

Brain development and the life course -the importance of the early caretaking environment

By Professor Frank Oberklaid

In September 2007 the Quality Counts – Responsive and Effective Child Care Conference was held in Melbourne to celebrate 10 years of the Childcare & Children's Health program. Professor Frank Oberklaid, Director of the Centre for Community Child Health, delivered a keynote address entitled Brain development and the life course – the importance of the early caretaking environment. The following article is adapted from Professor Oberklaid's presentation.

Brain development research

In recent years brain development research has been conducted by researchers from varied professional and disciplinary backgrounds. The convergence of research from neurosciences, developmental psychology and economics has led to an understanding that the early years of a child's life impact critically upon a range of outcomes throughout the life course.

The three themes of brain development that research has focussed on are:

- Brain development
- The life course
- The economics of human capital formation

A multitude of studies published by researchers indicate that the environment experienced by a young child literally sculpts the brain, and establishes the trajectory for long term cognitive and social-emotional outcomes. It has become apparent that to improve outcomes in adult life, there needs to be a focus on these critical early years. This has profound implications for public policy, as it indicates that investing in early childhood is an important and sound economic investment for the future.

The neuroscience of brain development

The human brain is not mature at birth. Its development is the result of complex, dynamic transactions between 'nature and nurture', that is, between biology and the environment. Genes (nature) provide the base or foundation for the development of the brain, but after birth nurture is the critical force in how the brain develops. It is clear that the brain is changed by experiences.

Optimal brain development is dependant upon a positive environment, incorporating factors such as: good nutrition, good health and a nourishing and stimulating environment.

Relationships in particular play a significant role in the development of the brain's social-emotional function.

Influencing the outcomes for brain development

Currently there is little that can be done to change the biology (nature) of the brain, although it is possible to reduce risks to the foetus, for example, by avoiding substance abuse during pregnancy. However, there is much that can be done to improve the environment (nurture) in which young children grow and develop.

Brains are built over time

The brain is sculpted by a person's early experiences which determine the development of neural circuits, known as 'synapses'. Brain architecture and skills are built in a hierarchical 'bottom-up' sequence. Foundations are therefore important, as higher level circuits are built on lower level circuits. The development of higher order skills is much more difficult if the lower level circuits are not wired properly.

The ability of the brain to be moulded decreases over time, and brain circuits stabilise, meaning that it is much harder to alter brain architecture at a later life stage. It is biologically and economically more efficient to support the optimal development of the brain during a child's early years than to try to resolve problems that may arise later in life due to dysfunctional brain development. There is constant 'pruning' of brain circuits that are not used, which highlights the concept of developmental windows or critical periods during early brain development.

The impact of relationships on brain development

Nurturing and responsive relationships build healthy brain architecture, providing a strong foundation for children's learning, behaviour and



health. The relationship a young child has with their caregivers literally sculpts the brain, and determines the development of brain circuits. It is therefore essential that child care settings promote consistent, nurturing relationships between child care professionals and children in which each child's needs are recognised and responded to sensitively.

Stress and brain development

When children do not experience protective relationships with their caregivers, their stress hormones can increase to high levels. This impairs cell growth, interferes with the formation of healthy neural circuits and disrupts brain architecture.

While some stress is a normal and important aspect of every child's experience and development, high and ongoing levels of stress, where children are not supported by warm and consistent relationships with their caregivers, lead to negative outcomes.

The range of stress responses and their impact upon brain development can be identified as follows.

Positive Stress

A moderate and transient stress response which results in mild increases in stress hormone levels and short lived increases in heart rate. Positive stress responses may occur as the result of encountering new people or situations, dealing

with frustration and adult limit setting and the pain of a minor fall or injection. Positive stress is an important part of healthy development, and occurs in the context of stable and supportive relationships.

Tolerable Stress

These are stress responses that can disrupt brain architecture, but are buffered by relationships with caregivers that are supportive and facilitate children's adaptive coping skills. These stress responses may be Caused by the death or serious illness of a loved one, parent divorce, witnessing a frightening event, major trauma or illness and natural disaster. Tolerable stress responses are generally limited to a short period of time, giving the brain opportunity to recover from the potentially damaging effects of the stress response.

Toxic Stress

Toxic stress responses occur as the result of strong and prolonged activation of the body's stress response, without the buffering protection of supportive relationships with caregivers. Toxic stress response can be triggered by extreme poverty, physical or emotional abuse, chronic neglect, severe maternal depression and family violence. Toxic stress disrupts brain architecture and leads to stress management systems that have a lower threshold of activation. This increases the risk of stress related physical and mental illness.

Problems in childhood

- Child abuse and neglect
- Vulnerable school readiness
- Poor literacy and school achievement
- Mental health problems - Attention Deficit Hyperactive Disorder (ADHD), conduct disorders, aggressive and anti-social behaviour
- Problems with communication and social interaction
- Obesity



Problems in adult life

- Mental health problems
- Family violence and aggressive/anti-social behaviour
- Crime
- Poor literacy
- Welfare dependency
- Substance abuse
- Obesity and related problems

Early brain development impacts later life

The disruption of early brain architecture, resulting in disordered brain circuits, leads to problems in childhood. There is evidence that many problems in adult life share their origins in pathways that begin in childhood.

Implications for policy

There is a need for increased government expenditure to address the challenges of the problems experienced in childhood and adult life. However, in the long term, addressing problems later in life is not sustainable: there will never be sufficient resources available, and treating established problems is often difficult, expensive and ineffective. It is therefore essential that policy focus on prevention, by investing in the most critical brain development period that occurs during a child's early years.

What are the answers?

There needs to be a major shift in public policy that focuses not just on treatment, but also on prevention and early intervention as priorities. There is evidence from successful demonstration that early intervention works by pre-empting and resolving problems early on.

Investing in the healthy development of children also has long term benefits not only for the individual but for society as a whole. Studies show that early, effective intervention can lead to positive future economic outcomes.

Early childhood education and care is central to policy and initiatives that can make a significant difference to children and their life course, with the primary focus being on the quality of relationships between young children and their caregivers.

Child care

Child care services should be regarded as valuable early learning environments rather than predominantly as 'child minding' services. They need to be universally accessible to everyone and in particular to disadvantaged children and families. The cost and availability of child care should not be a barrier to the accessibility, and it is important that families have options and are able to exercise choice in the child care they use.

It is vital that there is a strong focus on the provision of quality child care, particularly in relation to the expertise of caregivers, as well as in relation to physical amenities and the



ratios of child care professionals to children. To promote the availability and employment of skilled professionals to work with children, there is a need to radically review the training, pay and conditions, and career structures available to child care professionals.

Rethinking child care

In light of what brain development research suggests, it is important that child care be refocused based on the following three sets of relationships:

- With children - requiring a focus on appropriate training for child care professionals and the provision of quality services
- With parents - requiring a focus on health promotion and early detection of problems
- With community - requiring a focus on child care as a platform or hub for linking families with the community

Relationships with children

The relationships that children experience with their caregivers are a key factor in brain development. Experiences in the early years influence each individual's developmental trajectory and life course. It is therefore essential that children have access to quality child care services that provide rich learning environments for developing brains, and that recognise the critical value of child care professionals who possess expertise in early childhood care and education.

An overview of what is needed in child care

Macro:

- Public policies which promote accessibility and affordability
- Understanding that child care is more than child minding
- Investment in the training and professional development of child care professionals
- Commitment to the provision of quality child care programs
- Recognising the potential of child care as a 'platform' - that is, a source of information and modelling for parents and a hub of community network of early childhood services, where there are opportunities for early detection and referral of problems and potential risks

Micro:

- Expanded and strengthened quality framework for child care, such as the current Child Care Quality Assurance systems
- Training/education and upskilling of child care professionals
- Effective resources for child care professionals and families
- Establishing genuine partnerships between child care professionals and families in the care and education of children
- Establishing links with other professionals and community agencies

Relationships with the Community

Child care needs to be reconceptualised as an early learning environment, rather than primarily as a care environment, with a focus on the child care setting as a focal point from which families and children can be referred to other services such as medical and education services, as well as making links with other community agencies and resources such as libraries and recreation programs.

Conclusion

The research about the critical importance of the early years cannot be ignored. It is clear that children's early experiences impact significantly on brain development and brain architecture, which in turn has fundamental implications for children both in the short term, as well as throughout the life course. Promoting the healthy development of young children is both an ethical imperative and a sound economic and social investment.

Quality environments, both at home and out of home, where children are supported by positive and responsive relationships with caregivers, are crucial to the optimum brain development. Reconceptualising child care to reflect these understandings is one of the most important policy initiatives currently needed in Australia ■

Relationships with families

Child care services should play a central role in supporting families to ensure that children experience positive home environments. This can be achieved through child care professionals providing families with credible advice and guidance on child development, behaviour and health, as well as by child care professionals modelling positive child care practices for parents.

Child care services also have an important role to play in the early detection of risk problems and risk factors for children, as well as in the referral of families to community agencies and other support professionals.

For further information, visit the Childcare and Children's Health website at www.rch.org.au/ccch, or e-mail Professor Oberklaid at frank.oberklaid@rch.org.au

Further reading

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- Thompson, R.A. . (2001). *Development in the First Years of Life*. Retrieved 13 November, 2007, from http://www.futureofchildren.org/usr_doc/vol_11_no_1_no_photos.pdf