



UNDERSTANDING THE NATURE AND SIGNIFICANCE OF EARLY CHILDHOOD: NEW EVIDENCE AND ITS IMPLICATIONS

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INTRODUCTION AND OUTLINE



- Rather than reviewing the evidence regarding existing forms of service, this presentation will focus more broadly on what we know about child development - how children learn, what children need.
- My focus is not so much about challenging existing models of ECEC in Australia as challenging our understanding of the nature and significance of the early years.
- Over the past few decades, there has been a growing acceptance among scholars, professionals and policy makers of the importance of the early years
- However, as we learn more about the way in which experiences in the early years shape health, development and well-being, and the extent of these influences over the life-course, the true importance of these years becomes more and more apparent.

NEW RESEARCH EVIDENCE



- Evidence about the nature and significance of prenatal development and experiences, and their effects over the life course
- Evidence about the nature and significance of postnatal learning and development, and the impact of proximal environments
- Evidence regarding the long-term impact of early childhood experiences on development, health and wellbeing
- Evidence regarding neurological development and plasticity
- Evidence regarding the neurobiology of interpersonal relationships
- Evidence regarding 'social climate change' and its effects
- Evidence from economic analyses of child development and the benefits of investments in the early years
- Evidence regarding social inequalities and their effects
- Evidence from repeated measurement of key indicators of child development and functioning

PRENATAL AND POSTNATAL DEVELOPMENT



PRENATAL DEVELOPMENT



- Until recently, there had been a scientific misconception that the placenta provides a barrier for the growing foetus that protects it from the mother's physical and emotional environment
- We now know this is not the case – there is a free exchange between the embryonic and maternal blood systems, and the placental wall (which is thinnest during the first trimester when development is most rapid and fundamental) does not protect the child against drugs, alcohol, smoking, environmental toxins or maternal stress
- Moreover, instead of being a passive bystander in the womb during the pregnancy journey, the foetus actively responds to changes within the intrauterine environment
- This is an example of the biological mechanism of *developmental plasticity* by which organisms, in response to cues such as nutrition or hormones, adapt their phenotype to their particular environment

PRENATAL DEVELOPMENT



- According to the *developmental origins of health and disease* (DOHaD) hypothesis, the foetus makes adaptations based on the nutritional and hormonal signals that cross the placenta
- If the conditions are suboptimal, these adaptations can result in permanent alteration of the structure, physiology and metabolism of the offspring, thus laying a physiological basis for adult-onset disease
- This kind of prenatal programming has long-lasting effects on later health (cardiovascular disease, type-2 diabetes, obesity and metabolic syndrome) and fertility
- As a result, adult conditions such as coronary heart disease, stroke, diabetes, and cancer that were regarded solely as products of adult behavior and lifestyles are now seen as being linked to processes and experiences occurring decades before, in some cases as early as intrauterine life, across a wide range of impairments

POSTNATAL DEVELOPMENT



- Previously, infants were thought of as needing loving care and protection but not as active learners or social partners
- We now know that children come out of the womb primed to engage with their caregivers, and that the parents are primed to engage with them
- We now know that learning starts from birth and that learning and development are cumulative, with later development building upon earlier development.
- The proximal environments in which young children spend their time – physical, relational and learning environments – provide opportunities and experiences that shape development.
- Children adapt to these environments – another example of developmental plasticity – in ways that optimise their functioning in the particular environment, but that may have long-term consequences for development, health and wellbeing

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POSTNATAL DEVELOPMENT (cont)



- The stressful experiences endemic to families living in poverty can alter children's neurobiology in ways that undermine their health, social competence, and ability to succeed in school and life
- When children are born into a world where resources are scarce and violence is a constant possibility, neurobiological changes may make them hypervigilant, a helpful behaviour in the circumstances
- However, these adaptive responses to chronic stress also make it harder for them to control their emotions, focus on tasks, and form healthy relationships, all disadvantages in situations, such as school and work, where they must concentrate and cooperate to do well.
- An added complication is that children are *differentially susceptible* to environmental experiences: while most children are 'dandelion' children who do well in most environments, a minority are 'orchid' children who flourish in positive environments but react particularly badly to negative environments

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LONG-TERM IMPACT OF EARLY YEARS EXPERIENCES



- Key longitudinal studies – eg. *Adverse Childhood Experiences Study*, *Christchurch Health and Development Study*, *British Cohort Study*, and the *Longitudinal Study of Australian Children*
- These studies provide strong evidence of the way in which life-long effects of early experiences impact on the later achievements, social adjustments, mental health, physical health and longevity of individuals

Three key ways in which early childhood experiences can have long-term effects have been identified:

- biological embedding,
- accumulation processes, and
- developmental escalations of risk over time

Although they are distinguishable from one another, these pathways are not mutually exclusive.

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BIOLOGICAL EMBEDDING



- Biological embedding refers to a developmental process whereby prenatal and early childhood experiences influence physiological and neurological development in ways that have long-term consequences
- Early life social and environmental stressors, such as childhood abuse, neglect, poverty, and poor nutrition, become deeply embedded in the child's neurobiology
- These changes have been associated with an increased risk of common metabolic and cardiovascular diseases later in life, the emergence of mental and physical illness (such as anxiety, mood disorders, poor impulse control, psychosis, and drug abuse) and increased risk for psychopathology (from depression and conduct disorders to autism and schizophrenia)
- Inadequate diet in early life can permanently change the structure and function of specific organs or homeostatic pathways, thereby 'programming' the individual's health status and longevity

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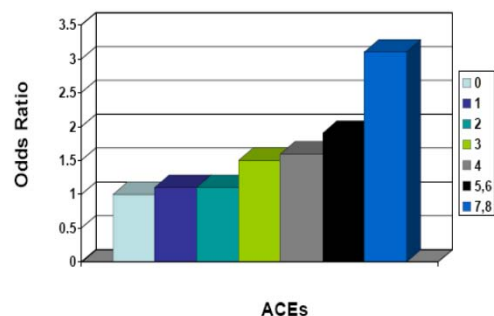
ACCUMULATION EFFECTS



- The cumulative effect of adverse experiences during childhood and the toxic stress they cause influences every aspect of health and well-being in childhood and beyond
- Adverse experiences include abuse (emotional, physical and sexual), neglect (physical and emotional) and household dysfunction (family violence, parental illness or drug abuse, parental separation and divorce)
- These effects cascade across all areas of developmental functioning thereby altering the course of development
- The greater the number of adverse experiences in childhood, the greater the risks of a range of adult health problems (including heart disease, liver disease and lung cancer) and psychological problems (depression, suicide attempts, alcoholism and drug abuse)

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Adverse Childhood Events and Adult Cardiovascular Disease



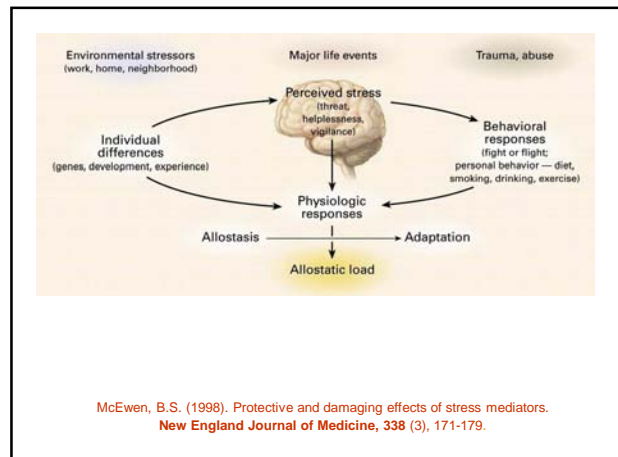
Dong et al (2004)

ACCUMULATION EFFECTS (cont)



- Over time, the cumulative wear and tear caused by exposure to chronic stress results in physiological changes to the body with long term adverse consequences for health and wellbeing
- This cumulative wear and tear on the body is known as **allostatic load**, and is caused by repeated mobilisations of multiple physiological systems over time in response to environmental stressors
- The longer the children have been exposed to stressors such as poverty, family violence or child abuse, the higher their allostatic load
- Childhood stressors may actually 'reset' the immune system in a manner that increases stress-related impairments in immune function, rates of infectious and chronic diseases, or blood pressure and cardiovascular disease incidence

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ESCALATIONS OF RISK OVER TIME



- Development is also shaped by developmental escalations in risk over time
- An exposure or experience at one stage of the life course influences the probability of others later in the life course, as well as associated health and developmental outcomes
- Thus, these experiences form chains of risk whereby a sequence of linked exposures that raise disease risk because one bad experience or exposure tends to lead to another and then another

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NEUROLOGICAL DEVELOPMENT AND PLASTICITY



- Brains are built over time through an ongoing process that begins before birth and continues into adulthood
- 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 environments and experiences have an exceptionally strong influence on brain 'architecture'
- However, the brain is capable of rewiring itself in response to significant changes in environments
- Our preferred metaphor for describing the early development of the brain is to talk about the 'architecture' of the brain – this captures well the importance of building firm foundations, but does not do justice to neurological plasticity, for which there is no equivalent in architecture
- Neurological plasticity as a two-edged sword

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NEUROBIOLOGY OF INTERPERSONAL RELATIONSHIPS



NEUROBIOLOGY OF INTERPERSONAL RELATIONSHIPS



- Healthy development depends on the quality and reliability of a young child's relationships with the important people in his or her life, both within and outside the family
- Relationships are the medium through which young children learn the skills that enable them to become fully participating members of society – in effect, children use the brains of adults to develop their own
- Sensitive and responsive care giving is a requirement for the healthy neurophysiological, physical and psychological development of a child
- The key qualities of effective relationships are attunement, responsiveness and respect
- Brains are changed by relationships – they can do this because our brains constantly communicate with each other through unconscious or subconscious neurobiological pathways of which we are unaware.

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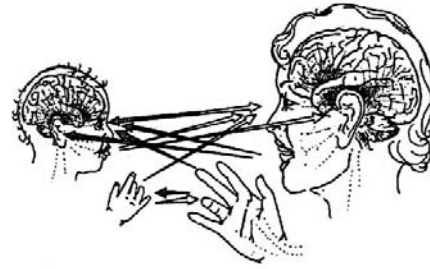
NEUROBIOLOGY OF INTERPERSONAL RELATIONSHIPS



- The subconscious pathways enable our brains to read the body and facial signals of others, and detect their intentions and emotional states.
- In effect, our (right) brains are able to communicate directly with other people's (right) brains independently of conscious communication processes or awareness.
- The right brain limbic areas that enable this to occur grow rapidly in the first two years of life and the nature of their development can have long-term implications.
- The growth of a baby's brain literally requires brain-brain interaction, and occurs in the context of a positive affective relationship.
- These interactions constitute a 'social synapse' that resembles the synaptic connections between the neurons in our brains

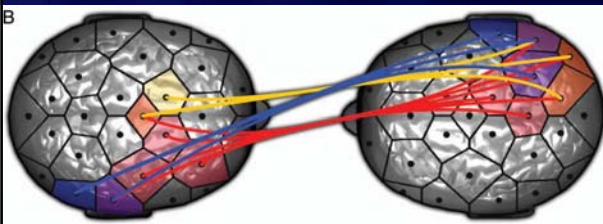
Cozolino (2006)

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Secure attachment and right brain development
(Allan Schore, adapted from Trevarthen, 1993)

INTER-BRAIN SYNCHRONISATION



Inter-brain synchronization in alpha (blue), beta (orange) and gamma (red) frequency bands related to interactional synchrony during spontaneous imitation of hand movements (Dumas, 2011)

'SOCIAL CLIMATE CHANGE'



- As a result of rapid social change, the world has become a more challenging and complex place, and the conditions under which families are raising children have changed
- Families who are relatively well-resourced are better able to meet the challenges posed by altered social conditions. However, poorly-resourced families can find the heightened demands of contemporary living and parenting overwhelming
- Gaps in family functioning are cumulative: the more advantaged families are initially, the better they are able to capitalise and build on the enhanced opportunities available, so that the gap between them and those unable to do so progressively widens
- There is also an increase in the numbers of families with complex needs, and more pockets of intergenerational disadvantage, underachievement and poor health and developmental outcomes

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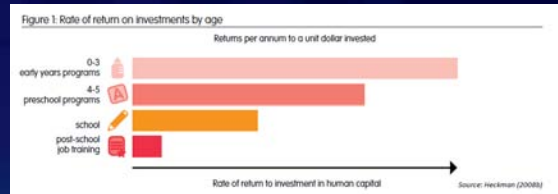
INVESTING IN THE EARLY YEARS



- In this changed world, the stakes have risen: national prosperity is seen as dependent upon the productivity of its citizens and workforce, and improving productivity requires people to master more complex skills.
- It is no longer acceptable to have children arriving at school poorly equipped to benefit from the learning and social opportunities schools provide, and therefore at risk of not developing the skills and qualities needed in a modern economy.
- Moreover, economic analyses by James Heckman and others show that investments in the early years are more cost effective and beneficial than later investments

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INVESTING IN THE EARLY YEARS



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In short, to foster individual success, greater equality of opportunity, a more dynamic economy, and a healthier society, we need a major shift in social policy toward early intervention, with later interventions designed to reinforce those early efforts.

James J. Heckman (2013). *Giving Kids a Fair Chance (A Strategy That Works)*. Cambridge, Massachusetts: MIT Press.

SOCIAL INEQUALITIES



SOCIAL INEQUALITIES



- **Social gradient effects** - in every society, regardless of wealth, differences in socioeconomic status translate into inequalities in child development
- Social gradients are evident across a wide range of developmental, health and well-being indicators: inequalities in outcomes are not concentrated exclusively at the bottom of the socioeconomic spectrum in a small group of poor or problematic families, but are distributed across the entire spectrum in a graded fashion
- Outcomes for children and families improve progressively the further up the socioeconomic spectrum they are, and worsen progressively the further down they move
- Discrepancies between children from advantaged and disadvantaged backgrounds emerge early, and progressively widen, with advantages and disadvantages accumulating throughout life

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Child health inequalities exist in all western countries including Australia and constitute a significant and potentially preventable public health problem.

The increasing evidence from developmental health research suggests that inequities emerging in early childhood are maintained into adulthood as higher rates of mortality and physical, social and cognitive morbidity across the social gradient.

Sharon Goldfeld and Sue West (2014). *Inequalities in early childhood outcomes: What lies beneath. Insight Issue 9*. Melbourne, Victoria: Victorian Council of Social Services
http://apo.org.au/files/Research/VCOSSInsight_InequalitiesInEarlyChildhoodOutcomesWhatLiesBeneath_Jan_2014.pdf

MEASUREMENTS OF KEY INDICATORS



The results of the Australian Early Development Census (formerly AEDI) show that significant numbers of children are arriving at school poorly equipped to benefit from the social and learning opportunities that schools offer, and schools struggle to make up the gap between those children and their peers.

SOCIO-ECONOMIC STATUS	Developmentally vulnerable on at least one AEDI domain (%)	Developmentally vulnerable on at least two AEDI domains (%)
Most disadvantaged SES communities	32.33	17.81
Most advantaged SES communities	16.30	7.18

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IMPLICATIONS



- This accumulation of new knowledge about the impact of prenatal and early childhood experiences on health, wellbeing and development in later childhood and over the life-course must change how we view the early years.
- It is now becoming apparent that it is no longer sufficient to think of this period as being about keeping children healthy and safe while allowing development to take its course until they become old enough to educate formally
- Instead, we need to be taking steps to ensure that children are provided with early childhood environments and experiences that build attachments, competencies and skills from birth, and protect them from escalating chains of adverse experiences
- Children learn from every encounter with their physical and social environments – therefore, in every environment, a curriculum of sorts is operating, and we need to ensure that what children learn benefits them over the life course

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IMPLICATIONS (cont)



- As a society, we have long-standing commitments to the public funding of hospitals and schools – but, as yet, no corresponding commitment to some form of early childhood provision, or even an agreement across society as to what that provision should be
- The contested issues surrounding child care provision illustrate these dilemmas well: What exactly are its aims? How can we ensure it is of high quality? Should it be publically funded?
- We are at a transitional point in our understanding of the nature and significance of the early years – we are much more aware of their importance but not yet committed to a course of action that will ensure that children's experience of this period is optimal
- In moving forward, it is crucial that we base whatever we do on the developmental evidence summarised here

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