From: The First Years: Ngā Tau Tuatahi. New Zealand Journal of Infant and Toddler Education. *Volume 7, Issue 2, 2005*

Relationship-Shaping: Teacher Consistency and Implications for Brain Development

By Miriam McCaleb & Nathan Mikaere-Wallis

Stimulated by a workshop given at the 'Too Infantastic' Teacher's Refresher Course at Living Springs, Canterbury, in April, 2005, this article explores recent developments in brain research, especially as it links to planning for relationships with infants and toddlers. One powerful pedagogical practice that supports planning for relationships and healthy neurological development is the use of primary caregiving in early childhood centres.

The past ten years have brought staggering changes in how brain development is understood. Highlighting the 'how', 'when', and 'why' of the brain, and our abilities to learn, this research makes it clear that we enhance the brain's ability to function by enhancing the quality of the relationships the person experiences. This has immediate implications for our practice and pedagogy when working with children. This article considers these findings and advocates a curriculum that plans explicitly for relationships. We begin with a review of the basic workings of the brain.

Brain Basics.

Brain research technology has brought a flood of new information about early brain development, enabling neuroscientists to confirm what early childhood educators have known for aeons – that a person's earliest years are utterly profound and life-forming (e.g. Shore 1997, Shonkoff & Phillips, 2000, Rockel, 2002).

Infancy and toddlerhood are times of massive brain growth. A baby's brain is only 15% formed at birth with the majority of the remaining 85% formed in the first years of life (Brainwave Trust, 2005). It is the only organ not fully formed at birth – instead taking until age four to reach 90% of its adult size (Perry, 2004).

During this time, the brain's cells, called neurons, *react* to experiences in the environment. These experiences literally shape the structure of the brain (Shonkoff & Phillips, 2000)

Around the third birthday, our brains begin the process of pruning away the least used cells. Our brains ensure we keep the information we'll really need to survive in our specific context. It is this adaptability that enables humans to within the contexts of their lives: children learn to live in the searing heat of the desert, in the icy tundra, in the open spaces of a farm, in the confines of a gang headquarters.

The *usual* experience of the child in the first three years thereby has life-long implications. At this time, an individual's brain is 'wired' to prepare for a lifetime of this *usual* experience. While change remains possible throughout a person's life span, there is no denying the significance of these first years, and the physical changes they cause within the structures of the brain.

Therefore, high quality infant/toddler care is not just about providing children with a great place to be when they're away from home (reason enough!) but it is quite possibly crucial to biological potential across a person's lifespan. The authors' argument is that the practitioner needs to understand the brain's hierarchical function if their pedagogy is to reflect neurodevelopment research findings.

The Hierarchical Nature of Neurodevelopment

It is often forgotten that the brain develops and functions hierarchically. Working from the base of the brain (**brainstem** or *reptilian* brain), development moves up through the **mid-brain**, **limbic system** and finally into the **cortex**. (Perry, 1997)

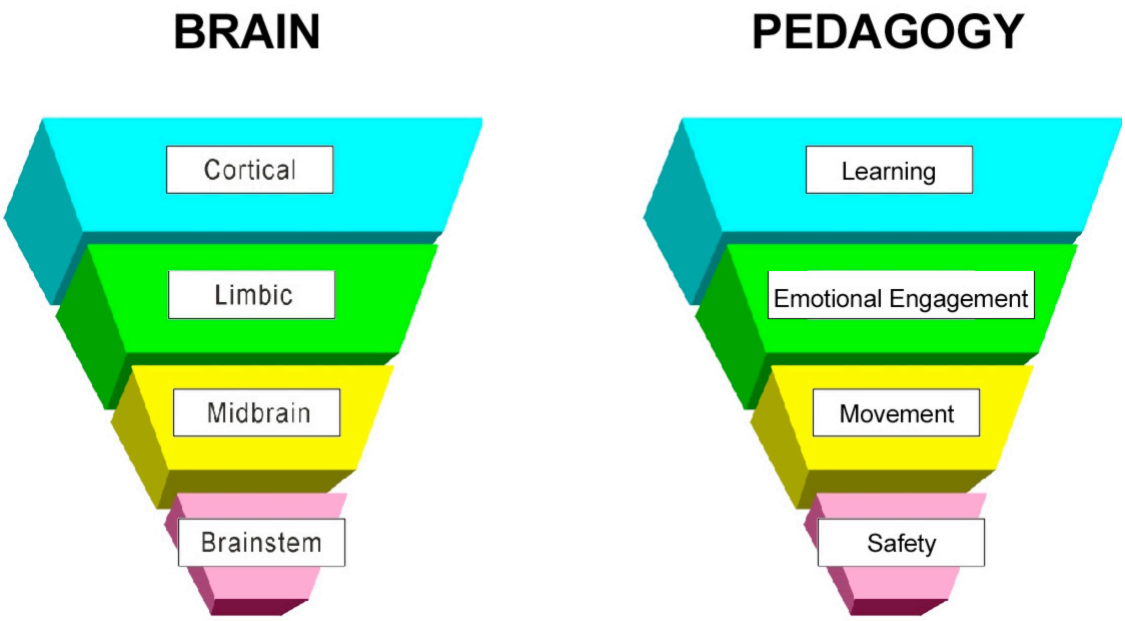
The brainstem is responsible for basic functions such as breathing, heart rate, body temperature and level of arousal. The brainstem registers any perceived threats and responds with high arousal mode, activating the 'freeze, fight or flight' survival function (Fancourt, 2000). This affects our ability to learn, because when the brainstem is aroused, other brain functions are correspondingly suspended. We therefore need to feel calm and safe in order to learn effectively.

Development focuses next on the mid brain, concerned most with motor development, and then on to the limbic system, generally thought of as the emotional centre of the brain. Along with the cortex, the limbic system performs a central role in our ability to interact with others and communicate effectively.

Finally, the brain shifts up to developing the much celebrated cortex, where our abilities to think logically, to think abstractly, emerge (Perry, 1997). The cortex is also recognised as a filter for our emotions – as though it asks 'is it wise to follow my emotional response in this situation?'

The easily recognisable cognitive functions of the cortex (for example, reading) has resulted in an emphasis being placed on understanding the cortex, without the necessary realisation that the cortex is the end result of a hierarchical process beginning in the brainstem.

Understanding the functions of each component in the hierarchy allows the early childhood practitioner to employ a pedagogy that is considerate of this. Ensuring the child's needs are understood and met with regard to each neurological component will likely establish a secure and robust base ready for the next component.



Adapted from Bruce Perry's Neurosequential Model (2004)

This principle lends itself easily to the metaphor of building a house. That is; the concrete for the foundations needs to have set and the walls need to be securely in place before the roof can be added. Similarly, considerations of the brainstem, mid-brain and limbic system need to be in place if we are to hope for secure and robust cortical development.

An Holistic Metaphor

We were enlightened by an analogy offered during *Too Infantastic's* keynote speaker, Rose Pere. During a midnight cup of tea in which we were discussing the functions of the brainstem, limbic system and cortex, Whaea Rose offered the following descriptor to consider how each neurological level was supported by the next.

She described the brainstem as being akin to the role tipuna play in the whānau: although often in the background, they are ultimately the decision makers in the whānau as to whether a certain course of action proceeds. As the oldest and original members of the whānau, they are setting the tone or the backdrop in which the rest of the whānau function. The brainstem as the oldest part of our brains performs much the same function.

The role of the mātua in the whānau was related to the limbic system by two main points. Firstly they were seen to be more responsible for *reacting* to the everyday, here and now, aspects of the world rather than the 'bigger picture' concerns of the brainstem. Secondly, both the limbic system and mātua play a vital role in the successful growth and

nurturance of the tamariki - albeit the cortex.

Whaea Rose related the cortex to the role of tamariki in the whānau, as both need to be *nurtured into being*. In the same way that successful, healthy children result from the parent's ability to love and nurture them (with support from tipuna), a healthy and successful cortex results from a limbic system and brainstem that are appropriately nurtured in order to successfully support the growth of the cortex.

This metaphor resonates because it is apt to analogise the development of a healthy cortex with the overall image of a healthy adult/child relationship.

Relationships and the Brain

The brain is literally built from interactions with people, happening at a time when adults may be tempted to undervalue the impact of such relationships because 'the baby won't remember'.

Consider Gerhardt's (2004, p24) view that "expectations of other people and how they will behave are inscribed in the brain outside conscious awareness in the period of infancy, and … they underpin our behaviour in relationships through life"

These issues are immensely important and their implications resonate on a societal level. People learn how to **be** people largely through their *early* involvement with other people.

Just as neuroscience buttresses the value of the 'basics' of early relationships, it also explains how failure to access at least one strong, meaningful relationship can result in damage that lasts a lifetime (e.g. Gerhardt, 2004, Karr-Morse & Wiley, 1997, Perry, B., 1997). It is well documented that one strong attachment relationship has the power to foster resilience.

Resilience and Attachment

Why is it that some children succeed in the face of adversity while others do not? A look at the literature concerning risk and resilience supports the importance of quality relationships (e.g. Gellert, 2002, Linke, 2001, Robinson, 2000)**.**

Gellert (2002) highlights the relational aspects of resilience and makes the salient point to teachers that all children identified as 'resilient' had "the consistent presence of a person outside the family circle who bonds with the child. In some studies this person is identified as a teacher..." (p.24)

Although the child's exposure to even one quality relationship in which they are respected and valued has a neurological impact on the self-perception and relationship skills of the child, Gellert (2002) also proposed that a child's capacity for resilience is also linked to significant relationships in addition to the primary attachment figure.

This research indicates a clear responsibility for the teacher in their role as carer, decision maker and, we propose, *relationship-shaper,* in the formative lives of children. The quality of relationship we are able to create thereby has a direct impact on the child's sense of a safe and secure world.

This message needs to be heard by uncles, aunties, neighbours and all individuals in the lives of children, but is particularly relevant to teachers considering the number of hours many children spend with them.

One secure attachment in a child's life can "serve as a protective factor against the negative impact of various adversities and risk factors" (Egeland & Erickson, 1999, p. 3). For some children, "a close relationship with a staff member will be the only opportunity to learn how to be and to feel valued in a close relationship" (Watson, 2001, p26).

Anecdotally, teachers often express their concern that multiple attachment figures may somehow detract from a child's primary attachment. The erroneous belief is that additional attachment figures will interfere with the primary attachment. While the importance of a primary attachment figure is well documented (Bernhardt, 2000), it is the absence of this attachment that does damage – *not* the additional support, love and nurturance that comes from the child *also* being attached to others.

Implications for Practice

One of the gifts from increased understanding about the brain in recent years is the reinforcement that the 'basics' – holding babies close, talking to them, smiling and laughing with children, bathing children in music & waiata – these are the things that serve people well (e.g. Shore, 1997, Gerhardt, 2004).

These are the opportunities that create an environment for a warm, responsive, reciprocal relationship to emerge, and– taking the 'house' analogy a little further - such a relationship is the best bet to build the kind of foundation that ensures an architectural marvel.

If, at three years of age, almost half of the limbic system is due to be pruned away with all the other unused connections throughout the brain, if it is truly a case of 'use it or lose it' (e.g. Cashmore, 2001), then everyone encountering young children should ensure that their interactions demonstrate (and live and breathe) respect, love, humour, grace, _____ (fill in an adjective specific to your cultural or familial or centre context).

Socio-cultural Perspectives

Relationships are unarguably important for young children, whether we consider them so for reasons of neurobiology or because of the protective factor of an attachment relationship. Relationships matter - is this really a surprise to early childhood teachers?

Early childhood teachers have long been proponents of socio-cultural theories of child development, the work of Lev Vygotsky (cited in Smith, 1998) and Urie Bronfenbrenner (*ibid*.) have challenged linear, universal models of child development.

The New Zealand early childhood curriculum is based upon relationships. The authors have found it impossible to find any part of Te Whāriki (Ministry of Education, 1996) – including learning outcomes, or questions for reflection, that does not apply to relationships. We encourage the reader to try this – turn to any of the explanations of the Strands and Goals, close your eyes, and point: the entire document is founded on relationships.

Quality Relationships: Quality Centres

Infants and toddlers are the fastest growing user group of child care in Aotearoa/New Zealand, and statistics show that there was a 52% increase in enrolments for this group in the ten years to 2004 (Ministry of Education, 2004). There were 54,000 live births in NZ during 2002, and 33,000 of those children were enrolled in out-of-home care before their second birthday (Ministry of Education, 2004; Statistics New Zealand Tatauranga Aotearoa 2005).

Is this a good thing or a bad thing? The answer is: it depends. It depends on both the quality of the child's home experiences, and the quality of the centre setting. One means of assessing quality is to measure children's stress levels, by measuring their cortisol levels. Cortisol is a stress hormone which contributes to activation of the 'freeze, fight or flight' response mentioned earlier. Too much cortisol production during infancy has been described as "particularly hazardous" to the brain (Gerhardt, 2004, p65).

Consider the results of this British study (Dettling, Parker, Lane, Sebane & Gunnar, 2000, cited in Gerhardt, 2004), reporting upon rates of cortisol:

> …it was not the mother's absence in itself that increased stress hormones such as cortisol, but the absence of an adult figure who was responsive and alert to their states moment by moment. If there was a member of staff in the nursery school who took on this responsibility, their cortisol levels did not rise. (p.48)

This study found that babies who do not have someone clued in to them specifically, someone *in loco parentis*, someone who might be described as a Primary Caregiver (or Key Teacher, Key Carer, or 'Aunty'), may become stressed when separated from their parent. Children under stress are children whose brains are not able to focus on learning.

Looking at it another way: a secure attachment relationship early in life may promote resilience throughout a lifetime. The issue of whether this occurs at home or at the centre is raised by Watson (2001, p.26) when she wonders "Is it possible that the relationship that a child may form with a special person at a childcare centre will make all the

difference to a child's sense of a safe and secure world?".

Universal Precaution – Primary Care

Most centres have the wherewithal to implement *universal* policies of precaution regarding the handling of an infectious illness. Yet there is less awareness of the need for such precaution regarding attachment relationships. Upon review of the wealth of research surrounding early relationships and their lifelong impact, surely we must apply the same logic to engaging in relationships with children taking into account different cultural contexts and practices.

Providing universal precautions assumes that for every child in a centre, we might be their only chance at a secure attachment relationship. Returning briefly to our metaphor of constructing a house – a policy of universal precautions could behave like a thorough building code, quake-proofing all in its path. Universal precautions applied to attachment relationships would serve all children in a centre – those with existing secure relationships have nothing to lose, those without have everything to gain. As Raikes (1996, p61) states so clearly: "The secure attachment to the teacher gives the child someone to go *to*, not just someone to leave *from*"

Even if we are motivated by entirely selfish means – that we want to live amongst people who have the cortical control to resist stealing our cars when old age renders us so forgetful we leave keys in the ignition – we must get serious as a sector about prioritising relationships in early childhood centres.

The authors' experience and other anecdotal evidence suggest many centres engage in what can be described as 'production line childcare', where children pass from adult to adult to adult as they move from the person available to wave goodbye to mum out the window, to the person 'on nappies today', to the person 'in the sleep room' to the person for whom Thursday is 'nursery day'. Clearly this is not planning for relationships.

Primary care is avoided for a number of reasons: perhaps because it makes staff rosters easier? Maybe because the arrangement is seen as restrictive (Wright, 2001), or because of suspicion about a relationship perceived as 'exclusive'. Promoting primary caregiving in early childhood centres does not mean that each child is involved *exclusively* with one adult. Each staff member remains committed to the care of all children (Bernhardt, 2000). An organisation of primary care simply ensures that no child is unconsciously ignored or marginalised.

Models of high quality, relationship enhancing practice exist. The work of Dr. Emmi Pikler provides examples of caregiving amidst less-than-ideal ratios that manage to foster robust relational health (see Gerber & Johnson, 1998; Gonzalez-Mena, 2004; Perry, 2002).

Conclusion

Even though increased recognition of early childhood teachers as professionals has brought about long-overdue increases in status and salary, we need to be cognisant of the fact that neither 'care' nor 'love' are dirty words. As Carmen Dalli (2003, p.4) encourages "…we need to rehabilitate love and care in the discourse about what we do and position it so that it is not a political bludgeon".

It is time to create structures in centres that enable staff to concentrate on being with children and families. Creative planning of such allows more room for the vital business of being in relationship with children.

The realities of early brain development and the importance of relationships demand that we have the courage to do the intangible, the immeasurable, to *care* about children. Sometimes it is that intangible thing -that warm feeling that can't be academically referenced- that best describes a quality experience in an early childhood centre. Perhaps this tells us we are in an environment of conscious *relationship-shaping.*

To revisit the metaphor of house building: early childhood teachers have an opportunity to be part of the foundational construction. NO one knows where those children and their capacity for relationships will go and what relationships they will be able to create themselves.

In planning for a lifetime of relationships, early childhood teachers can go a long way towards constructing resilient children who are firm in their knowledge that they have a place in the world: they can create and maintain relationships with people.

He aha te mea nui o te ao? He tangata, he tangata, he tangata! The most important thing to people is other people.

References:

Bernhardt, J.L. (2000). A primary caregiving system for infants and toddlers: Best for everyone involved. *Young Children*, 55 (2), 74-80

Brainwave Trust, The (2005). Retrieved from the World Wide Web, August 3, 2005: http://www.brainwave.org.nz/

Cranley Gallagher, K. (2005) Brain research and early childhood development: A primer for developmentally appropriate practice. *Young Children*, 60 (4) 12-20

Dalli, C. (2003) Presentation to the European Early Childhood Research Association *Professionalism in early childhood practice: thinking through the debates.* EECERA, Glasgow, 2003.

Egeland, B., & Erickson, M.F. (1999). Findings from the parent-child project and implications for early intervention. *Zero to Three*, 20(2), 3-10.

Fancourt, R. (2000). *Brainy babies.* Auckland: Penguin Books.

Gellert, G. (2002). Resilience in children. *The First Years/ Ngā Tau Tuatahi: New Zealand Journal of Infant and Toddler Education,* 4 (1), 21-24

Gerber, M. & Johnson, A. (1998). *Your self-confident baby*. New York: John Wiley & Sons.

Gerhardt, S. (2004). *Why love matters: how affection shapes a baby's brain*. New York,NY: Brunner-Routledge

Gonzalez-Mena, J. (2004). What can an orphanage teach us? Lessons from Budapest. *Young Children*, 59 (5), 26-30

Karr-Morse, R. & Wiley, M.S. (1997) *Ghosts from the nursery: Tracing the roots of violence*. New York: Atlantic Monthly Press

Linke, P. (2001). Paper presented at the 'Our Children Our Future' Conference, *Helping children develop resilience*. Adelaide, 2001

Ministry of Education (1996). *Te Whāriki. He Whāriki mātauranga mō ngā mokopuna o Aotearoa. Early childhood curriculum.* Wellington: Learning Media.

Ministry of Education (2003). *Early Childhood Education Time-series* . Retrieved 25 March, 2004 from the World Wide Web: http://www.minedu.govt.nz/index.cfm?layout= document&documentid=6184&indexid=6122&indexparentid=3832

Perry, B. D. (1997). Incubated in Terror: Neurodevelopmental Factors in the 'Cycle of Violence' In: *Children Youth and Violence: The Search for Solutions* (J Osofsky, Ed.) Guilford Press, New York, pp 124 – 128.

Perry, B. D. (2004). *The neurosequential model of therapeutics: Using principles of neurodevelopment to help traumatized and maltreated children.* (Unpublished)

Perry, M. (2002) Toward a culture of respect for infants and toddlers *The First Years/ Ngā Tau Tuatahi: New Zealand Infant and Toddler Education,* 4(1), 25 – 28.

Raikes, H. (1996). A secure base for babies: Applying attachment concepts

to the infant care setting. *Young Children*, 51(5) 59-67

Robinson, J.L (2000). Are there implications for prevention research from studies of resilience? *Child Development, 71(3), 570-572*

Rockel, J. (2002) Using neuroscience to challenge our thinking on teaching and learning in the early years. *Childre**nz** Issues*. 6(2) 18-20

Shonkoff, J. & Phillips, D. (Eds.). (2000) *From Neurons to Neighbourhoods: The Science of Early Childhood Development*. Washington, D.C.: National Academy Press.

Shore, R. (1997). *Rethinking the brain: New insights into early development*. New York: Families and Work Institute.

Smith, A.B. (1998). *Understanding children's development: a New Zealand perspective.* (4th ed.). Wellington, N.Z.: Bridget Williams Books

Statistics New Zealand Te Tari Tatau, retrieved from the World Wide Web July 4, 2004: http://xtabs.stats.govt.nz/eng/TableViewer/Wdsview/dispviewp.asp?ReportId=381

Statistics New Zealand Te Tari Tatau, retrieved from the World Wide Web July 4, 2004: http://www.stats.govt.nz/domino/external/web/nzstories.nsf/0/a462f8980eb513f4cc256b180003812d?OpenDocument

Watson, S. (2001). Attachment theory revisited. *The First Years/ Ngā Tau Tuatahi: New Zealand Infant and Toddler Education*, 3(1), 22-26.

Wright, S. (2001). Closing our eyes very tightly: Attachment theory in the lives of children and other people. *The First Years/ Ngā Tau Tuatahi: New Zealand Infant and Toddler Education*, 3(2), 14-18.

Glossary of Māori terms:

Mātua	Parents
Tamariki	Children
Tikanga	Practices; philosophy
Waiata	Song
Whaea	Literally translates as 'mother', and used as a title of respect toward women who are a generation older than the speaker; implies wisdom and power.
Whānau	Family; extended family.