



From Early Child Development
To
Economic Development

UNICEF
Innocenti Research Centre
Report Card 7

Child poverty in perspective:

An overview of child well-being in rich countries


**A comprehensive assessment of the lives
and well-being of children and adolescents
in the economically advanced nations**

For every child
Health, Education, Equality, Protection
ADVANCE HUMANITY

unicef 

		Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5	Dimension 6
Dimensions of child well-being	Average ranking position (for all 6 dimensions)	Material well-being	Health and safety	Educational well-being	Family and peer relationships	Behaviours and risks	Subjective well-being
Netherlands	4.2	10	2	6	3	3	1
Sweden	5.0	1	1	5	15	1	7
Denmark	7.2	4	4	8	9	6	12
Finland	7.5	3	3	4	17	7	11
Spain	8.0	12	6	15	8	5	2
Switzerland	8.3	5	9	14	4	12	6
Norway	8.7	2	8	11	10	13	8
Italy	10.0	14	5	20	1	10	10
Ireland	10.2	19	19	7	7	4	5
Belgium	10.7	7	16	1	5	19	16
Germany	11.2	13	11	10	13	11	9
Canada	11.8	6	13	2	18	17	15
Greece	11.8	15	18	16	11	8	3
Poland	12.3	21	15	3	14	2	19
Czech Republic	12.5	11	10	9	19	9	17
France	13.0	9	7	18	12	14	18
Portugal	13.7	16	14	21	2	15	14
Austria	13.8	8	20	19	16	16	4
Hungary	14.5	20	17	12	6	18	13
United States	18.0	17	21	12	20	20	-
United Kingdom	18.2	18	12	17	21	21	20

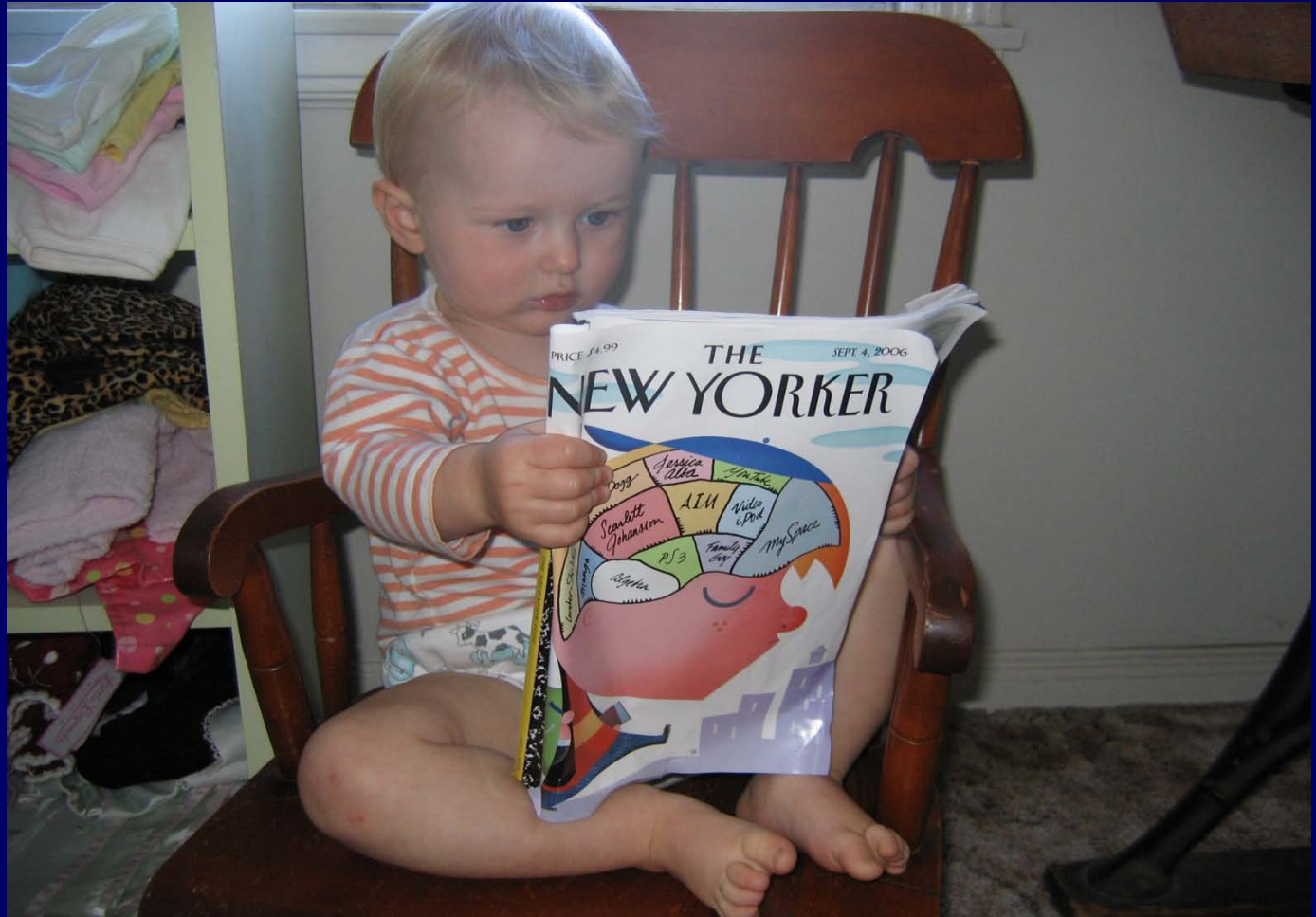
OECD countries with insufficient data to be included in the overview: Australia, Iceland, Japan, Luxembourg, Mexico, New Zealand, the Slovak Republic, South Korea, Turkey.



“Gross underinvestment in children, and their mothers ... is one of the most potent ‘engines’ driving the growing inequality within and between nations.”

Enrique Iglesias, President
Inter-American Development Bank

Brain Development In Infants and Toddlers

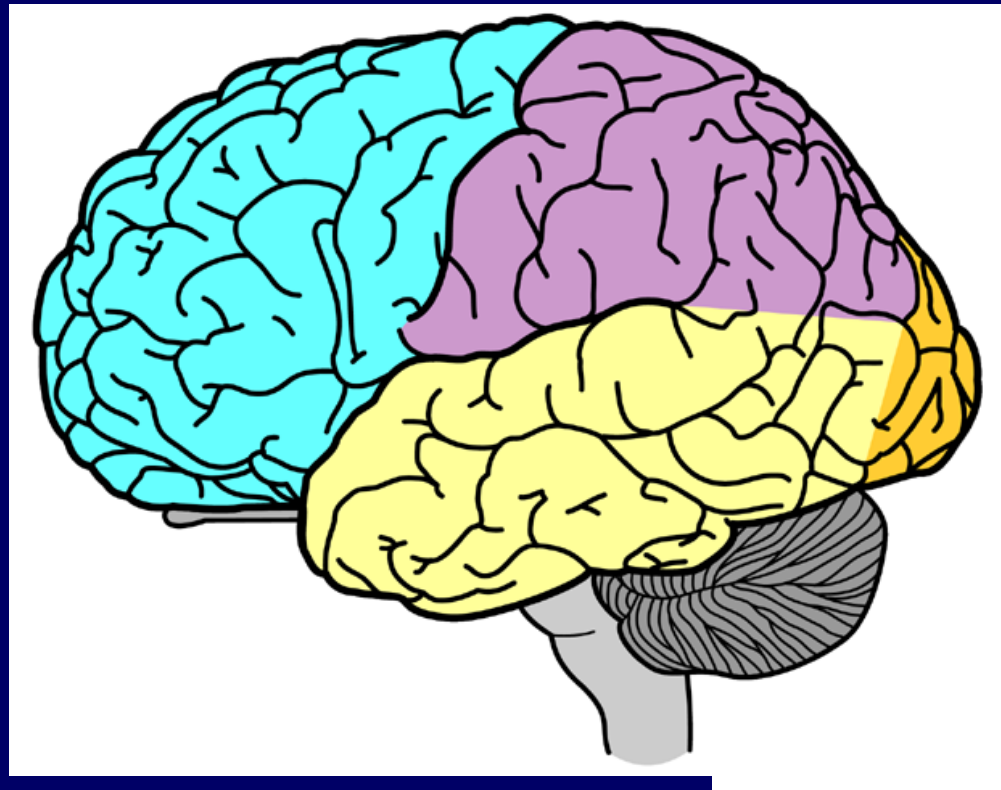


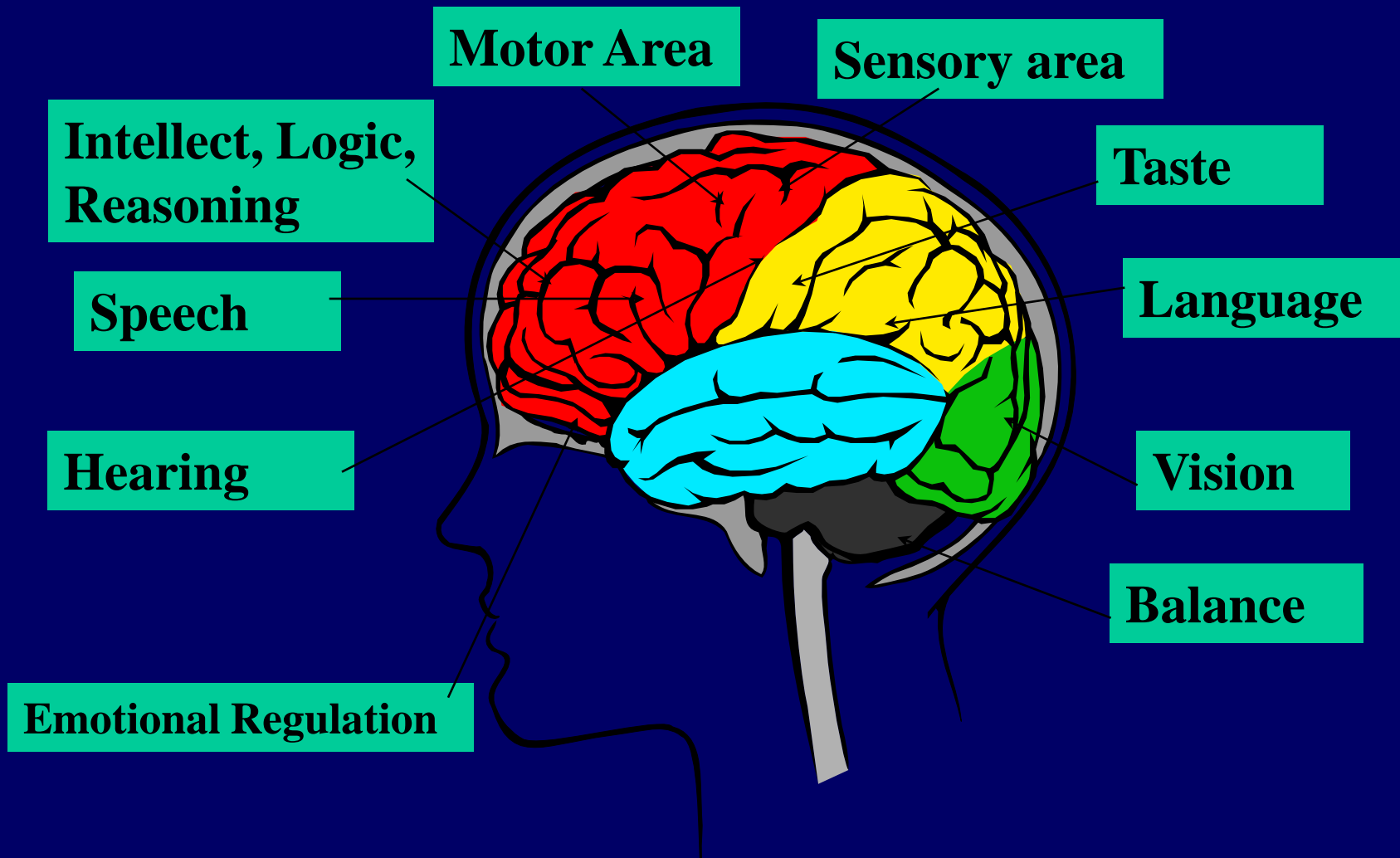
Developed by Ronald J. Lally. © 2007, WestEd, The Program for Infant/Toddler Care.
This document may be reproduced for educational purposes.



NEUROSCIENCE

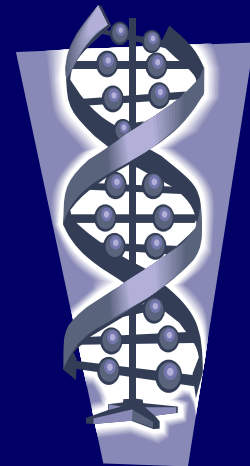
Brain Architecture



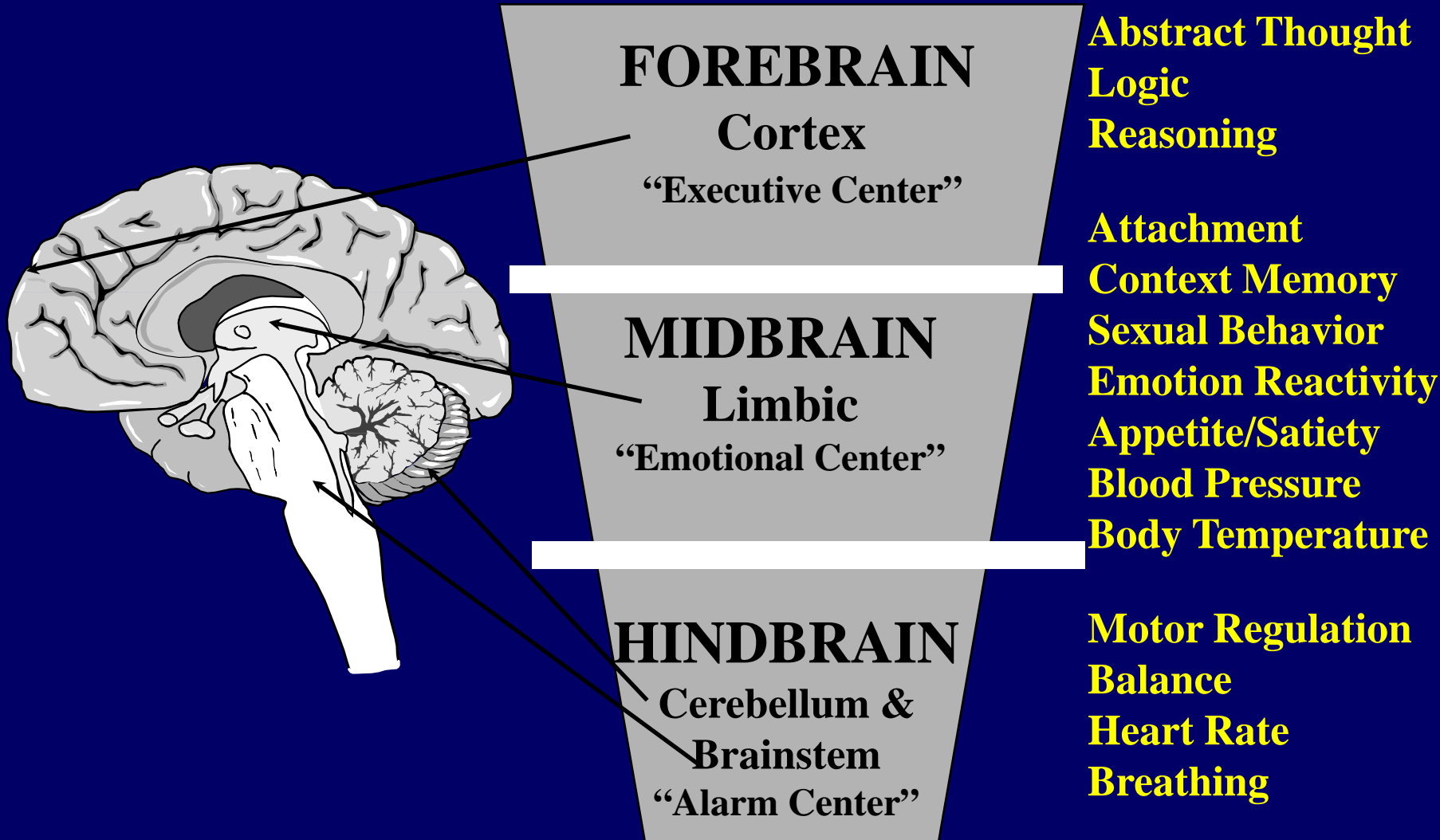


Gene / Environment Interaction

- **Environments can influence genes as they release. Their intensity can either reduce or increase genetically based risks.**



Hierarchy of Brain Development



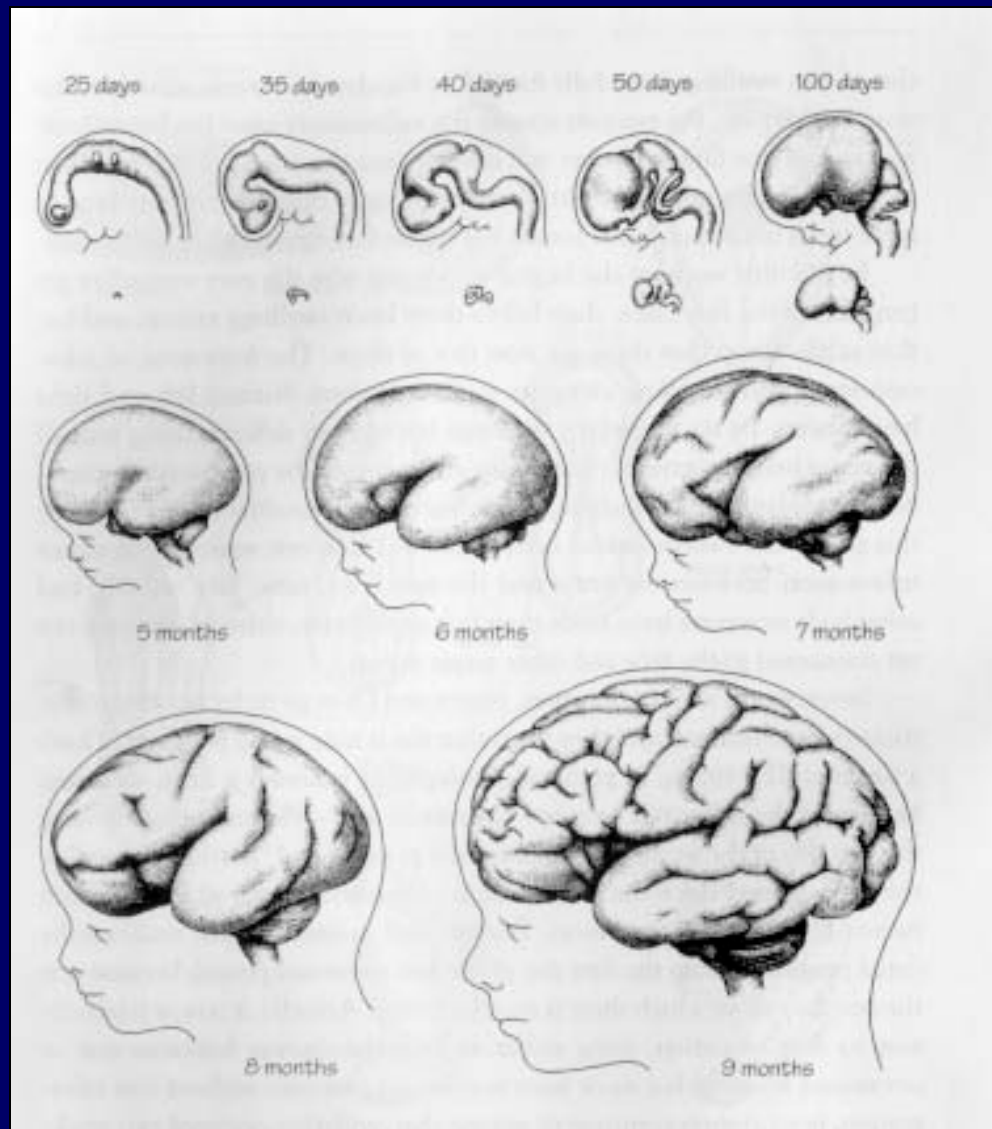
Prenatal Development

The nervous system begins to develop just before the third week of gestation.

Cell creation and movement to the right spots occur during the first five prenatal months.

Brain Size: 25% at Birth;
90% Age 5

Talking Reasonably and Responsibly about
Early Brain Development, University of
Minnesota

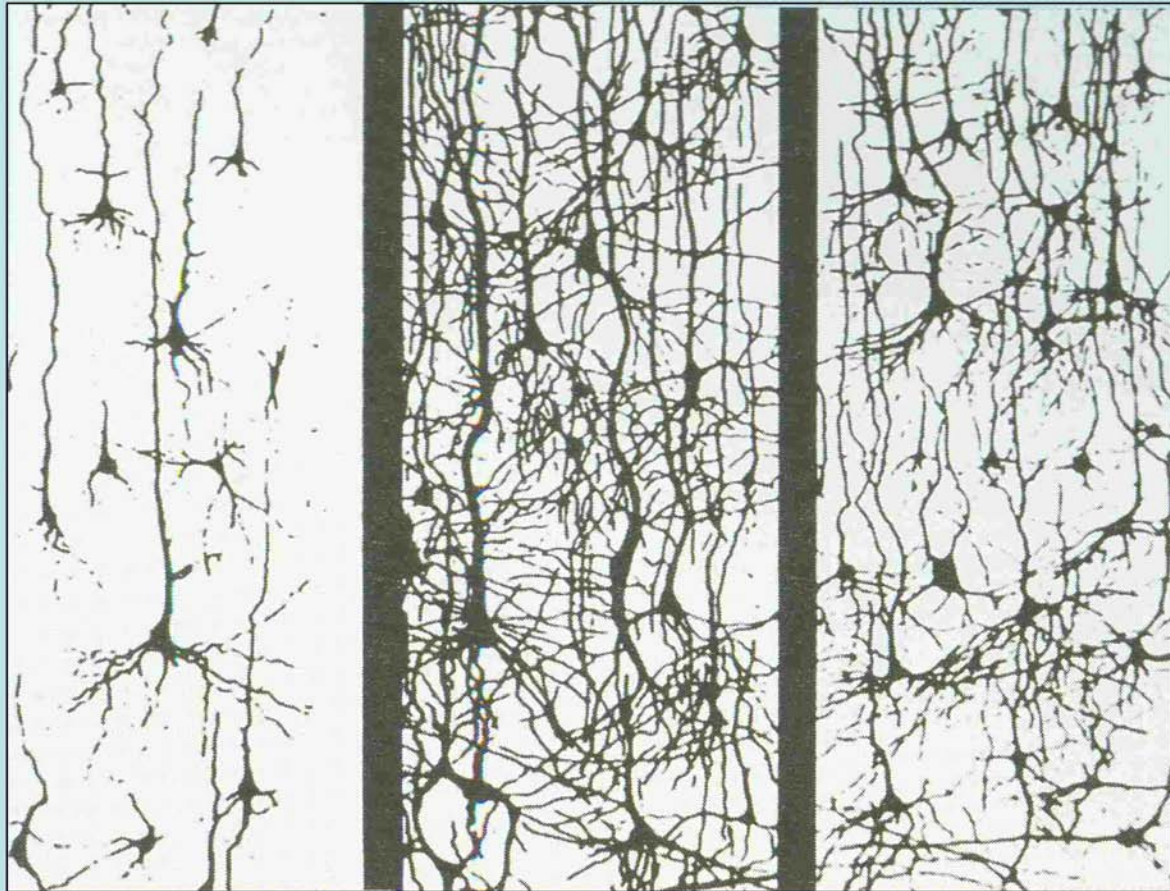


Synaptic Density

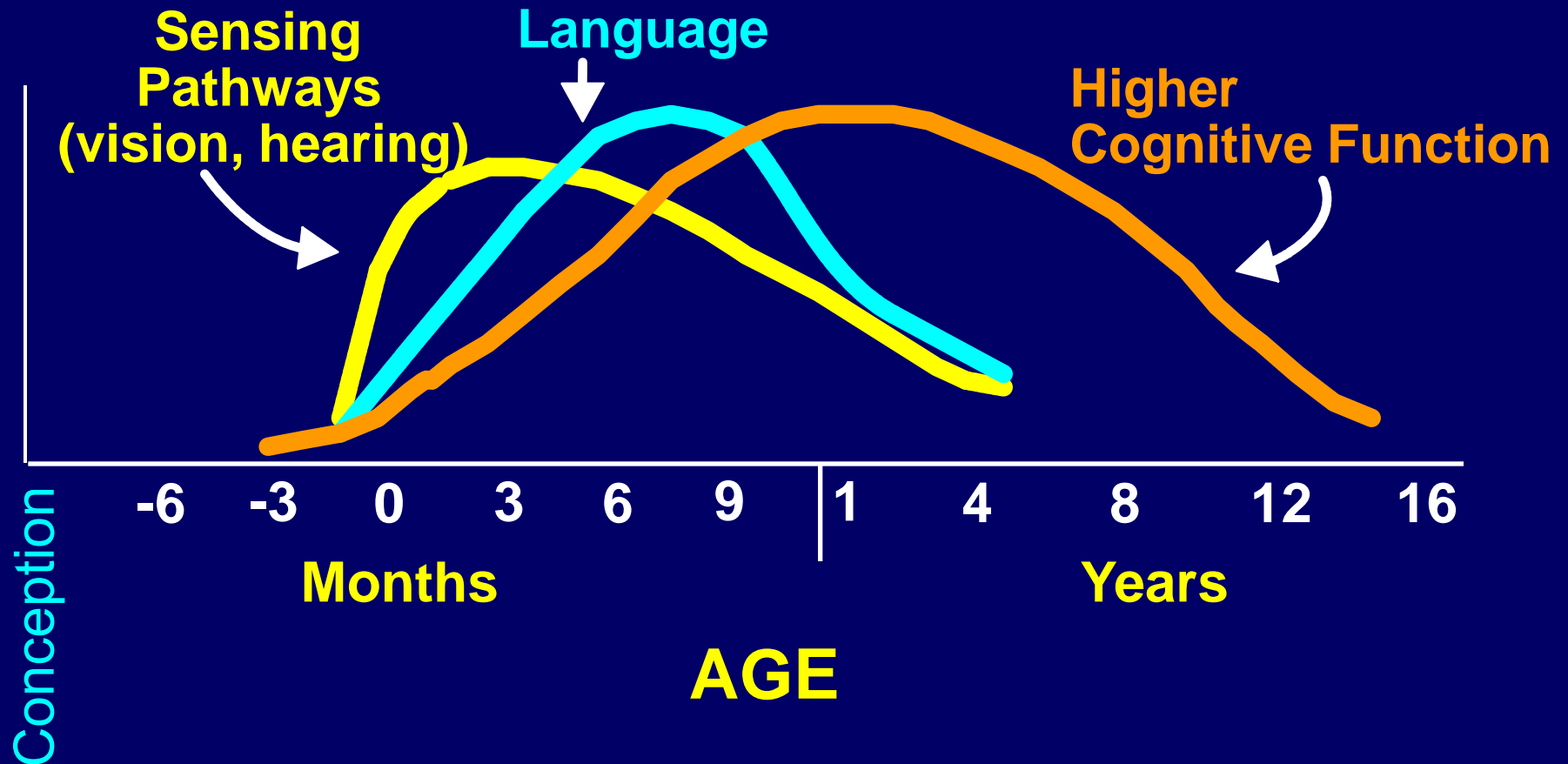
At Birth

6 Years Old

14 Years Old



Human Brain Development – Synapse Formation



Early Risk Factors

- **Prenatal:**
 - **Poor nutrition**
 - **Pregnancy complications**
 - **Alcohol**
 - **Prescription, O-T-C, & illegal drugs**
 - **Exposure to toxins**
 - **Stress**
 - **Parental depression**
- **Birth & First Months**
 - **Poor Nutrition**
 - **Delivery complications**
 - **Neurological insult**
 - **Exposure to toxins**
 - **Difficult temperament/ hyperactivity/attention/ impulsivity problems**
 - **Stress**
 - **Parental depression**

Understanding and Dealing with Stress

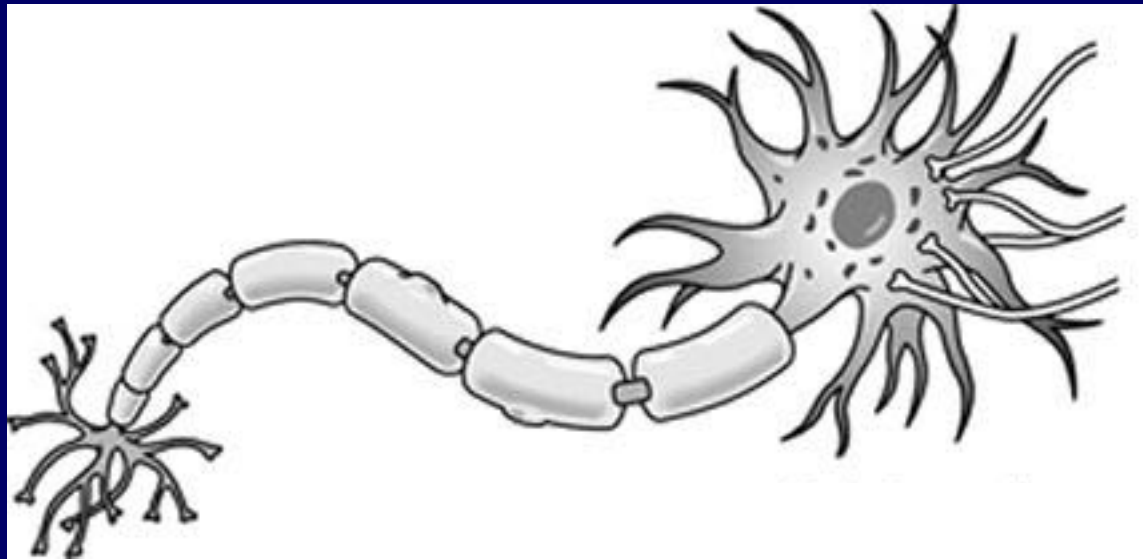


Image: www.brainconnection.com

© 1999 Scientific Learning Corporation



**Brain Development in
Early Life Sets
Trajectories for
Development
Throughout Life**




Experience-Based Brain Development in the early years of life sets neurological and biological pathways that affect:

- Health
- Learning
- Behaviour

The Hypothalamus Pituitary Adrenal Gland (HPA) Pathway – Stress

- Affects cognition, behaviour, the immune system, and many other biological systems
- Touch in early life is important in setting the neurological pathways and the control and response of this pathway – sensitive period



Brain HPA Pathway and Immunology

- Stress can make you ‘sick’
- Stress can change the way the immune system responds
- Mediators
CRF, Cortisol – Cytokines - Interleukins



Positive Stress

- Refers to moderate, short-lived stress responses, such as brief increases in heart rate or mild changes in stress hormone levels. Learning to adjust to it is an essential feature of healthy development. Examples: meeting new people, getting an immunization, entering child care.
- Events that provoke positive stress tend to be those that a child can learn to control and manage well with the support of caring adults and which occur against the backdrop of generally safe, warm, and positive relationships.

Tolerable Stress

- Refers to stress responses that could disrupt brain architecture, but generally occur within a time-limited period and are buffered by supportive relationships that facilitate adaptive coping. These conditions usually give the brain an opportunity to recover from potentially damaging effects.
- Examples of stressors include death, a serious illness of a loved one, a frightening injury, divorce.

Toxic Stress

- Refers to strong and prolonged activation of the body's stress management systems in the absence of the buffering protection of adult support, disrupts brain architecture and leads to stress management systems that respond at relatively lower thresholds, and increases the risk of stress-related physical and mental illness.
- **Examples of stressors include extreme poverty, physical or emotional abuse, chronic and serious neglect, enduring maternal depression, family violence.**



"The impact of severe stress
(early childhood) can leave an
indelible imprint on brain
structure and function."

Martin Teicher
Scientific American, 2002



HEALTH





The Brain and Health

- From the time of the ancient Greeks to the 20th century, it was accepted that the mind can affect illness.
- The new thrust of the biosciences and the new treatments for disease have recently caused us to have less interest in the mind-body interaction and disease.

Esther Sternberg (NIH)



Historical

Industrial Revolution and Population Health in the West

- Tom McKeown
 - 25% public health
 - 75% better nutrition
- Robert Fogel
 - Major factor better nutrition of children
 - Early childhood set risks for chronic diseases of adults
 - Better quality of population improved economic growth



Socio-Economic Factors – Life Cycle and Health

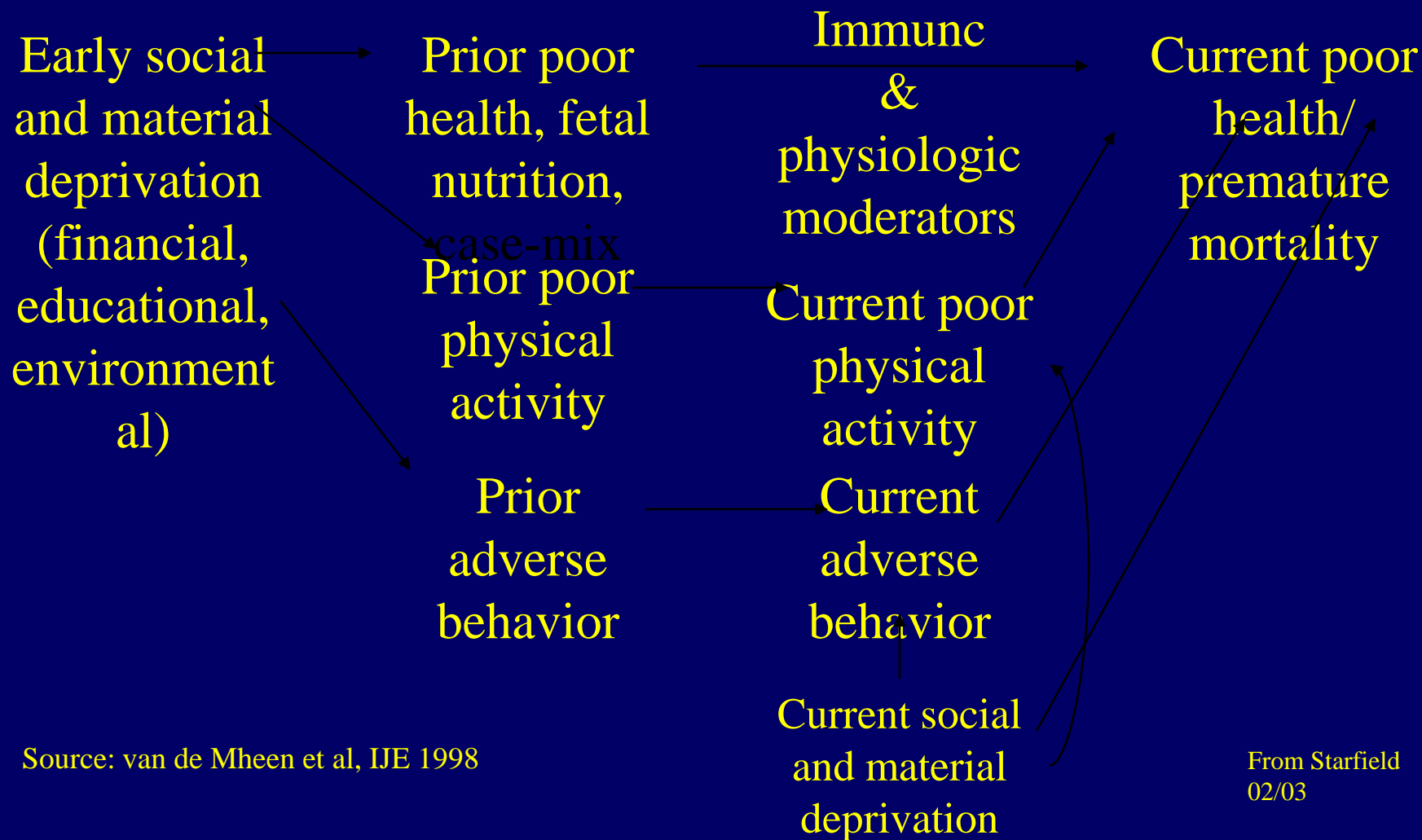
In Utero - Barker et al

Early Years - Power and Hertzman

Adult Life - Marmot et al

Biological embedding in the early years
influences health risks in adult life

Childhood Antecedents of later Childhood and Adult Health



Source: van de Mheen et al, IJE 1998

From Starfield
02/03



Swedish Longitudinal Study – ECD and Adult Health

Number of Adverse ECD Circumstances*


0 1 2 3 4

Adult Health

Odds - Ratios


General Physical	1	1.39	1.54	2.08	2.66
Circulatory	1	1.56	1.53	2.91	7.76
Mental	1	1.78	2.05	3.76	10.27

* Economic, family size, broken family and family dissention



Health Problems Related to Early Life

- Coronary Heart Disease
- Non-insulin Dependent Diabetes
- Obesity
- Blood Pressure
- Aging and Memory Loss
- Mental Health (depression)



"Follow up through life of successive samples of birth has pointed to the crucial influence of early life on subsequent mental and physical health and development."

Acheson, Donald - Independent Inquiry into Inequalities in Health, 1998




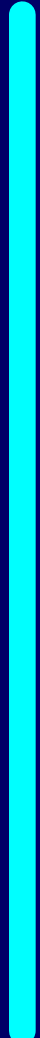



BEHAVIOR



Behavior

- Involves HPA axis, hippocampus and frontal brain
- Early brain experience affects pathways
- Behaviour affected by early child development
 - antisocial behaviour and violence
 - drug and alcohol addiction
 - depression
 - post traumatic stress
- Behaviour possibly affected – autism, dyslexia, attention deficit disorder, schizophrenia



"The origin of these behavior problems can be traced back to fetal development and infancy. High quality care-giving support ... during the first three years ... reduces ... the seriousness of behavior problems."

Tremblay, R. - Developmental Health and the Wealth of Nations, 1999

Substance Abuse and Childhood Abuse

*Odds Ratios for Drug
and Alcohol Use*

Exposure to
Child Abuse*

Drugs

Alcohol

0

1.0

1.0

1

2.7

2.0

2

2.9

4.0

3

3.6

4.9

4+

4.7

7.4

* Scale: 0 none
4 intense



LEARNING

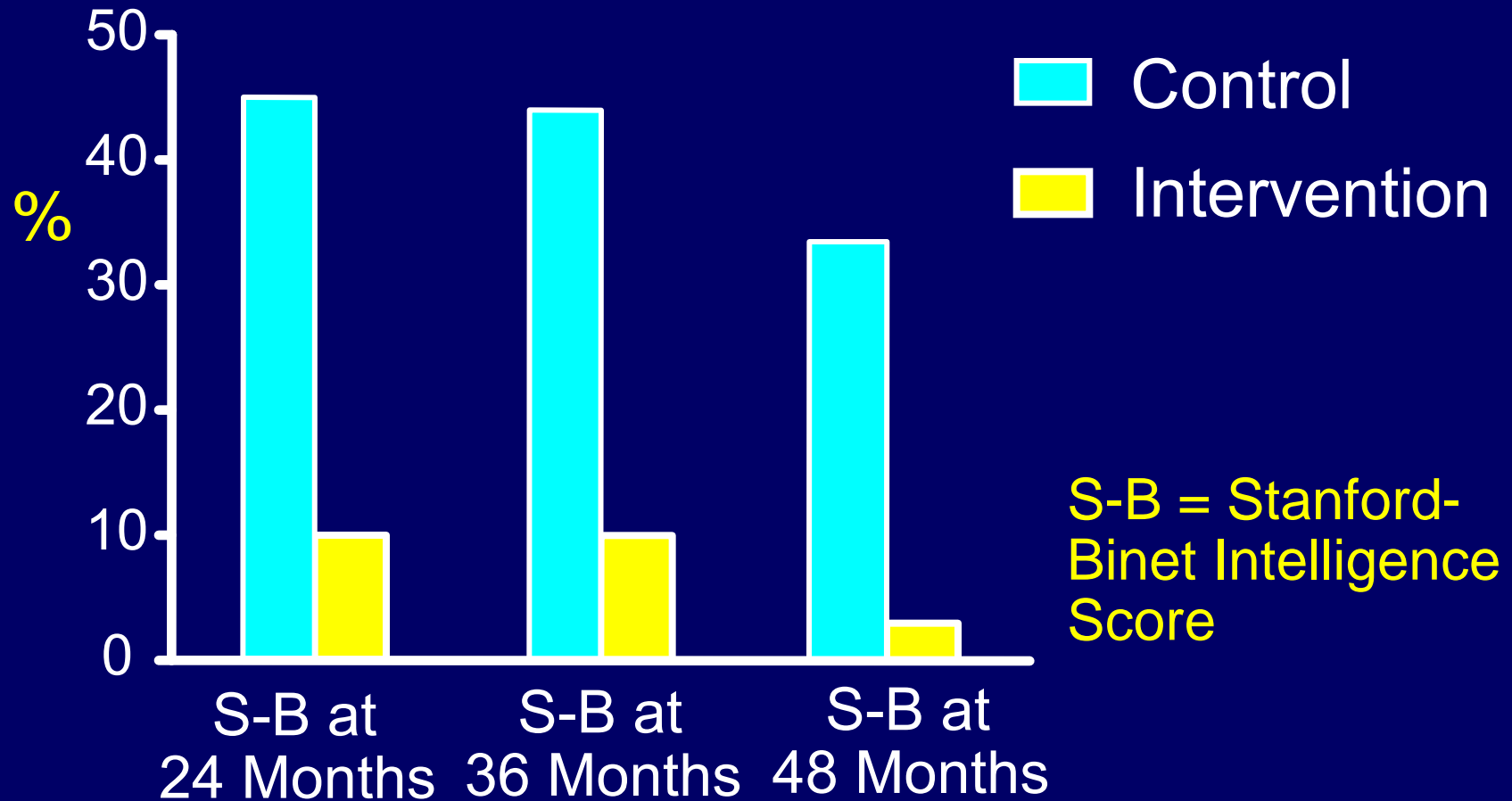


Intervention Studies

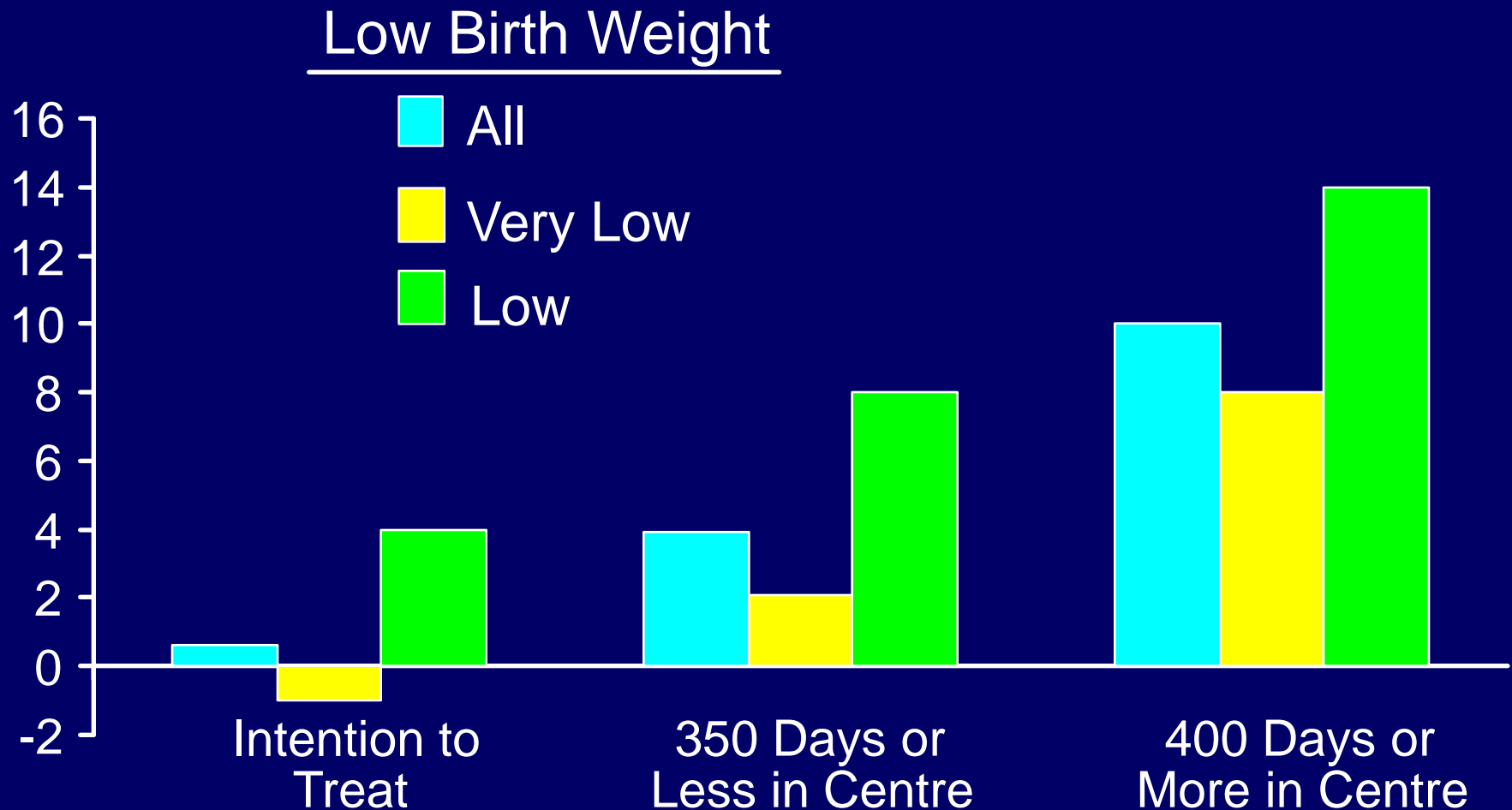
- Grantham-McGregor
- Abecedarian
- Ypsilanti
- Osborn and Milbank
- Bergmann – France
- Other (World Bank Report)

Compatible with biological and animal studies

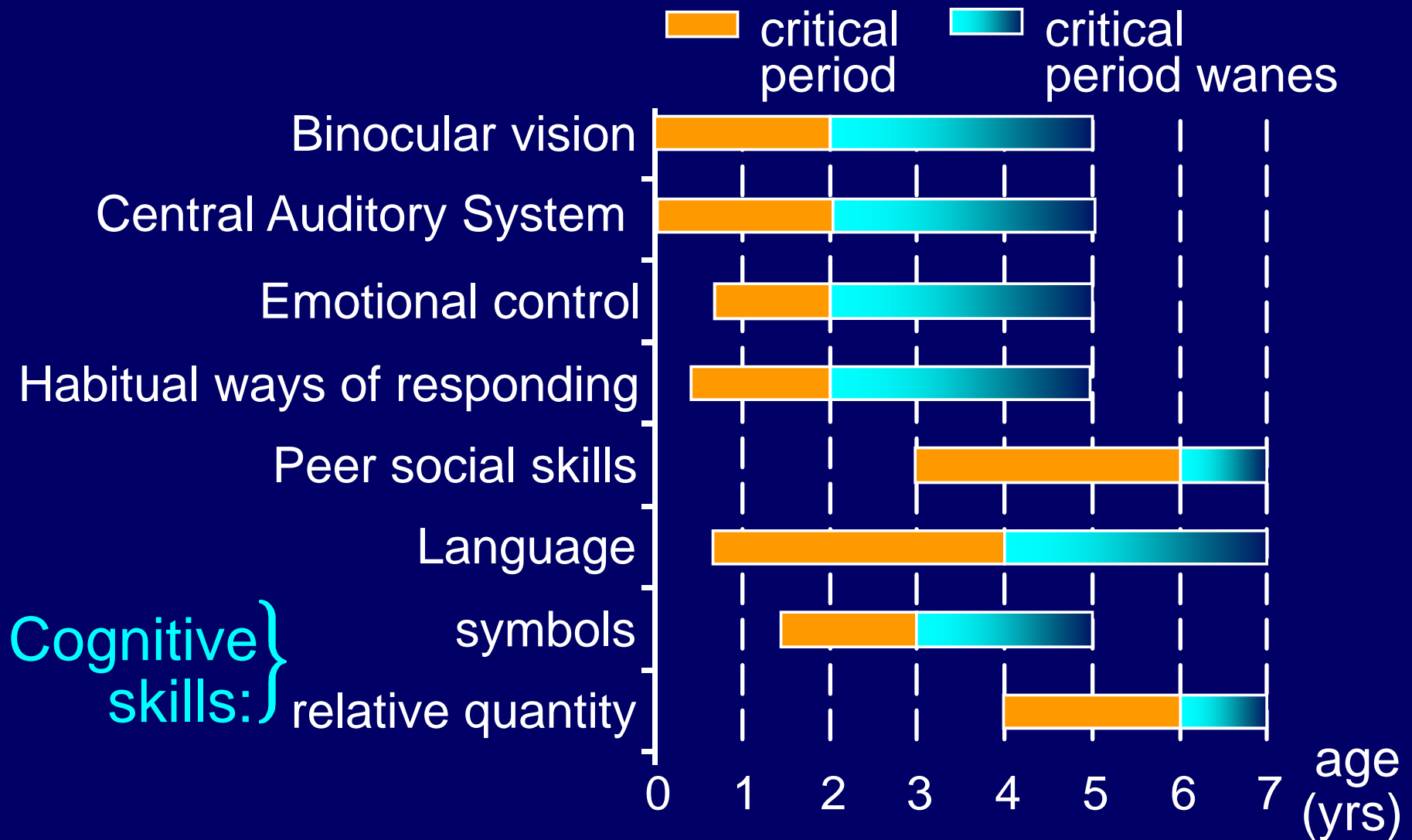
Percentages of Preschool Control and Intervention Children with IQ Scores Lower Than 84 in the Carolina Early Intervention Program



WISC Verbal Scores Age 8 – Low Birth Weight Children in ECD Centres (Ages 1 to 3)



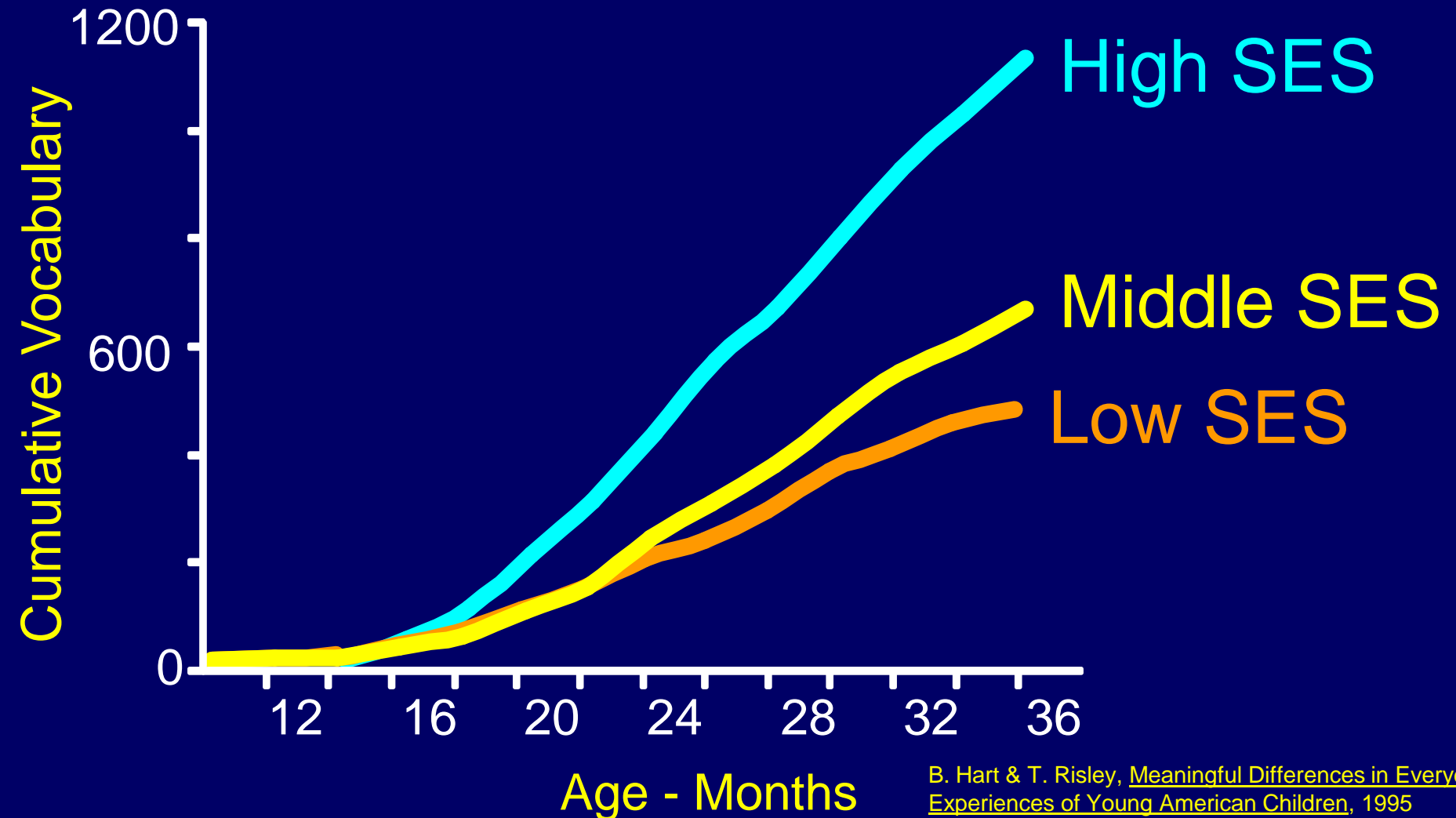
Sensitive Periods for Early Development





LITERACY

Literacy – Early Vocabulary Growth





Levels of Literacy: A Reflection of ECD

Level 1: indicates persons with very poor skills.

Level 2: people can deal with material that is simple

Level 3: is considered a suitable minimum for coping with the demands of everyday life

Level 4 describe people who demonstrate

and 5: command of higher-order processing skills



Document Literacy

1994 – 1998, Ages 16 to 55

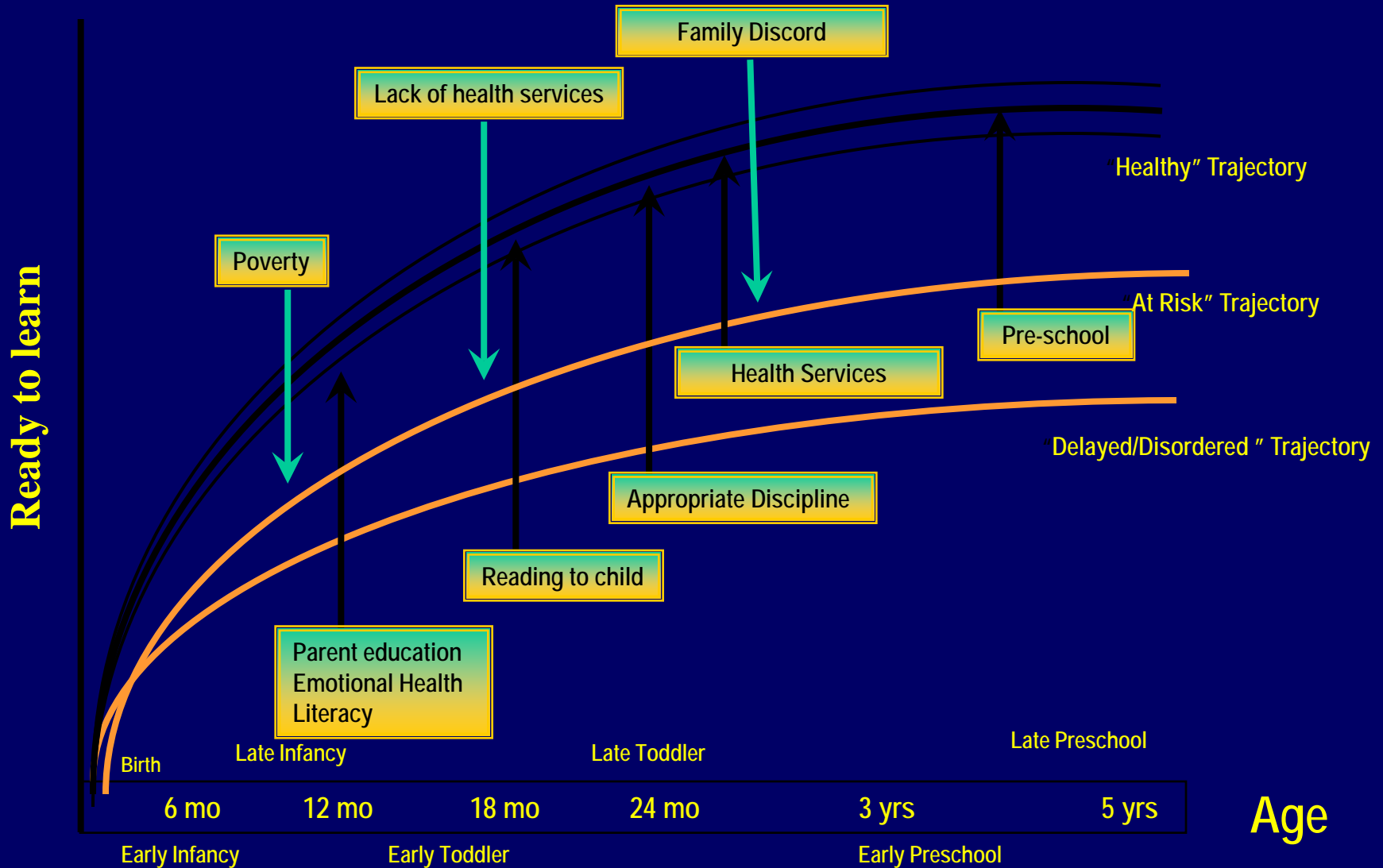
	Level 1 and 2	Level 4 and 5
Sweden	23%	34%
Canada	42%	23%
Australia	43%	17%
United States	48%	18%
Chile	85%	3%

Summary

- The longitudinal studies of birth cohorts, the intervention studies and observational studies all show that experience-based brain development in early life affects learning and behaviour.
- The earlier an infant has exposure to quality experience, the better the outcome.
- These data are compatible with our understanding of brain development and function.

Strategies to Improve Health Development Trajectories

*Back to
Overall Model*



Converging Service Sector Strategies to Create an Early Childhood Integrated Service Delivery Platform

Early Care & Education

Deliberate Opportunities for Cognitive, Social and Emotional Learning

Training on Child Health and Development

Training on Maintaining a Safe and Healthy Early Care Environment

Parent Education/Anticipatory Guidance

Child Observation to identify possible physical/emotional health problems

Linkage to Community Resources

Medical Home

On-going Assessment of Child Development

Elicit & Address Parent Concerns

Anticipatory Guidance

Preventive Health Care

Acute and Chronic Health Care

Integration with Community Resources for Referral

Integrated Service Delivery Platform 3.0

Home Visiting

Housing Services

Adult Education

Job & Life Skills Training

Marriage & Family Counseling

Case Management

Anticipatory Guidance from Pediatrician

Anticipatory Guidance from ECE Provider

Child Birth Classes

Parenting Classes

Advice from Friends and Family

Parenting Information from Media Sources

Positive Parent-Child Interactions

Infant Mental Health Consulting in ECE Programs

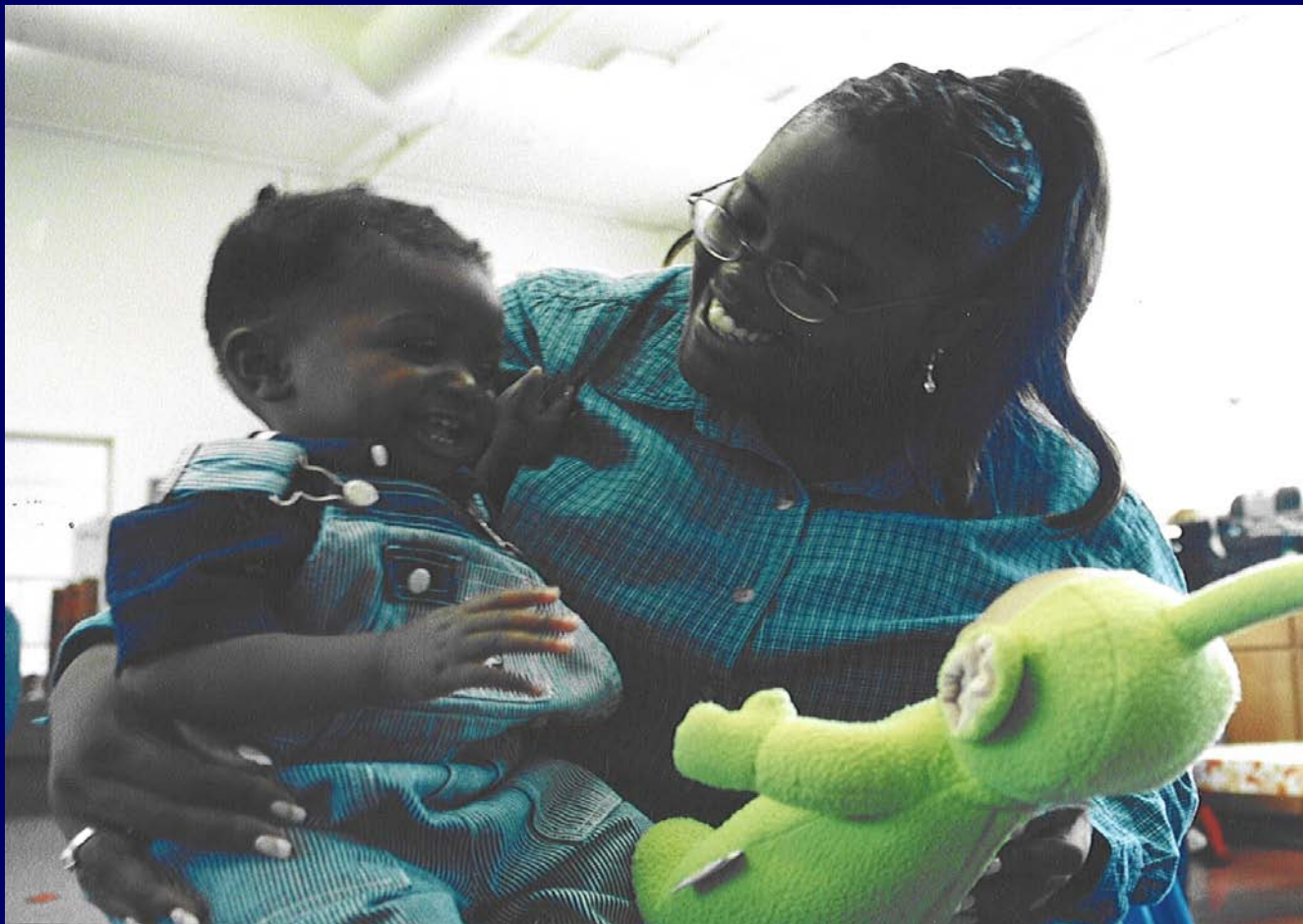
Part C

Family Support

Parent Education

Mental Health & Socio-Emotional

Nurturing Relationships & the Brain



Infant Needs

- **Nurturance**
- **Support**
- **Security**
- **Predictability**
- **Focus**
- **Encouragement**
- **Expansion**



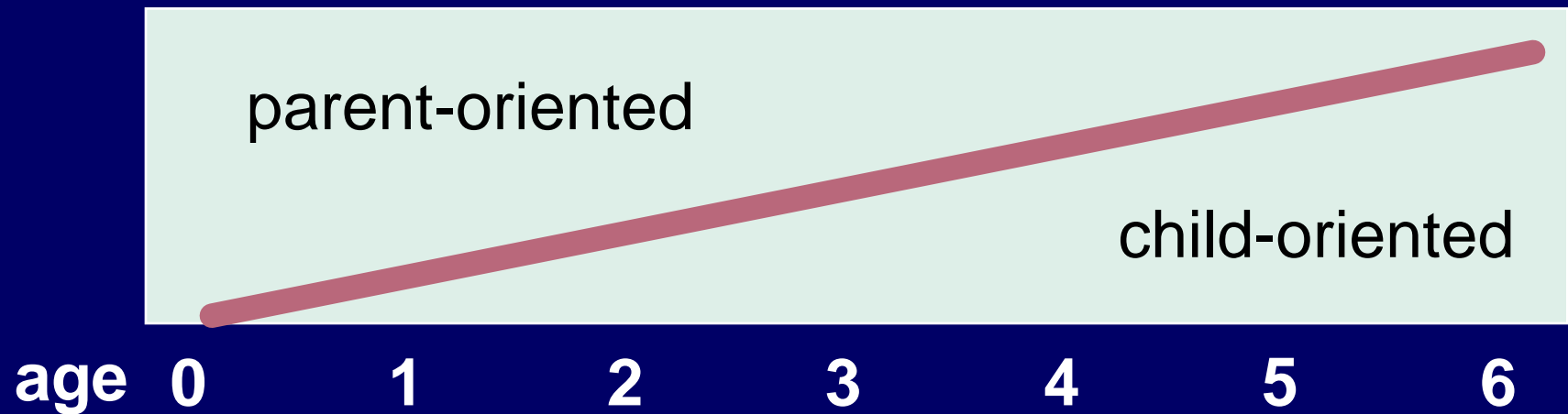
**EARLY CHILD
DEVELOPMENT
AND
PARENTING
PROGRAMS**



Most Effective Early Child Development Programs

- Center Based ECD Programs
- Integrated Programs
- Parent Involvement
- Begin Early

Source of Brain Stimulation



Components of Early Childhood Development and Parenting Centres:

- ECD & care (parental and non-parental) arrangements
- Play-based learning
- Resources
- Prenatal & postnatal supports
- Nutrition programs

Infant Care Policies and Practices That Foster Brain Development



Recommended Policies for Quality Child Care

- Primary Care
- Small Groups
- Continuity of Care
- Personalized Care
- Cultural Responsiveness
- Attention to Their Special Needs

Effective Intervention Program Elements

- **Developmentally based guidance & discipline**
- **Consideration of temperamental differences**
- **Modeling and sharing a responsive process**
- **Focus on intellectual interests of child**
- **Development of individual intervention strategies**
- **Reflective supervision**
- **Linked home visit, health, mental health and special education services**

Points to Remember

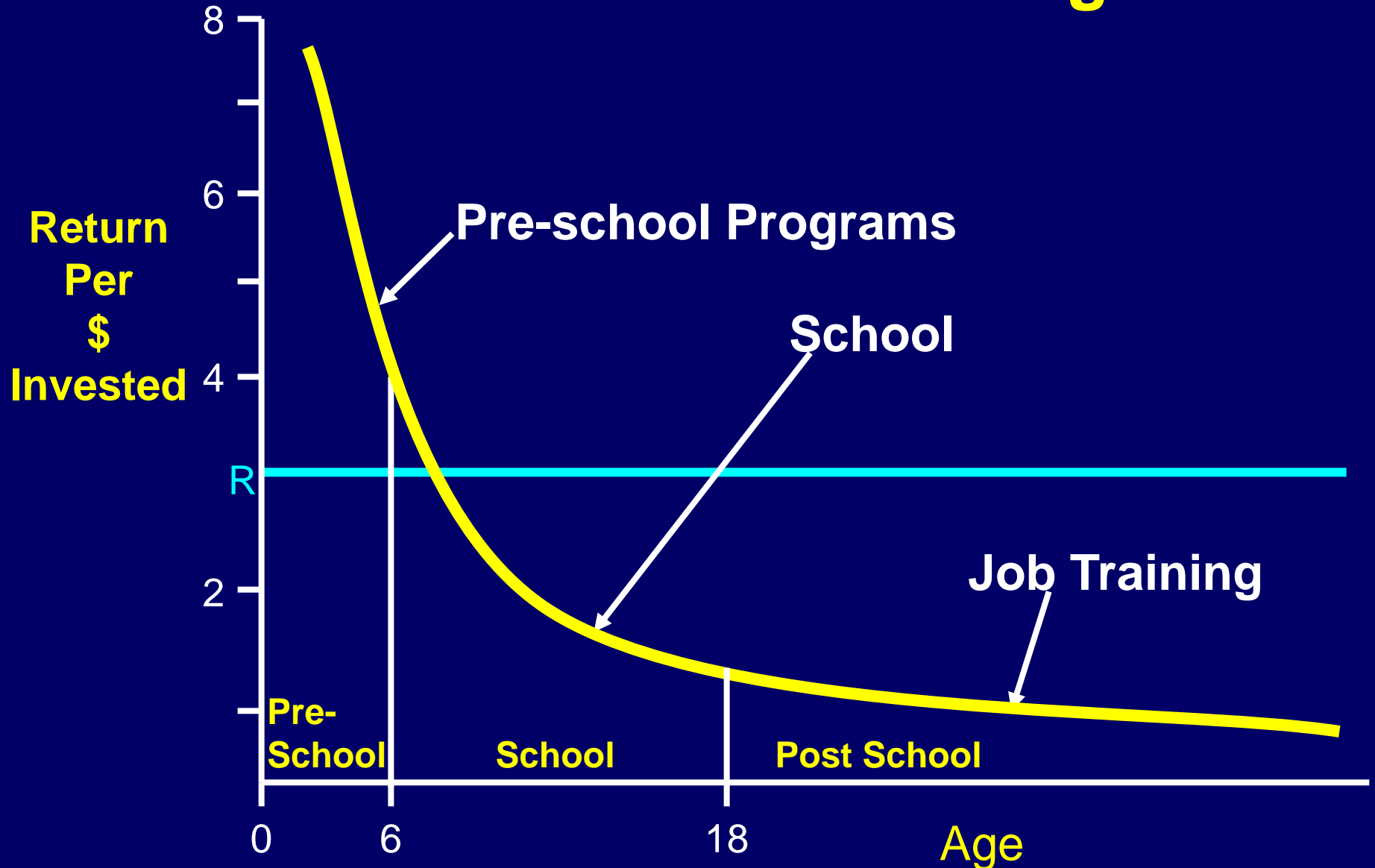




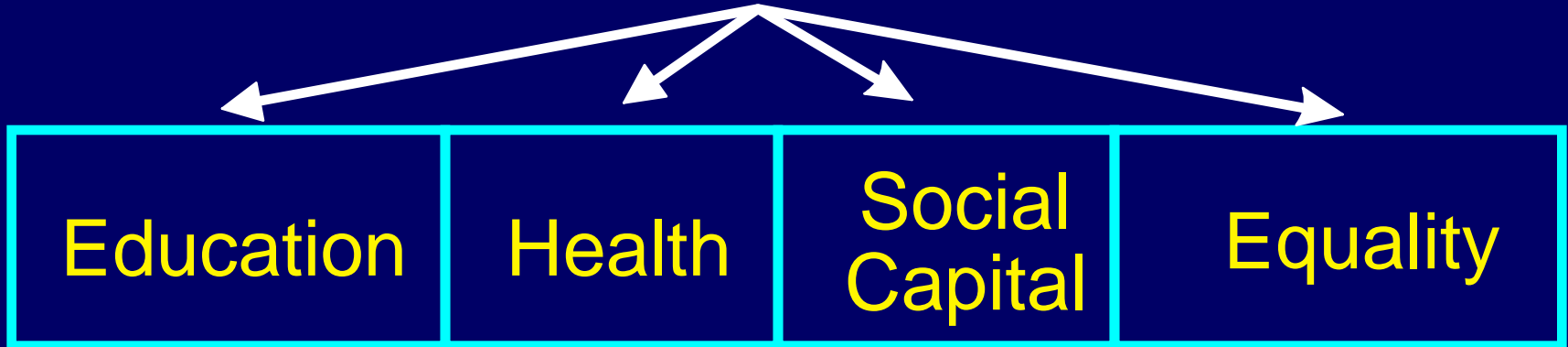
Points to Remember

- There are learning windows but for humans most windows never close completely
- Synapse loss is a natural occurrence based on the pruning of seldom used connections
- Early emotional and social experiences are as important to the wiring of the brain as intellectual experiences
- Healthy early development depends on nurturing and dependable relationships
- Experiences create expectations which alter perceptions

Rates of Return to Human Development Investment Across all Ages



ECD



Economic Growth

Human Development

References

1. *From Early Child Development to Human Development*. Editor: Mary Eming Young, World Bank, Washington, 2000.
2. *Synaptic Self: How Our Brains Become Who We Are*. Joseph LeDoux, Viking Penguin, New York, 2003.
3. *The End of Stress As We Know It*. Bruce McEwen, Joseph Henry Press, Washington, 2002.
4. *Developmental Health and the Wealth of Nations*. Editors: Daniel P. Keating, Clyde Hertzman, The Guilford Press, New York, 1999.
5. *From Neurons to Neighborhoods. The Science of Early Child Development*. Editors: Jack P. Shonkoff and Deborah A. Phillips, National Academy Press, Washington, 2000.
6. *Early Years Study, Final Report Reversing the Real Brain Drain*. Hon. Margaret Norrie McCain and J. Fraser Mustard, Publications Ontario, Toronto, 1999.
7. *Vulnerable Children*. Editor: J. Douglas Willms, University of Alberta Press, Edmonton, 2002.
8. *Readiness to Learn at School*. Magdalena Janus and Dan Offord, In Isuma (Canadian Journal of Policy Research) Vol. 1, No. 2, 2000.
9. *Why are some people healthy and others not?* Editors: Robert G. Evans et al, Aldine De Gruyter, New York, 1994.
10. *The Early Years Study Three Years Later*. Hon. Margaret Norrie McCain and J. Fraser Mustard, The Founders' Network, 2002.