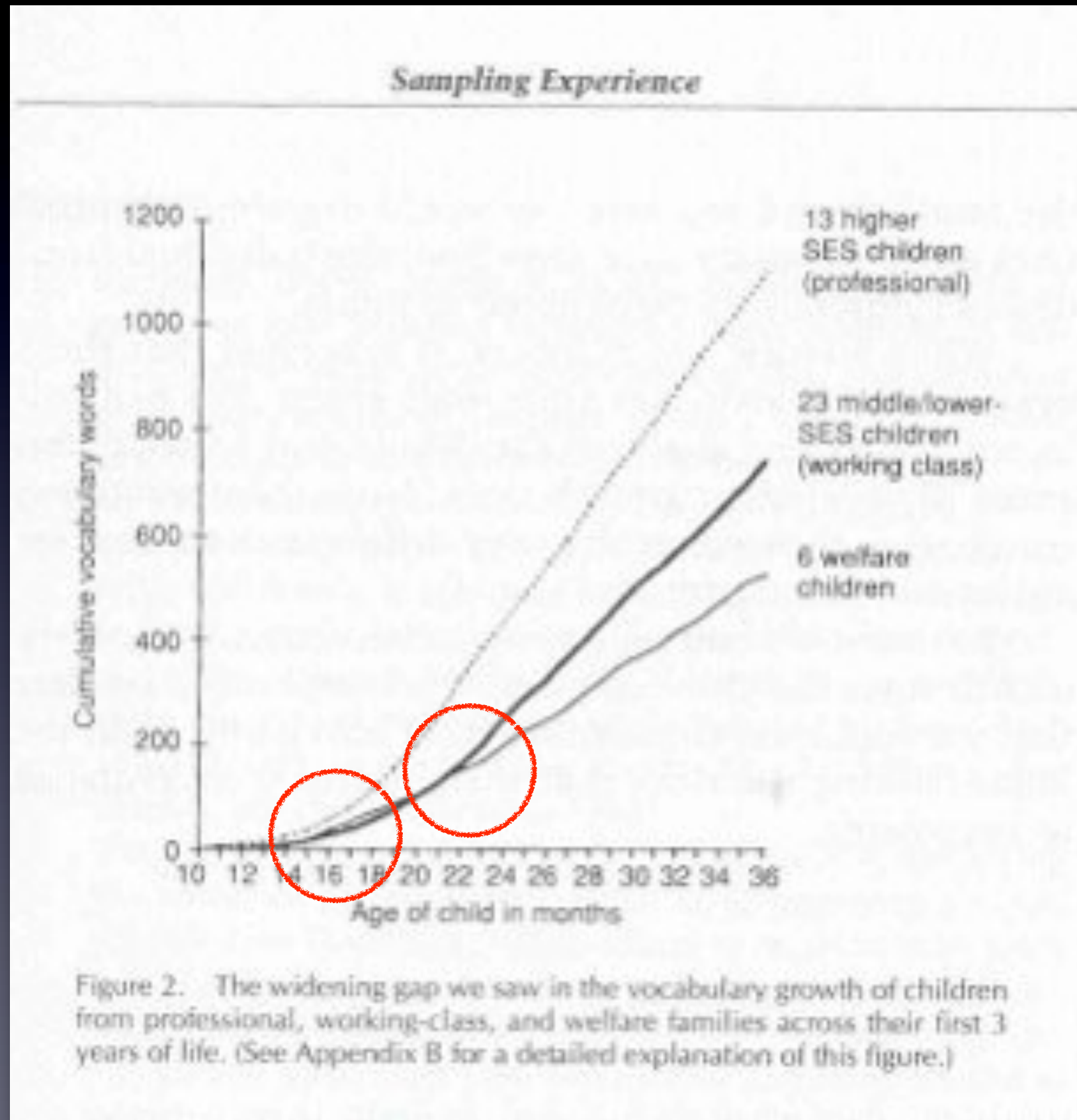
...that children should not be appropriately disciplined

FIVE NUMBERS TO REMEMBER

700 New Neural Connections per Second



18 Months:



From Risley, T & Hart, B, 1995


90-100%

A baby is lying on its back in a play gym. The baby is wearing a red long-sleeved shirt and is looking up at the camera. The play gym has a blue frame with various colorful toys hanging from it. The baby is lying on a white mat.

Chance of
Developmental Delays
when Children Experience
6-7 Risk Factors

3:1 Odds

**of Adult Heart Disease
after 7-8 Adverse
Childhood Experiences**

The background of the slide is a dense, overlapping pattern of US dollar bills, including \$100 and \$50 bills, which are slightly faded and tilted. The bills are scattered across the entire frame, creating a textured, financial backdrop.

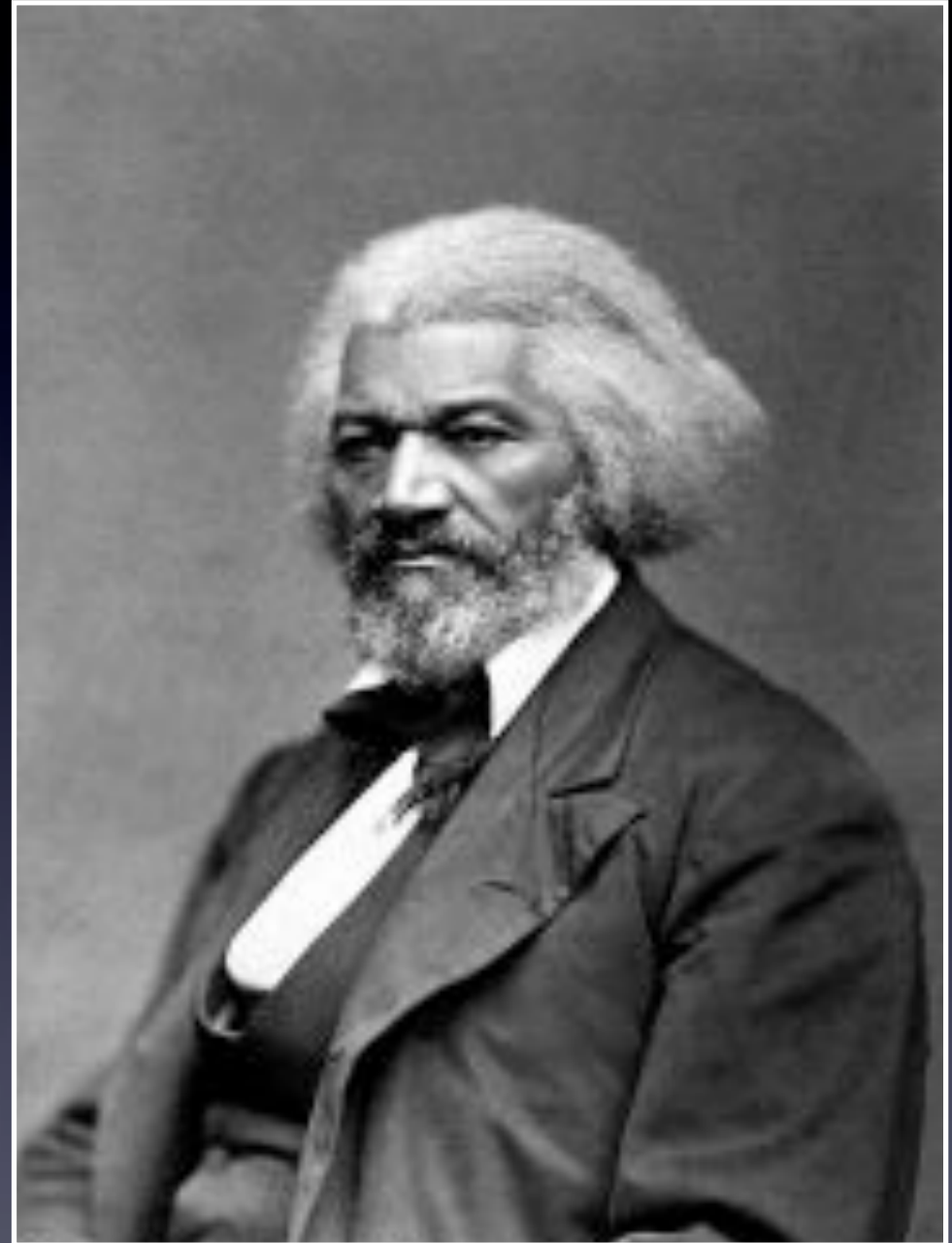
\$4-\$9

**in Returns for
Every Dollar Invested
in Early Childhood Programs**

Creative Commons-licensed work by flickr user *Tracy O*

**“It is easier to build
strong children than to
repair broken men.”**

**— Frederick Douglass
(1817–1895)**



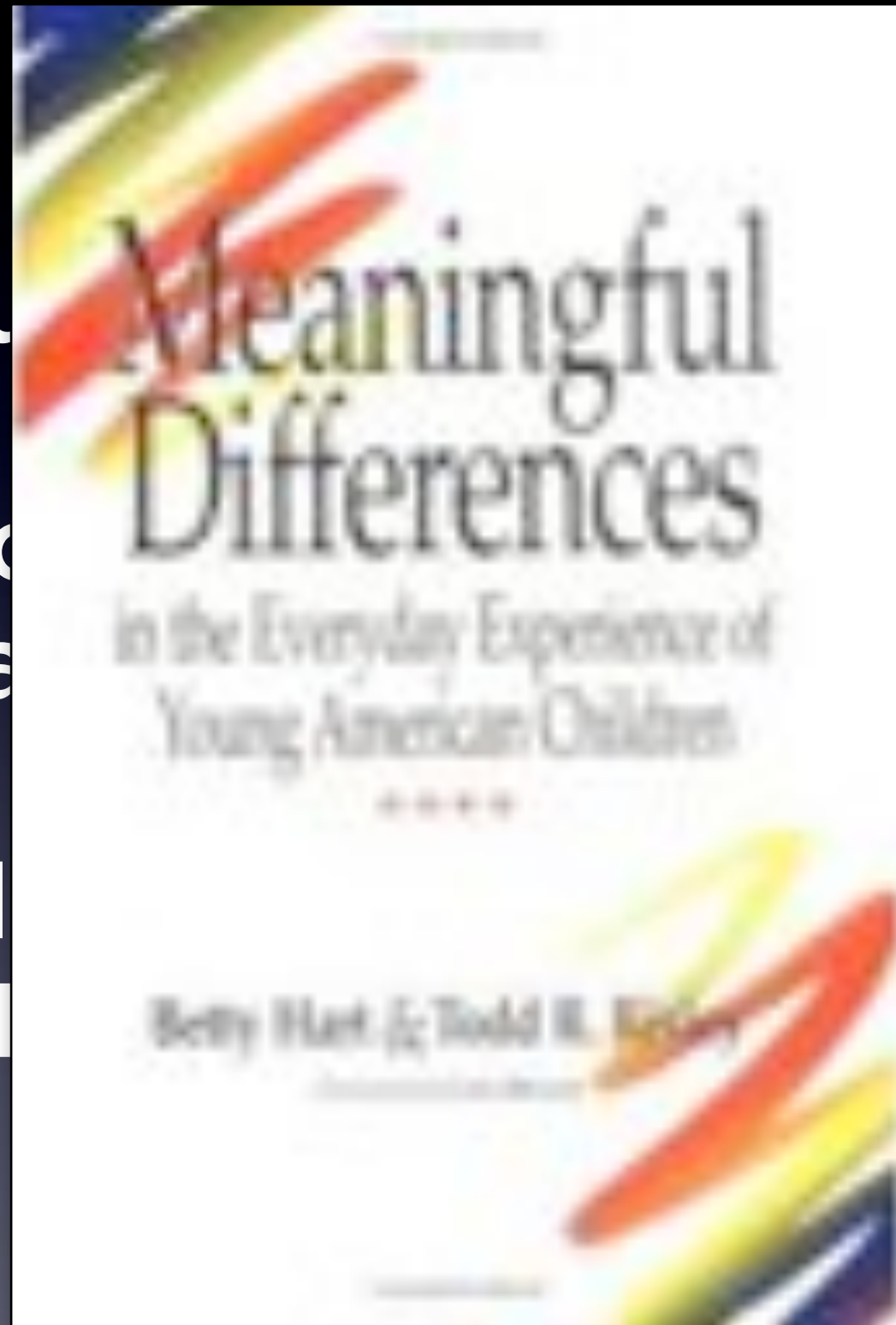
Public-domain image

Part Two


Reading Reality

Meaningful in the Experience America

Todd
Betty



Children from low-income families hear as many as **30 million fewer** words than their more affluent peers before the age of 4.



One-third
of children
enter school
unprepared
to learn.

Most (88%)
will **never**
catch up.

Creative Commons-licensed work by flickr user *horizontal.integration*

Why Reading?

Reading is **the**
fundamental skill
for learning

Awareness
of books

Understanding of printed
words and what they
represent

Using background
knowledge and
strategies to obtain
meaning from print

Fluent reading

Emergent Literacy:

the early display of an awareness by children that **print conveys information**. It is an amalgamation of children's oral language development and their initial attempts at reading and writing. Such attempts include "reading" the pictures of a book, or scribbling. Emergent literacy, **if supported** by meaningful interaction in oral and written language, **evolves into full literacy** skills. (Teale & Sulzby, 1986)

Dialogic Reading:

The act of reading becomes a **conversation** between the adult and the child; the adult helps the child become the teller of the story by becoming the listener, questioner, and audience for the child.

Reading to children
may not be a natural skill for adults.

Reading at all may not
be something an adult is capable of.

Reading problems may have
been an issue for generations.

Reading should be fun!

“While schools can do much to raise achievement among children who initially lag behind their peers, all too often pre-school gaps set in train a pattern of **ever increasing inequality** during school years and beyond.

Any drive to improve social mobility must begin with an effective strategy to **nurture the fledgling talent in young children** so often lost before it has had a chance to flourish.”

The Sutton Trust



Images from Reach Out and Read National Center

Reach Out and Read

- National program to promote early literacy and school readiness
- 3 components:
 - Literacy rich waiting rooms
 - A new book at each well visit, 6 months to 5 years
 - Anticipatory guidance for parents

It's not just about the book

- Book as a tool
 - Stimulus for developmental surveillance
 - Opportunity to model reading behaviors
 - Vehicle for providing individualized, “just-in-time” anticipatory guidance

The Book as Surveillance Tool

- Fine motor development
(maturity of grasp, hand skills)
- Social/emotional interaction with others
(shared attention, affect)
- Cognitive skills
(attention, memory)
- Expressive and receptive language
(vocabulary, comprehension of words)

The 6 Month Visit

- Scenario: Doctor hands a book to a 6 month old and begins to talk to the parent about the importance of reading aloud.
- What will happen next?
- And then???

Developmental Milestones: 6-12 months

- Sits, crawls, explores
- Reaches for book & puts in mouth
- Palmar raking to turn thick pages
- Babbles (6mo.); imitates speech sounds
- Understands a few words
- Plays peek-a-boo (9 mo.)
- Points to pictures (12 mo.)
- Routines important

Anticipatory Guidance: 6-12 months

- Read daily
- Read before baby can talk
- Establish reading routine
- Length of reading may vary
- Hold child on lap — let child explore the book

Anticipatory Reframing

- Anticipatory Guidance: Counseling to prepare parents for changing developmental needs
- Framing: Placing behaviors in developmental context
- Anticipatory reframing: Making preemptive strike against negativity

Helping parents provide emotional support

- Set age-appropriate expectations
- Interpret child's behaviors and actions
- Identify child's new and emerging skills
- Empower parent to promote child's learning and future success
- Open the door for parent-child reading

Follow the baby's lead:

- Choosing a book
- Eating the book
- Patting the book — turning pages, pincer grasp
- Pointing
- Deciding when they are finished
- Social referencing

A Tale of Two 2-year olds

- Practice experience changed the way I think about well child care
- “I think he’s stupid”
- “I think he’s crazy”
- “WHY?”
- “He wants to hear the same book over and over.”

Putting it all together – the 12 month visit



Nyla

What Did We Learn?

Social:

2-parent family

Dad works

Grandma

Sisters

Bedtime routine

Dad:

Allows baby to hold book

Enjoys family time

Points to engage baby

Reads to baby at home

Misinterprets behavior

Developmental:

Mouths book

Manipulates book

Turns pages

Constant happy babble

Sings

Winks

“Dances”

Some words

Back-and-forth style

Visual tracking left to right

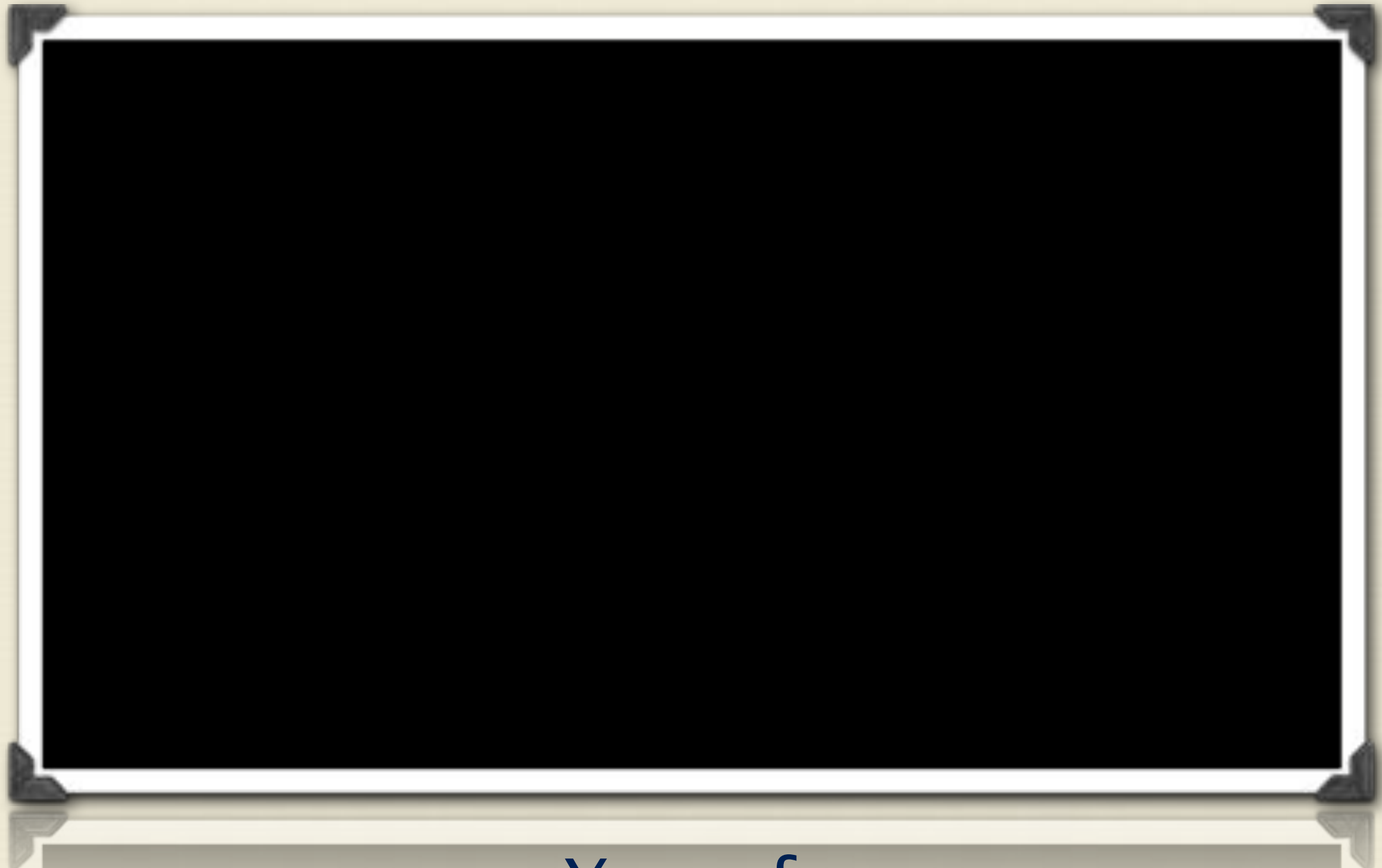
Familiar with, enjoys reading

IN 3 MINUTES!

What We Know Now:

- Infants who have been read to are different by 6 to 9 months of age.
- Parents who receive books and guidance are much more likely to read to their young children
- Young children who are read to show meaningful gains in language skill

Parental Engagement Translates to School Readiness



Youcef

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Thank you !
(and time for questions!)

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