
THE SCIENCE OF YOUNG CHILDHOOD

Kelly Sullivan, Ph.D.

Licensed Psychologist and Assistant Professor

Duke University Medical Center, Department of Psychiatry and
Behavioral Sciences

and

Director of Mental Health Services, Center for Child and Family
Health

MYTHS OF INFANCY AND YOUNG CHILDHOOD

- “I have no memories from that time so...”
(Kyle Pruett, former president of Zero to Three)
- Caring for an young child comes naturally

IMAGINE... WHAT IF WE EACH GOT ONLY ONE COMPUTER TO LAST OUR WHOLE LIFE?

- How would we want that computer to be built?
- Even if we can update it throughout its life, how important is it that it starts with great capacity and skill from the beginning?

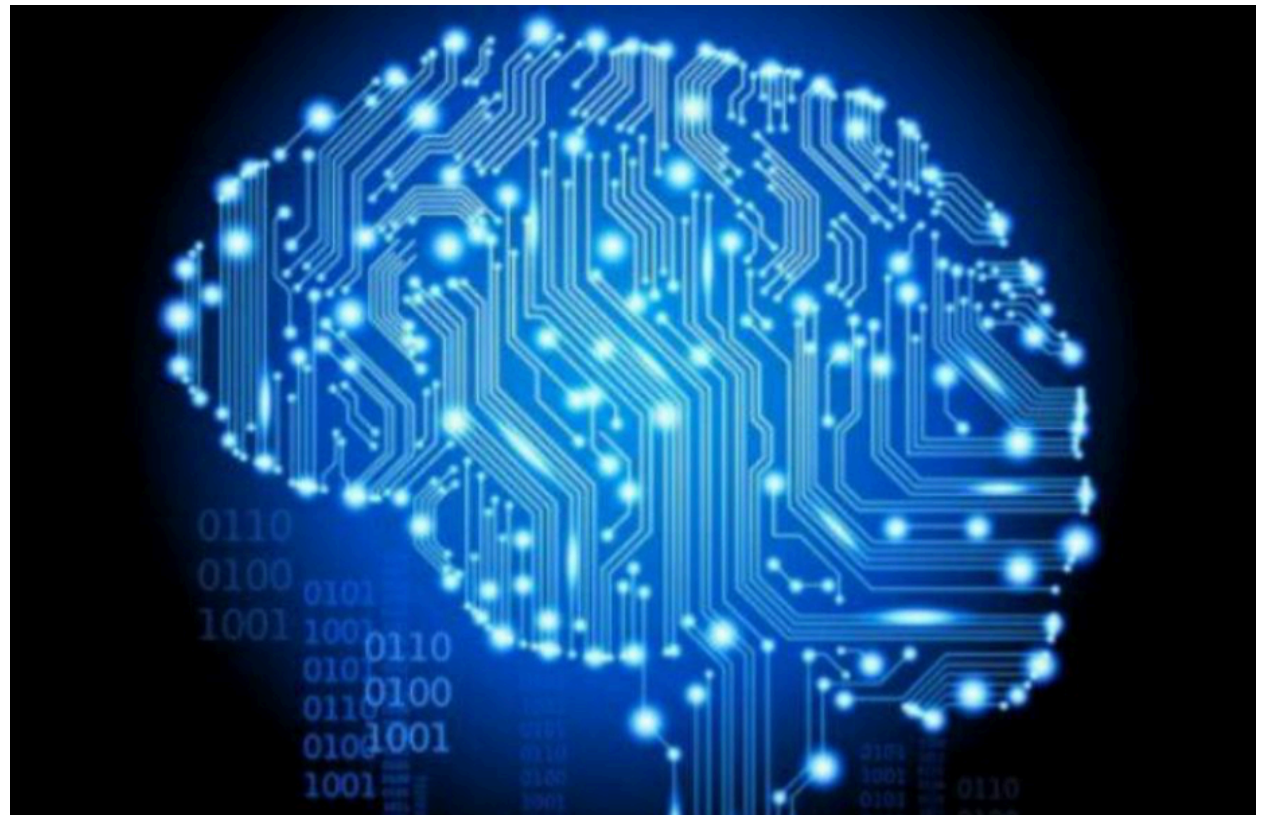


OUR BRAINS: OUR LIVING COMPUTERS

Functioning:

- Educational
- Social
- Health
- Mental health
- Occupational

= HUMAN CAPITAL



IS IT NATURE OR NURTURE?



BUILDING THE BRAIN THROUGH EXPERIENCES

**36 weeks
gestation**

Newborn

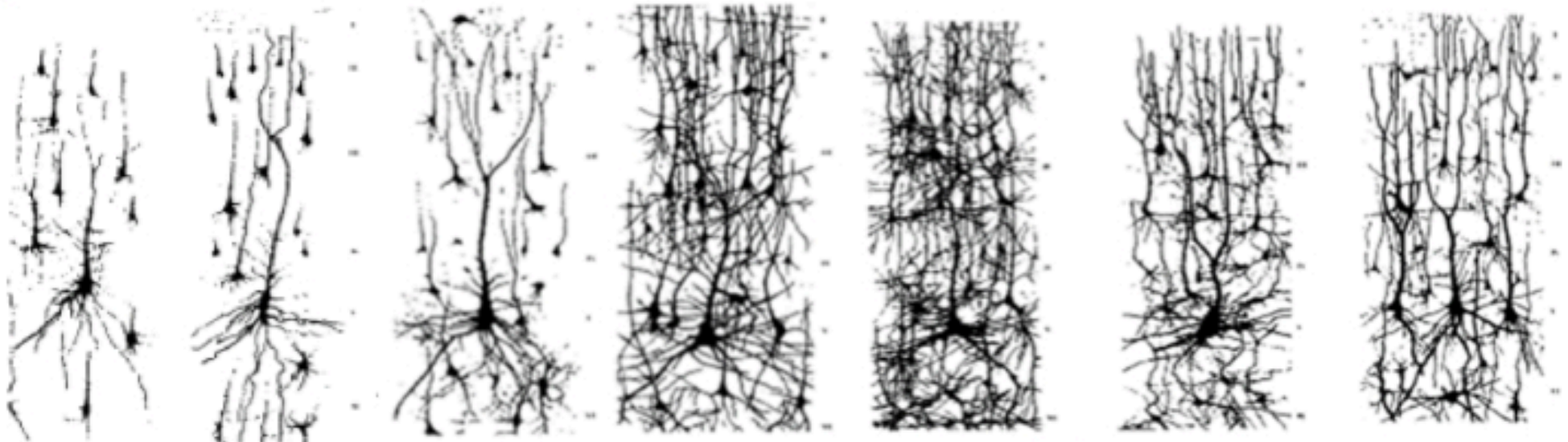
3 months

6 months

2 years

4 years

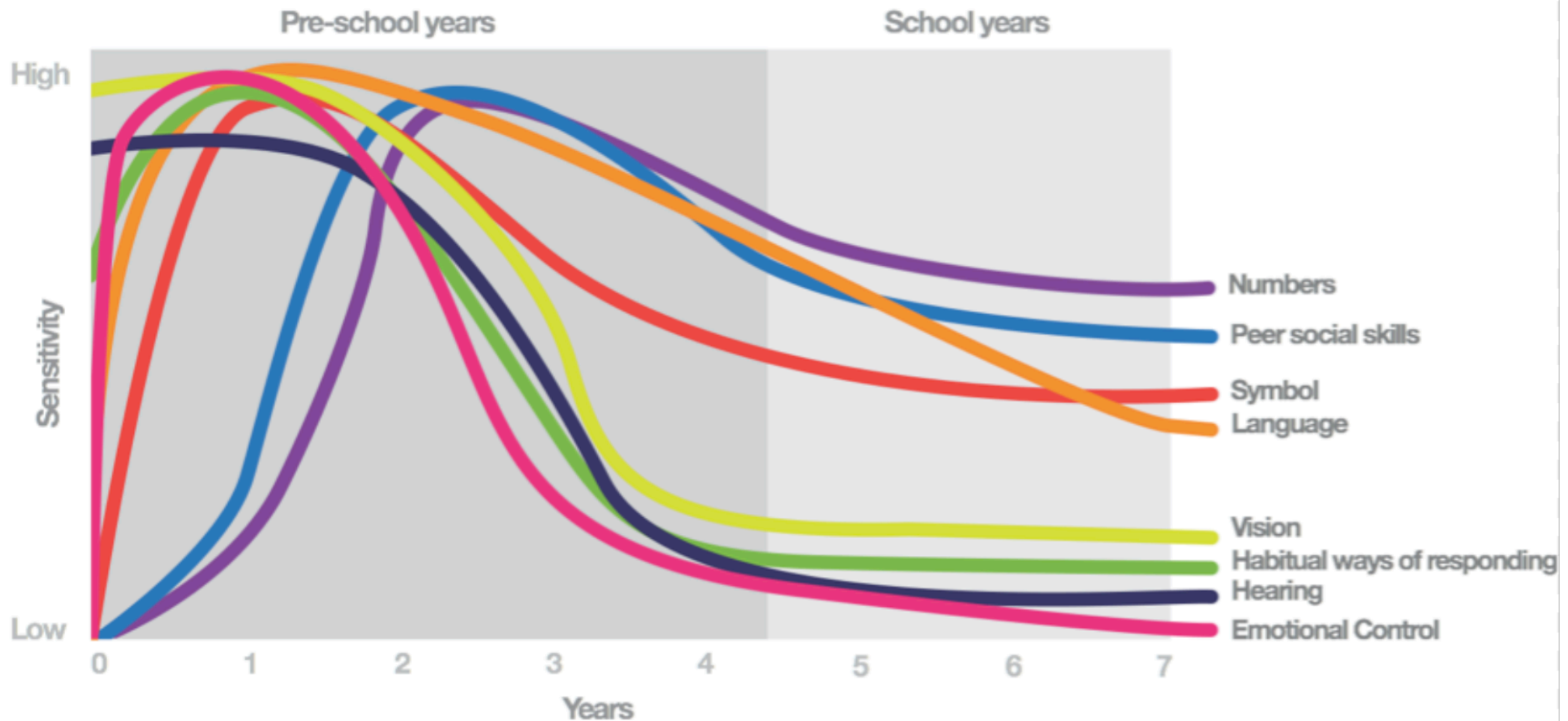
6 years

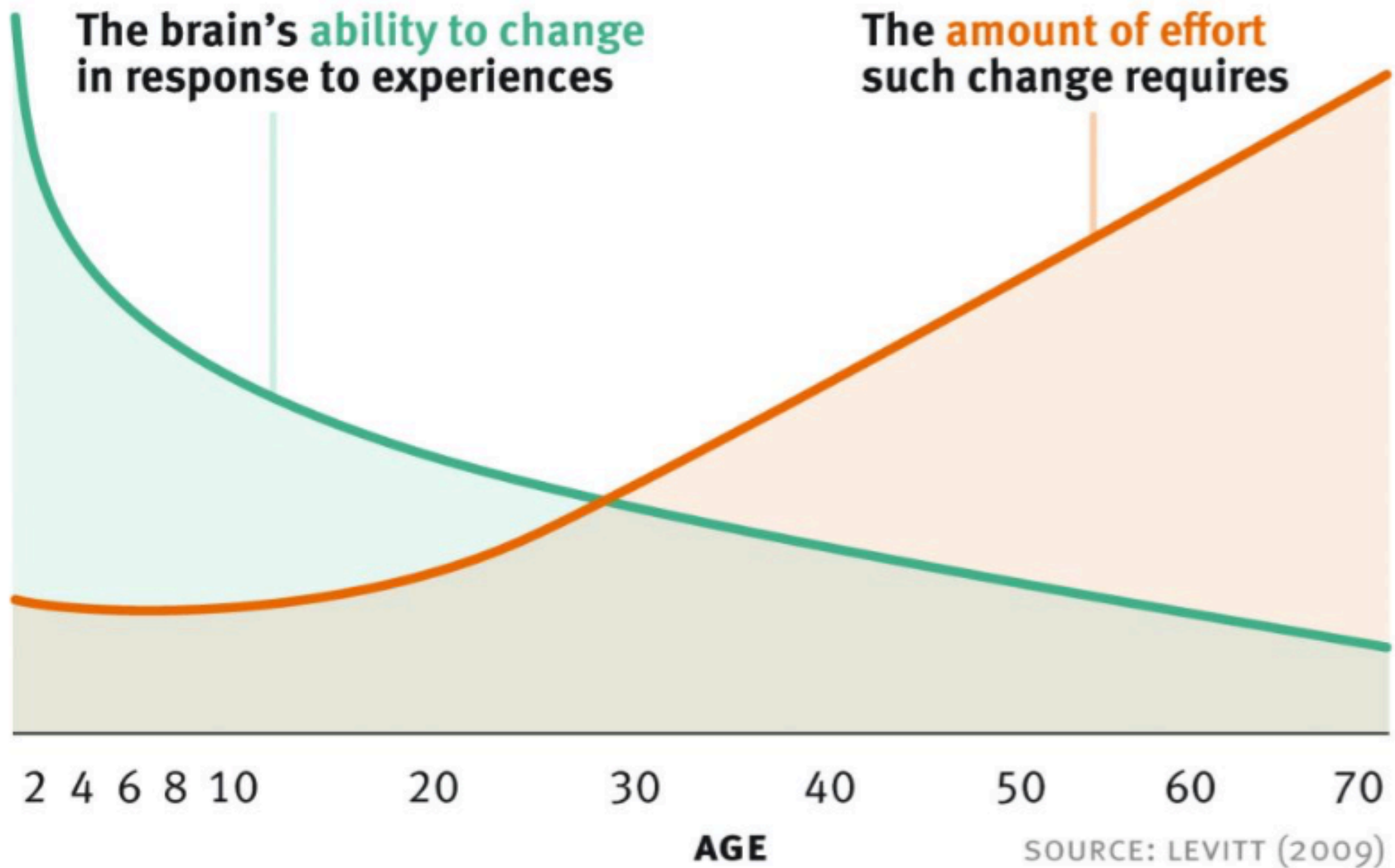


Synapse formation

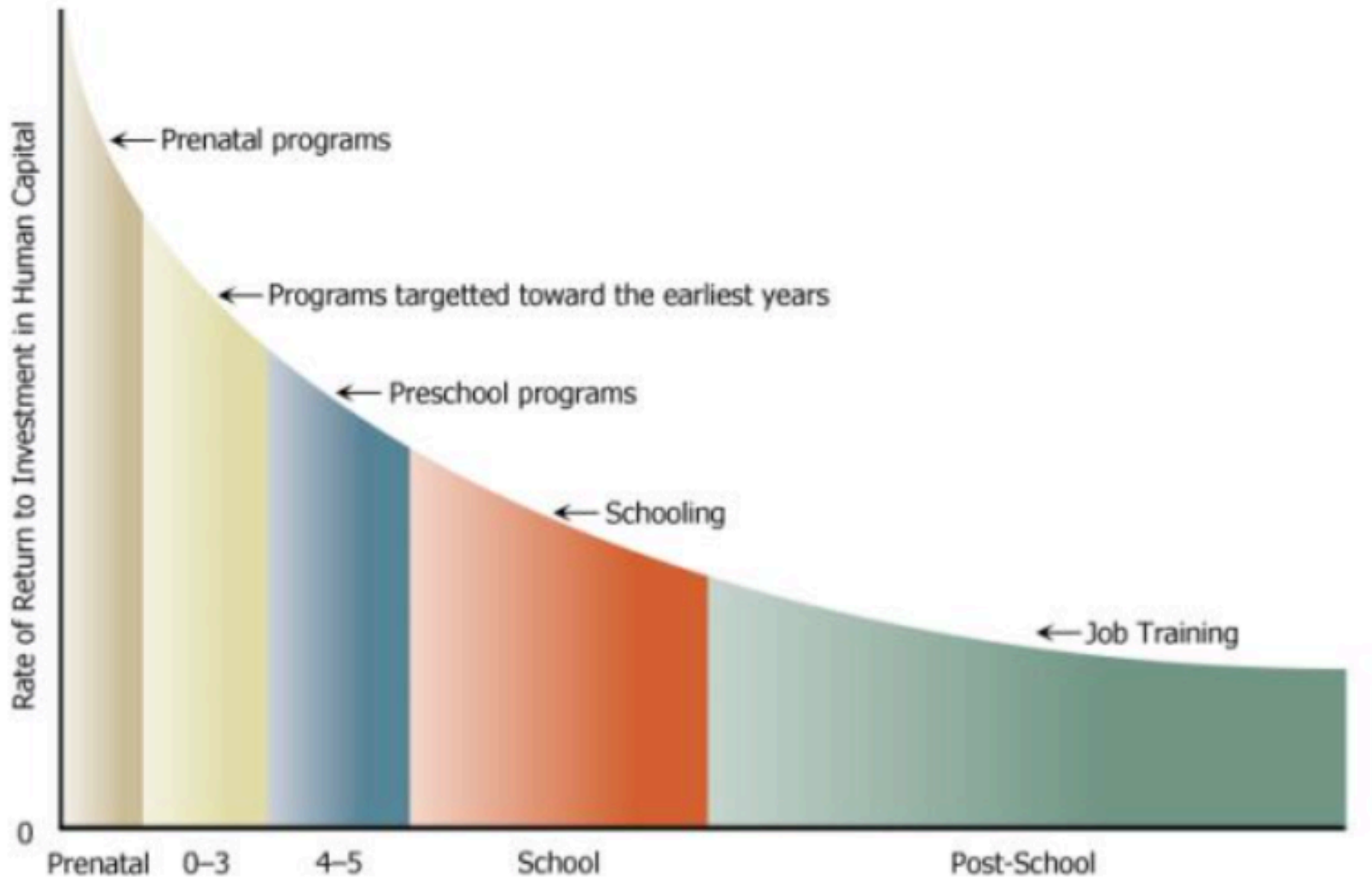
Synapse pruning

“SENSITIVE PERIODS” IN EARLY BRAIN DEVELOPMENT





Rate of Return to Human Capital Investment at Different Ages



Heckman, J. J., (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, 312(5782)1900-2.

Trauma and the Brain



Staying alive
is most
important
function



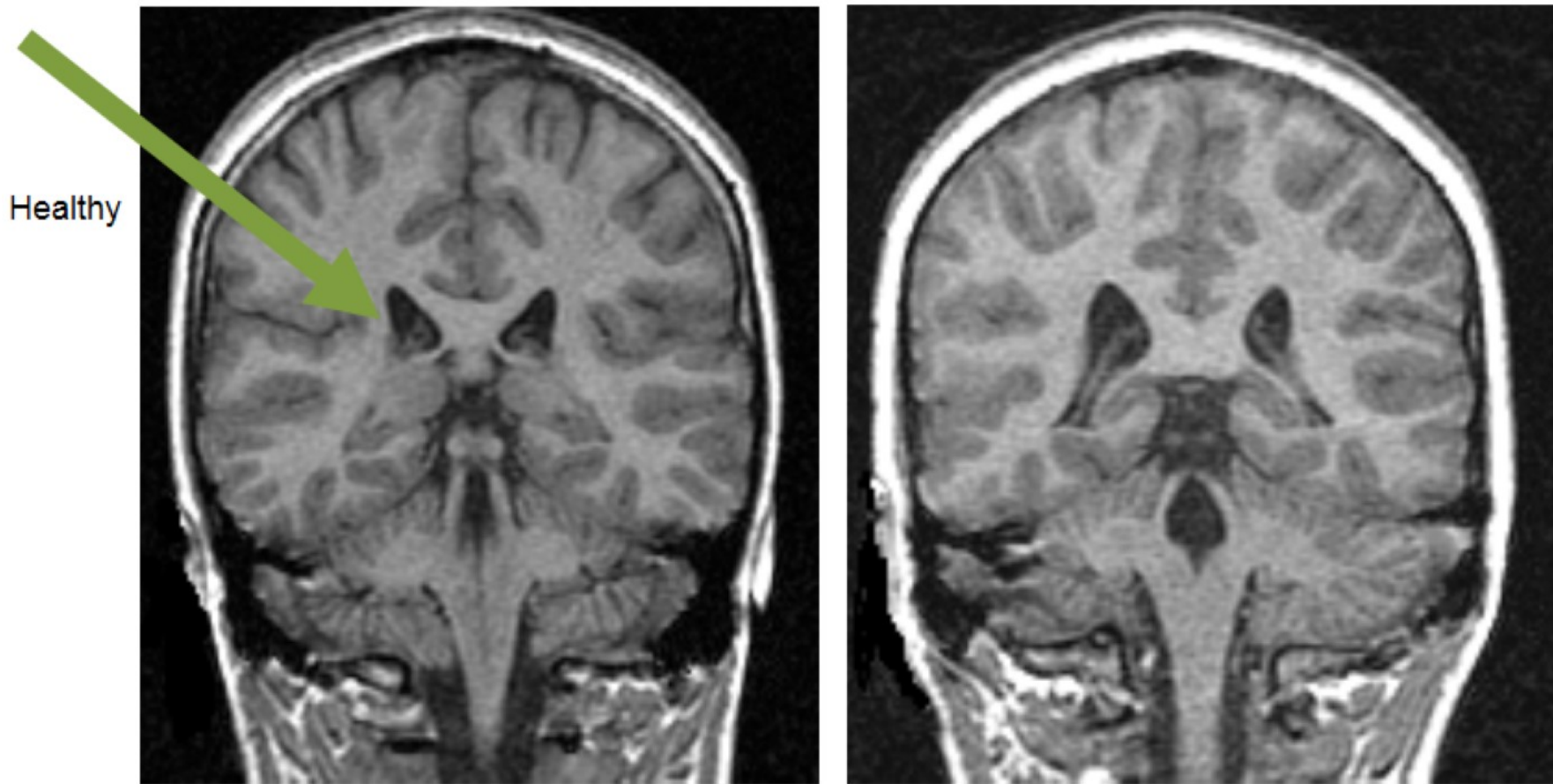
Exquisitely
sensitive to
environment



Scary events
(alternatively,
safety and
security)
influence brain
development in
powerful ways



Lateral Ventricles



Lateral Ventricles of 11 year old boy with PTSD vs. Healthy. De Bellis et al., Biological Psychiatry, 1999.

EXPOSURE TO TRAUMA DERAILS DEVELOPMENT

- Between 20% and 50% of American children are victims of violence within their families, at school, and in their communities (Finkelhor & Dziuba-Leatherman, 1994)
- An even greater number are witnessing violence and may be traumatized

TRAUMA AND EDUCATIONAL OUTCOMES

- Decreased intellectual functioning
- Decreased reading ability
- Lower grade-point average (GPA)
- More days of school absence
- Decreased rates of high school graduation

**TRAUMA
IMPEDES
LEARNING**

Hurt et al., 2001; Delaney-Black et al., 2002; Grogger, 1997.

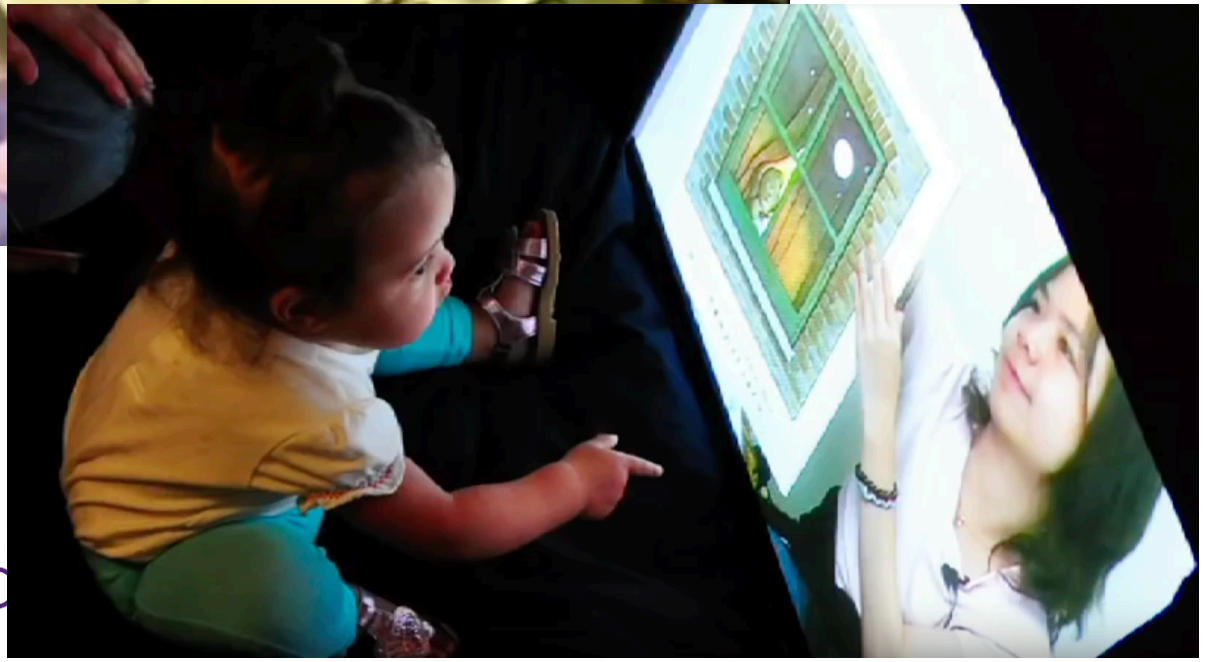
WE ARE SOCIAL CREATURES





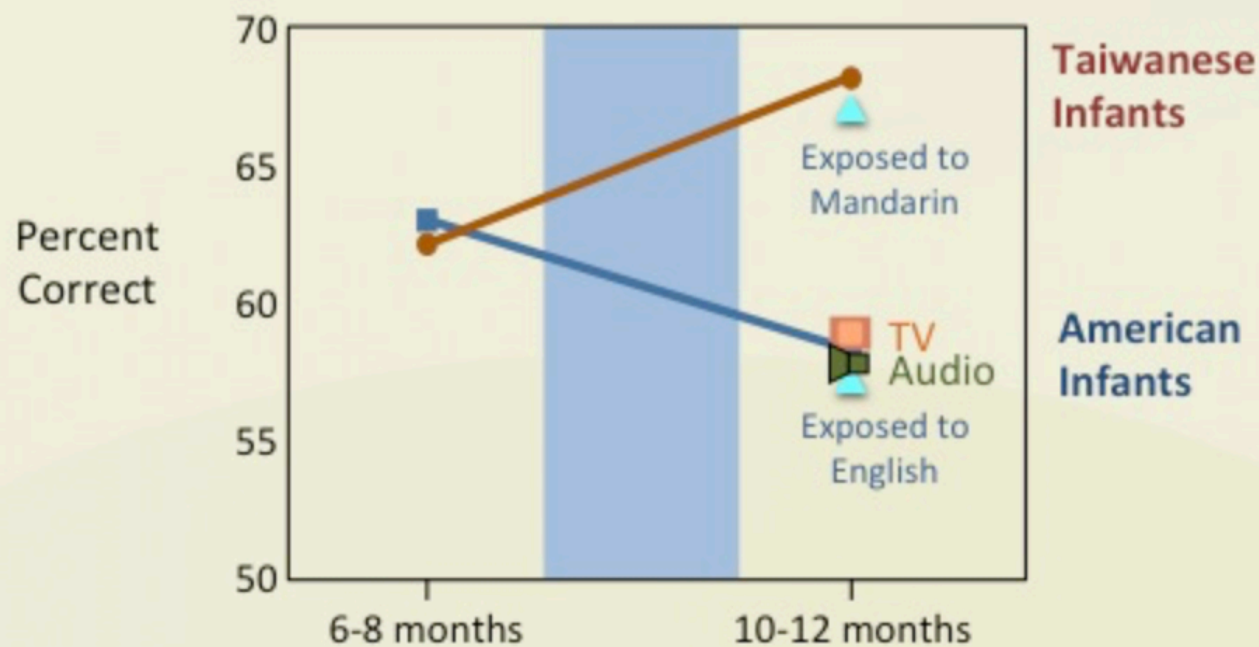
WHO IS IN THE FACTORY WITH THEM?



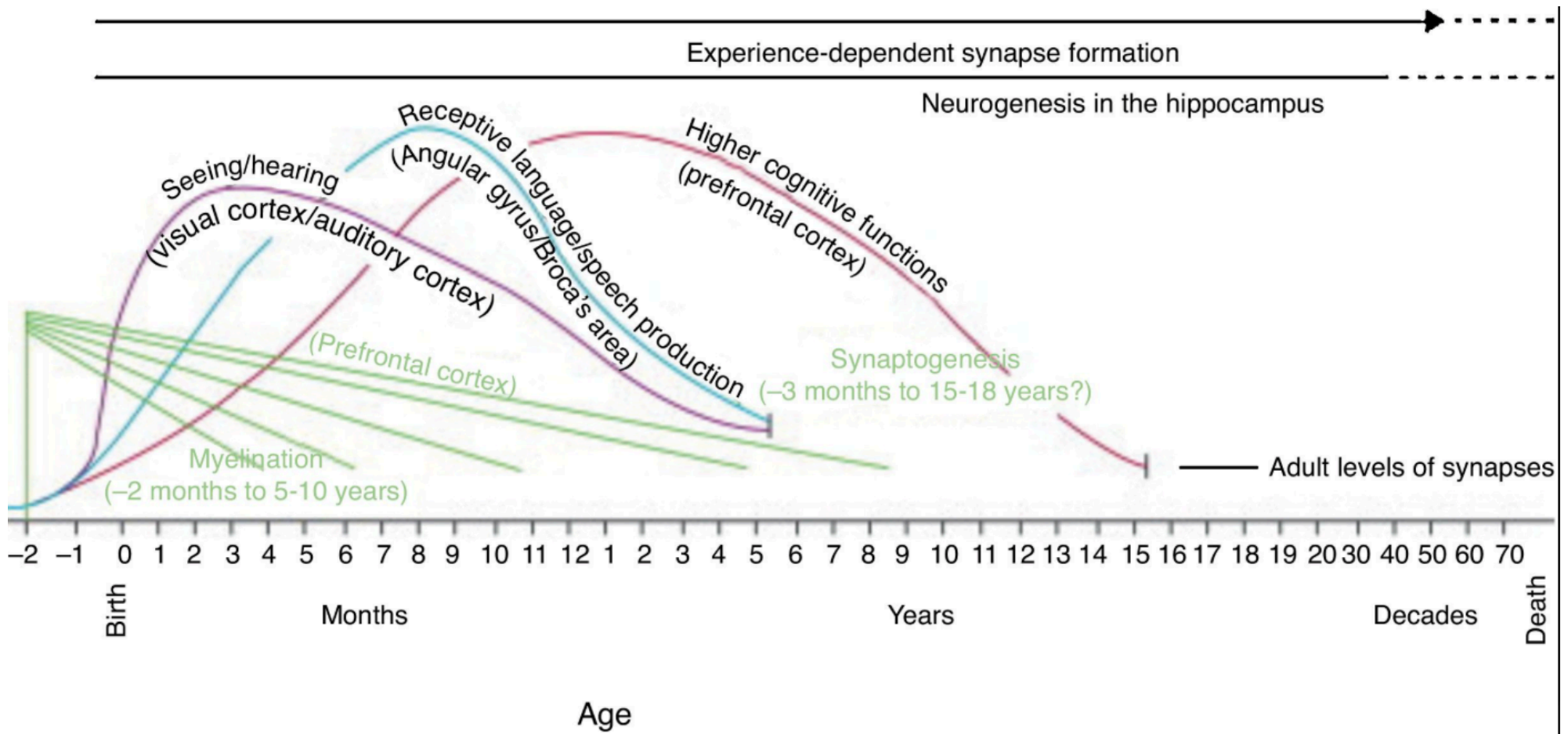


THE YOUNGER WE ARE THE MORE WE LEARN THROUGH SOCIAL INTERACTION

Performance on Mandarin t^h-ç Sounds







BUILDING STRONG BRAINS

Our goals for children
will not be met
if those in the factory with the child
are not interacting with the child

AND

*if they do not know the science about how you build
the brain*

THANK YOU!!!

kelly.sullivan@duke.edu