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Te Tāhuhu o te Mātauranga Aotearoa

Quality early childhood education for under-two-year-olds: What should it look like?

A literature review

Report to the Ministry of Education

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Executive Summary

The results of this literature review provide strong incentives for policy-makers to maintain optimum ratios of adults to infants, ongoing training including in the specialist area of infant pedagogy, and environments which facilitate low levels of stress. Research shows these variables to be of particular importance in the education and care of infants under two years of age for two key reasons. Firstly, with responsibility for a smaller number of infants, and ongoing training that keeps abreast of specialised knowledge and skills, adults are more likely to be attuned to very young children. Secondly, attuned adults and quality environments are now understood to have a marked impact on the development and learning of infants. Some of these impacts are felt immediately whilst others emerge in adolescence; all have long term implications for individuals and society. The evidence demonstrates that quality early childhood education at this very early age has lasting benefits for infants and their families – especially those from disadvantaged sectors – and for society. The high quality education and care of infants therefore constitutes a key investment in the future of Aotearoa New Zealand.

Introduction

Participation rates of under-two-year-olds in out-of-home group-based early childhood services (ECS) have risen markedly in many OECD countries (OECD, 2001; UNICEF, 2008). This includes Aotearoa New Zealand where participation rates for this age group grew by 36% between July 2000 and July 2009 (Ministry of Education, 2010). The Ministry of Education has responded to this important trend by commissioning this review of research published in the last decade about the factors that impact the quality of experience in ECS, and outcomes, for under-two-year-old infants in order to generate an evidence base to underpin policy and practice for quality ECS provision for this age-group.

In keeping with trends, this report does not re-litigate whether or not under-two-year-old children should be in centre-based ECS. Instead, it addresses three key questions in accord with the Ministry focus:

i What does research evidence suggest about what quality early childhood education for under-two-year-olds should 'look like'? What are the features or dimensions of quality? How should these vary according to the age of the child and other key factors?

ii To what degree does the current provision of early childhood education in New Zealand for under-two-year-olds reflect what is known from research evidence about the features/dimensions of quality for this group? What can support as close an alignment as possible to these features in the future?

iii What do we know about the capacity of ECE to improve outcomes for under-two-year-old children from low SES, Māori, Pacific or other backgrounds that include risk factors or vulnerabilities? What is meant by quality in these projects and what are the variables at play? What worked?

The review methodology employed for accessing the research evidence in this report involved a systematic search for English-medium research published in the last ten years within the following databases: ERIC, PsychINFO, Ebsco and Academic Search premier. Academic journals were chosen that were known to highlight new knowledge with specific relevance to the key foci of the study. These are described as follows:

i the notion of quality early childhood education

ii the effects of early childhood education on under-two-year-olds, including in relation to at-risk populations and with respect to dimensions of quality such as adult:child ratios, group size, staff qualifications and training, and professional development

iii general child development research, in particular research seeking to apply new neurobiological knowledge to understanding human functioning in the very early years including relevant medical information

iv reviews about quality early childhood education for under-twos

v research on pedagogy with under-two-year-olds

vi policy commentaries about quality for under-two-year-olds in early childhood settings internationally.

Articles identified through the search were included in the study if they met the following criteria:

- the article clearly described the methods of data collection and analysis used in the study (i.e., it reported an empirical study, or a review of empirical studies)
- the study provided sufficient information to enable a judgment about the reliability and validity of its findings
- the study was published in the last ten years or was deemed to offer important research findings – either in terms of its context and/or for its contribution to the current knowledge base.

It is recognised that there may be important work still in progress and/or local indigenous research that has not been accessed through this process.

Key findings

Within the field of early childhood development, the expansion of research methodologies and theoretical approaches to investigation has brought about a heightened appreciation of the unique and sophisticated social, cognitive, and emotionally complex nature of infant and toddler functioning, and of communication as a dialogic phenomenon. The underlying neural mechanisms for cognitive and emotional processes appear to be the same (Bell & Wolfe, 2004); this means that right from infancy, thought and behaviour are being integrated. Through implicit and explicit memory, mental models are built that act as filters for the way an infant perceives the world and responds to it. Taking the view that the under-two-year-old is more socially competent than was previously understood, there has been an increased interest in under-two-year-olds as social beings, in relationship with others – the people, places and things that comprise their learning experience – and the centrality of these relationships to learning and development.

Positivist approaches to research using traditional variables continue to reveal important insights into the field, and have contributed substantially to this review. At the same time, innovative research approaches and access to more sophisticated research materials (such as video) have made it more possible to access the experience of under-two-year-olds than ever before. As a result, several studies are now able to demonstrate the impact of early childhood experience on the lives of under-two-year-olds. This includes their relationships with teachers and peers. Taken together, these research approaches provide insi*ghts that were previous*ly inaccessible. Children's development is now viewed as an interactive process involving "nature *and* nurture or nature *with* nurture" (Herrod, 2007, p. 199). In Gerhardt's (2004) words: "The baby and the care it receives is an inseparable whole" (p. 305).

A parallel development has been the emergence of translational research (Cicchetti & Gunnar, 2009; Meltzoff, 2009; Shapiro & Applegate, 2002) which emphasises the advantages of pooling important insights from neuroscience with developmental psychology, education and other disciplines to highlight the connectedness between the social, physical, linguistic, cognitive and emotional experience of infants and associated implications for learning and optimal development. This is significant because it is now recognised that no one body of knowledge can make finalised claims about the complex nature of quality without considering its conceptual situatedness, and that multiple scientific bodies of knowledge each play an important role in explaining it. Meltzoff, Kuhl, Movellan & Sejnowski (2009) have suggested that the new question for future research is about the role of "the social" in learning, and the factors that make

social interaction such a strong catalyst for learning. The foundational mechanisms for this appear to be "the three social skills … [of] imitation, shared attention, and empathetic understanding" (p. 285).

Three key messages summarise the findings of this report:

1. Early childhood settings for under-two-year-olds should be places where children experience sensitive responsive caregiving that is attuned to their subtle cues, including their temperamental and age characteristics. This style of caregiving should be marked by a dialogic relationship that recognises the importance of infant contributions as central to adult intervention and response. Such an approach promotes reciprocity in interaction and creates what is otherwise called intersubjective attunement. Sensitive responsive caregiving of this nature enables emotion regulation in infants and toddlers and wires up the brain for learning (Campos, Frankel & Camras, 2004; Gloecker, 2006). Lack of attuned responsive caregiving constrains the developing brain creating "black holes" (Turp, 2006, p. 306) in the architecture of the brain that can persist throughout a lifetime.
2. Early childhood settings for under-two-year-olds should be low-stress environments that actively avoid 'toxic stress' or are able to buffer children against toxic stress "through supportive relationships that facilitate adaptive coping" (Shonkoff, 2010, p.359). Toxic stress occurs in situations where the child has no control over events and no access to support from an adult who can soothe them (National Scientific Council on the Developing Child, 2005). Factors that produce toxic stress include low quality care, either at home or out of home, which prevents the development of a history of responsive attuned care. Reviewed research implies that the best way of doing this is to have adults working with children who understand the impact of their actions on children's development and are trained to make that impact a positive one. The research suggests that regulable elements of quality environments, such as an ideal adult:child ratio of 1:3 or a 'good enough' ratio of 1:4 (Gevers Deynoot-Schaub & Riksen-Walraven, 2008; Munton, Mooney & Rowland, 2002); small group sizes of no more than 6 - 8 (Frank, Stolarski &Scher, 2006; Girolametto, Weitzman, van Lieshaut & Duff, 2000; Lee, 2006; Thomason & La Paro, 2009); and calm quiet environments are essential to maintain a low stress environment. Low stress environments are correlated to healthy brain development.
3. Environmental conditions and teacher action interconnect in creating quality ECS for under-two-year-olds. Reviewed research suggests that the achievement of attuned teacher-child relationships requires a holistic pedagogical approach and structural conditions that support the teacher in context. Quality pedagogy is not merely the product of actions by one teacher but rather relies on a membrane of constantly evolving supportive connections between teachers and children, teachers and teachers, structural elements of the organisation of the centre, and the centre's philosophy and leadership style, all of which are located within a broader policy infrastructure (Dalli & Urban, 2010a; Gallagher & Gifford, 2000). Research suggests that when these work together for the benefit of the infant, their learning and development is considerably enriched.

Shonkoff (2010) has argued that the path to quality ECS for children is "well marked – enhanced staff development, increased quality improvement, appropriate measures of accountability, and expanded funding to serve more children and families" (p. 362). He sees a second path as also essential: to encourage further experimentation, innovation and research which "positions current best practices as a promising starting point, not a final destination" (Shonkoff, p. 362). Shonkoff argues that both provision and research are necessary since there is much more yet to be discovered about the impact of experience on the developing brain but no time to waste in the life of an infant. The overwhelming consensus across research is that the role of the teacher is of primary significance. The pedagogy initiated by the teacher is therefore at centre stage.

What does quality pedagogy 'look like' with under-two-year-olds?

The term pedagogy captures the idea that teaching and learning influence each other. Pedagogical research and debates about best practice in early childhood education inevitably draw on child development knowledge. In the context of early childhood practice with under-two-year-olds, the dominant developmental concept referred to is intersubjectivity, or the infant's ability to engage others in interpersonal communion (Stern, 1985), or person-to-person connectivity Trevarthen (1998; see also Braten, 1998; Rommetveit, 1998), or joint attention (Tomasello, 1988) such as seen in dyadic proto-conversations between infants and adults who mutually attend to one another's cues about their emotional state and cognitive interests.

Linking understandings of intersubjectivity and its developmental potential together with understandings about pedagogy (or teaching and learning) as co-dependent activities leads to the conclusion that pedagogy with under-two-year-olds is realised in the establishment of attuned interaction between children and their caregivers who are present, supportive and responsive to the interactional cues of the infant and toddler.

Researchers have identified that intersubjective interactions (and thus learning and teaching) are more likely to occur within relationships that exhibit: emotional engagement, alertness, reflective presence, respect, engagement in critical reflection, and dialogue. 'Presence' here refers to both a physical and emotional presence, active listening processes, and an ability to orient oneself towards the relationship with the child and the child's experience. The idea of teachers "lingering lovingly" (White, 2009) with infants and toddlers so that they can feel appreciated as unique personalities is another aspect of intersubjective interactions.

The term 'interactional synchrony' is used to highlight that infants and toddlers are active social partners in their own right and contribute creatively to establishing and maintaining intersubjective interactions. At the same time, research has shown that adults have the key role in initiating cognitively stimulating interactions that are attuned to the child (Jaffe, 2007; Warner, 2002). This is significant for caregiving practice and shows that the caregiving environment, and the nature of the interactions within it, have the potential to improve or limit learning. It highlights that pedagogy is a learning encounter that teachers create (Johansson, 2004).

There is consensus that pedagogy with under-two-year-olds is specialised and different to teaching and learning with older preschoolers. This is due to the different communication styles of infants and toddlers, and the increased physical care and emotional nurturing that they require. By adding the notion of an 'ethic of care' (Dalli, 2006; Goodman, 2008) to understandings about early childhood pedagogy, and creating the idea of a pedagogy of care (Rockel, 2009), contemporary literature has shifted the concept of infant and toddler pedagogy away from a didactic stance towards activities and developmentally appropriate practices, and towards a dialogic practice that places the teacher at the centre of the curriculum.

Other key ideas informing current research on pedagogy, and best practice with under-two-year-olds include that:

1. The neurobiological insight that the brain and the body are interrelated provides scientific support for the view that physical care is pedagogical work (Manning-Morton, 2006); this has led to the view that pedagogy with under-two-year-olds is not just a meeting of minds, but a meeting of bodies *and* mind (Thelen & Smith, 1996; Shonkoff, 2010). Contemporary research has picked up on this concept and applied it to understandings of toddlers, in particular (see, for example, Lokken, 2000; White, 2009).
2. Attachment relationships are seen in some contemporary research contexts as 'the curriculum' for under-two-year-olds (Raikes, 1993). In a meta-analytic study of the security of children's relationships with non-parental care providers, Ahnert, Pinquart & Lamb (2006) reported that group size, adult:child ratios and caregiver sensitivity are all implicated in the formation of attachment relationships. Gevers Deynoot-Schaub and Riksen-

Walraven (2008) likewise highlighted the importance of favourable adult:child ratios (1:3), and the need of caregiver education for work with very young children.

3. Infants' and toddlers' agency is evident when they explore, enquire and play and engage in co-operative activity that enables both cultural transmission and cultural creation of meanings. This includes what happens during peer interactions which to date have been insufficiently researched for this age-group. Existing research suggests there is a need to re-think some assumptions about toddler play; for example, Licht, Simoni & Perrig-Chiello (2008) showed that toddler conflict over objects may indicate a wish to explore as opposed to a wish to possess. White's (2009) study revealed similar insights by analysing the genres toddlers used to convey their ideas.
4. Infants and toddlers are also very physical beings leading to the suggestion that infant and toddler pedagogy needs to be attentive to children's bodily perspective, their movement and their gesture (Capone & McGregor, 2005; Carpenter, Nagell, & Tomasello, 1998; Crais, Watson, & Baranek, 2009; Gillen, 2000; Hoiting, 2007; Kendon, 2004; McNeill, 2005; Roth, 2001; Southgate, van Maanen, & Csibra, 2007; White, 2009; Winter, 2004).
5. Centre-home partnerships can inform the infant and toddler curriculum, and make continuity of learning more possible (Raban, 2001; Theilheimer, 2006).

Specific factors that are recognised to impact on quality pedagogy are listed below either as enablers of, or barriers to, quality pedagogy.

Enablers of quality pedagogy

1. Teachers who act as intersubjective partners (Elliot, 2007; White, 2009) optimise opportunities for learning and development and foster infants' and toddlers' capacity to learn. This includes through interactions that promote heightened levels of intimacy (Dalli & Kibble, 2010b; Elfer & Dearley, 2007); a caring ethic (Bardige, 2006; Rockel, 2009), and joint attention (Barton & Tomasello, 1991; Liszkowski, Carpenter & Tomasello, 2007; Tomasello, 1988; Tomasello & Farrar, 1986; Wright, 2007).
2. Teachers who employ distinctly specialised practices for infants (e.g., under-one-year) and toddlers (Chapman, 2007; Dalli et al., 2009; Degotardi & Davis, 2008; Fleer & Linke, 1999; Stephen, Dunlop & Trevarthen, 2003; White, 2009), are present to them (Goodfellow, 2008) and pay attention to the learning opportunities within routines (Deans & Bary, 2008) and rhythms of everyday experiences (Nimmo, 2008;Warner, 2002).
3. Teachers who are knowledgeable about contemporary theories of development and learning (including neuroscience) and provide curricula that are individually, socially and culturally relevant (Bardige, 2006; David, Goouch, Powell & Abbott, 2003; Degotardi & Davis, 2008; Lagercrantz, 1997; Meltzoff et al., 2009).
4. Teachers who understand the role of play in learning for these specific age groups (Alcock, 2007; Kowalski, Wyver, Masselos & de Lacey, 2005; McCain & Mustard, 1999, Munton et al., 2002; White, et al., 2009), are aware of the interactive atmosphere that they can create (Johannson, 2004; Parker-Rees, 2007),
5. Teachers who have the ability to interpret and respond to the subtle cues offered by infants (Tomasello, Carpenter & Liszkowski, 2007) and toddlers (Løkken, 2000; White, 2009) across diverse cultural contexts (Gonzalez-Mena, 2009; Walker, 2008).
6. Ongoing, consistent and stable relationships (attachments) between teachers and infants and toddlers, as well as with their families (Ahnert , Pinquart & Lamb, 2006; Bardige, 2006; De Wolff & van IJzendoorn, 1997; Lee, 2006; Liszkowski, Carpenter & Tomasello, 2007; O'Malley, 2008; Rogoff, 2003; Theilheimer, 2006; Walker, 2008). This includes the use of diverse communication strategies to build infant-toddler learning capabilities, confidence and competence, and support for families.

7. Specialised teacher education or professional learning opportunities that emphasise intersubjectivity in infant and toddler pedagogy (Gevers Deynoot-Schaub & Riksen-Walraven, 2008; Klein & Feldman, 2007; Manlove, Vasquez & Vernon-Feagan, 2008; Thomason & La Paro, 2009), and equips teachers with the ability to be reflective/reflexive practitioners (ERO, 2009; Gallagher & Mayer, 2008; Honig 2002; Johansson, 2004; Lee, 2006).
8. Positive working environments for teachers (Goodfellow, 2008; Manlove et al., 2008) which facilitate low turnover of staff, enhance the status of teachers (Gallagher & Mayer, 2008; Munton et al., 2002), and are conducive to attunement with infants and toddlers within ongoing relationships.
9. Small group sizes (Frank, Stolarski &Scher, 2006; Girolametto, Weitzman, van Lieshaut & Duff, 2000; Lee, 2006; Thomason & La Paro, 2009).
10. High adult:child ratios (Gallagher & Mayer, 2008; Gevers Deynoot-Schaub & Riksen-Walraven, 2008; Lee, 2006; Muenchow & Marsland, 2007; Munton et al., 2002; Nyland, 2004b) with a recommendation of 1:3 (Gevers Deynoot-Schaub & Riksen-Walraven, 2008).
11. Professional teacher education programmes to promote the study of relationships and emotions in conjunction with practicum courses to integrate theory with practice (Lee, 2006); to focus on the ways infants and toddlers develop their working theories as they learn more in relation to knowledge domains (Sands & Lichtwark, 2007), and to increase the quality of the *learning encounters* (Johansson, 2004) rather than deliver a prescribed *programme of activity*.

Barriers to quality pedagogy

1. Structural (external) conditions which undermine, or do not work together to support process elements of quality that derive from teachers' knowledge (Johansson, 2004); this includes the whole package of variables such as adult:child ratios, teacher training and experience, teacher involvement along with the organisation of environments and philosophies of practice (ERO, 2009; Johannson, 2004; Rockel, 2009; White, 1995);
2. High staff turnover (Gallagher & Mayer, 2008), low status and poor working conditions (Sims, Guilfoyle & Parry, 2005), as well as inadequate adult:child ratios (Gevers Deynoot-Schaub & Riksen-Walraven, 2008) which have a significant impact on teachers' ability to demonstrate effective infant and toddler pedagogy.
3. Inconsistent care by one or a small number of adults interferes with infants' ability to experience sensitive responsive care that attends to their changing needs, communication and language (Stephen et al., 2003).

This investigation found a lack of empirical research in relation to a specialised pedagogy of care in the New Zealand local context, and a need for a more specialised focus on pedagogy with under-one and under-two-year-olds in pre-service teacher-education programmes and professional development (Degotardi & Davis, 2008; Lokken, 2006; Nyland, 2004a; Rockel, 2009).

Regulable elements of quality: What can policy influence?

The four-decade legacy of research emphasis on structural aspects of quality for ECS has recently been applied to under-two-year-old provision and consistently suggests that higher quality care is associated with more positive outcomes and fewer negative ones (Jacob, 2009; NICHD, 2004). Quality in these studies is defined as:

- more highly-educated caregivers who promote positive social interactions, and
- lower ratios of children to caregivers.

Benefits of routine high quality early childhood education have been shown for all children not just those enrolled in intensive high quality early intervention programmes (Vandell et al., 2010) and are evident in cognitive-academic

outcomes for children at age 12 years (Belsky et al, 2007). Moreover, parenting quality is connected to the effects of high quality centre-based childcare (Adi-Japha & Klein, 2009; Belsky et al., 2007; Vandell et al., 2010). Reports of more behaviour problems associated with increased use of childcare in infancy also note that these problems appear mediated by the age of the child and quality of care (Jacob, 2009; NICDH, 2005). Small effect sizes of the connection between quantity of hours in childcare and more externalising behaviour (expressed as risk-taking behaviour) are maintained into adolescence (Vandell et al., 2010).

Given the interrelated nature of different structural elements in the construction of a quality experience for under-two-year-olds and their families within centre-based early childhood provision, a key implication from the studies reviewed is that any changes to regulable elements of quality are likely to have repercussions beyond the immediate change of the element itself.

Interactions between regulable elements are outlined as follows:

1. Adult:child ratios of 1:3 are considered ideal (Expert Advisory Panel on Quality ECE and Child Care, 2009; Muenchow & Marsland, 2007; Munton et al., 2002) to enable the style of interaction needed for optimal outcomes for children (see Chapter 4). Adult:child ratios provide pre-conditions for positive interactions, but the nature of the child-teacher interactions may be determined by other factors (Goelman et al., 2006; Milgrom & Mietz, 2004). Ratios interact with higher levels of staff satisfaction, which interact with other factors like appropriate levels of remuneration (Goelman, et al., 2006).
2. The higher cost of staff with an improved staff-child ratio can be mitigated by low staff turnover as improved working conditions and job satisfaction reduce stress (Fisher & Patulny, 2004).
3. There is a link between higher level qualifications and a positive attitude towards infants and toddlers and their learning (Arnett, 1989; Kowalski, Wyver, Masselos, & de Lacey, 2005). Having the possibility of a career structure, with high status that recognises the professional expertise of staff, is seen as benefitting quality (McCain & Mustard, 1999).
4. The content of undergraduate programmes of early childhood teacher education should include: (i) critical reflection; (i) a focus on understanding the diversity of children's and families' contemporary lives (MacFarlane et al., 2004); and (iii) a research and evaluation focus (Nimmo & Park, 2009). The content should be relevant for work with infants and toddlers and reflect what is known about infant learning and development (Elfer & Dearnley, 2007; Hallam, Buell & Ridgley, 2003; Macfarlane, Noble & Cartmel, 2004).

Factors that are recognised as barriers to positive effects from centre-based ECS include:

1. Large group size, untrained staff, high child:staff ratios (Munton et al., 2002)
2. Low status, lack of appropriate pay in recognition of professional expertise in working with infants and toddlers leading to high staff turnover, and therefore lack of career structure and leadership from knowledgeable and experienced directors and teachers (Ireland, 2007; Nyland, 2007; Pessanha, Aguiar & Bairraeo, 2007)
3. Lack of professional development of staff (Ireland, 2007; Tout, Zaslow & Berry, 2005).
4. Lack of optimal environmental factors, such as high noise levels, infectious illnesses within the ECS (Bedford & Sutherland, 2008; McLaren, 2008; Vernon-Feagans & Manlove, 2005); along with lack of knowledge about appropriate nutrition for infants and toddlers (Story, Kaphingst & French, 2006).

Early intervention studies: At-risk children

A further aspect of investigation in this report was a review of the outcome studies of the effects of early intervention programmes which provide high quality centre-based early childhood education for at-risk children under two years of age in order to identify elements that worked well.

Factors that were positively associated with the effectiveness of the early intervention programmes were:

1. Central-government-supported programmes, like Early Head Start (EHS) and Sure Start (SS), have the capacity to make the biggest difference most quickly. This was evident in the increased access to high quality childcare for infants and toddlers identified by the first evaluations of EHS (Love et al., 2004), and in the rapid expansion of SS (Gray & Francis, 2007).
2. The different implementation protocols of the EHS and SS, and the developmental trajectory of SS, suggest clear programme protocols, as well as clear models of community partnerships, are beneficial.
3. Structural features of high quality early intervention programmes mirror those identified in high quality early childhood education programmes outlined earlier. Specifically, low adult:child ratios, staff qualifications and a well-articulated curriculum are related to sustained interactions between adults and children and positive outcome measures for children (Love, Kisker, Ross & Raikes, 2005).
4. Interventions with children prenatally exposed to cocaine showed that qualified interventionists were essential to the success of the intervention programme, and that additional language intervention (e.g., milieu teaching) while expensive, was also very effective (Bolzani Dinehart, Yale Kaiser & Hughes, 2009).
5. Centre-based programmes, and programmes that combine centre-based intervention with home-visiting work better than home-visiting alone (Campbell et al., 2008; Love et al.,2004)
6. There is a range of interrelated factors that impact on the effectiveness of an intervention, including ensuring access through the provision of transport for children and parents to a centre-based facility.
7. Most of the interventions were multi-service provisions that met health as well as educational needs.

This list is supported also by Herrod (2007) who summarised the characteristics of successful US- based early intervention programmes he reviewed as:

1. being relatively intensive
2. at least one year long if not longer
3. employing teachers who have higher qualifications than those in regular programmes
4. providing better pay for teachers
5. having lower student-to-teacher ratios than the norm and a limited total classroom size
6. being generally research based and designed to have a control group and specific outcome measures
7. having greatest impact where there is greatest risk.

Long term effects of early intervention programmes on children's developmental outcomes were shown to be persistent into adulthood (e.g., Campbell et al., 2008; McCormick et al., 2006) and discernible in adult cognitive and academic achievements, including reading and mathematical skills, and in vocational outcomes in adulthood (Campbell et al., 2008). The studies highlight the fact that high quality early childhood intervention can act as a buffer from the effects of risk in social, cognitive and linguistic domains of learning.

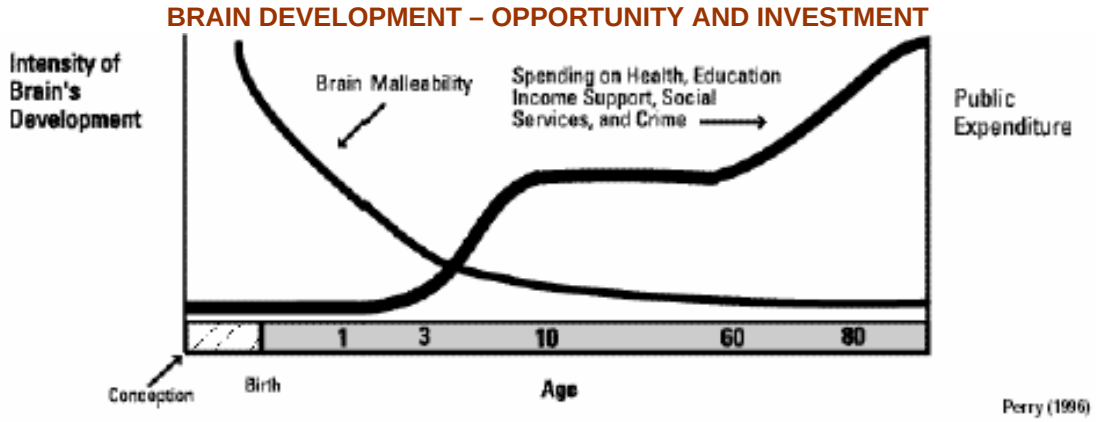
Additionally, this review found that parents benefit from the practical support they receive through their child's attendance at an early childhood programme. Their children's learning and language made the parents more responsive to the child's bids for attention at home (Love et al., 2005). Parents in EHS read more to their infants than parents in the control group (Love et al., 2005) and provided a more stimulating home-learning environment (Melhuish et al., 2008a).

Conclusion

The overwhelming consensus across studies, and contexts, is that quality ECS for under-two-year-olds are characterised by attuned relationships between children and adults. These relationships are underpinned by a number of interrelated elements that can be addressed in policy. These include high ratios, ongoing professional development and low stress environments. This report has shown that the impact of such policy investment is huge and will benefit society both now and in the future. As Fox and Rutter (2010) noted in the introduction to a special edition of the top-ranked journal *Child Development*, devoted to the topic of the importance of early experience for later development:

> To borrow an analogy from economics, by investing early and well in our children's development, we increase the rate of return later in life and in so doing improve not only the lives of individuals but of societies as well. (p. 36)

This echoes McCain and Mustard's (1999) argument presented to the Ontario government about the need to maximise 'brain power' potential through early investment in the human lifespan when the brain's development is most intense and malleable. The graphic representation of their argument, drawn by Perry (1996, cited in McCain and Mustard) is reproduced below.



Brain's Wiring and Development
Reproduced from McCain and Mustard, 1999, p. 108

High quality early childhood education can make a lasting difference and act as a protective factor for children at risk. This points to the need for future policy to take account of the role of high quality early childhood education for under-two-year-olds as a unique area of education planning that can enhance children's life chances. The lessons learnt from other countries would suggest that planning should also take account of the limited amount of research in this area and seek to fund research alongside policy implementation. This would provide a local and indigenous research base from which to plan ahead. In its absence at this point, the compelling lessons from international studies provide a very clear direction to follow.

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Chapter 1: Introduction

Abstract

This chapter sets the context for the commissioning of this literature review report including: the growth in participation rates of under-two-year-olds in formally organised group-based early childhood services; a curriculum framework that sees the education and care of infants and toddlers as specialised; rapid expansion of scientific knowledge about early development and the importance of early experiences; a thirty-year tradition of scholarly debate about the nature of quality in early childhood services; increasing recognition that early childhood education and care is a multi-disciplinary field that draws its knowledge base from a broad range of scholarly areas; and the emergence of translational research which, by crossing disciplinary boundaries, is creating a new knowledge base to inform policy and practice. The chapter also outlines the scope of the review and the study methodology. It concludes with a preview of the content of each chapter.

The purpose of the review is to provide the Ministry of Education with further information to support it in ensuring quality early childhood education provision for this age group in New Zealand.

The review draws on research evidence from a variety of scholarly fields to respond to two key questions:

1. What does research evidence suggest about what quality early childhood education for under-two-year-olds should 'look like'? What are the features or dimensions of quality? How should these vary according to the age of the child and other key factors?
2. To what degree does the current provision of early childhood education in New Zealand for under-two-year-olds reflect what is known from research evidence about the features/dimensions of quality for this group? What can support as close an alignment as possible to these features in the future?

It also addresses a third subsidiary question identified to be of interest to the Ministry of Education in setting priorities for the review:

3. What do we know about the capacity of ECE to improve outcomes for under-two-year-old children from low socio-economic status, Māori, Pacific or other backgrounds that include risk factors or vulnerabilities? What is meant by quality in these projects and what are the variables at play? What worked?

1.1 Context

Participation rates of under-two-year-olds in out-of-home group-based early childhood services have risen markedly in many OECD countries (OECD, 2001; Unicef, 2008).

In Aotearoa New Zealand participation rates in early childhood services for under-two-year-olds grew by 36 percent between July 2000 and July 2009 (Ministry of Education, 2010) mirroring trends in comparable countries.

The report responds to this important change in the conditions under which very young children experience their childhood by considering what is known about the best ways to achieve high quality provision for under-twos in early childhood education settings. It is not the purpose of this report to re-litigate whether or not under-two-year-old children should be in centre-based early childhood education.

Scrutiny of the question of 'what is quality for under-two-year-olds in early childhood settings?' is timely in light of recent advances in brain imaging technology which have expanded our knowledge about human growth and development and illuminated connections between individual parts of the brain and specific human functioning (e.g.,

Inder, 2002; Shonkoff, 2010; Shonkoff & Phillips, 2000; Shore, 1997). Recent research has further indicated that the steepest rate of growth of neurological pathways is in the early years (Centre on the Developing Child, Harvard University, 2007). These advances have led to attempts to integrate new neurobiological understandings with knowledge/s from other fields, particularly developmental psychology (e.g., Moriceau & Sullivan, 2005; National Scientific Council on the Developing Child, 2007; Siegel, 2001). Shonkoff and Phillips (2000) described these attempts as seeking to:

> update scientific knowledge about the nature of early development and the role of early experiences, to disentangle such knowledge from erroneous popular beliefs or misunderstandings, and to discuss the implications of this knowledge base for early childhood policy, practice, professional development, and research. (p. 3)

The term "translational research", used in the title of Chapter 3 of this report, refers to research that is attempting to cross disciplinary boundaries to achieve this type of knowledge base.

This review reflects the fact that in recent years there has also been increasing recognition that early childhood education is a multi-disciplinary field that draws its knowledge base from a broad range of scholarly areas (e.g., Ministry of Education, 2002; OECD, 2001). Beyond those already mentioned, relevant fields include the sociology of childhood, curriculum theory and pedagogical research and scholarship: Developments in these fields are thus also relevant to understanding what quality might mean for very young children in early childhood settings and add to the timeliness of this review. For example, the recent emphasis on children's rights in the sociology of childhood (e.g., Alderson, 2005; Hart, Price Cohen, Farrell Erikson & Flekkøy, 2001; Te One, 2009) inevitably connects to advocacy arguments about the rights of very young children to quality experiences at all levels of their environment: physical, emotional, social as well as at the level of ideas. For example, Ireland (2006) has argued for the child's right to be considered a learner from the moment of birth, an idea that in Aotearoa New Zealand was introduced to the early childhood community as an "innovative" curriculum concept with the publication of *Te Whāriki* (Ministry of Education, 1996, p. 7).

Te Whāriki also describes the education and care of infants and toddlers as "specialised" and "neither a scaled-down three- or four-year-old programme nor a baby-sitting arrangement" (p. 22). This illustrates the point argued by sociologists of childhood and children's rights advocates that children have a right to be taken seriously and to be treated with respect (e.g., Mason & Fattore, 2005; Smith, Gollop, Marshall & Nairn, 2000; Te One, 2009; White, 2009). Yet, to see the infant and toddler as a learner still constitutes a challenging paradigmatic shift for many teachers (e.g., Grieshaber & Cannella, 2001; Smidt, 2006; Urban, 2008). This is evident in the growing body of writing and research seeking to articulate the specialist nature of high quality infant and toddler pedagogy in this country (e.g., Bary et al., 2008a, 2008b; Dalli, 2006; Rockel, 2004) and elsewhere (e.g., Katz, 2003; Macfarlane, Noble & Cartmel, 2004; Rofrano, 2002). The increasingly diverse and multicultural population of New Zealand adds a further important lens through which to understand quality for the very youngest children in early childhood settings.

This review takes on board the view that the notion of quality in early childhood education has now accrued a thirty-year tradition of scholarly discussion and debate (see, for example, Moss & Pence, 1994; Pence & Pacini-Ketchabaw, 2006; Phillips, 1987). As argued in Chapter 2 of this report, this scholarly legacy alerts us to the problematic nature of the notion of quality and to its historical, cultural and paradigmatic embeddedness, and thus also to the need to view attempts to define it in immutable or universalistic terms from a critical perspective.

1.2 Scope of the review

The following databases were searched for English-medium research published in the last seven to ten years: ERIC, PsychINFO, Ebsco and Academic Search premier.

The databases were selected after the principal investigator and second author identified peer-reviewed high ranked journals that report empirical research in the fields of child development and early childhood education generally. Journals were chosen that were known to highlight relevant new knowledge:

- about how the notion of quality in early childhood provision is currently understood and debated
- from research on the effects of early childhood education on under-two-year-olds, including in relation to at-risk populations and with respect to different dimensions of quality
- from child development research generally, including research seeking to apply new neurobiological knowledge to understanding human functioning in the very early years
- from existing reviews about quality early childhood education for under-twos
- in relation to structural elements of quality, e.g., staff qualifications and training, professional development
- in pedagogical literature on the nature of quality provision for under-twos
- in policy commentaries about how to ensure quality in ways that are amenable to policy intervention.

A set of keywords was devised which the project librarian then used to run three trial searches going back over the last seven- to ten-year period. These were to test out the nature and number of studies that different arrangements of keywords would produce.

Concurrently with running the electronic searches, the researchers' existing endnote libraries (total articles = 569) were systematically searched and keywords generated to help categorise and prioritise articles by their relevance to the current review.

The keywords used were as follows:

setting	actors	events	process	other
quality group care group size sleep room changing area nappy-change /diaper decibels noise levels adult-child ratio culture mealtimes mat times routines low SES bilingual poverty	infants toddlers babies teachers qualifications staff leadership at risk vulnerable ethnic gaps racial gaps involved families Māori Pacific / Pasefika	learning play child development knowledge numeracy literacy language acquisition intentionality curriculum caregiving multi-modal gestures attachment	pedagogy intersubjectivity methods responsive care reciprocity joint attention intentionality interaction teacher-child relationship access parent participation intensity of provision/ participation early intervention effective programs emotion tuning-in	discourse brain development neuroscience vignettes quality debate specific programs gesture cognition empirical motivation

Articles identified through the search were included if they met the following criteria:

- the article clearly described methods of data collection and analysis used in the study (i.e. it reported an empirical study)
- the study provided sufficient information to make some judgment about the reliability and validity of its findings
- the study was published in the last seven to ten years or was deemed to be of high relevance (if earlier than 2000).

A professional judgement was made by the researchers on the basis of available information in the sources read about the methodological rigour of each study; the scholarliness of each study cited in this report is signaled in the contextual information provided for the cited material.

In triangulating the findings of this review, the key test used was to be alert to the question of whether for groups with similar characteristics; the findings reported were pointing in a similar direction or creating a coherent picture rather than a contradictory one. The researchers were also mindful of issues of face validity in reporting studies, particularly in relation to the applicability of findings from studies carried out in the United States of America to the New Zealand context.In reporting results, attention was also given to the study limitations identified within the studies themselves including limitations of attribution, or correlation compared to causation, or – less frequently within these peer reviewed articles – where limitations were identified by the researchers.

1.3 The structure of the report

The report contains seven chapters. The focus of Chapters 2 to 6 derives from the review questions. It should be noted that the themes covered in each chapter reflect the themes present in the literature identified by the systematic library searches, and not by an *a priori* plan of what each chapter should cover. Thus, for example, the limited coverage of some issues such as culturally-appropriate pedagogy in Chapter 4 reflects the fact that they are absent in the pedagogical literature published in the peer-reviewed databases searched. Where such gaps were identified in the writing up of the report, efforts were made to go beyond the databases when possible. Nonetheless, this was not possible for all topics and is a limitation to be aware of.

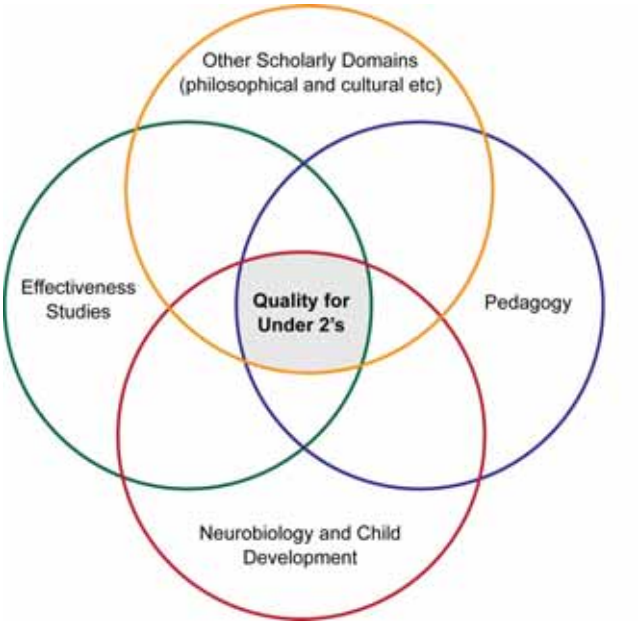
Chapter 2 of the report provides an outline of the way that the notion of "quality early childhood education" has been understood historically, both as it applies broadly to the 0–5-year-old/0–8 year-old age group served by early childhood provision nationally and internationally, and more specifically for 0–2-year-olds, which is the age group at the focus of this review.

Chapter 3 reviews new knowledge about very young children's development with particular reference to the growth of understanding about the interface between neurobiological and holistic development. This is to provide the broad scholarly context of new knowledge that is currently informing discussions about what quality early childhood provision for under-two-year-olds "should look like", as per the brief for this literature review.

In Chapter 4, the focus shifts to research about what high quality early childhood pedagogy looks like for under-two-year-olds. The term *pedagogy* is defined and enablers and barriers of quality pedagogy identified and discussed.

Chapter 5 provides an update on research that identifies so-called "structural" elements of quality. Noting that quality is a multi-faceted construct that is conceptually constructed in diverse ways (e.g., as a continuum of proximal, distal, and intermediate factors that affect the lived experience of children, see Goelman et al., 2006), and ecologically determined, the chapter uses a question and answer format to provide a state-of-the art statement of what is currently understood about regulable elements of quality.

A key message from this review is that quality is a multi-faceted construct. Thus, attempts to understand what this means for infants and toddlers in New Zealand early childhood settings must take account of multiple discourses from a range of scholarly domains. In the compilation of this review, it has been helpful for the research team to conceptualise the scholarly domains as overlapping as in the venn diagram below.



This review brings together discourses about quality early childhood education from different scholarly domains in a way that also seeks to maintain awareness of the ecological, fluid and multi-perspectival dimension of this construct (see Chapter 2). A practical implication of this view of quality is that each of the chapters in this review tells only a part of the "story" about quality for under-two-year-olds. All chapters need to be read as complementary but especially Chapters 4 and 5, which are both based on child development research.

In Chapter 6, a narrative review is presented of studies that report quantitative data on the effects of early intervention programmes with children under two years of age. This replaces a meta-analytic review of this literature that did not proceed due to lack of studies that fitted the necessary criteria. Although, as Melhuish et al. (2008) have noted, "studies with disadvantaged populations may have little relevance for the general population" (p. 1161), this selection of studies is included in the report because this area of research was deemed of interest to the Ministry in the commissioning of the report. The aim of this chapter is to highlight elements of key early intervention programmes found to be associated with positive child and family impacts. In this way, this chapter addresses questions about what is currently known about 'what works' for under-two-year-old children at risk.

A synthesis of findings structured around the questions of the review concludes the report.

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Chapter 2: The Quality Debate: Past and present discourses

Abstract

The aim of this chapter is to outline the landscape of scholarly debates about the notion of quality in early childhood education from the rise of childcare research in the 1960s and into the first decade of the new millennium. Two related lines of scholarship are identified: a discursive philosophical line and an effectiveness/ impact measurement line.

In the first part of the chapter changes in discourses about quality in early childhood education research between the 1960s and the end of the 1990s are described as outcomes of three waves of research on childcare, including within the New Zealand early childhood context. The1970s' and 1980s' view of quality as dependent on structural elements of the environment (such as physical space, adult:child ratios, group sizes, and staff qualifications) and key early intervention studies initiated in this period are briefly discussed to set the scene for more detailed discussion in Chapters 5 and 6.

Discussing ecological views of quality that emerged in the late 1980s and 1990s, the more socio-cultural understanding of quality as a multi-dimensional concept is foregrounded. In this perspective, quality exists in the 'eyes of the beholder' and is thus able to be understood from a range of perspectives as a project that is continuously evolving at the level of practice.

In the second part of the chapter more recent debates about quality are discussed including from the perspectives that: quality is that which makes a demonstrable beneficial impact on child development; that quality early childhood education can be considered a right that children have; and that from post-structuralist perspectives quality must be considered as neither neutral nor innocent but as a technology of government. These perspectives illustrate the many theoretical and methodological lenses that are now being brought to early childhood research. No longer is quality viewed in a formulaic manner, but instead, post positivist approaches place context in centre stage and suggest that conversations about the meaning of 'quality' for under two-year-olds might need to also include critical analysis of dominant ideas about our youngest learners and their entitlement to high quality early childhood education

The impact of this shift has been significant since it is now argued that quality can be found in the relationships that take place between adults and infants. The factors that once occupied researchers' attention therefore are now seen as subsidiary to this pedagogical and relational emphasis.

The impact of new neuroscientific knowledge about development on conceptions of quality early childhood education is also discussed.

This chapter considers how "quality" in early childhood services has been constructed in scholarly debates over time, with particular emphasis on current discussions and how they relate to the provision of early childhood services for under-two-year-olds in centre-based settings. It is worth reiterating that the presence of infants and toddlers in formal early educational contexts is a relatively recent phenomenon. This means that while there is much discussion about quality in research focusing on 3- and 4-year-old children, there is a comparatively much smaller empirical literature base (at least within the English-language scholarly literature) that has focused on quality provision for under-two-year-olds.

Starting with a brief history of quality discourses in early childhood education research, this chapter identifies two related lines of scholarship on quality early childhood education: a discursive philosophical line and an effectiveness/impact measurement line. The philosophical arguments around the notion of quality are reviewed in the second part of this chapter, with a particular focus on what is new in the debate. Studies focusing on the measurement of the impact of quality early childhood education provision, or the effectiveness of early childhood education within an early intervention framework, are foreshadowed in this chapter and discussed more fully in Chapter 6.

2.1 A brief history of the quality discourses

As noted earlier, debates within the English-speaking world around the notion of quality early childhood services have now acquired a 30-year tradition. This tradition alerts us to the historical, cultural and paradigmatic embeddedness of the notion of quality and to the need to critically evaluate attempts to define it in immutable and universalistic terms.

2.1.1 Three waves of childcare research: structural views of quality

By the 1990s, English-medium literature had identified at least three "waves" or generations of research on childcare (Farquhar, 1990; Melhuish, 2001; Melhuish & Moss, 1991; Pence & Pacini-Ketchabaw, 2006; Scarr & Eisenberg, 1993). The first wave, dominant during the late 1960s and 1970s, asked whether out-of-home childcare, or daycare in American parlance was bad for children. The eventual consensus that what matters for development is not the use of out-of-home childcare of itself but rather the quality of the childcare, whether at home or out of home (e.g., Phillips, 1987; Schaffer, 1990), opened the way to a second wave of research. It is important to note that most of this research was carried out within the North American context at a time when regulated centre-based care for infants and toddlers in New Zealand was still a relatively recent phenomenon[1]. In this period, participation of New Zealand under-two-year-olds in these settings was still relatively limited, and not empirically investigated (May, 2001).

During the 1980s, the 'second wave' research aimed to identify those elements within the environment, such as caregiver behaviour, adult:child ratios, and the physical environment, that could be manipulated to produce high quality provision for children and families (e.g., Howes & Rubenstein, 1995; McCartney, Scarr, Phillips, Grajek & Schwarz, 1982). Licensing regulations adopted in the 1980s and 1990s in a number of jurisdictions, including in New Zealand, largely relied on this type of research to establish standards. Assessment tools to measure the overall or global level of quality of early childhood centres, such as the Early Childhood Environment Rating Scale (ECERS) (Harms & Clifford, 1980) and subsequently its equivalent for infant-and-toddler settings, the Infant/Toddler Environment Rating Scale (ITERS) (Harms, Cryer, & Clifford, 1998), also relied on findings from this second wave of research in determining which elements of the environment to include as scale items. Developed within the North American context, the measures swiftly became a popular tool in research where an instrument was needed to produce valid and reliable information across programmes (Harms & Clifford, 1983a, 1983b). Subsequently revised by the original developers as the ECERS-R (Harms et al., 1998), and more recently extended by Sylva, Siraj-Blatchford and Taggart (2006) as the ECERS-E, the ECERS measures remain widely used. The more recently developed Classroom Assessment Scoring System (CLASS) (Pianta, La Paro, & Hamre, 2008), also developed within a North American context, and aimed at assessing classroom quality in preschool through to third-grade classrooms, similarly includes research from this period among its references.

2.1.2 A New Zealand baseline for quality

Within the New Zealand context baseline understandings of what constitutes quality in early childhood education and care crystallised in a number of key policy, research and pedagogical documents published over this period. For example, the Meade Report (1988), commissioned by government as part of the wholesale reform of education in the late 1980s, made recommendations on the future of New Zealand's early childhood education and care services on the basis of the following components of quality culled from a review of contemporary research:

1. appropriate staff/child ratios
2. appropriate group size
3. appropriate caregiver qualifications
4. curriculum planning and implementation that is appropriate

[1] The first childcare regulations were promulgated in 1960.

5. te reo Māori and tikanga Māori
6. consistent care and education – low turnover of staff
7. partnership between early childhood services and the parents and whānau
8. safe and healthy environment
9. a close relationship with the community.

Written at the end of the 1980s, this list reflected the awareness – which was later to mark out the so-called "third wave research" – that quality did not simply depend on the existence of structural measures but also on the *dynamic* interactions between these and process characteristics, such as adult caregiving and teaching practices that have since come to be described as 'pedagogy' (this concept is further explained in Chapter 4). A frequently cited example of this type of research is Howes, Phillips and Whitebook's (1992) work which used three independent samples of children attending daycare centres in two American states with different licensing standards, and assessed the quality of in-centre childcare relationships between 414 children (aged 14 to 54 months) and their teachers, and specific developmental outcomes. Using adult:child ratios and group size recordings every 15 minutes as indices of structural quality, subscales from the ECERS and ITERS to measure process quality, and a battery of developmental tests and rating scales to measure children's attachment behaviour, social orientation and peer interaction, the study concluded that "good things go together" (p. 458). In other words, Howes et al. found that licensing standards did make a difference to the quality of care provided for children, and that centres which maintained adequate adult:child ratios and group sizes also tended to employ well-educated teachers and pay relatively high salaries. Furthermore, the authors found that a predictable pathway existed from regulable elements of quality to process quality, and thence to relationships with teachers, and to relationships with peers. They also pointed to the need to research how these variables combined with family variables to affect child development, an issue addressed in other studies (Howes & Olenick, 1986; Melhuish, 2001).

Within the New Zealand context the international scholarly consensus, exemplified in Howes et al.'s (1993) study, that both structural and process components mattered for quality early childhood provision was reflected in the design of a national study of 200 under-two-year-olds in 100 early childhood centres across Auckland, Hamilton, Wellington, Canterbury, Otago and Southland (Smith, Ford, Hubbard & White, 1995). The results revealed that the quality of education and care these young children received was significantly correlated with working conditions, and the qualifications, training and background education of their educators. Further analysis of the data in this study by Barraclough and Smith (1996) found that parents' choice of childcare centre was typically determined by cost and location, and that support was needed for parents to discern what constituted quality education and care for this age group. In an associated video entitled *The Search for Quality Educare,* produced by Anne Smith (1993) as a pedagogical and parent education tool, eleven features of quality were listed. New Zealand parents were advised to look for these when choosing an early childhood setting for their child:

1. sensitive and responsive interactions between adults and children
2. adult-child ratios
3. trained staff
4. stability of staff
5. group size
6. planned programmes or curriculum
7. peer stability and harmony
8. sensitivity to family and culture

9. biculturalism
10. safe and healthy physical environment
11. cost linked to quality.

Each element was then illustrated through discursive commentary by well-known national and international early childhood experts and through filmed sequences from actual childcare and preschool settings in New Zealand. The features named by Smith (1993) were also included in a literature review by Podmore and Meade (2000). In both cases the authors placed a specific focus on staff qualifications and indicators of quality.

2.1.3 Third wave research on quality: an ecological perspective

"Third wave" research in the late 1980s and early 1990s reflected a more ecological conceptualisation of quality. The research literature, still emanating mainly from North America, focused on aspects of adult behaviours such as involvement in quality interactions with children, and the links of these behaviours to children's cognitive, linguistic and socio-emotional development. Links to the socio-cultural context in which the early childhood experience occurred also became a focus of this wave of research, subsequently leading to a new philosophical orientation that asked 'who says what is quality?' (e.g., Farquhar, 1993; Moss & Pence, 1994; Woodhead, 1996).

Within New Zealand an awareness of the importance of context had already permeated to policy circles. Throughout the 1980s the policy agenda for early childhood education was dominated by the need to respond to the particular issues of the historical inequity of funding and resourcing faced by different parts of the early childhood sector; this eventually resulted in the transfer of the administration of childcare from the Department of Social Welfare to the Department of Education (Meade & Podmore, 2002). During this period, as researchers and other advocates lobbied for policy improvements to regulations and funding arrangements, and policy makers sought to build evidence-based arguments for change, the scarcity of New Zealand early childhood research necessitated a heavy reliance on research findings from outside the country. Nonetheless, it was standard practice for New Zealand researchers (and policy makers) to point out the pitfalls of such a practice, including the dangers of generalising findings from a North American context to the New Zealand one. Particular difficulties highlighted in these discussions were: (i) the different historical and cultural contexts of early childhood services between the two countries; and (ii) the tremendous variations between the regulatory contexts of the different states internally within the US making comparisons across the US problematic (e.g., Belsky, Steinberg, & Walker, 1982), let alone beyond.

It is noteworthy that another strong theme within New Zealand discussions about quality at the end of the 1980s was to do with cultural variations in understandings of the meaning of quality. In the main this discourse took the form of advocacy by indigenous Māori (e.g., Irwin, 1987) and Pacific Nations people (e.g., Ete, 1993) who in policy settings and sector conferences pointed out that so-called "mainstream" Pākehā perspectives of quality did not satisfy Māori or Pacific aspirations from early childhood education and care provisions. The 1980s was the decade when Ngā Kohanga Reo emerged on the early childhood scene as a uniquely Māori response to the likelihood that the Māori language would be lost to future generations unless something was done to preserve it. The establishment of the first kohanga reo in 1982 with a *kaupapa* of whānau development around *te reo* and *ngā tikanga* Māori made an implicit statement about expectations about quality in early childhood services for Māori. Similarly, Ete argued passionately that early childhood services valued by the Pasifika community were being provided by the churches through practical resources like church halls, as opposed to state funding or other resourcing. Underlying these discussions was an implicit question about the meaning of quality early childhood education in these communities. While in the 1980s and early 1990s these views were not "research-based" in the usual tradition of Western scholarship, they sounded a note that chimed with a new theme that was beginning to emerge in scholarly journals and publications elsewhere (e.g., Lamb, Sternberg, Hwang &

Broberg, 1992; Tobin, Vu & Davidson, 1989), namely that quality is not a universal concept, but rather a value-based, relative and contestable one.

The new theme in childcare research in the mid- to late 1990s, therefore, was one that positioned the notion of quality as multi-dimensional, and as existing 'in the eyes of beholder' (Farquhar, 1991; Moss & Pence, 1994), and thus able to be understood from a range of perspectives. In this period a key reference point was Lilian Katz's (1993) proposition that there are at least four perspectives from which programme quality can be viewed: the 'top-down" perspective seen by visiting adults or observers and identified by selected characteristics of the setting; the "bottom-up" perspective of how the setting is experienced by the children in the setting; the "outside-inside" perspective which refers to the experience of parents served by the programme; and the "inside" perspective of the staff who provide the programme.

2.1.4 An expanded scholarly base for early childhood studies: quality as multi-perspectival

Within the international early childhood academic community, the late 1990s also saw an expansion of scholarship that emphasised the need to re-conceptualise the disciplinary base of early childhood education away from an exclusively child developmental focus to incorporate insights from multiple disciplines. For example, Americans Stott and Bowman (1996), called child development knowledge a "slippery base" (p. 169) for practice, firstly because of its changing nature, and secondly because child development research can only approximate reality rather than explain what experience means to the child; which, according to psychologists, is what matters for development. Thirdly, there is the fact that child development theory and research reflect particular historical and socio-political positions. In other words, what is researched, and how, is determined by dominant discourses and values at the time.

Additionally, as increasing numbers of critical writers had begun to point out (e.g., Burman, 1994; Lubeck, 1996; Moss, 1994; Singer, 1993; Walkerdine, 1984; Woodhead, 1996), most theories of development are based on Western ideas and reflect Western values, yet they claim universal application. This tends to produce views of what is 'normal' that construe and create 'difference' as 'abnormal', inferior or pathological. Some argued that this tendency contributes to disenfranchising the poor and the powerless (Burman). In response to these arguments, the map of the specialised knowledge base of early childhood education began to be re-drawn to take on board the notions that:

1. theories change and so too, do their implications for practice (Berk & Winsler, 1995)
2. theories need to be judged not only from the point of view of how well they describe or explain behaviour, but also how useful they are in optimising potential in a given context (Carpenter, Dixon, Rata & Rawlinson, 2001)
3. values underlie all theory and practice (e.g., Cannella, 1997)
4. children do not exist outside of a social context (e.g., Jenks, 1996).

The consequence of such arguments has been that since the mid-1990s there has been a greater awareness in early childhood scholarship that in order to enrich our understanding of development, it is important to look to other human science disciplines beyond child development, such as sociology, philosophy, anthropology and health studies. By extension, debates about the nature of quality in early childhood education became increasingly concerned with the idea that quality is multi-dimensional and open to multiple perspectives.

Starting from this premise, Moss and Pence's (1994) edited volume *Valuing quality in early childhood services* became an instant classic. Working in two diverse cultural contexts, the UK and Canada, Moss and Pence pulled together a collection of writings by international authors, including New Zealanders Smith and Farquhar (1994), who collectively argued that there are many stakeholders with an interest in evaluating quality and simultaneously illustrated the relative, value-based and dynamic nature of the concept of quality. Martin Woodhead's (1996) image of a cube with three visible faces to represent the three dimensions of (i) indicators of quality, (ii) stakeholders' perspectives, and (iii) beneficiaries' perspectives contributed to this new line of scholarship serving to heighten interest in the argument that quality is

inevitably perspectival and, as Woodhead argued, context-bound. Woodhead, by background an English developmental psychologist, built his argument on his experience of compiling the reports of four early childhood intervention studies involving children and their families in poor communities in India, Kenya, Venezuela and France. Arguing that any early childhood programme was a complex human system shaped by individual and group interests, values and cultural patterns, Woodhead concluded that existing models of quality were based on Euro-American thinking that assumed that child development could be isolated as a "separable subject both for study and for professional intervention" (p. 10); he argued that this was "both untenable and unhelpful" (p.10) in the majority of world contexts of his studies. Woodhead argued that a distinction needed to be made between the quality issues faced in affluent Western societies – the minority world – and quality issues faced by the developing economies of the Third World where the majority of the world's children live their childhood. Viewing quality as "relative but not arbitrary" (p. 10), Woodhead proposed an approach that was "more contextual, more holistic and more open… to issues of quality" (p. 10) and would take account of the three questions of: "Who are the stakeholders?", "Who are the beneficiaries?", and "What are the indicators of quality?"

The arguments presented by Moss and Pence (1994) and Woodhead (1996) can now be viewed as the beginnings of a steady stream of writings that in the late 1990s increasingly positioned the notion of quality as contestable, perspectival, and open to debate. This included arguments that quality measures, such as the ECERS, were based on particular values that were culturally derived (e.g., Rosenthal, 1999), and thus needed to be applied with caution. In this vein, Munton, Mooney and Rowland (1995) proposed that, as there can be no agreed definition of quality, the best alternative would be to develop a conceptual framework for deconstructing it, a task that Dahlberg, Moss & Pence (1999, 2007) and others undertook in subsequent years.

2.1.5 Quality as a measured outcome

Meanwhile, as these philosophical debates about quality continued to unfold, research and policy interest in the developmental impact of childcare experience had not abated but became connected to discourses about programme effectiveness, and early intervention programmes for at-risk populations, as investments for the future. Research on projects such as the longitudinal Abecedarian study, begun in the 1970s at the University of North Carolina at Chapel Hill by Craig Ramey (e.g., Campbell & Pungello, 2000; Campbell & Ramey, 1995), some of the Head Start projects including the newer Early Head Start ones (e.g., Ontai, Hinrichs, Beard & Wilcox, 2002), the Chicago Longitudinal Study (e.g., Ou, 2005), and the High/Scope Perry Preschool Project (Schweinhart et al., 2005) all remained in citation throughout the 1990s and into the first decade of the new millennium (see also Dearing, McCartney & Taylor, 2009).

Additionally, in the 1990s and early 2000s attention increasingly focused on the results emerging from the prospective longitudinal *Study of Early Child Care* initiated in 1991 by the US National Institute of Child Health and Human Development (NICHD) (Peth-Pierce, 1998). The study began partly as a consequence of challenges to the methodological integrity of "first wave" research which erupted in the late 1980s in what became known as the "Belsky controversy"[2] (Belsky, 1987, 1988; Clarke-Stewart, 1988; Phillips, McCartney, Scarr & Howes, 1987). The controversy had re-opened the debate about the impact of infant day care on the child's attachment to the mother. In an effort to settle this ideologically and politically sensitive issue in a scientific manner, the NICHD had invited applications from the researcher community to collaborate in a multi-site study with the aim of:

> moving beyond the global questions about whether child care is good or bad for children….[and] focus[ing] on how the different aspects of care – such as quantity and quality – are related to various aspects of children's development. More specifically, researchers are evaluating the relationship between child care and children's cognitive and language development, children's relationship with

[2] In 1986 Jay Belsky published a paper in which he claimed that a circumstantial case could be made that early infant non-maternal care (in any context) may be associated with an avoidant attachment to the mother, diminished compliance and cooperation, increased aggressiveness and greater social maladjustment in later years. Rebuttals by Phillips et al. (1987) claimed that Belsky's argument was based on a selective and mis-interpretative reading of available data and called for more carefully controlled studies of infant day care because the "evidence on infant day care was not all in" (p. 20).

> their mothers, and their self-control, compliance and problem behaviors, as well as peer relations and physical health. (Peth-Pierce, 1998, p. 2)

The final line-up of selected researchers included prominent participants in the Belsky controversy, and a steering committee of NICHD scientists. A total of 1,364 children were recruited at age one month from 10 different sites and a complex study designed which attempted to avoid the limitations of earlier studies. The design took account of many variables, including the characteristics of the childcare and family environment; it also assessed children's development using multiple methods. Phase one of the study followed the children from one month to age three years; since the first results of the NICHD study appeared in the mid-1990s, any discussion of the impact of quality childcare from a developmental perspective inevitably has referenced this work.

By the beginning of the new millennium there were thus two dominant lines of scholarly discussions distinguishable in the international literature: one was concerned with philosophical discussions about the meaning of quality, and the other related to research interested in untangling the impact of various daycare/childcare variables on child outcomes.

2.1.6 Crossing into the new millennium: the New Zealand trajectory

Meanwhile, in the New Zealand context, early childhood research and policy had started a different trajectory. Within a policy context aimed at creating a seamless education system from early childhood to tertiary education, an initiative to develop national curricula for the different educational levels led to the development of the early childhood education curriculum guidelines, *Te Whāriki*. The result of an extensive sector-wide consultation process, *Te Whāriki* aimed to allow the diversity of the sector to be expressed around a conceptual and theoretical framework that invites dialogue and "responsive, reciprocal, relationships… with people, places and things" (Ministry of Education, 1996, p. 9). *Te Whāriki* thus implicitly defined quality as based on a pedagogy of relationships with learning outcomes re-conceptualised away from traditional subject areas and towards goals stated in terms of children's well-being, belonging, contribution, communication and exploration: the five "strands" of the curriculum based on the four principles of empowerment, holistic development, family and community, and relationships. This approach led to significant pedagogical changes across all early childhood services, including: the development of new assessment tools using observational and narrative reflections known as 'Learning' and 'Teaching stories' (Carr, May & Podmore, 2002); the action research tool for quality improvement in centres, *The Quality Journey*, released in 1999 (Ministry of Education, 1999); and professional development programmes using these tools. These key resources, developed to support the implementation of *Te Whāriki*, together with the document *Quality in Action* (Ministry of Education, 1998) which provided guidance to early childhood services about how to implement the 1996 revised *Statement of Desirable Objectives and Practices*, strove to articulate further what quality in early childhood education, across the 0 to 5 years age-range, should look like in this country. As White (2003) has noted, the latter was a deliberate move away from the prescriptive accreditation processes that were being implemented in other countries, such as the US and Australia, and towards a process that used the more empowering evaluation model of self-review (Collins, Davey & White, 2005; Fetterman & Wandersman, 2005).[3]

These New Zealand innovations attracted significant international interest. For example, *Te Whāriki* is one of four curriculum models cited in the OECD's *Starting Strong* documents (OECD, 2001); it is referred to in the literature review commissioned by the English Department for Education and Skills (DfES) *Birth to three matters* (David, Goouch, Powell & Abbott, 2003), and features as a key reference in the first ever national Australian Early Years Learning Framework entitled *Belonging, being and becoming* launched at the end of 2009 (Council of Australian Governments, 2009).

[3] In the event, despite being offered to each early childhood centre in the country, *The Quality Journey* was not widely implemented (Collins, 2007) and was subsequently overtaken by the introduction of *Ngā Arohaehae Whai Hua: Self review guidelines* (Ministry of Education, 2006).

In the local context, the implementation of these innovations positioned quality as an ongoing quest that is achievable through a continuous system of self-improvement in which the key components are: (i) teachers' ability to engage in evaluation processes; (ii) structural support features; and (iii) an ongoing openness to knowledge of what constitutes quality. Initiatives taken at the beginning of the new millennium as part of the implementation of the 10-year strategic plan for early childhood education, *Pathways to the Future: Ngā Huarahi Arataki* (Ministry of Education, 2002) further developed this positioning.

The rest of this chapter deals with ongoing philosophical discussions of the notion of quality over the past decade; quality as understood through studies focusing on the measurement of impact and effectiveness are discussed in Chapters 5 and 6.

2.2 Discourses of quality in the new millennium

2.2.1 Developments in New Zealand: quality as continuously evolving practice

Continuing along the same trajectory started in the 1990s, the New Zealand discourse of quality during the first decade of the new millennium was largely constructed around a view of quality as a project that is continuously evolving at the level of practice in early childhood settings. Two key developments marked out this discourse, and each devolved from two of the core goals of *Pathways to the Future: Ngā Huarahi Arataki* (Ministry of Education, 2002): improving quality services, and enhancing collaboration.

One development was the compilation of *Ngā Arohaehae Whai Hua: The Self-Review Guidelines* (Ministry of Education, 2006) as an initiative that built on *Quality in Action*, and *The Quality Journey,* to further support centres to evaluate their own practice. The *Self-Review Guidelines* differed from the earlier documents in being conceptually linked to the evaluation methodologies of the Education Review Office (ERO), thus bringing together the goals and priorities of the state monitoring service with those of individual ECS. Evaluating the uptake of this approach by early childhood services, the Education Review Office (2009) reported that:

> A challenge for services is to sustain ongoing self review by embedding practices that withstand changes in management, staffing and ownership. Other factors affecting the sustainability of self review included the quality of leadership, the extent to which staff worked as a team and the organisational culture of the service. A lack of self review in some of the services could be attributed to such factors. (Education Review Office, 2009, p. 18)

The second development that contributed to the discourse of quality as continuous self-review and self-improvement was the initiation of the *Centres of Innovation* (COI) action research programme which, between 2002 and 2009, enabled 20 early childhood services to be nominated a COI through a competitive selection process. Once successful, the staff of the COI were teamed up with an academic researcher to work through a three-year action research process to document, research and disseminate their innovative practice. As the teaching teams presented their work at conferences and published their reports in a series of edited volumes (Meade, 2006, 2007, 2010) a new discourse of quality arose within the practitioner community around the notion of teacher-researchers engaging in systematic reflection, and action, to improve practice (Dalli, 2010; Meade, 2010). Additionally, specific practices implemented by the COIs, became associated with quality provision for under-twos. For example, three COIs, the *A'oga Fa'a Samoa* (Meade, 2007; Podmore & Wendt Samu, 2006), *The Massey Child Care Centre (Hoiho section)* (Bary et al., 2008), and the *Childspace Ngaio Infants and Toddlers Centre* COI (Dalli & Kibble, 2010), highlighted how the use of a key worker system, or primary caregiving system, could enhance the learning experiences of infants and toddlers, while both *Te Kopae Piripono* COI and the *Greerton Early Childhood Centre* (Greerton Early Childhood Centre, 2010) showed that practices of shared leadership facilitated family involvement and whanau development.

2.2.2 The international trajectory of quality discourse

Within the international context, meanwhile, discourses on quality were following a path that Melhuish (2001) had accurately predicted in an article aimed at taking stock of the debates about quality in early childhood at the start of the new millennium, and contemplating its likely future. Melhuish (2001), a British researcher with a longstanding career in child care research, considered the ongoing debates to be an illustration of the value-laden nature of the concept of quality but, in his words, "this does not invalidate any one approach to quality, as long as the values underlying the approach are recognised" (p. 1).

Quality as demonstrable difference

Melhuish's (2001) stocktake of "the quest for quality in early day care and preschool experience" was carried out at a time when he had just become involved in the *Effective Provision of Pre-school Education* (EPPE) project in the UK. In stating his case, Melhuish argued that measurement was a major issue in discussions about quality of care because "measurement objectifies theoretical assumptions about what quality is" (p. 1). Together with the NICHD study of early child care, the EPPE project is currently one of the frequently cited longitudinal studies investigating children's early childhood experiences in the English-speaking world. Having reviewed the ways that different studies had sought to study the developmental impact of quality early childhood provision, and how quality of care had been measured since the 1980s, Melhuish concluded that while measures of quality that relied on observation methods were common, they were also flawed. He offered at least two reasons for this. In the first place, measures of settings (e.g., ECERS; ITERS) do not take account of the fact that even in the same setting, the experience of different children varies. Secondly, alternative methods that seek to remedy this by observing focal children (e.g., Pierrehumbert et al.'s 1996, *Observation de lieu de vie de l'enfant* (OLIVE) and the NICHD's 1996 *Observation of specific children and caregivers* (ORCE)) succeed in obtaining more accurate understanding of the experience of specific children, but have the significant drawback of being very expensive of researchers' time and produce results that may not generalise to other children. Melhuish thus predicted that in the new millennium there would be a move away from observational methods that focus on the settings, or specific child and caregiver functioning, and towards paradigms for research that adopt "hierarchical models of children nested within families, families within settings, settings within cultures (communities) etc." (p. 4). Melhuish envisaged that these models would require statistical analysis such as multi-level modelling (Goldstein, 1995, cited in Melhuish, p. 4) or linear level modelling (Bryk & Raudenbush, 1992, cited in Melhuish, p. 4) which would enable an answer to the question of whether a particular institution attended by a child "made a difference" (p. 4).

The issue of *making a difference* was emphasised by Melhuish (2001) as a way of defining quality in early childhood provisions. In his view, using multi-level modelling to determine whether an early childhood setting made a difference to children would mean moving to a definition of quality which sees quality as indicated by "demonstrable beneficial effects on child development" (p. 4). He argued that this would be an advance on earlier ways of defining quality. Multi-level modelling would identify an institution as either effective (high quality) or ineffective (low quality) so that the specific characteristics of the setting could then be investigated intensively, including through qualitative research, to arrive at an understanding of the processes that underlie the quality of the provision. He argued that this was the approach that the EPPE study planned to follow. Melhuish concluded that as it is now the norm for children to experience some form of out-of-home child care in the early years, it was to be expected that all future longitudinal studies of children's development would include measurement of the childcare experience. He saw this as resulting in the integration of the study of childcare more firmly within developmental psychology.

Melhuish's prediction of the type of research that would ensue in the new millennium has certainly been borne out as evidenced by many of the studies cited in Chapters 5 and 6, including the NICHD's study (e.g., 2003, 2004, 2005a, 2005b) of early child care in the US.

Quality as relative, perspectival, locally constructed and complex

At the same time, a separate and equally vigorous line of scholarship has continued to grow that has elaborated the statement by Moss (1994) that:

> Quality in early childhood education is a relative concept. As such, quality in early childhood services is a constructed concept, subjective in nature and based on values, beliefs and interests, rather than on objective and universal reality. Quality childcare is, to a large extent, in the eye of the beholder… (p. 172)

The rest of this section elaborates on this line of research and scholarship; it outlines the discursive nature of 'quality' as it addresses the question of: What are the current issues in relation to debates about 'quality' early childhood education? What is new in the debate?

As signalled already, current scholarship on 'quality' emphasises the importance of carefully assessing how meanings of 'quality' differ; this difference exists not only across time, but also across and within places. An important theme has been the emphasis on critical engagement with 'quality' discourses as a counter measure to the potentially colonising effects of universalistic notions (Cannella & Viruru, 2004; Viruru, 2001). For instance, Islam (2010) recently proposed the need to focus on 'little narratives' (petits récits) as a way of engaging with issues of quality that address cultural and historical difference, while Rix, Paige-Smith and Jones (2008) argued for a recognition of the potentially damaging effects that universal notions of quality can have for children and families, particularly those who potentially benefit from early intervention programmes. Rix et al.'s (2008) argument emerged from their small scale investigation of English parents' perceptions of the quality of an early intervention programme in which their Down Syndrome children were enrolled. They reported that "parents did not identify a single effective approach to their children's learning, but talked about many positive early learning opportunities and experiences in the lives of their families" (p. 75). The authors concluded that these parents perceived early intervention as counterproductive when their children felt they were not in control and did not meet early intervention specialists' expectations. Parents "suggested that these feelings were often engendered by the developmental, target-driven strategies at the heart of much of the current early intervention process" (p. 75). 'Quality' in this context refers to particular opportunities and experiences that enable children's learning. The notion of 'little narratives' captures the emphasis on paying attention to specific characteristics of the situation, in this case how learning is experienced by the child: as enjoyable, enabling and empowering because it relates to the child's specific context. Little narratives of this kind thus enable critical engagement with universal notions of 'quality' and highlight that the concept is contestable.

According to some authors, 'quality' is often assumed as self-explanatory (Dahlberg, Moss, & Pence, 1999; Fleer & Kennedy, 2006) and even given 'iconic status' in much of early childhood policy and research discourse. It has been argued that the current eagerness to optimise outcomes for young children via early intervention programmes (see Chapter 6) can add to this iconic status by rendering 'quality' invisible as a complex, multifaceted construct (Graue, 2005). Moss (2005) warned that dominant contemporary discourses of 'quality' assume that the concept is neutral, measurable, and value-free and raised concerns over the effects of positioning such assumed concepts of quality at the centre of early childhood pedagogical work, policy and its evaluation. Specifically, he argued that when the meaning of 'quality' is taken for granted, other possibilities for talking about pedagogical work are closed off. Moss proposed "an" alternative that would involve talking about pedagogical work as "meaning making" (p. 405) in which "plurality, contingency, subjectivity, provisionality, political process, and ethics" (p. 405) were welcomed. Above all, Moss urged for awareness that when the concept of quality was invoked, there was a political and ethical choice that followed.

Working in different contexts across multiple continents, other critical early childhood scholars like Australian Fenech and Sumsion (2007), English author Julia Manning-Morton (2006) and Canadian researcher Susan Prentice (2009) have made similar statements; each has insisted on the importance of problematising the concept to stimulate the

continuation of "conversations so that the measures and enactments of quality can be as complex as the practice" (Graue, 2005, p. 522).

Critical engagement with how quality is conceptualised and enacted in early childhood discourse is particularly important for pedagogical work with infants and toddlers because research on what 'quality' learning and teaching entails for such young children is relatively scarce. Yet, despite this gap, literature about pedagogical work with the youngest learners shows a notable absence of critical analysis about how these young children are discursively shaped. Those few studies that have paid attention to infant and toddler experiences as learners in early childhood settings (e.g., Dalli, Rockel, Craw, Doyle, & Duhn, 2009; Ireland, 2006) thus provide a platform from which 'quality' can start to be re-assessed specifically for this age group.

Some of the small body of existing literature that addresses issues related to 'quality' infant and toddler pedagogy pays particular attention to the interrelationship between teachers' characteristics and complex contextual and philosophical issues, from a range of perspectives. For example, at a time when having university qualified staff employed in infant and toddler settings was still the exception in most Australian early childhood centres, Ireland (2006) carried out case studies in centres that gave priority to employing degree qualified staff with the aim of investigating what happened "when babies have teachers" (p. 1). Ireland's analysis highlighted that these centres succeeded in employing degreed staff through the interrelationship of complex factors including: well-developed leadership within the centre, strong philosophical beliefs about the value of qualified staff, efficient management strategies, and teachers' and centre directors' individual capacity to act ethically and viably to provide high quality early childhood education.

Quality as children's lived experience

Complex interrelationships as a feature of quality practice were highlighted also by Gammage (2003) who drew on research to argue that the best environment for learning is created by teachers who are "well informed" and "have current theory at their fingertips" (p. 353). He argued that the teachers who are well placed to create the best learning environments for young learners are the ones with the abilities to continuously review and evaluate pedagogy and curriculum (see also Chapter 4).

One study that provides an effective insight into Gammage's (2003) argument at the level of lived experience of quality is Eriksen Ødegaard's (2006) research with 1–3-year-olds in a Norwegian preschool[4]. Through analysing videoed recordings of the toddlers' interactions with their friends and adults during 15 mealtimes, Eriksen Ødegaard showed that the children, including non-verbal ones, were initiating and maintaining "co-narratives" that "related to the problems in their lives …. and co-constructed meaning on the emotions of anger, fear, loss and desire in an effort to make meaning and take control of these important life themes" (p. 83). Eriksen Ødegaard identified 39 co-narratives on topics such as: birthdays (a story of anger); "gloomy Santa Claus" (a story of fear) and so on. One story that involved a child who "was not yet two years old" (p. 86) was called "Frida is gone" (a story of loss) and related to one of the preschool adults having left the table to take her break. Two under-two-year-old children and an adult participated in this co-narrative as the children and the adults constructed meaning about the fact that not everyone was present, but that Frida would return. Eriksen Ødegaard (2006) reflected that adults are used to thinking of children as preoccupied with "the here and now" and often may not notice very young children's initiation of emotionally-charged narratives; for infants and toddlers in ECE, she pointed out, life is more dramatic than adults tend to notice: "Such matters are worth talking about, and need stories … to make meaning out of situations and emotional states" p. 89). Eriksen Ødegaard argued for more awareness that dialogue constructs meaning and thinking and creates cultural patterns for expressing and enacting emotions, and experiencing the world.

[4] Within the Norwegian context 'preschool' is a generic term for early childhood services.

From the perspective of the quality debate this study illustrates some of the teacher qualities discussed by Gammage (2003) as necessary to create the best learning environments for very young learners: teachers who are "well-informed" and "have current theory at their fingertips" (p.353). Similar micro studies of infants' and toddlers' experiences carried out in New Zealand over recent years (e.g., Alcock, 2007; Brennan, 2005; Dalli, 1999; Dalli & Kibble, 2010; Stephenson, 2009; White, 2009) likewise illuminate a range of different context-specific infant/toddler cultures, even within the same centre. They indicate the importance of generating different context-specific and micro-level understandings of quality alongside traditional ones. As with Eriksen Ødegaard's (2006) study, these New Zealand studies provide evidence that the co-construction of narratives enables toddlers "to come to grips with the problems in their lives" (Eriksen Ødegaard, p. 89). This is a new insight that challenges not only dominant discourses of pre-verbal children's ability to construct meaning, but also throws light on the widely-held and mistaken belief that 'toddlers have no problems in their lives' (Ødegaard). Cumulatively, they point to the need to consider how dominant discourses conceptualise very young children, and consequently 'quality' pedagogy and curriculum for this age group. Gammage (2003) has argued that quality pedagogy demands a high level of academic literacy and the ability of adults to engage with current research (see also OECD, 2001). Additionally, Eriksen Ødegaard's work (alongside that of others) signals the need to move away from the perception that children of this age are limited in their learning through, for example, their inability to focus, or short attention spans.

Smith (1999) made a similar argument cogently in a study (reported earlier) which remains one of the few New Zealand studies that has critically examined the nature of infant and toddler experiences in group-based early childhood settings using a mixed method research approach. Combining analyses of measures of structural quality with qualitative analyses of interactions in the hundred childcare centres involved in the study, Smith concluded that "joint attention episodes may be an important micro indicator of quality in early childhood environments since centres with joint attentional episodes achieved higher mean scores on overall infant quality" (p. 95). However, joint attention sequences were not reported at all in a third of the centres in Smith's study. Reflecting on the findings, Smith noted that it was commonplace among staff working with under-two-year-olds (in 1990s New Zealand) to assume that the children were too young to be engaged in learning; this assumption led to many missed opportunities for rich learning offered at times of "joint attention".

Quality as a right of children

Freeman (2007) has argued that the most fundamental of rights is the right to possess rights. The release of the United Nations Convention on the Rights of the Child in 1989 prompted questions about what the term 'child's rights' means in theory and in practice. The word 'rights' is difficult to define and there are many diverse and contrary understandings about what constitutes children's rights (Alderson, 2000, 2002; Alston, 1994; Freeman, 1992). For example, a discourse of children's needs has been "a powerful theoretical device for constructing images of childhood, prescribing for care and education, and judging the quality of adult-child relationships" (Woodhead, 1997). On the other hand, children's rights discourse views the child as agentic, capable and competent of expressing an opinion (see for example, Alderson, Hawthorne & Killen, 2005; Lansdown, 2005; Smith, 2003, 2007). In relation to infants and very young children in early childhood education and care settings, General Comment 7 (United Nations Committee on the Rights of the Child, 2005) argues for states parties, or countries that have signed UNCROC: to support parents; to encourage child-centred practices in early education; and for early childhood professionals to develop partnerships with parents to realise the intent of the respective articles. Particular articles of UNCROC establish specific rights. For example, Article 28 (1) establishes the right to education, progressively, and "on the basis of equal opportunity" (CRIN, 2007, p. 12); Article 29 (a) entitles children to an education "directed to the development of the child's personality, talents and mental and physical abilities to their fullest potential" (Child's Rights Information Network, 2007, p. 13); and Article 31 has been interpreted as a right to play (Freeman, 2007). These particular articles have direct relevance to the programmes offered in early childhood settings, they embed notions of what quality early childhood provision looks like, and provide the basis for advocacy for children's rights to access early education of high quality.

UNCROC also acknowledges adults' responsibilities to care for children, including respecting children's rights to express, or form, a point of view, and in so doing, assert their rights to be involved in decisions that affect them (Article 12).

These studies suggest that conversations about the meaning of 'quality' for under-two-year-olds might need to also include critical analysis of dominant ideas about our youngest learners and their entitlement to high quality early childhood education (Te One, 2009).

'Quality' for whom? Post-structural questionings of discourses of childhood

As highlighted in the preceding section, in the new millennium a focus on how subjects, concepts and discourses are produced has begun to challenge the nature of knowledge production in the early childhood field. Analyses of childhood as a socio-political construct (Baker, 1998; Bloch, Kennedy, Lightfoot, & Weyenberg, 2006; James, Jenks, & Prout, 1998; Rose, 1990) argue convincingly, and persistently, that subjects such as 'the child', 'the teacher', and 'the infant' are made and re-made in daily encounters, in policy, in educational discourse and on a global level (for example in global policy commentaries such as in OECD and UNICEF reports). Using post structuralist ideas, childhood is therefore seen as an intensively governed domain, and early childhood education as a 'technology of government' (Foucault, 1994), or as a site where subjects are constructed (Ailwood, 2004). The subjects of early childhood education are teachers, children, families and communities, with the task of critical analysis being to understand what conditions and possibilities exist for "subjects who live and work within the early childhood years" (Ailwood, p. 28). These kinds of analyses are exploring the parameters of current discourse by focusing on the interrelations of power and knowledge production (Ailwood, 2003; Duhn, 2008; Fendler, 2001; Løkken, 2009; Osgood, 2006; White, 2005, 2009). Studies in this paradigm point out that it is important to be vigilant about the ways in which discourses and subjects are produced to create spaces for analyses of possibilities and limitations of current practices and theories in early childhood education. Such analyses are the foundation for discussions of 'quality' that intend to go beyond technicist perspectives (e.g., Gammage, 2003; Moss, 2005). For example, White (2005) recorded dialogues with home-based caregivers and separately with diploma-trained coordinators from the same organisation. The results revealed that in a context where there was no shared professional educational background, there were staggering (and in some cases, alarming) differences in beliefs, and associated discursive practices about what constituted quality among the study participants. White concluded that quality was a constructed concept that required dialogue and dissensus, as well as consensus, if it was to be realised in early childhood education contexts.

Analyses of subjects and discourses point out that iconic beliefs and approaches, such as those related to 'quality', 'play-centred' and 'child-centred' practices and pedagogies, are neither neutral nor innocent. Rather, they are Foucaultian technologies of government that shape children's, parents' and teachers' sense of self in specific ways (Ailwood, 2003; Langford, 2010). For example, Lind (2005) has challenged the existing "paradigm that views play as fun: as having no external goals" (p. 264), and argued instead that play is a careful reproduction of the existing social/cultural/economic order. This was illustrated in a study in which a teacher's taken-for-granted beliefs about what was going on during an episode of rough-and-tumble play were totally transformed when she was able to look more closely at what the children were doing, and ask them about it. This revealed that the shapes were "signifying practices" and that the children were using their bodies to make "creations" with meanings (p. 256). Lind argued that disruption of the existing paradigm had led the teacher to re-name and re-interpret, "thus creating a relational space for the children and teachers. Shifting discourses and subject positions emerged as participants [in the event] performed different modes of being teacher and child" (p. 265). Lind saw these new "relational spaces" (p. 266) as offering an opportunity for new learning for the children and the teachers, the "subjects" (Ailwood, 2003) of early childhood discourse.

Similarly, Fleer (2005) has argued for a re-thinking of how subjects are made to challenge universalising discourses, such as child development. With increasingly diverse populations, western notions of child development do not 'fit'

every child (see also Burman, 1994; Singer, 1993; Woodhead, 1996). She argued that the term 'child development' has been reified and:

> now represents a static and monocultural view of children. We could suggest that the term 'cultural historical development of children' more closely captures the dynamic and complex nature of the interlacing institutional structures, cultural belief systems, and the dynamic processes of children engaged in daily activity together with other people. (Fleer, 2005, p. 6)

From the perspective of infants and toddlers as child-subjects, the challenge to review child development could create powerful new spaces from which new understandings can emerge, such as the previously discussed notion of the pre-verbal child as meaning-maker (e.g., Eriksen Ødegaard, 2006; Johansson, 2001; Smith, 1999; White, 2009).

Quality discourses from demographic trends

Another example of a new/emerging "subject" is the 'only, lonely' child in the western middle class early childhood context (Gammage, 2003). For these children and their families, early childhood education becomes increasingly important as a site that facilitates socialisation for single children. With constantly increasing numbers of infants in early childhood centres, and with their average age at entry decreasing, large scale studies, such as the *Longitudinal Study of Australian Children* (LSAC) involving 5107 infants, are beginning to open up new understandings about these shifts. For example, within the Australian context Harrison and Ungerer (2005) reported that 36 percent of the infants in their study were cared for during the week by someone other than the parent – this included care by other relatives or caregivers, as well as centre-based early childhood services. The main reason for having infants in early childhood services was parents' work (72 percent). Most infants (75 percent) of those in regular out-of-home care received a single type of care; however, 22 percent experienced two types of care arrangements while 3 percent of infants were cared for in three or more arrangements each week. When starting care, infants averaged 14.9 hrs per week in non-maternal care. The average time spent in combination of formal and informal care was 20.8 to 24.6 hrs per week respectively. Parents rated all types of care as on average high with the highest rating given to grandparents (mean 1.1) and the lowest to all-day centre care (mean 1.4): "however, the difference [in rating] between the two was minimal" (Harrison & Ungerer, p. 29). These findings illustrate the changing context in which children in many different parts of the world now live their childhood, lending significance to Fleer's (2005) call to challenge static views of childhood, and by extension, what a quality experience in early childhood settings might look like.

Quality discourse in social policy: early childhood as early intervention

A further theme in Harrison and Ungerer's (2005) report on the *Longitudinal Study of Australian Children* echoes one frequently found in US early intervention studies (e.g., the Carolina Abecedarian project and Early Head Start discussed in Chapter 6). They suggested that early childhood services "can be an effective intervention for disadvantaged children or for children with special educational needs" (p. 26). Hungerford and Cox (2006), also working within the Australian context, echoed this view and reported that quality child care experiences (which were interestingly not defined), made a positive difference to self-regulatory behaviour and peer competence of children aged 24 months (this finding applied also to children aged 36 months). This led them to recommend that policy makers should "identify sub-groups of families within the entire heterogeneous low-income population who are in need of intensive services and to develop effective interventions that are tailored to their needs" (p. 650). The study raised concerns regarding the accessibility of quality services, pointing out that the cost of childcare in Australia determined the type of care for infants, with the informal type being the most common due to low or no cost. This concern was raised also in Harrison and Ungerer's (2005) study which reported that: "Mothers with less earning potential may be less able to utilise child care provisions in the formal sector when infant child care is needed. Similar concerns have been raised in Doiron and Kalb's (2005) recent review and analysis of child care demands and household labour supply". (p. 29)

Also writing from a social policy perspective but with a focus on the here-and-now, Cass (2007) started from the premise that "good quality ECE is of benefit in improving social/emotional well-being, and cognitive development outcomes for all children, particularly for low income and disadvantaged children" (pp. 97), and considered what policy priorities might look like in Australia if:

> a child-centred social investment approach were adopted to enhance the material, social and cultural resources directed to children on the basis of equity and promotion of a good childhood in the present, and not predominantly on the basis of economic efficiency. (p. 100)

Cass emphasised the importance of early childhood provision for mothers as workers to evade poverty (p. 101), a point underscored also by Ailwood (2004). The latter warned that women are often conceptualised very ambiguously as workers/citizens; she urged that any discussion of early childhood education as a site for early intervention should be supported by critical engagement with women's changing roles as workers/citizens.

Cass (2007) also argued that early intervention perspectives are often dominated by 'human capital' theory in which the young child is positioned as a 'future citizen' within a broader discourse that aims to enhance educational and employment participation by disadvantaged sectors of the population. Within this discourse, childhood is constructed as a time of "intervention, shaping and moulding 'agents of change for the future' (Ailwood, 2004, p. 20) without acknowledgement that, as Gammage (2003) pointed out, for meaningful 'quality' early intervention, the "child must have the opportunity to *be* as well as become" (p. 349). This is a particularly relevant comment in light of the emerging focus on brain research (see Chapter 3) as a contributing paradigm in which to frame education and care for infants and toddlers.

Quality as informed by neurobiological research

Over the last decade reference to neurobiological research has become commonplace in early childhood discussions particularly when advocating for high quality provision. Most commonly cited are claims that neuro-synapse connections are formed in the post-natal period through children's experiences within their early environment, and that brain development is a highly complex process with many variables (National Scientific Council on the Developing Child, 2004, 2007; Siegel, 1999). Gammage (2003), among others, has noted that MRI scanning and bio-chemical techniques have "led us to re-emphasise how interactive and crucial are the first 3 or 4 years of life" (p. 345). While noting that it is dangerous to think of particular phases as "irredeemable critical periods" (p. 344), Gammage (2003) makes the point that neurobiological research has alerted us once more to the fact that the first years of life are without doubt an important phase in children's life.

Based on these ideas, a new quality discourse has emerged that, for the purposes of this review, can perhaps be described as dependent on what Cicchetti & Gunnar (2009) and Meltzoff (2009) have called 'translational research', or research that crosses disciplinary borders. According to Meltzoff (2009), translational research is required since drawing evidence from one discipline alone, such as psychology for instance, limits understandings of very young children and their experiences and thus would not capture the complex nature of quality. This idea is further explored in Chapter 3.

2.3 Summary points

This chapter has traversed writings about the meaning of quality in early childhood education with the aim of (i) providing a backdrop against which to explore current understandings about quality; and (ii) providing a picture of contemporary discourses about this notion. The following statements provide a summary of key points in the literature.

1. Discussions about quality in early childhood education have tended to come from two distinct lines of scholarship: discursive philosophical discussions of the notion of quality, and studies seeking to measure impact of different structural features on children's developmental outcomes.

2. Three waves of childcare research between the 1970s and the 1990s resulted in (i) a consensus in the early 1980s that what matters for children's development is the quality of early childhood provision rather that out-of-home care of itself; (ii) identification of elements within the childcare environment that can be manipulated to provide high quality provision, such as adult: child ratios, caregiver behaviour, and the physical environment. These formed the basis of licensing standards and measures of quality such as the ECERS and ITERS; and (iii) a view that quality is an ecological phenomenon and open to contextual variation.

3. New Zealand understandings about elements of quality during the late 1980s recognised the importance of context and crystallised around the following components:

    - appropriate staff/child ratios
    - appropriate group size
    - appropriate caregiver qualifications
    - curriculum planning and implementation that is appropriate
    - te reo Māori and tikanga Māori
    - consistent care and education – low turnover of staff
    - partnership between early childhood services and the parents and whānau
    - safe and healthy environment
    - a close relationship with the community.

    There was also strong awareness of cultural variations in meanings about quality; this was in line with emerging international discourses in the late 1980s of the value-based nature of the concept.

4. In the 1990s philosophical debates about quality increasingly emphasised the multi-dimensionality of the concept; quality was understood as existing "in the eyes of the beholder" and as able to be viewed from the perspective of different stakeholders. An accompanying argument was that the scholarly base of early childhood education and care needed to be expanded to include insights from multiple disciplines, rather than solely child development. This opened the debate to the position that quality is a contestable notion, able to be deconstructed, and impossible to define in immutable ways.

5. Internationally, longitudinal studies reported in the 1990s, including the Carolina Abecedarian, and some of the reports from the NICHD study of early child care, linked the issue of quality with that of programme effectiveness in achieving beneficial outcomes for at risk populations. The notion of quality as "making a difference" to children's developmental outcomes underlay these studies. In New Zealand, meanwhile, a new discourse of quality developed around the introduction of the early childhood curriculum, *Te Whāriki*, which impacted greatly on local early childhood pedagogy and swiftly influenced international discourses of curriculum.

6. During the first decade of the new millennium New Zealand discourses of quality took on notions of reflective practice and self-review, aided with a focus on action research as a tool to achieve this. The COI projects came to be seen as benchmarks of quality practices.
7. Quality as multi-perspectival, locally constructed and complex was a key idea in philosophical writings in the new millennium.
8. The view that quality should be understood through little narratives of lived experience focused researchers' thinking on understanding the complex nature of different perspectives on quality.
9. A new arrival in debates on quality is the argument that quality services are something that children have a right to.
10. Demographic trends in contemporary societies have been used to support the argument that early childcare is here to stay and thus requires new policy approaches that move away from seeing early childhood services as an investment in the "future citizen" and towards seeing early childhood services as the contemporary contexts of childhood.
11. Neurobiological research has been used to create arguments to improve the quality of children's experiences in group-based early childhood settings.
12. Recognition of the contestable nature of the notion of quality has resulted in a call for translational research that would bridge the gap between knowledges from different disciplines that inform understandings of quality.

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Chapter 3: New Knowledge from Child Development: Neurobiology and Translational Research

Abstract

Technological advances over the last decades have facilitated neurobiological research including research on the brain functioning of living young children. This has re-positioned child development research at the centre of early childhood scholarship. In this chapter recent additions to child development scholarship in high quality peer-reviewed journals are reviewed with particular attention to 'translational research'. Translational research attempts to integrate new knowledge from a range of disciplines into new understandings that have implications for practical contexts and policy. Translational research has provided evidence about the interaction between experience and the developing brain, and how repeated affective experiences, of both positive and negative nature, create implicit and explicit memories which are encoded within the architecture of the brain. These become mental models that filter the way perceptions are channelled to construct responses to the world.

Discussing the effects of stress in infancy, as well as the connection between experience, brain development and emotion regulation, the chapter reviews the argument that toxic stress, or stress over which infants cannot exercise control, is a risk factor to brain development, the immune system, emotional well-being and to cognitive functioning. Toxic stress can result from low quality infant experience at home as well as from pre-natal exposure to maternal stress; it also arises in low quality non-parental early childhood settings

Cumulatively, translational research published in the last decade at the interface of neurobiological and developmental psychology suggests that (i) responsive attuned caregiving within stable relationships is the type of caregiving that facilitates both emotional and cognitive well-being, and thus learning; and (2) unresponsive, inconsistent and unstable relationships with caregiving adults, as well as repeated exposure to highly stressful environments have a negative impact on brain functioning and overall development.

There is debate about whether the first two years of life are critical periods for brain developments or, alternatively, windows of opportunity that are under-recognised as periods of learning and development.

> Babies are like the raw material for a self. Each one comes with a genetic blueprint and a unique range of possibilities. There is a body programmed to develop in certain ways, but by no means an automatic programme. The baby is an interactive project not a self-powered one. (Gerhardt, 2004, p.18)

Despite the resistance of critical theorists to seeing child development as the dominant disciplinary field for understanding the experience of very young children (as noted in Chapter 2), the fast growth of knowledge emanating from this discipline about infants' and toddlers' developing brains has been difficult to ignore. Gerhardt's statement above articulates but one of a number of key insights about human development that recent neurobiological research has substantiated. As an area of active research, neurobiology has once again positioned child development research in the mainstream of early childhood scholarship.

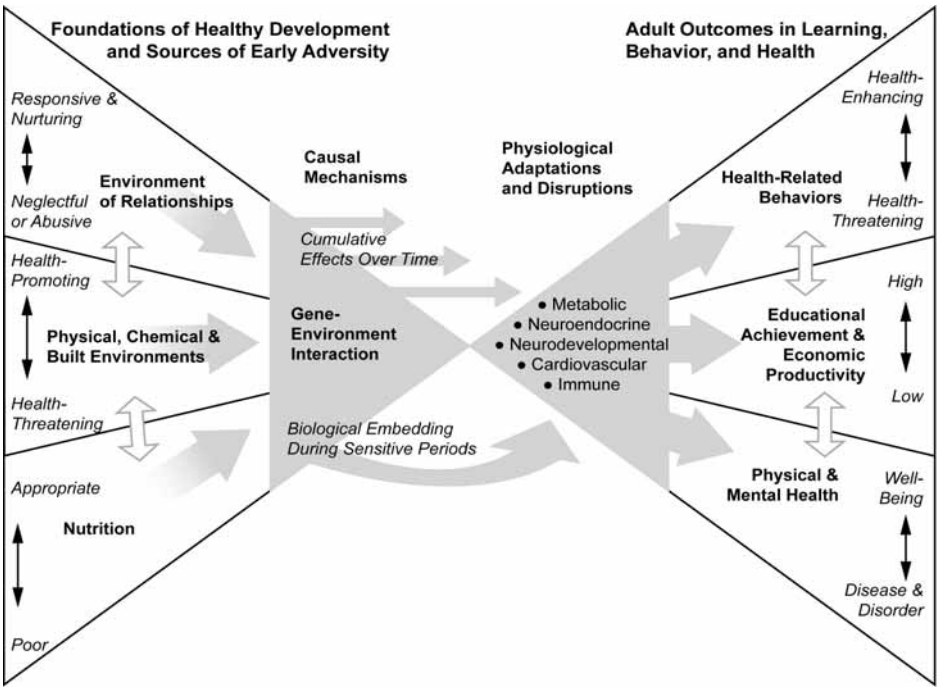
This chapter reviews recent additions to the knowledge base of child development with particular reference to increased understandings about the interface between neurobiological and wholistic development. This is to provide a broad scholarly base that is relevant to the question of what quality early childhood education for under-two-year-olds "should look like".

3.1 Nature with nurture: The baby as an inseparable whole

One area where neurobiological inquiry has created significant new insights is in explaining the impact of early experiences on learning and development. For example, writing in *Clinical Pediatrics,* Henry Herrod (2007) from the Department of Pediatrics at the University of Tennessee, has suggested that neurobiological research has heralded a fundamental shift in conceptualising child development away from "a simple nature-versus-nurture situation" and towards a "nature *and* nurture or nature *with* nurture" proposition (p. 199). As Catherwood (1999) explained a decade ago:

> This new understanding of brain growth provides for the first time an appreciation of how biology and the environmental content and context are inextricably linked in the very tissue of the developing brain. Many of the essential characteristics of children's learning can be more competently described from this frame of reference. (p. 31)

Neuroscientific knowledge, then, is now acknowledged to have wholistic implications for understanding development, as opposed to explaining the brain as a discreet organ. As the above quote illustrates, Gerhardt (2004, p. 305) saw one implication as being that "the baby and the care it receives make up an inseparable whole". Drawing on this knowledge base, Hugo Lagercrantz (2009), professor at the Karolinska Institute in Sweden, has refuted prior claims that infants do not have a consciousness. He has suggested that babies are not only self-aware, perceptive, emotionally competent and interactive, but they are able to retain memories, and capable of drawing on a variety of language forms in communication – both features of consciousness which were previously thought to be gained later in development. Viewed alongside Schore's (1994, 2001) insights about the encoding nature of the infant brain in the first year of life, these insights into infants' capabilities are seen to present new challenges to educationalists and to policy makers alike. For example, in a recent issue of the journal *Child Development*, Jack Shonkoff (2010), Chair of the American National Council on the Developing Child and renowned for his pioneering work in bringing neurobiological research into policy arenas, has suggested that policy makers need to consider ways that new information about the brain might be applied in addressing contemporary societal issues. Emphasising the recognised importance of (i) child-adult interactions; (ii) consistent and stable adult-child relationships; and (iii) the role played by young children in their own development, Shonkoff proposed a "biodevelopmental framework" (p. 358, reproduced below) that can be applied in seeking to untangle the origins of disparities in learning, behaviour and health status.



A biodevelopmental framework for understanding the origins of disparities in learning, behavior and health
(see also: http://developingchild.harvard.edu/topics/science_of_early_childhood/)

3.2 Translational research: Bringing "the brain" and "the social" together

Neurobiological research has traditionally taken place in the context of: laboratory experiments on rodents and primates; the separate study of genes and molecular genetics; and the study of visual or audio perceptions of human infants (Fox & Rutter, 2010). Only very recently has the brain *function* of living young children been accessible to researchers (Meltzoff, 2009) through such innovative research practices as: magnetic resonance imaging, or MRI (Inder, 2002); robotics (Meltzoff, Kuhl, Movellan & Sejnowski, 2009); or saliva tests (Sims, Guilfoyle & Parry, 2005). New technologies have enabled investigations of neural patterns of "synaptic 'blooming' or 'pruning'" (Fox & Rutter, 2010, p. 24), gland functioning, DNA processes (Meaney, 2010), and 'event-related potentials' (ERI) (deRegnier, 2005) to name a few. Other known routes to information about the brain functioning of humans remain unused due to the invasive nature of the methods required. These include investigations of hormones such as corticotropin through spinal fluid samples; and adrenocorticotropin via blood tests (Gunnar & Donzella, 2002).

With the developing ability to access brain functioning, it is now possible to study the active brain, and its neurobiological interconnectedness, through the lens of other disciplines (e.g., developmental psychology) and thus bring together insights from distinct disciplines to explain how experience (e.g., interactions with people and environments) and biology (e.g., synaptic activity in the brain) impact on each other (Stiles, 2009). In accordance with this approach, Meltzoff (2009) has advocated for 'translational studies' as the new science of learning. Translational studies are studies that involve the cross-fertilisation of discoveries in different disciplines like psychology, education, machine learning and neuroscience and "are leading to changes in educational theory and the design of learning environments" (Meltzoff et al., 2009, p. 288): What is now known, and what can be known, is informed by the complementary nature of each field.

Translational research reviewed by Meltzoff et al. (2009) suggests that optimum brain development is strongly connected to affective relationships and stable environments during infancy and toddlerhood, and to the "three social skills that are foundational to human development but rare in animals: imitation, shared attention and empathetic understanding" (p. 285). Thus, Meltzoff et al. identify the new question for future research as being about the role of "the social" in learning: "What makes social interaction such a catalyst for learning?" (p. 288). Fox, Leavitt and Nelson (2010) further suggest that it is in these connections between the brain and human experience that the greatest insights about human development are to be found, since "changes in the environment – particularly when they are dramatic and pervasive – may have the power to alter neural connectivity and cognitive processing between systems" (p. 34). Researchers therefore argue that bringing a variety of disciplines to bear on neurobiological research has the potential to "drive a new generation of early childhood policies and practices" (Shonkoff, 2010, p. 358).

Bell and Wolfe (2004) pointed out that evidence they reviewed indicated that the underlying neural mechanisms for cognitive and emotional processes might be the same, and thus suggested that in future we need to consider these two processes as intricately bound. For example, Bell and Wolfe reported that the attentional processes of one brain system, the anterior attention system (AAS), appear to regulate both cognitive and emotional processing. In particular one brain structure associated with the AAS, the anterior circulate cortex (ACC) has two separate sub-divisions: the cognitive subdivision is activated in tasks that involve "conflict between two forms of stored information" (p. 367), while the emotional subdivision is activated by affect-related tasks. They argued that "even during infancy, the Anterior Attention System may already begin to integrate thought and behaviour and exert control on emotional experience and expression" (p. 367) and that this has implications for emotional regulation, working and long-term memory, and temperament.

These findings point to the same conclusions reached by the National Council on the Developing Child at Harvard University (2004a; 2004b; 2005;2007; Center on the Developing Child Harvard University, 2010), which aims to bring "sound and accurate science to bear on public decision-making affecting the lives of young children" (see

www.developingchild.net). In a series of working papers published since 2004, The National Council on the Developing Child has presented evidence that "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" (2004a, p. 1).They also cite evidence that shows that "early experiences are built into our bodies" (Center on the Developing Child, 2010, p.1). Focusing on the link between emotion, the brain and the body, they noted:

> emotional development is actually built into the architecture of young children's brains in response to their individual personal experiences and the influences of the environments in which they live. In fact, emotion is a biologically based aspect of human functioning that is "wired" into multiple regions of the central nervous system that have a long history in the evolution of our species. (2004b, p. 2)

Bringing together the insights of the working papers in the publication *The science of early childhood development,* the National Council on the Developing Child (2007) further highlighted that the active ingredient in the interactive dynamic between genes and experience is "the 'serve and return' nature of children's engagement in relationships with their parents and other caregivers in their family or community" (p. 1).

3.2.1 Toxic stress as a risk factor in infancy

One cited effect on brain development has been the damage incurred to infant brain circuits and hormonal systems from excessive and prolonged exposure to high levels of "toxic stress" (National Scientific Council on the Developing Child, 2005, p. 1). Toxic stress refers to situations in which young children are exposed to stress over which they cannot exercise control, and where they have inadequate access to advocacy and support from an adult who can soothe them. Poor quality early care, either through insensitive parenting or in stressful education and care settings (such as inadequate attachment relationships with adults), is described by several authors as a key contributor to toxic stress (Roisman et al., 2009) with the National Scientific Council on the Developing Child noting that "the relationships children have with their caregivers play critical roles in regulating stress hormone production during the early years of life" (p. 3).

Stress is often assessed through measures of levels of cortisol, which is a hormone that helps the body to manage stress and can be measured through saliva swabs. Normally, basal (i.e., measured on awakening) cortisol levels are high in early morning and reduce over the day to reach a low level in the evening and in the early phase of sleep. As stress typically increases cortisol levels normal for the time of day, cortisol has often been described as a stress-sensitive hormone (Watamura, Donzella, Alwin & Gunnar, 2003). Occasional surges of cortisol throughout the day are known to be beneficial and are associated with exciting events, including displays of affection; but continuously elevated stress hormone levels in infancy are associated with permanent "negative" brain changes[5] that lead to elevated responses to stress throughout life, such as higher blood pressure and heart rate (Gunnar, Morison, Chisholm, & Schuder, 2001; National Scientific Council on the Developing Child, 2005). This response begins in the first months of life so that infants regularly exposed to stress demonstrate higher levels of cortisol secretions and more sustained elevations of cortisol in response to stressful situations.

As toxic stress has been identified to have a significant impact on brain areas such as the hippocampus (Bell & Wolfe, 2004) – which has an important role in long-term memory – and is able to be detected as early as three months of age (Gunnar & Donzella, 2002; Watamura et al., 2003), toxic stress has been identified as a risk factor in infancy. Watamura et al. have suggested that toxic stress can affect the immune system as well as emotional well-being, and Shonkoff (2010) added that cognitive functioning is significantly impaired when the individual is continually exposed to toxic stress. Reporting on data gathered as part of the longitudinal NICHD Study of Early Child Care and Youth Development, Roisman et al. (2009) found that both (a) higher levels of maternal insensitivity in early childhood, and (b) more time in childcare centres in the first years of life were uniquely (i.e., each, and separately but not interactively)

[5] Sometimes referred to as "the corrosive effect of cortisol".

related to lower base levels of cortisol at age 15 years. This finding is consistent with the so-called "attenuation hypothesis" which suggests that early interpersonal stressors ultimately result in the "downregulation of basal cortisol levels in later life" (p. 909).

Several studies have now been conducted to measure and understand the impact of stress during children's early years. Watamura et al.'s (2003) and Roisman et al.'s (2009) are relevant to this review because they are among the few that have investigated cortisol levels in saliva with under-two-year-olds.

Watamura et al's (2003) study involved 67 infants and toddlers across seven single-age classrooms (i.e., that separate infants and toddlers) in four full-day American child care centres. The centres were described as being of adequate to excellent quality on the ECERS scale (Harms & Clifford, 1980). Alongside saliva measures, teachers in the study completed an Infant Behaviour Questionnaire, and researchers (i) observed infants at two-minute intervals over any or all activities, and (ii) coded the children for signs of distress. For 36 of the 67 children, saliva measures taken at the childcare centre were compared with saliva measures taken in the home during the same period, thus allowing comparisons of cortisol levels across the two settings.

Watamura et al. (2003) reported four main findings:

1. Rising cortisol levels were evident over the course of the childcare day with toddlers showing higher increases of cortisol than infants
2. For the children for whom home data were present, the pattern of rising cortisol levels over the course of the day obtained from the childcare saliva samples was not evident in the home saliva samples, suggesting that the age-related cortisol increases were context sensitive
3. Within the toddler age-group, children who were more involved in peer play exhibited lower cortisol levels during play experiences than at other times of the day
4. Temperamentally "fearful" children had higher increases of cortisol levels over the course of the day than non-socially fearful children.

The results from Watamura et al's (2003) study were subsequently discussed in relation to other related studies and this reveals that the relationship between stress levels (as measured via saliva cortisol levels), age of child, childcare attendance and other factors such as temperament (particularly social fearfulness, or shyness), quality of childcare, and peer play is highly complex and not yet fully understood. For example, in relation to their first three findings, the authors noted that:

> The specificity of the rising pattern of cortisol to child care but not to home settings raises the issue of what it is about full-day child care that stimulates increases in cortisol for toddlers and to some extent for young preschoolers, but not necessarily for infants or older children. One problem in answering this question is that the nature of child care changes with age because of the differing developmental demands of each age group. Thus, infant rooms confront children with a different environment from toddler rooms, which in turn are different from preschool rooms. Even if adult-to-child ratios and daily schedules were the same in infant, toddler, and preschool child care, because the children are age grouped, the social context would be different. As noted, peer play is one of the factors that differs markedly between infant and toddler age groups. We observed very little peer play among children in the infant rooms, and a markedly higher amount of peer play in the toddler rooms. Examined for infants and toddlers combined, 76 percent of the variation in peer play could be explained by its linear association with age. Just being in a toddler classroom, however, did not ensure that children would play with other children. Within the toddler age period, older toddlers spent more time in play with peers than did younger toddlers. Furthermore, within the toddler setting, children who managed to spend more of their time in play with peers had lower midmorning and midafternoon cortisol concentrations, and those who engaged in more complex social play had lower midmorning cortisol

> concentrations. As most toddlers exhibit a rising pattern of cortisol across the child care day, it is reasonable to conclude that the context is challenging. It seems, however, that toddlers who are managing to play more frequently and more complexly with other children are physiologically less reactive to the context. (p. 1016)

Later, commenting on their fourth finding that teacher-rated temperamental fearfulness was significantly associated with higher cortisol levels over the child care day, the authors noted the need for caution in interpreting the finding because:

> Not only are [the findings] correlational, thus the direction of effect cannot be determined, but there are several studies in which shyness or social fear has failed to predict cortisol activity in young children (see Gunnar, 2001, for review). Thus, it will be important to replicate these results. (p. 1016)

Citing findings from a study of cortisol activity in a family-based childcare setting (Dettling, Parker, Lane, Sebanc & Gunnar, 2000) in which levels of cortisol had increased for half the children studied and decreased for the other half, Watamura et al. (2003) further noted that "more studies of different types of child care as well as of quality of child care settings are needed" (p. 1018) along with further consideration of the mediating impacts of temperament and age.

Roisman et al.'s (2009) study tackled some of the issues raised in Watamura et al.'s (2003) analysis. As noted earlier, Roisman et al.'s study drew on data gathered as part of the large NICHD Study of Early Child Care and Youth Development which prospectively tracked over 1,000 participants from age 1 month through to 15 years as part of a comprehensive multi-site study (see Chapter 2, section 2.1.5). Roisman et al.'s sample comprised 863 of the total 1,364 study participants for whom saliva samples were available from age one-month-old at regular intervals until the age of 3 years (14 in total) and then again at age fifteen years. At the time of gathering saliva samples, the children's caregivers were asked to concurrently record events, sleeping arrangements and medications taken. These samples were analysed together with videotaped interactions of the infants and mothers at age 5, 15, 24 and 36 months and 15 years; and temperament questionnaires were completed by the mothers of the infants at age 1 and 6 months. The study found lower levels of cortisol (measured on waking up in the morning) at age 15 years where subjects had experienced higher levels of maternal insensitivity *and* what they described as "high-quantity, low-quality centercare exposure" (p. 909) in the first three years of life. Although the magnitude of the predictive significance of the combination of insensitive parenting, and use of early childhood education on cortisol level at 15 years was small, the authors argued that this finding was robust and "neither sex nor difficult temperament conditioned [their] finding" (p. 916). From the point of view of this review, therefore, this finding is significant because it lends support to the attenuation hypothesis described above. In other words, low quality infant experience at home *and* in the early childhood education setting has far-reaching consequences for health, cognition, emotionality and associated disorders in adulthood (see also Shonkoff, 2010).

Further evidence of the connection between stress and later developmental functioning, comes from another recent American study which investigated the impact of pre-natal maternal stress on infants by taking saliva samples from 125 mothers and their full-term infants at 3, 9 and 12 months of age (Davis & Sandman, 2010). Their findings confirmed that maternal stress was related to stress in their infants suggesting that "while prenatal exposure to maternal stress and stress hormones predict development, significant associations do not emerge until 12 months of age" (p. 143). The researchers expressed their intention to follow these infants in subsequent studies to further elucidate the nature of the relationship between high levels of stress in infancy and later development.

Looking at stress in yet a different context, Gunnar and Donzella (2002) drew on three studies of infants in orphanage settings (Carlson & Earls, 1997; Gunnar et al., 2001; Kroupina, Gunnar & Johnson, 1997) to suggest that orphans living in institutional settings exhibited higher levels of cortisol than those who were adopted. Specifically, the "normal daytime rhythm" (Gunnar & Donzella, 2002, p. 214) conducive to lower stress was not evident in the orphanage as opposed to the home setting. A significant ameliorating factor, however, was tentatively suggested by Gunnar and

Donzella (2002) on the basis of early results of a study of foster care subsequently published by Dozier and Bick (2007). The latter found that cortisol levels were lower in children who were placed with foster parents who had received parenting training. Dozier and Bicks' study aimed to avoid putting the neurobiological systems of already at-risk or neglected children at further risk by training foster parents to 'read' and interpret children's cues (a skill essential for intersubjectivity, as highlighted in Chapter 4). They argued that by creating a predictable interpersonal world for the fostered children, it was possible to "enhance the probability that vulnerable infants grow into healthy, well-adjusted children" (p. 415).

A number of key messages can be drawn from these studies. Firstly, it is clear that toxic stress is a risk factor in infancy. Secondly, poor quality care either at home, or in early childhood settings, or in combination, is a key contributor to toxic stress with recent analysis indicating that the negative impact of poor quality care affects children of all temperamental styles and of either sex immediately as well as later in life. Thirdly, the studies indicate that more research is needed to elucidate the mediating impact of temperament, sex and age under conditions of toxic stress. Finally, it is also clear that sensitive and attuned relationships with responsive caregiving adults provide the best context for infants and toddlers to thrive.

3.2.2 Responsive caregiving: a buffer against stress and a way of wiring up the brain for learning

Reviewing developmental studies of cortisol and behaviour in human children during the first five years of life, Gunnar and Donzella (2002) emphasised the importance of variations in the quality of care to changes in cortisol level (stress responses). Gunnar and Donzella described quality of care as "a multi-faceted construct that includes the caregiver's availability, attention to the child, sensitivity to the child's needs, structuring of the environment, and responsiveness to the child's signals" (p. 208). They argued that sensitive, responsive caregiving appeared to allow children to experience and express distress in ways that elicited help without elevating cortisol levels, while children who lacked a history of responsive caregiving were unable to elicit this help and demonstrated elevated cortisol levels in stressful situations. They concluded:

> Under conditions of sensitive and responsive caregiving, the high cortisol responsivity of the newborn diminishes and it becomes difficult to provoke increases in cortisol to many stressors by the end of the first year of life. Presumably this…develops as children learn to expect that their attachment behaviours (e.g. proximity seeking) and distress reactions (e.g. crying) will elicit aid from caregivers. When cared for responsively and sensitively, children anticipate that adults will protect them and thus that they can cope with threat. (p. 215)

The buffering effect of responsive caregiving was also noticeable for children who were "temperamentally vulnerable, including children who tend to get easily angered and frustrated as well as those who tend to be fearful and anxious" (Gunnar & Donzella, 2002, p. 215).

In her review of neurobiological research at the beginning of this decade, psychoanalytic psychotherapist Sue Gerhardt (2004) reached the same conclusion. She further argued that when infants and their adult caregivers engage in joint activities that are joyously shared, infants release hormones that support the development of brain cells and neural pathways. Repeated exposure to such positive interactions lead young children to develop the ability to trust and commit to others, an insight Gerhardt used in sub-titling her book: "how affection shapes the human brain".

The following vignette taken from a report commissioned by the Canadian state of Ontario to review what was known about brain research and its implications for educational policy (McCain & Mustard, 1999) illustrates the type of positive interactions that infants and toddlers thrive on. The sensory input of the father, and his attention and responsive reading of the book, illustrate how multiple interpersonal connections can be established to stimulate the brain's neural pathways to be ready for literacy learning:

> A father is reading a storybook to his toddler daughter (18 months old), who is sitting in his lap. His arms are around her, holding up the book with large colorful pictures. He is reading the words and talking about animal pictures. He waits for his daughter to point out the animal's nose and eyes. Once more, the sensations of warmth, touch, smell, vision, sound and position are wiring and sculpting the toddler's brain. The cross-wiring of the sensory stimulation to the different parts of the brain is laying the basis for language and later literacy and other functions of the brain. (McCain & Mustard, p. 34)

It is important to note that what is being highlighted in this example is that the route to literacy is through responsive interactions *during* reading rather than the reading activity *per se*. As Shonkoff (2010) has argued, learning for infants and toddlers is not a case of a binary choice between cognition or emotionality; rather it is the result of both. He suggests that early childhood programmes need to strike a balance between cognition and emotionality, the clear implication being that placing significant attention on emotional and social development assists cognition.

3.2.3 Neurobiology, implicit memory and emotion regulation

The link between brain development and emotion regulation is a strong theme in neurobiological research reported in child development journals. Campos, Frankel & Camras (2004) suggested that emotional regulation is aligned to a two-step emotional and cognitive process characterised by i) a feeling and ii) a modulating response. Emotional regulation, according to Campos et al., is a culturally determined response that draws on the cues offered by significant adults to the infant. Where emotionally attuned interactions are not provided for infants, the ability to regulate emotions is impaired, negative patterns are internalised and the infant does not learn socially acceptable behaviours. This phenomenon, in turn, has a negative consequence on relationships which, as a result, further constrain the developing brain thus creating what Turp (2006) called "black holes" (p. 306) in the architecture of the brain that can last a lifetime. (See Chapter 4 for characteristics of teacher behaviour found to be positively associated with emotion regulation).

Focusing on the issue of how negative early experiences impact on the developing brain, Siegel and Hartzell's (2003) work draws attention to how implicit and explicit memories are encoded within the architecture of the brain. They argued that experiences lay down an implicit memory that can shape the child throughout life. Siegel and Hartzell define implicit memory as already present at birth (having encoded prenatal experiences *in utero*), and continuing throughout the lifespan:

> Implicit memory results in the creation of the particular circuits of the brain that are responsible for generating emotions, behavioral responses, perception, and probably the encoding of bodily sensations. (p. 22)

Siegel and Hartzell (2003) explained – as Gerhardt (2004) also did – that mental models are created when repeated experiences are generalised. Such models filter the way perceptions are channeled and help construct responses to the world. For example, if an infant's distress is responded to, he or she will generalise the presence of the adult as providing a sense of well-being and security. Siegel and Hartzell (2003) commented that the brain can encode implicit memory without consciously having to attend to the experience until: "by the second birthday, the further development of the prefrontal regions of the brain enables a sense of self and time to begin to develop, signaling the beginning of autobiographical memory" (p. 35) or explicit memory that is consciously recalled. In light of the impact of early experiences on implicit memory, Siegel and Hartzell emphasised the importance of ensuring that experiences in the first months of life are the most beneficial possible.

Contributing a further line of research that promises new insights about brain functioning, including in the area of memory and language development, is Meltzoff et al.'s (2009) focus on "perception-production brain systems for speech" (p. 287). Meltzoff et al. have suggested that magnetoencephalography (MEG) technology will soon enable the

investigation of the effects of social interaction and sensori-motor experiences on cortical[6] processing including in language learning. He plans to employ interactive humanoid robots to work with toddlers. These robots have the capacity to recognise both moods and activities and their use in researching toddlers' language has the potential to offer a further window of insight into this area of brain functioning.

3.3 Critical periods or windows of opportunity?

Given the accumulation of new knowledge about brain functioning, and the promise of more to come, it is perhaps not surprising that the under-two-year-old period is increasingly described as a critical and currently under-recognised period for learning and development. In yet another publication by the National Scientific Council on the Developing Child (2007), this phenomenon is described as "a succession of 'sensitive periods', each of which is associated with the formation of specific circuits that are associated with specific abilities" (p. 5).

Fox and Rutter (2010) prefer the metaphor of "windows of opportunity" rather than the term "critical periods" (p. 23). Similarly to The National Scientific Council on the Developing Child (2007), they suggest that there are periods in the early years that hold significant potential for learning and development (and, by implication, teaching). Others (see, for example, Keuroghlian & Knudsen, 2007 in their study of animals) purport that the plasticity of the brain suggests a capacity to adapt over a lifetime. Gunnar and Cheatham (2003), however, suggested that the extent of plasticity in the human brain is dependent on the level at which stress hormones function after toxic stress episodes are eliminated in the child's life – a phenomenon which is only beginning to be understood. They concluded that all that could be said at that point was that "the longer a child is neglected, the higher the degree of developmental delay" (Gunnar & Cheatham, p. 208).

Irrespective of whether damage is permanent or not, however, the consensus of recent neurobiological research appears to be that the developing brain is vulnerable to the effects of negative early childhood experiences. In other words, unresponsive, inconsistent and unstable relationships with adults coupled with repeated exposure to stressors appear to negatively affect brain development. On the other hand, responsive attuned caregiving facilitates both emotional and cognitive well-being, and thus learning.

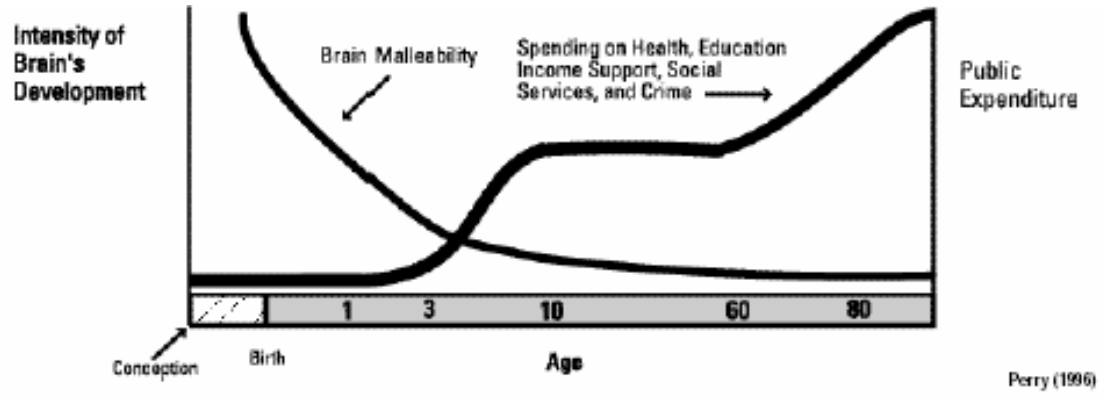
Commenting on the evaluation of new evidence on the importance of early experience for later development in a special edition of the journal *Child Development*, Fox et al. (2010) noted:

> To borrow an analogy from economics, by investing early and well in our children's development, we increase the rate of return later in life and in so doing improve not only the lives of individuals but of societies as well. (p. 36)

This echoes McCain and Mustard's (1999) argument presented to the Ontario government about the need to maximise 'brain power' potential through early investment in the human lifespan when the brain's development is most intense and malleable. The graphic representation of their argument, drawn by Perry (1996, cited in McCain and Mustard) is reproduced below.

[6] The cortex is a sheet of neural tissue that is responsible for integrating sensory impulses and higher cognitive functioning, including language, memory and attention.

BRAIN DEVELOPMENT – OPPORTUNITY AND INVESTMENT



Brain's Wiring and Development
Reproduced from McCain and Mustard, 1999, p. 108

3.4 Summary points

The purpose of this chapter has been to review recent additions to the scholarly base of child development that are relevant to answering the question of what quality early childhood education for under-two-year-olds should look like.

Taking on board the argument about the potential of translational research to inform and change "educational theory and the design of learning environments" (e.g., Meltzoff et al., 2009, p. 288; see also Cicchetti & Gunnar, 2009) this chapter concludes with a summary of key messages from the literature reviewed, and what these might suggest about what high quality early childhood education for under-twos should look like.

3.4.1 Key messages

1. New insights from neuroscience highlight that the brain is not a discreet cognitive organ; rather, brain development is strongly connected to affective relationships and other environmental conditions during the early years. Thus children's development is an interactive process involving "nature *and* nurture or nature *with* nurture" (Herrod, 2009, p. 199). In Gerhardt's (2004) words: "The baby and the care it receives is an inseparable whole" (p. 305).
2. Optimal brain development is strongly connected to sensitive responsive caregiving. A 'serve-and-return' dynamic in social interactions serves as a catalyst for learning (National Scientific Council for the Developing Child, 2005).
3. Sensitive responsive caregiving enables emotion regulation in infants and toddlers and wires up the brain for learning (Campos et al., 2004). Lack of attuned caregiving constrains the developing brain creating "black holes" (Turp, 2006, p. 306) in the architecture of the brain that can persist throughout a lifetime.
4. The underlying neural mechanisms for cognitive and emotional processes appear to be the same (Bell & Wolfe, 2004); this means that right from infancy, thought and behaviour are being integrated. Through implicit and explicit memory, mental models are built that act as filters for the way an infant perceives the world and responds to it.
5. Meltzoff et al. (2009) have suggested that the new question for future research is about the role of "the social" in learning, and the factors that make social interaction a strong catalyst for learning. The foundational mechanisms for this appear to be "the three social skills … [of] imitation, shared attention, and empathetic understanding" (p. 285).

6. Toxic stress is a risk factor in infancy and significantly impairs cognitive and emotional functioning as well as the immune system. Toxic stress occurs in situations where the child has no control over events and no access to support from an adult who can soothe them. Factors that produce toxic stress include low quality care, either at home or out of home, which prevents the development of a history of responsive attuned care.

3.4.2 What should high quality early childhood education for under-two-year-olds look like on the basis of these insights?

Based on the key messages in the literature reviewed in this chapter, two important implications arise about what high quality early childhood education for under-two-year-olds should look like.

1. Early childhood settings for under-two-year-olds should be places where children experience sensitive responsive caregiving that is attuned to their cues, including their temperamental and age characteristics. This style of caregiving should be marked by a 'serve-and-return' dynamic that allows reciprocity in interaction, and creates what is otherwise called intersubjective understanding. (See Chapter 4 for further elaboration).
2. Early childhood settings for under-two-year-olds should be low-stress environments that actively avoid toxic stress, or are able to buffer children against toxic stress "through supportive relationships that facilitate adaptive coping" (Shonkoff, 2010, p.359). Reviewed research implies that the best way of doing this is to have adults working with children who understand the impact of their actions on children's development and are trained to make that impact a positive one.

Shonkoff (2010) has argued that the path to these outcomes is "well marked – enhanced staff development, increased quality improvement, appropriate measures of accountability, and expanded funding to serve more children and families" (p. 362). He sees a second path as also essential: to encourage further experimentation, innovation and research which "positions current best practices as a promising starting point, not a final destination" (Shonkoff, p. 362). Shonkoff argues that both provision and research are necessary since there is much more yet to be discovered about the impact of experience on the developing brain but no time to waste in the life of an infant.

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Chapter 4: Quality Pedagogy for Under-two-year-olds: What is the consensus?

Abstract

In this chapter, literature on pedagogy within infant and toddler early childhood education and care is reviewed within the context of (i) recent research in child development; and (ii) research on contemporary practice in centre-based out-of-home early childhood provision overall.

The key argument from contemporary literature is that pedagogy with under-two-year-olds is specialised, and that responsive relationships are as central to pedagogy as they are essential for optimum learning and development.

This chapter reviews pedagogically-relevant literature about intersubjectivity and related concepts, including the idea that the teacher is an attachment figure and "*is* the curriculum" with children younger than two years old. The nature of desirable teacher practices with infants and toddlers, the role of infant-toddler exploration, enquiry, and play, and contextual factors known to impact on teachers' ability to demonstrate these practices are explored. The final part of the chapter summarises issues reviewed and lists enablers and barriers to high quality pedagogy.

Chapter 3 introduced the notion of intersubjectivity as a key characteristic of the responsive caregiving or a "serve-and-return" (National Scientific Council on the Developing Child, 2005) style of interacting implicated in optimum brain development. This concept pervades pedagogical literature published in the last decade; it takes centre-stage in much of the recent discussions about desirable practices in infant and toddler centres alongside the related constructs of attunement, sensitive responsiveness, interactional synchrony, and teacher presence. Edwards and Raikes (2002) and Johansson (2004) wrote of intersubjectivity as a relational 'dance' between adult and infant. In this dance the teacher takes on many roles: partner, attachment figure, observer, knowledge bearer, investigator, and mediator. Reciprocally, the child is seen as a partner who contributes and constructs knowledge and learning within a 'community of practice' approach (Rogoff, Turkanis & Bartlett, 2001; Wenger, 1999) that includes the caregiving adults, parents/whānau and community. The central argument from the contemporary literature base is that pedagogy for under-two-year-olds is specialised, focusing on specific relationships that are central to pedagogy and essential for optimum learning and development.

This chapter reviews pedagogically-relevant literature about intersubjectivity and related concepts, including the idea that the teacher is an attachment figure and "*is* the curriculum" with children younger than two years old. Literature is reviewed about the nature of desirable teacher practices with infants and toddlers, the role of infant-toddler exploration and enquiry, and play. Contextual factors known to impact on teachers' ability to demonstrate these practices are explored. The final part of the chapter summarises issues reviewed and raised for future consideration.

4.1 Defining pedagogy with infants and toddlers

The term *pedagogy* has only recently entered the discourse of early childhood education in New Zealand although its use in continental European scholarly discourses has a much longer history (Watkins & Mortimore, 1999). The New Zealand early childhood curriculum (Ministry of Education, 1996) – being inclusive of infants and toddlers – has been pivotal in shifting attitudes from a task-oriented view of practice towards what is now described as "pedagogy" (e.g., Rockel, 2009, p. 1). The introduction of a three-year early childhood teacher-education qualification in 1988[7] prompted teachers to theorise their practice with infants and toddlers and to start to see teaching and learning as a holistic endeavour that went beyond physical care.

[7] Prior to this a one-year qualification was offered for childcare in New Zealand.

Pedagogy has been variously described as both a science and an art, a combination of skills, knowledge, dispositions and associated strategies that reside in the domain of teacher practice, and can therefore be strategically employed to promote learning. As Loughran (2010) suggests:

> …pedagogy is concerned with the relationship between teaching and learning. Understanding this interplay between teaching and learning and learning and teaching is an important shift in focus from teaching alone because it really means that the two exist together. The fact that teaching influences learning, and learning influences teaching, and the way that is done, offers insights into the science of education. (p. 36)

4.1.1 Learning and care are interrelated: intersubjectivity in a community of learners

The specific nature of pedagogy for infants and toddlers can be challenging to define for both teachers and policy makers since the unique characteristics of infants and toddlers and their associated learning require adults to re-vision taken-for-granted notions about the division between learning and care derived from their own most recent life experiences.

The nature of learning for very young children is both corporeal and complex, combining care routines and everyday experiences as curriculum (Leavitt, 1994; Løkken, 2006; Sansom, 2007). Additionally, infants and toddlers communicate in multi-modal semiotic ways that require adults to learn to know the child and their particular communicative idiosyncrasies (Elliot, 2007). Ishiguro (2009), Løkken (2000), Nyland (2004) and White (2009) have all noted that responsive adults need to be sensitive to gesture and 'body' in order to make communicative interpretations; this supports well-established findings from now classic research on how children's language learning is enhanced by contingent responses by adults (e.g., Bates & Tomasello, 2001). In an evaluation of a new curriculum for babies and toddlers in South Australia, Winter (2003) reported that pedagogical strategies worked best when adults established a good relationship with the infant, toddler, and their family, based on ongoing interactions. Relationships enabled teachers to achieve an awareness of the impact of their own (teacher) practices on the learner. The curriculum document's title *"We can make a difference"* (Department of Education and Children's Services, 2005) clearly focuses on teachers examining their beliefs and the need to constantly review their practice. The draft Australian National Early Years Learning Framework (DEEWR, 2008) identified that teachers provide pedagogical leadership when they:

> … create a culture of consideration for the ethical implications of relationships and pedagogies … draw on a number of knowledge bases about children, learning and curriculum … [and] articulate their practice and its intentions clearly to children, families, colleagues, professionals in other disciplines, and the broader community. (p. 11)

A doctoral study within the New Zealand context likewise emphasises the importance of a culture of professional enquiry and self-review through exploring teachers' practical philosophy; Grey (in preparation) has found that self-review enhances a culture of ethical relationships within the centre that among other things enabled the teaching team to view children's competence more clearly.

That learning and care are interrelated and central to infant and toddler practices was a key point made by Smith et al. (2000) in a literature review report to the Ministry of Education a decade ago. Neurobiological research since then, discussed in the previous chapter, supports Smith et al.'s conclusion. The suggestion that there may be critical periods or significant windows of opportunity for brain development during birth to three years (see, for example, Fox, Leavitt & Nelson, 2010; National Scientific Council on the Developing Child, 2007; Shonkoff & Phillips, 2000; Shore, 1997; Siegel, 1999; Siegel & Hartzell, 2003) is now establishing a consensus in the literature that stable, responsive, caring relationships are central to the future well-being and development of very young children. This is true for infants and toddlers regardless of contexts: home or out-of-home (see Chapter 3).

Several writers (e.g., Bardige, 2006; David, Goouch, Powell & Abbott, 2003; Honig, 2002; Lancaster, 2002; Løkken, 2006; Nyland, 2004; Rockel, 2010; White, 2009) have argued that infant and toddler pedagogy holds a unique place in education and can therefore be viewed differently to teaching and learning with older preschoolers. Beyond the unique semiotic communication styles that justify this claim, researchers (e.g., Gonzalez-Mena & Widmeyer-Eyer, 2009) have noted that infant and toddler pedagogy is different to that with older preschoolers because of the increased physical caregiving demands that this age group places on teachers (Chapman, 2007; Fleer & Linke, 1999) and heightened levels of intimacy it entails (Dalli & Kibble, 2010; White, 2009). Beyond the demands of the everyday tasks involved in the physical care and the emotional nurturing of infants, researchers and scholars have argued that an 'ethic' of care (Dahlberg, Moss & Pence, 2007; Dalli, 2006; Rockel, 2010) shifts pedagogy away from a didactic stance towards activities and developmentally appropriate practice (Ministry of Education, 1993) to a dialogic emphasis that places the teacher at the centre of the curriculum. It is at the interface where teachers of infants and toddlers engage in intimate acts of intersubjectivity that high quality pedagogy with under-two-year-olds occurs (Elliot, 2007; White, 2009).

4.2 Key concepts about quality pedagogy with under-two-year-olds

As an experienced practitioner with infants and toddlers in several contexts in Turkey, North America, and Canada, Elliot (2007) conducted detailed interviews with seven practitioners in infant and toddler centres in Canada as part of her doctoral studies. She concluded that teaching under-two-year-olds involves highly specialised, skilled pedagogy which can be clustered under the central notion of intersubjective interactions. Elliot argued that the developmental concepts of emotional security, exploration and enquiry as learning and identity formation are linked to the establishment of intersubjective relationships and these can be more fully understood by drawing upon knowledge from a range of disciplines. This connects to the ideas about translational research reviewed in Chapter 3.

4.2.1 Intersubjectivity and related constructs

Johannson (2004) described intersubjectivity in early childhood education as:

> A pedagogical encounter with the child's life world… encountering the child's life world involves approaching and trying to understand the child's whole being. Bodily experiences and expressions, as well as ways of relating to others constitute the components of a child's very existence in the world, and are as such significant for learning. (Johannson, 2004, p. 11)

As a pedagogical strategy, intersubjectivity relies on a range of strategies implicated in interpersonal communication. Research in the last decade has used terms such as:

- joint attention (Liszkowski, Carpenter, & Tomasello, 2007; Wright, 2007)
- presence (Bagdi & Vacca, 2005; Goodfellow, 2002)
- intimacy (Gerhardt, 2004; Goodman, 2008; Vincze, 2007)
- attunement (Carpendale & Lewis, 2006; Guilar, 2006; Meltzoff & Moore, 1998; Parker Rees, 2007; Rolfe, Nyland & Morda, 2002; Rommetveit, 1998)
- interactional synchrony (Gonzalez-Mena & Widmeyer Eyer, 2009)
- ethical awareness (White & Nuttall, 2007)
- sensitivity (Thomason & La Paro, 2009)
- self awareness (Johansson, 2004)
- keen observation (Dalli, Kibble, Cairns-Cowan, Corrigan & McBride, 2009; Kingston & Wright, 2008; Lancaster, 2002; Moll & Tomasello, 2007; Ødegaard, 2007; Podmore, 2006; Rolfe et al., 2002; White, 2009).

Within studies using these constructs, researchers have identified that teacher interactions that achieve intersubjectivity are likely to occur within relationships that exhibit: emotional engagement; alertness; reflective presence; respect; engagement in critical reflection; and dialogue (Goodfellow, 2002; Macfarlane, Noble & Cartmel, 2004; Parker-Rees, 2007). Goodfellow's (2008) use of the term 'presence' captures the idea that teacher interactions are concerned with physical as well as emotional presence (or attunement), active listening processes, and an ability to orient oneself "towards the nature of the professional-child relationship and the child's experience rather than focusing on techniques and strategies" (p. 18).

Different theoretical perspectives have been used in research which has argued the importance of intersubjectivity, including attachment theory (Gevers Deynoot-Schaub & Riksen-Walraven, 2008); cultural psychology with its emphasis on communicative exchange, meaning-making, development and learning as active constructing within social practices (e.g., Hobson, 2002; Lemke, 2007; Rogoff, 2003; Stetsenko, 2004; Wright, 2003); critical feminist perspectives examining teachers' practice as 'emotional labour' (Goodfellow, 2008; Leavitt, 1994; Manning-Morton, 2006); recent phenomenological 'experiential' perspectives that emphasise presence, attunement and empathy with a child's life world within a democratic pedagogy that involves dialogue with children and adults (Eriksen Ødegaard, 2006; Langford, 2010; Løkken, 2000; Rinaldi, 2001, 2006; Stephenson, 2009); and the dialogic study of toddler assessment by White (2009) as already discussed.

A related concept is the idea of a 'pedagogy of listening' which has emerged from the Reggio Emilia approach to early childhood education (e.g., Rinaldi, 2001). In a culture of listening, the key idea is that children's views are respected. For example, Rinaldi (cited in Dahlberg & Moss, 2005) explained "listening" as "welcoming and being open to differences, as recognising the importance of the point of view and interpretation" (p. 99).

Within the New Zealand context, another important concept is expressed in the term 'ako' (Tamati, 2005) which places the teacher and learner in a reciprocal learning relationship. White (2009) has further described intersubjectivity as an aesthetic act that requires adults to "linger lovingly" with infants and toddlers so that they can be appreciated as unique personalities.

Several studies (Dalli & Kibble, 2010; Rockel, 2003; Shearsby & Thawley, 2002; Theilheimer, 2006) have argued that a primary caregiver system and high ratios provide the optimum conditions for intersubjectivity to occur since in such conditions the teacher is more likely to take the time needed to 'know' the young child better (and the child to know the teacher) in order to promote learning. Others have suggested that intersubjectivity evolves out of meaningful relationships that are achieved through sensitive and attuned practice over time (Chapman, 2007; O'Malley, 2008; Tardos, 2007; Walker, 2008; White, 2009). There is much overlap in these ideas, despite the diverse theoretical influences. In all cases, intersubjectivity is overwhelmingly posited as a central tenet of quality pedagogy.

4.2.2 Infants and toddlers as active social partners: interactional synchrony in learning encounters

Research findings over several decades have supported an understanding of infants and toddlers as active and sophisticated participants in the social processes of learning and development, actively seeking emotionally satisfying and engaging relationships (Bremner & Fogel, 2004; Kaye, 1982; Mahler, Pine & Bergman, 1975; Stern, 1985). Current developmental research continues to provide empirical evidence demonstrating infants' and toddlers' propensity, desire, and ability to engage in satisfying communication and involvement with others. Cumulatively the research findings support the socio-cultural thesis that learning and development is a social practice (Fleer, 2010; Rogoff, 2003; Vygotsky, 1998; White, 2009), and that infants and toddlers therefore require a rich social environment (Tomasello, Savage-Rumbaugh & Kruger, 1993) that enables them to participate in an ongoing reciprocal engagement (Bennett, 2008; Trevarthen, 1998). The establishment of joint attention has been found to be implicated in the development of a range of human cognitive and social abilities including increases in communication and language (Liszkowski et al.,

2007; Moll & Tomasello, 2007), cooperative activity (Warneken, Chen & Tomasello, 2006); and imitation (Tomasello et al., 1993).

In an attempt to understand more clearly the verbal and non-verbal interactions that take place between infants and adults, Jaffe, Beebe, Feldstein, Crown and Jasnow (2001) undertook a microanalysis of social interactions between four-month-old infants and their caregivers. The researchers wanted to measure the synchronicity, linkage and coordination of their interactions, which they described as in their monograph title as "rhythms of dialogue". The cognitive development and security of attachments of these infants were then tested at age 12 months. The results of their study showed a correlation between the nature of early interaction and subsequent cognition and attachment relationships. As Warner (2002) suggested, this finding is significant because it demonstrates that attuned interactions can indeed enhance learning potential from a very early age.

The link between positive caregiving and learning was evidenced in another study by Jaffee (2007), this time involving 1,720 three- to twenty-four-month-old at-risk infants who had been removed from their biological families because of extreme dysfunction. Following placement in new caregiving relationships, with selected and trained caregivers, Jaffee reported that higher language scores were recorded when the amount of cognitive stimulation increased; for those children for whom the amount of cognitive stimulation did not increase, lower than expected scores were reported.[8] Jaffee argued that since child characteristics were not found to contribute to the nature of interactions they experienced, these findings are significant for caregiving practice. They suggest that it is the caregiving environment, and the nature of interactions that take place within it, that has the potential to improve or limit learning.

The idea that pedagogic practice exists in "a social world where individuals meet in interaction" (Bengtsson, 2002, cited in Johansson, 2004, p. 230) brings in the notion that pedagogy is a learning encounter that teachers create. In this view 'curriculum' is enacted in the space of children's embodied, everyday experiences, which occur in close relation and interrelation with others. Here ideas about intersubjectivity merge with the phenomenological notion of a person's 'lifeworld' being constituted by experience in the world. This makes learning the outcome of the experience of mutual engagement with the same object of attention. These new understandings of pedagogy offer a useful contrast to more traditional views of learning that are frequently based on developmental and maturational perspectives.

4.2.3 Secure, responsive relationships: the teacher as attachment figure

The establishment of consistent, secure, responsive and reciprocal relationships between infants, toddlers and their teachers is a strong theme in pedagogical literature about working with infants and toddlers (e.g., Gallagher & Mayer, 2008; Gevers Deynoot-Schaub & Riksen-Walraven, 2008; Honig, 2002; Klein & Feldman, 2007; Lee, 2006; Manning-Morton, 2006; Parker-Rees, 2007; Tardos, 2007). In their investigations of secure relationships, most researchers have traditionally drawn on attachment theory with other perspectives, like phenomenology, sometimes invoked as a way of looking more intently at individual children's lived experience, or lifeworld, within the group culture of an early childhood service (e.g., Dalli, 1999; Erikson Ødegaard, 2006; White, 2009). These authors identified that recognising that the very young child has preferences for whom to be with is central to shared meaning-making between teachers and infants or toddlers.

Definitions of attachment emphasise that it is an emotional bond that develops over time, and distinct from the notion of an instantaneous biologically-based process that is hypothesised to occur in mothers shortly after birth, during a hypothesised *maternal sensitive period* (Sluckin, Herbert and Sluckin, 1983). By contrast to the term 'bonding' which is defined mainly as something that happens in adults (Schaffer, 1994), attachment is defined as the gradual growth of a feeling of mutual love and emotional dependency between caregiver and child (Ainsworth & Bowlby, 1991). While earlier attachment research implied there was a need for a substitute maternal figure within an exclusive caregiver

[8] Other early intervention studies reviewed in Chapter 5 report similar findings.

relationship in an early childhood service, more recent interpretations incorporate culturally bound practices that are inclusive of intimate, continuous and supportive relationships with others in the context of group care (O'Malley, 2008; Rogoff, 2003; Walker, 2008). Despite challenges over the last couple of decades from various theoretical and cultural positions that argue, for example, that attachment theory serves to perpetuate societal expectations of motherhood (e.g., Burman, 1994; Eyer, 1992; McCartney & Phillips, 1988; Singer, 1992) without acknowledging support for parenting from others in the community (e.g., Rockel, 2010; Sims, 2009), it is clearly evident that attachment theory maintains a legitimate place in research on development and learning for under-two-year-olds, particularly its notion that children use sensitive responsive adults as "a secure base from which to explore the world and as a haven for safety" (Ainsworth & Bowlby, 1991, p. 337). This place has been recently strengthened by the conclusions of two key meta-analyses (Ahnert, Pinquart, & Lamb, 2006; De Wolff & van IJzendoorn, 1997), which, having reviewed the findings of 40 and 66 investigations respectively, have confirmed that secure caregiver-child attachments are promoted by regular interactions with sensitive and responsive caregivers.

hnert et al's (2006) meta-analysis is also relevant to this study because its results clarify some of the conditions which facilitate attachment relationships between adults and infants and toddlers in out-of-home childcare settings, such as group size, adult:child ratio, and caregiver sensitivity. In other words, where children are in small groups, or where adult:child ratios are favourable, sensitive caregivers are able to monitor children's emotional needs and respond more readily than in larger group settings or where ratios of staff-to-children are less favourable. Also, within the studies included in the meta-analysis, secure attachments between children and caregivers in home-based early childhood settings were predicted by the same factors as secure attachments between children and home adults, that is, by the adult's responsiveness in a one-on-one context. In centre-based early childhood settings, on the other hand, the meta-analyses showed that the children's relationships with the caregivers "were predominantly associated with measures of the care providers' behaviour towards the group as a whole" (p. 673). Noting that infant-caregiver attachments in home-based early childhood settings had been shown to improve by caregiver participation in training programmes, but that no equivalent training had been identified for caregivers working in centre-based early childhood settings, Ahnert et al. suggested that research was needed that focused on the relationship between caregiver sensitivity and group dynamics.

A more recent study underpinned by an attachment theory perspective is also useful in further elucidating the dynamics involved in interactions between infants and toddlers and their caregivers in group-based early childhood settings. Conducted in the Netherlands by Gevers Deynoot-Schaub and Riksen-Walraven (2008), the study involved an analysis of the quality of interactions between 70 children, their childcare caregivers and three peers during structured play in their childcare centre at age 15 months and 23 months, and between the children and their primary caregiving parent at home. The key findings included that the quality of interaction with the centre caregivers at age 15 months, judged in terms of caregivers' supportive presence, and respect for the children's autonomy, was significantly poorer than that between the children and their parents. However, by 23 months this finding had changed so that the quality of caregiver-child interaction was no longer poorer and in some respects was better than that between parents and children. These findings applied even when children's caregivers had changed over the intervening period of the two observations, so that they could not be explained as a function of the caregivers becoming more familiar with the children. Additionally, at both age points, the children were observed to express more negativity towards their parents at home than towards their caregivers at the centre. These unexpected findings prompted the authors to suggest that, firstly it may be easier for caregivers to establish and maintain intersubjective relationships with older children, and secondly that since the second year of life is one of overall rapid development, it could be that the children became more oriented towards their peers, and hence less dependent on the adults around them, making them easier to manage in a group setting.

Gevers Deynoot-Schaub and Riksen-Walraven's (2008) finding of more negativity at home (replicating findings in earlier studies cited by the authors) led them to suggest further research into the differences between age groups. Since

the children had been observed at home on days when they had not attended their childcare setting, an earlier hypothesis that home was the place for which children "saved" (p. 187) any distress "for expression with their primary attachment figures" (p. 187) could not be supported. From a pedagogical perspective the authors noted that the high level of teacher supportive presence that they had observed with 58 percent of the very youngest children indicated that very high quality care for young children is possible. However, the fact that 42 percent of 15-month olds received inadequate caregiver support also led them to question whether group care, *under the conditions they observed*, was the most appropriate for very young children. This question was especially significant for those of a difficult temperament which other studies had already established as being more at risk of lower quality care than peers with an 'easier' temperament (De Schipper, Tavecchio, Van Ijzendoorn, & Van Zeijl, 2004). The authors suggested two options for how the care of very young Dutch children in group situations could be improved: (i) decreasing the number of children per caregiver down to the 3 children per 1 adult ratio recommended by De Schipper, Riksen-Walraven and Geurts (2006) in their experimental study within the same Dutch context; and (ii) improving caregiver education so that it went beyond the current norms of secondary vocational training level that did not specifically prepare trainees for work with very young children.

4.2.4 Attachment relationships as curriculum

Research from an attachment theory perspective emphasises the notion of relationships-as-curriculum. Translating research into implications for practice, Honig (2002), for example, argued that "building secure attachments can be considered a prime goal in early childhood education" (p. xi) because secure attachments have been found to be related to long-term emotional well-being, social competence, and emotional regulation. Conversely, poor attachments have a long-term negative impact on learning and development as well as on emotional regulation (see also Gloeckler, 2006).

Lee's (2006) qualitative study of the relationship-building process for three infant-teacher dyads in a university-affiliated early childhood education setting in New York City, provides further evidence of the need to promote caregiving adults' understanding of the importance of attachment relationships with infants and toddlers. Using observations, video recordings, and interviews with teachers, Lee collected rich descriptions of various phases of the relationship development process between the teachers and infants in naturalistic settings. Lee's analysis revealed that interactive and relationship-oriented behaviours occurred during the consolidated relationship phase and included: following the child's point (or focus) of attention; use of sensitive judgments about involvement; emotional connection and investment in the relationship; and mutual enjoyment and delight. Lee concluded that early childhood education professional preparation programmes should promote the study of relationships and emotions and "develop practicum courses that make theory and practice come together" (p. 148).

Within the New Zealand context, the value of responsive attachment relationships as the basis for infant and toddler pedagogy was explored in at least three recent projects funded within the Centres of Innovation (COI) action research programme. For example, Bary et al. (2008) used a case study approach to show how the centre developed an Attachment Based Learning (ABL) programme for infants and toddlers which enabled better relationships between teachers, children and families. Similarly, the A'oga Fa'a Samoa COI, examined how the 'key teacher system' through which children remained with the same teacher throughout their time at the early childhood centre, worked in relation to the centre's focus on enhancing the use of Samoan language, the children's identity within the programme, and particularly to ease the transition to school (Podmore, with Wendt Samu & the A'oga Fa'a Samoa, 2006). In the Childspace Ngaio Infant and Toddler Centre COI, the teachers' focus on peaceful-caregiving – as curriculum (Dalli et al., 2009) highlighted the centrality of the teachers' sensitive attunement to children's cues, as primary caregivers, in creating peaceful and responsive relationships with children and their parents. In all three studies, the presence and actions of sensitive, attuned adults was the result of planned actions on the part of teachers working within an action research model: Their results demonstrate the practical significance of adopting attachment theory concepts in daily practice, and the importance of reflective action in implementing innovative pedagogy.

4.2.5 Sensitive responsiveness, joint attention and engagement

Working within a more overtly socio-cultural theoretical framework, but with concepts that also derive in part from attachment theory, Smith (1999) argued that the building of close and nurturing relationships, shared meanings and experiences during joint attention sequences are pre-requisites for the establishment of intersubjectivity, or a meeting of minds. Similarly, Gallagher and Mayer (2008) have suggested that pedagogical interactions with infants and toddlers need to be gentle, responsive and individualised, involving sensitive and timely adjustments, as well as responses that are contingent on children's verbal and non-verbal cues, temperament, cultural background, interests and current 'zone of proximal development' – Vygotsky's (1998) famous *ZPD*. Adult positive affect, communicated for example via body language and tone of voice, are also understood to play an important role in establishing intersubjectivity and secure relationships.

Australian Berenice Nyland (2004) likewise emphasised that joint attention episodes are a key 'state', or learning format, for young children and play a significant role in early language development, including the acquisition of both lexical and conversational skills. This view is also promoted in Tomasello's influential research in which he and his colleagues continue to demonstrate the ways very young children learn in concert with others (Bates & Tomasello, 2001; Call & Tomasello, 1999; Hare, Call, & Tomasello, 2006; Moll & Tomasello, 2007; Tomasello, 1997, 2001; Tomasello, Akhtar, Dodsen, & Rekau, 1997; Tomasello, Carpenter, & Liszkowski, 2007; Tomasello et al., 1993). Tomasello's studies provide compelling evidence of infants' propensity for sophisticated, engaged and satisfying communication. In one investigation of infant pointing, Tomasello et al. (2007) highlighted the fact that:

> …when an adult reacted uninterestedly, infants ceased pointing for him. Our interpretation is that infants understood E's [the experimenters] attitude about the reference is different from their own, that is, as not wanting to share their interest in the referent. (p. 19)

These findings establish that adults' sensitive engagement has clear significance for infants and toddlers, as they seek to share commonality but also to establish and maintain the fact that their interests are sometimes different to those of their adult caregivers (see also Stephenson, 2009; White, 2009). Based on their findings Tomasello and his colleagues have suggested that extended periods of joint attention where adults focus on non-verbal (e.g., pointing), as well as verbal communication with infants during routines, are likely to promote earlier language development and greater social as well as cognitive interest. Additionally, joint attention was found to be more successful when it was motivated by a child's point of interest rather than the teachers' (Liszkowski et al., 2007). This suggested that infants' intentional communication already resembled adult dialogue and therefore comprised a "full communicative act" (p. 19; see also Southgate et al., 2007).

4.2.6 Interactions as meetings of body and mind

The recognition from neurobiological research (see Chapter 3) of the interrelated nature of the brain and the body, as well as the importance of a social partner, is increasingly leading researchers (Lagercrantz, 1997; Løkken, 2000; Meltzoff, Kuhl, Movellan & Sejnowski, 2009; White, 2009) to focus on children's learning with their body as an existentialist phenomenon of synchronicity. For example, in White's study, the innovative use of a video camera incorporated into a hat worn by a toddler vividly showed how the toddler's experience at an early childhood centre involved constant movement with her whole body in space, and a constant seeking out of social partners. This point is also highlighted in Løkken's (2000) careful observations of toddlers in Norwegian early childhood education settings. As Løkken (2006) put it, for the very young child, the modus operandi *is* the body. White (2009) points out that it is imperative that the teacher interprets such acts and responds in the most appropriate manner.

Focusing in a different way on very young children's physicality as an integral part of teachers' interactions with very young children, Manning-Morton (2006) drew on neurological research that supports the idea of "physical care as a key aspect of professional practice" (p. 45). She noted that for participants in a process-oriented professional development

project based in London, called 'Key Times', "the manner in which babies and young children are held and touched is internalised and becomes part of their sense of self" (p. 45). Manning-Morton (2006) argued for the theoretical bringing together of mind, body and emotion as an integration of the human organism and suggested that the theoretical 'boundary-crossing' currently happening among disciplines such as neuroscience, psychoanalysis and developmental psychology (or translational research, to use Cicchetti and Gunnar's (2009) term) may offer a more useful professional knowledge base for future early childhood practitioners since neither the mind nor the body, nor cognition and emotion, are discreet parts of the human learner. Manning-Morton's reflections call for an awareness that pedagogy with infants and toddlers is not just about a 'meeting of minds' but a meeting of bodies *and* minds.

Australian Joy Goodfellow (2008) also noted the particular characteristics of effective pedagogy with infants and toddlers as involving subtle and sophisticated strategies, including emotional labour. She argued that more detailed work was needed with video and text that can be viewed and re-viewed in order to illuminate its complexity and the sophisticated teaching role that effective work with infants and toddlers entails.

4.2.7 Infant-toddler agency: exploration, enquiry and play

Research from within a socio-cultural research framework emphasises the notion of infant-toddler agency. This refers to the ability of the young child to exercise effect on the world through the expression of mind and body in reciprocal acts; agency makes intersubjectivity possible (e.g., Eriksen Ødegaard, 2006; White, 2009). Agency is displayed by infants and toddlers when they use gesture and voice to communicate with others in the knowledge that they can have an impact on their environment and other people, and vice versa. In the context of the New Zealand curriculum, pedagogy that promotes agency is considered consistent with socio-cultural notions of teaching and learning that are based on reciprocity and relationship (Rockel, 2010).

The physical movement that allows an infant to explore can be understood as an unfolding process for gross motor development (e.g., Resources for Infant Educarers, 2006) that then becomes a catalyst for learning through exploration in a holistic sense. Rockel (2010) illustrates the mutuality of such an experience for teacher and infant in the context of an early childhood setting in New Zealand:

> Jenny lay on her back using her legs, toes, fingers and arms – the whole concentration of her body on the purpose of manipulating a large ball. She glanced across to show me her satisfaction and pleasure in doing this. I returned her smile with a smile and a nod acknowledging that I recognised her endeavours but not distracting her from her own goals [Teacher's diary]. (p. 101)

Infants use their agency to explore with their body in order to further their learning. Rockel (2010) states that infants "use all resources at their command: nuances of sound, volume and pitch; ranging from the subtlest of expressions to the dramatic expression involving the whole body of waving arms and legs or arching the back" (p. 101). The responsiveness to such communication signals indicates how the teacher and child can move forward in their understanding of one another.

Pikler's ideas published in the English translation (Pikler, 1994, cited in RIE, 2006) support this claim, suggesting that through free movement an infant is learning *how* to learn:

> While learning during motor development to turn on the belly, to roll, creep, sit, stand and walk, he is not only learning those movements, but also how to learn. He learns to do something on his own, to be interested, to try out, to experiment. He learns to overcome difficulties. He comes to know the joy and satisfaction which is derived from this success, the result of his patience and persistence. (p. xxiv)

Seen in this light, as Piaget (1950) also argued, infants have an immediate capacity to learn, and a teacher's pedagogical task is to understand what this learning involves and respond accordingly. The interactive connection between brain and movement has been confirmed by neurobiological studies (e.g., Thelen & Smith, 1996) creating the need for

pedagogical practice to recognise it also and incorporate the insight in practice (Gonzalez-Mena & Widmeyer Eyer, 2009).

A study which explored the interactive influence between brain and movement involved a comparison between the interactions of 18 12-month-old children with a human adult, and those of three young chimpanzees, across four cooperative activities, problem solving and social games (Warneken et al., 2006). A key component of the experiment was adult withdrawal from interaction at a given point. All children sought at least once, with a "communicative attempt" (p. 640) to re-engage the adult at each withdrawal. The researchers suggested that this could be interpreted as children attempting to "reinstate a shared goal" (p. 640). By comparison, the chimpanzees made no attempts, ever, to re-engage the adult, leading to the interpretation that "these results are … evidence for a uniquely human form of cooperative activity involving shared intentionality that emerges in the second year of life" (p. 640).

The researchers suggested that this type of cooperative activity is what enables both cultural transmission and cultural creation: "the achievement of results in interaction with others that could not be achieved alone" (p. 661). The findings of this study point to 'uniquely human' possibilities and developments that arise out of young children's intersubjective drive to seek out expert partners for cooperative social activity. As Warneken et al. (2006) further noted, the interconnection with shared intentionality also assists the developing linguistic expertise:

> … cooperative interactions with shared intentionality require the formation of a joint goal: both participants are aimed at the goal and they also want the other to be aimed at the goal along with them. They also require the forming of joint intentions, at some point translated into coordinated action, to achieve the goal. (pp. 660–661)

These findings are pertinent to this review especially in light of Nyland's (2004) evidence in an Australian study that teachers seldom recognised the communicative agency of very young children and, as a result, underestimated their potential for learning. Nyland argued that the teachers were influenced by views of the infant as needy, instead of seeing them as protagonists in their own development. Similarly, White (2009) discovered that in a New Zealand education and care context the teacher had limiting views of the toddler, and privileged verbal language over the range of body movements and gestures that a toddler deployed for intersubjective purposes. When these acts were subsequently discussed with the toddler's teacher, greater understanding and appreciation of the toddler ensued. This, in turn, influenced the nature of the curriculum offered at the centre so that instead of promoting 'activities' that were typically suited to older children, the teacher started to recognise the significance of free-form movements, intimate overtures and carnivalesque acts[9] for learning (see also the work of Brennan, 2005). Furthermore, the teacher realised the importance of dialogue with parents and toddlers themselves in planning a curriculum that would facilitate exploration. By appreciating more, the teacher was then able to expect more. In this way, the efforts of the teachers were rewarded through the development of more meaningful encounters with agentic toddlers.

The agentic body: infants' and toddlers' physicality

The importance of working with the 'agentic body' as central to pedagogy has been argued also in New Zealand by Sansom (2007). Introducing the notion of the body as curriculum, she draws attention to the need that teachers acquire the sensitivity to recognise agency in a child's physicality. Using Pinar's (2004) notion of *currere*[10] to signify that curriculum is a living, breathing curriculum of humanity, Sansom argued that a different perception of curriculum can be provided by addressing what it means to include the whole self (the body and mind) and, in so doing, re-conceptualise a pedagogy of the body. Through this reconceptualisation there is the possibility of recovering the myriad ways in which young children learn and are present in the world. This would also reflect the underlying principles of

[9] Carnivalesque acts are those that represent resistance to authority and characterise a great deal of the experience of toddlers in education and care settings according to White (2009). They are important to learning because they provide a sophisticated means of expressing irony, satire and humour around imposed events, or situations that are often outside of the toddler's control.

[10] *Currere* is the Latin infinitive verb from which the word curriculum derives; currere means to run a course (as in a race).

holistic development (*kotahitanga*) and empowerment (*whakamana*) found in the preliminary intentions of New Zealand's early childhood curriculum *Te Whāriki* (Ministry of Education, 1996). Sansom argued that when *currere* is adopted as an understanding in curriculum it enables teachers to pay attention to the young child's holistic presence for the purpose of becoming more attentive to their everyday experiences. By being attentive to children's bodily perspective, teachers can recognise children as "corporeal, intentional, active, feeling, reflective" beings (Leavitt & Power, 1997, p. 71), thereby validating and empowering the body and the child. This is a new area of research area in which there is a growing focus on movement and gesture in infant and toddler experience (Capone & McGregor, 2005; Carpenter, Nagell, & Tomasello, 1998; Crais, Watson, & Baranek, 2009; Gillen, 2000; Hoiting, 2007; Kendon, 2004; McNeill, 2005; Roth, 2001; Southgate, van Maanen, & Csibra, 2007; White, 2009; Winter, 2004).

4.2.8 Pedagogy and play

Research on play is beginning to discover infants and toddlers as fascinating subjects. For example, Kowalski, Wyver, Masselos and De Lacey (2004) investigated pretend/symbolic play across 12 early childhood centres in Sydney. Starting with the hypothesis that this type of play is beneficial for cognitive development, a key finding from their study was that, for toddlers, symbolic play occurred more frequently and at more complex levels in mixed age settings. Furthermore, the provision of play materials was found to assist repetition and increase symbolic play.

Using a completely different approach of studying in-depth, an 18 month-old toddler's "play" activity in a group-based early childhood setting, White (2009) found that the toddler's symbolic play was based on careful observation of older peers/adults and their engagement with everyday objects. Such play was then artfully employed as an intersubjective strategy to facilitate communication with adults, rather than as a lone cognitive act. White therefore argued that it is often in *not* knowing – and instead trying to aesthetically understand, in dialogue with toddlers and their families – that the greatest insights about toddlers' learning in play are discovered.

In a separate study of play and learning for under-three-year-olds conducted as part of an international study of play, White, Ellis, Stover, Rockel and Toso (2009), invited parents and teachers to discuss their interpretations of video-ed play experiences of six 15 to 22-month-old toddlers in a range of New Zealand early childhood education contexts, including a Samoan language nest and Māori immersion settings. The video data showed toddler play to be characterised by engagement with artefacts, activities and the environment, as well as observations of adults and peers followed (or preceded) by mimicking and repetition, and movement across space. Discussing their role in the toddlers' play, teachers described it as facilitative, as providing resources and interactions that responded to their understandings of the toddlers' interest and engagement with "people, places and things". At times, the teachers chose not to intervene in play situations in the belief that the toddlers were exploring independently, thus trusting the toddlers to be agents of their own learning, with sensitive support that included passive engagement and observation as well as active intervention, modeling and scaffolding. The authors concluded that regardless of the pedagogical strategy employed, both the teachers and the toddlers displayed an intentionality that afforded a high degree of agency to the toddler. This finding suggests that pedagogy of this nature involves a repertoire of approaches rather than a specific technique, and that teachers need to select appropriate pedagogical strategies according to their intimate knowledge of the learner (Stover, White, Rockel, & Toso, in press).

These New Zealand findings contrast markedly with those reported about the play activities of toddlers by teachers and parents in countries such as Australia and America who participated in the play study (Fleer & Pramling-Samuelsson, 2009). In these contexts, pedagogical strategies during play encounters with toddlers emphasised provocation and the strategic promotion of scientific concepts. Pedagogical strategies were therefore more directive and focused, based on teacher observations of children at play and aligned to traditional theories rather than the socio-cultural orientations evident in the New Zealand practice. It is interesting to note that the country most closely aligned to New Zealand

pedagogy, Sweden, shares with New Zealand a national curriculum framework based on similar values (albeit using a terminology of democratic outcomes for children in Swedish society).

Peer play as a pedagogical encounter

Løkken (2006) has described the playful style of toddlers as joyful and corporeal and beyond the grasp of teacher knowing but instead, located in the peer culture. Taking a slightly different angle but also referring to the fact that play is often seen as outside of the teacher's pedagogical domain, Wood (2007) has commented that play is often "marginalized in pedagogical discussions with adult-directed activity taking precedence" (p. 307). However, as White (2009) has argued, infant and toddler play does represent another intersubjective encounter where the teacher's contribution is essential since under-two-year-olds require support to learn specific genres of play in a group setting (White, 2009).

Similar arguments were made by Fabes, Hanish and Martin (2003) who investigated the effects of peers on childcare adjustment. However, having explored peer conflict between peers in infancy and toddler age through recording uninterrupted activity and exploration with peers across the 8 to 22 month age range, Licht, Simoni and Perrig-Chiello's (2008) demonstrated that conflict between peers was consistently motivated by the need to explore, not possess. They found that conflict was only evident when activities were interrupted and exploration thwarted. These findings put a different light on earlier investigations of toddler conflict which tended to suggest that negative physical encounter is inevitable for children of this age group.

Despite the prevalence of peer activity in early childhood education contexts, there are few investigations of the pedagogical role of the teacher in this area of under-two-year-olds' intersubjective experience. The work of Løkken and others (e.g., Dalli, 1999), however, suggests that further investigation is warranted since it is evident that there is much yet to understand about infants' and toddlers' learning in these group contexts. This is clearly exemplified by the findings of the COI study at Greerton Infant Toddler Centre (Greerton Early Childhood Centre, 2010; Sands & Lichtwark, 2007) which had children's questions at the heart of the investigation. This study included the notion of teaching children to ask questions in relation to domains of knowledge. The teachers focused on children's indications of "question asking" and "question exploring" by generating working theories about the body and sign languages that the pre-verbal infants and toddlers used to express their curiosity and their developing understandings about the world. Teachers reported that as a result of their investigation they were able to develop a clearer consensus about the nature of pedagogy offered to infants and toddlers (Sands & Lichtwark, 2007). They noted:

> Infant and toddler settings must be places of intrigue, places of high expectation where there is a willingness to get involved in deep investigations, where children and teachers drive the learning as passionate learners finding out together. (p.7)

These findings are also in tune with those reported by Parker-Rees (2007) in his literature review of the role of imitation in the early stages of social interaction. Parker-Rees explained that babies are social well before they are able to construct an identity of their own and obtain valuable information about the culture from the difference between what they do and how familiar adults respond. He argued that adults act as social mirrors, and that children adapt as part of a creative process; he expressed concern that understandings of pedagogy remain dominated by a rather narrow, systemiSing approach to the profiling of individual intellectual abilities. According to Parker-Rees, this limits the extent to which enjoyable, ongoing interactions and relationships can develop in "busy" early childhood education settings. He lists a number of suggestions about how teachers can be supported in their awareness and understanding of babies' propensity for "full-on" creative engagement with others.

4.2.9 Centre-home partnerships: minimising discontinuities

Taking a different tack to arguing that children are competent active agents of their own development, Raban (2001) argued for a curriculum that is informed by strong family and community partnerships. She challenged the view of 'readiness' or needing to wait for children to show an interest in, for example, literacy, numeracy, or musical activity before introducing them to these culturally-valued knowledges. In recognising the significance of early experiences she explained how experience modified the structure of the brain and the complexities of the linkages necessary for later learning. Raban's focus was on a curriculum that builds further learning to ensure that discontinuities between home, preschool and school are minimised for most vulnerable groups of children.

The significance of centre-home partnerships is evident in a year-long study of music experiences for children aged 17 to 20 months (Suthers, 2004). The study concluded that participation and commitment by staff were crucial to the effectiveness of the curriculum. However, as a result of programme demands, the toddlers were only offered music sporadically; Suthers argued that these toddlers missed out on important opportunities for self expression, individualised responses and sociable interactions as well as development of cognitive/physical/social/language and music skills. This is a significant argument given that musicality is present in infants at birth and is related to the skills implicated in responsive and intersubjective interactions (Trevarthen, 1998). Clearly, the more recent literature reported in this study signals a shift in thinking about infants and toddlers as thinking, feeling and highly competent people who learn in metacognitive ways within and beyond the early childhood education context.

In summary, this section has presented research and scholarly articles arguing that pedagogy with under-two-years-olds is realised in the establishment of intersubjectivity between children and their caregivers who are present, supportive and sensitive. This argument emerges from research which by and large has been influenced by understandings from attachment theory, in particular the view that teachers' or caregiving adults' responsive interactions with very young children are crucial for establishing relationships that promote the overall well-being of the corporeal and social under-two-year-old.

4.3 Effective teacher practices: Presence and attunement

In this section the focus is on literature that deals with *how* optimum learning can be achieved through effective pedagogical practices.

4.3.1 Continuity of caregiver / primary caregivers

Continuity of caregiver means that infants and toddlers remain with the same teacher during a significant part, if not at all, of their first years in a programme (Hegde & Cassidy, 2004). In the United States, the National Association for the Education of Young Children (NAEYC, 1991) recommends that "every attempt is made to have continuity of adults who work with children, particularly infants and toddlers" (NAEYC, 1991, p. 40). Nonetheless, this is very rarely practised in the United States (Cryer, Hurwitz, & Wolery, 2001).

The current professional recommendation of continuity of caregivers for infants and toddlers is consistent with research cited above about interactional synchrony as well as the view from attachment theory that attachment relationships, and security between a child and a teacher, may positively relate to other areas of development, such as socio-emotional development, cognitive development, and language development (Eric Digest, 2003; Hegde & Cassidy, 2004). Various benefits of continuity of caregiver have been reported including: overcoming emotional problems (Chirichello & Chirichello, 2001); alleviation of anxiety (Hanson, 1995); and more self-confidence (Groves, 2000).

Theilheimer (2006) considers continuity of caregiver to be a necessary component of a high-quality childcare setting. She has advocated a primary caregiving system as a way of establishing an environment in which meaningful and lasting relationships can develop, not only between caregivers and children but also between caregivers and families.

She argues that as the family and primary caregiver get to know each other better, they build the relationship that will help the family and the child separate from each other when it is time for the child to stay alone at the centre. Theilheimer argued that children are more likely to accept a new place or person when they sense that it meets with the approval of a loved one.

Theilheimer (2006) noted that having a primary caregiver system means that the caregiver expects to adapt to the child instead of making the child adapt to the centre. In a primary caregiving system the caregiver can take time to find out how a child likes to fall asleep, prefers to be fed, and reacts to touches, smells, and sounds. As babies quickly learn to anticipate their interactions with the people they know best, they are able to feel secure and understood, and soon become able to move beyond the primary caregiver to investigate the world.

By contrast, high caregiver turnover, or abrupt changes in caregivers, have been found to have a disruptive impact (Howes & Ritchie, 2002; Raikes, 1993) on attachment relationships between children and caregivers. A well-cited work by Howes and Hamilton (1992, cited in Cryer et al., 2005) found that with multiple changes in caregivers, toddlers were likely to try and re-create the quality of the relationship with a previous caregiver rather than respond to the behaviour of the new caregiver; they also reported a relationship between the number of caregiver losses experienced by a preschooler and the likelihood that the child will be socially withdrawn or aggressive with peers (Howes & Hamilton, 1993). Furthermore, transitions from familiar to new classrooms of teachers were found to be associated with increased distress in infants and toddlers (Howes & Hamilton, 1993, cited in Cryer et al., 2005).

In a more recent study, Howes and Ritchie (2002) suggested that prolonged separations from familiar caregivers, and repeated detaching and re-attaching to people who matter, are emotionally distressing and can lead to enduring problems. In their own study of 38 infants/toddlers (aged 8 to 26 months) who transitioned from familiar to new classrooms without continuity of caregiver, Cryer et al. (2005) identified some specific factors that may mediate children's experience in making transitions. For example, they found that not all children showed increased distress on moving to a new class (about 60 percent of the children showed no distress), and when there were heightened levels of distress, this diminished by the end of a few weeks. They concluded that: (i) children can adapt to a new environment over a month's time; and (ii) there are individual differences within children, as well as environmental ones that are likely to influence children's distress levels during transitions. The differences related to two variables: (i) the age of the child; and (ii) the quality of the early childhood provision within their pre-transition classroom.

With regards to age, younger children showed more distress than older children, leading Cryer et al. (2005) to suggest that the ages of children should be considered when deciding whether to move them to a new class or teacher. Cryer et al. also proposed that the age of the child might act as a proxy for other more specific variables that affect children's distress at transition. For example, older children might have experienced more changes in caregiver due to teacher turnover, and may have adjusted to separating from caregivers. They suggested that future research could provide practitioners with more exact information on optimal ages or developmental stages to consider when moving children, or it might provide clarification on why age appears to be important.

In terms of the quality of the children's pre-transition classroom, Cryer et al. (2005) found that a higher global quality score on the ITERS was associated with less child distress in the initial classroom compared to children in lower quality classrooms. After the transition, however, the children in higher quality pre-transition classrooms were more likely to show increased levels of distress irrespective of the ITERS quality of their new classroom. They argued that if it is assumed that children's levels of distress increase when moved to a new class because they are leaving a teacher to whom they have become attached, then this finding implies that on average, children are more likely to become attached in higher rather than lower quality classrooms. They noted also that it is still unknown whether the heightened

levels of distress are harmful, or have a long-term negative effect on children's development (FPG Child Development Institute, 2005).

Continuity in the caregiver-child relationship has many advantages for children, parents and teachers: It builds up more secure and trusting relationships between children, parents and teachers, and the familiarity that it creates makes caring for some children easier (Hegde & Cassidy, 2004). However, parents interviewed by Hegde and Cassidy reported that not having an opportunity to know different caregivers was a potential disadvantage, and some felt threatened by the primary caregiver's relationship with their baby, worrying that it might supplant their own place, a finding reported also in the Childspace Ngaio Infants and Toddlers COI project (Dalli et al., 2009). Recognising the different perspectives, researchers have suggested that continuity of care should be an option rather than a necessary part of each child's and family's experience (Chirichello & Chirichello, 2001). In other words, they point out that no parent or child should be forced to enter into a long-term relationship, and parents should be given the option to voice any concerns they have regarding this practice, and seek modifications (Hegde & Cassidy). Hegde and Cassidy also suggested that it will be highly beneficial if future research investigated whether some teachers and children would benefit more than others from continuity of care.

As a pedagogical practice, continuity of caregiver, such as through primary caregiving, or a key worker scheme, faces many challenges (Hegde & Cassidy, 2004). In the US, approximately 30 percent of the teachers are estimated to leave the early childhood teaching profession annually (US Department of Education, 1997) making continuity of care nearly impossible. Additionally, staff absences on sick or annual leave, and times at the beginning and end of the day when not every staff member (Miller, 1995) mean that there are times when a child's caregiver may not be present at the same time as the child. Proponents of continuity of care have suggested various strategies to counter these difficulties, such as ensuring there are secondary caregivers (Kibble, Cairns-Cowan, McBride, Corrigan, & Dalli, 2010) for each child, avoiding taking new children only in the youngest group, or overlapping staff so that if a staff member leaves, children are never left with a stranger (Rolfe, 2003). Cryer, Hurwitz & Woley (2003) have pointed out that keeping children with the same teacher is more likely when multi-age groups are used, because having a birthday or reaching developmental milestones does not force a change in class. However, continuity of caregiver can be used also with same-age groupings. For example, teachers and their children may use the same physical space through their years together or they may move from one classroom to another. In settings with multiple teachers, all teachers and children might move together (e.g., Podmore et al, 2006) while in another setting, a subgroup of children might move with only one of the teachers.

Explaining the implementation of their primary caregiving system with infants and toddlers, the Ngaio Childspace Infants and Toddlers COI argued that continuity of care through a primary caregiving system required a team approach that all staff took on board so that it was able to function at the three different levels of (i) interactions between children and teachers; (ii) a pedagogical system that structured and supported the teachers' work (e.g., through the nomination of a secondary caregiver for each children; agreement to work to the children's rhythms not to the clock); and (iii) responsive relationships between teachers, children and parents (Dalli & Kibble, 2010).

Theilheimer (2006) suggested that programmes can schedule caregivers' hours such that all the people known to a child won't be absent at the same time. Additionally, she advocates that each time a new caregiver steps in, this should be explained to the child to acknowledge the relationship between child and primary caregiver and to respect the child's ability to understand that relationship.

Rolfe (2003) adds the suggestion of gradual transition processes that are long enough to allow the young child to become familiar with the new childcare environment before a separation from the attachment figure occurs. This means that children can visit their new setting and teacher before moving between age-groupings within the same centre, or

their new teacher can visit them a few times so that they can get to know each other. Hegde and Cassidy (2004) noted that parents could be asked to stay with their child for extended periods of time and children time in the new classroom can be gradually increased to make the transition smoother.

In sum, the pedagogical practice of continuity of caregivers is reported in research as a desirable strategy with the potential of significant benefits for maintaining synchronous and attuned relationships between children and their caregivers. At the same time, debate continues about the practicalities of its implementation.

4.3.2 Responsive interaction and attunement during routines

Within the New Zealand context, the search for practices that would result in continuity in relationships and the type of attunement and intersubjective relationships discussed earlier have led many practitioners to explore the ideas of Dr. Emmi Pikler, a Hungarian paediatrician and reformer of caregiving practices in an orphanage in Budapest, and her student, Magda Gerber, founder of the Resources for Infant Educarers (RIE) approach in the United States. Gerber's (1979, cited in Hammond, 2009) approach to joint attention is that nurturing moments in care create a meaningful context for adult and child interactions. These are times when adults handle infants gently (or otherwise), informing the children of the caregiver's attitude toward them. Hammond (2009) explains:

> The gentleness or roughness with which we lift, carry, and manipulate their bodies determines how willing they are to open themselves to us, and to the world, because we represent their world in the beginning, and we are their primary link to the rest of it. How human culture is first conveyed to infants is quite literally in our hands. (p. 11)

Gerber and Pikler studied infants and toddlers over many years and believed that the prime opportunity to engage in close interactions with very young children was during care routines such as mealtimes, nappy-changing and preparation for sleep, a view argued also by several writers in the New Zealand early childhood context (e.g., Dalli et al., 2009; Deans & Bary, 2008; Freeman, 2008; Rockel & Peal, 2008). These intimate moments, Gerber argued, create an opportunity for joint attention interactions in which shared meanings can develop through the attunement necessary for cooperative action (e.g., in feeding an infant on one's lap, changing a nappy) assisted by conversation (Dalli & Kibble, 2010). Within this perspective, the full attention offered during care routines is balanced with the notion of play as the domain of the child (Gonzalez-Mena & Widmeyer-Eyer, 2009), and with the belief that infants as learners require opportunities to make their own discoveries while the caregiver remains fully available nearby, without directing the action (Hammond, 2009).

Teachers at Childspace Ngaio Infants and Toddler Centre in Wellington explored the potential of Pikler's and Gerber's approach to enhance joint attention by focusing on their use of primary caregiving (Dalli et al., 2009) as part of their *peaceful-caregiving-as-curriculum* pedagogy. By documenting their interactions with very young children through video recordings of care moments, and analysing their interactive strategies during those times, the teachers were able to identify the specific behaviours they used to achieve intersubjective interactions with pre-verbal under-two-year-olds in their group setting. The behaviours were attuned to children's bodily, vocal and paralinguistic communication cues and recurred in an interaction pattern with three components: (i) an invitation by a teacher; (ii) followed with a suggestion; and (iii) concluding with an engagement in an activity or joint attention sequence in which the teacher and child cooperate in achieving a shared goal. The teachers labelled the pattern "being responsive with our ISE" with ISE being an acronym for the three components of the pattern – invite, suggest, engage – as well as a mnemonic homonym for *eyes,* on which the teachers depended for the intent observations that enabled their attunement (Dalli & Kibble, 2010).

Both within the New Zealand context (Stuart with Aitken, Gould, & Meade, 2008) and the Australian one (Brannock, 2004) studies have highlighted that the ability to work with infants and toddlers, including establishing and maintaining

intersubjectivity during routines, is not one that can be taken for granted. For example, evaluating local assessment practice Stuart et al. reported that teachers of under-two-year-olds commented on the difficulty of reporting moments of shared understanding with children of this age (see also Blaiklock, 2008; Cooper, 2009; Education Review Office, 2007). Similarly, Brannock reported incongruence between teacher beliefs about how toddlers learn and teacher practices during routine situations speculated that the incongruence could arise out of an inability to articulate how children learn.

But challenges in generating shared meaning between teachers and very young children also arise from the environmental conditions in which teachers work. White's (2009) study has demonstrated the futility of simply knowing about the need to establish intersubjectivity and signals that teachers need to work in conditions that are conducive to full attunement. Routines, rosters and other imposed systems act to disrupt the relational intimacy necessary to achieve high levels of mutual understanding and appreciation. Similarly, attitudes, ideologies (e.g., stereotypical views of toddler capabilities that limit or support what the teacher can see or hear) and whether the prevailing mindset embraces degrees of uncertainty, contingency or provisionality (see also Dahlberg & Moss, 2005), all influence whether the subtle messages (and genres of communication) offered by very young children can be picked up. As a teacher in Elliot's (2007) study explained:

> So much care is nonverbal. Attachment is maybe not demonstrated through language all the time. They are not saying "I love you," but it is about a baby who rolls over to the other side of the room and then quickly glances back at you. And you have in that glance, you are completely connected to them and they are completely connected to you. Then they move on and they go somewhere else. Or, just a glance, or a smile, or a quick touch. It may not be a huge moment. It is a huge moment, but it is not a demonstrated, overt moment. (p. 85)

Research of this kind points to the interconnected nature of environmental conditions and teacher action. It suggests that the achievement of attuned teacher-child relationships requires a wholistic pedagogical approach aimed at the teacher in context (see also section 4.4).

4.3.3 Autonomy with connectedness

Thomason and La Paro (2009) reported on research carried out as part of the preliminary validation of the *Classroom Assessment Scoring System* (*CLASS*) (Pianta, La Paro & Harme, 2008) measure of process quality which focused on optimum teacher-child interactions in toddler settings and up to grade 3. In seeking to develop a refined construct of quality teacher-child interaction for toddlers that respected the toddler's need for "autonomy with connectedness" (p. 285), the developers of the CLASS identified the following key dimensions of teacher-child interaction that had not been reflected in earlier measures: positive climate; negative climate; teacher sensitivity; regard for child perspective; behaviour guidance; and language modeling.

These dimensions highlight the multi-faceted challenge for teachers to be attuned to infants' desires in order to support their sense of agency and enquiry. They also reflect the fact that teacher actions are affected by, and affect the context in which they work. This reiterates the point argued in the preceding section.

4.3.4 Practices with under- and over- one-year-olds

A literature review (Stephen, Dunlop, & Trevarthen, 2003) commissioned by the Scottish Executive on the development of under-three-year-olds and compiled with a view to highlighting implications for out-of-home care, distinguished between suggested practices with infants under one year of age, and toddlers over one year. Stephen et al. (2003) stated that for under-one-year-olds, out of home provision requires:

- consistent caregiving by one adult or a very small number of adults able to form a warm relationship with the child and to respond sensitively to the infant's changing needs and preferences and developing pride in achievement

- minimising staff turnover and changes of carers
- a focus on responding to infants as individuals with their own needs
- communication about the changing ways and temperaments of babies with parents who know their own child, the carer and routines of the care environment well. (p. 5)

Turning their attention to toddlers (in their second year of life), the authors proposed that toddlers need caring environments that offer:

- opportunities to extend knowledge and understanding through intimate, consistent and confident relationships
- structured adult-child conversations in the context of games that develop categorising and symbolic coding
- talk between adults and children that considers the past, present and future, and extends and shares imagination
- an environment rich in things to explore, opportunities for physical movement, dance, song, rhyme, story telling and creative activities
- a sensitive and flexible balance between encouraging children to express their thoughts and feelings and to reflect on discovery and what they know
- encouragement to toddlers in pretend play in groups
- care by adults who know the narrative style of the children they care for and the level of communication and language used by each child
- sensitivity to differences in children's social and cultural backgrounds while encouraging regard for the culture and norms of the playroom
- staff who are prepared to take a receptive and imitative part in children's projects
- caregivers ready to respond positively in differences in children's temperaments and preferences
- staff who attend to the development of pro-social behaviour as well as children's emotional well-being and learning. (p. 6)

Through separating suggested practices on the basis of age, the authors present a nuanced view of adjustments in teacher practices required to take account of incremental differences in autonomy and competence that become visible as babies into mobile and autonomy-seeking two-years. Throughout the age range, however, the key message is that infants and toddlers "need constant and affectionate company, and good quality care depends, therefore, on stable and intimate relationships with carers who know each child well" (Stephen et al. 2003, p. 9).

David, Goouch, Powell and Abbott (2003) in their research brief to the UK Department of Education and Skills compiled to inform *The Framework to Support Children in their Earliest Years* and carried out at the same time as that by Stephen et al. (2003), similarly wrote:

> Babies come already 'designed', or 'programmed' to be deeply interested in the people and the world in which they find themselves. They are incredibly observant and selective, as well as being extremely clever at interpreting what they witness. They learn best by playing with things they find in the world, and above all by playing with the familiar people who love them. (p. 150).

In this way both Stephen et al. (2003) and David et al. (2003) offered a framework of suggested practices around the same key concept that no matter the age of the learner, they need to have adults willing and able to engage with them in attuned interaction on an ongoing basis, to read their cues, and to facilitate their engagement in the world so that they can extend their knowledge. This point is re-iterated once more in the next section.

4.3.5 The teacher *is* the curriculum

A doctoral study by Gloecker (2006) carried out within a North American context, investigated how teacher interactions with toddlers were related to the early development of emotion regulation in toddlers. Using a case study design, Gloecker observed three lead toddler teachers/caregivers interacting with eight to ten children in each of three classrooms, conducted interviews with the teachers and the parents, and assessed the children's temperament. Analysing the combined data, Gloecker identified the following teacher responses to the children's emotional displays, including when they were crying or upset:

- being both physically and emotionally present to the children
- providing warm, responsive, predictable care
- spending a large part of the day sitting, kneeling or bending down on the children's level
- a steady stream of both verbal and non-verbal (emotional) communication that is positive and warm
- narrating what is happening, explaining, and giving advance notice for changes in activities
- language that is respectful and responsive
- appropriate use of warm, sensitive touch
- engaging in many, ongoing reciprocal interactions where teachers stop, look and listen for the child's response
- looking and listening with attention to what children are saying
- consistent primary teachers/caregivers
- offering choices
- labeling and describing emotions
- daily routines that build a sense of safety and security
- setting limits in ways that model and teach children appropriate social skills and self-regulation
- offering comfort and support for children's emotions in ways that model for them strategies for how to take care of themselves and calm themselves down
- emotional protection and fairness
- distraction
- inviting participation in activities rather than requiring it
- creating space or access for children to come and be near, around or in lap of teacher/caregiver
- calling children by their names
- allowing time for transitions
- engagement in shared activities that are fun, enjoyable and provide a sense of delight, emotional connection and create meaning between teachers and children.

Although Gloecker's analysis was focused primarily on identifying practices that laid the foundation for toddlers to learn emotion regulation, it is clear that these practices have much in common with components of teacher behaviours that several authors cited in this chapter have noted to be associated with responsive attuned relationships (e.g., Dalli et al., 2009, David et al., 2003; Stephen et al., 2003). The study provides further empirical support of the pedagogical effectiveness of attuned, responsive teacher interactions with under-two-year-olds.

Overall, the work reviewed in this section illustrates the consistent emphasis on the desirability of caregiver proximity, presence, commitment, engagement and responsiveness to the infant and toddler and to their embodied experiences in early childhood group settings. There is consensus in the literature that good pedagogy for under-two-year-olds is primarily based on positive interactions marked by intersubjectivity that is maintained over time. Practices that are conducive to such pedagogy focus on teachers being fully present physically, emotionally, cognitively and linguistically. In other words, it is not the activity or the resources by themselves that constitute curriculum, but the teacher herself, in concert with the infant or toddler. From this standpoint, the teacher *is* the curriculum.

4.4 The teacher in context

In pedagogy of the nature that is being portrayed in contemporary literature, it is clearly necessary for teachers to draw on a broad repertoire of relational strategies to engage intersubjectively with infants and toddlers.

4.4.1 Teacher knowledge and work environment

Johansson's (2004) investigation, involving 105 teachers and approximately 450 toddlers (1–3 years) from 20 municipalities across Sweden, provides insights into some of the relational strategies teachers need not only in interacting with children but also in managing the relationships between: their understanding and perspectives on the child; their knowledge of learning and development; the quality of the learning encounters; and the impact of overall centre atmosphere on learning encounters. Johansson found that positive interactive experiences were associated with pedagogical encounters in which teachers positioned the child as partner in the learning process, while controlled or unstable interactive experiences were associated with teacher views of children as incompetent and irrational. Within an interactive atmosphere, the teacher showed sensitivity and presence in the lifeworld of the toddlers, and a strong physical and mental involvement in the child's action and experiences.

Johansson's findings provide supportive evidence for an argument that teachers need to be equipped to critically evaluate and identify implicit and explicit theories in their practice as this would enable them to select the most appropriate pedagogical strategy at any given moment, rather than learn to deliver a prescribed programme of activity. This study points to the need for rigorous theoretical engagement and reflection in teacher preparation, and provides insights into pedagogical perspectives that are associated with responsive interactions.

An aspect of responsive interaction has been described by Im, Parlakian and Sanchez (2007, p. 66) as "culturally informed teaching". Teaching of this nature refers to the expertise of the adult in engaging with, and encouraging, participation from children and their families from diverse cultural groups. This is especially important given the increasing numbers of cultural groups represented in early childhood education services, and the additional emphasis placed on teacher relationships with parents of under-two-year-olds. For instance, in a study by Chen and McCollum (2000) the perceptions of 13 Taiwanese mothers regarding the development of social competence in their 12-month-old children showed marked differences in expectations which would be important for an early childhood practitioner to understand and appreciate in their pedagogical practice.

Engaging with the notion of responsive interaction from a teacher educator perspective, Degotardi and Davis (2008) have suggested the need to explore alternative models of teacher preparation. They argued that an understanding of unique infant and toddler characteristics, temperaments and personalities, as well as an exploration of personal relationship histories, and attitudes to intimacy should be included (see also Gallagher & Mayer, 2008; Honig; 2002; Lee, 2006)**.** Several writers (Lee, 2006; Liszkowski et al., 2007; Parker Rees, 2007; Thomason & La Paro, 2009; Warner, 2002) have suggested that adults preparing to work with under-two-year-olds need support with practicum experiences to develop and build their awareness of infant and toddler communicative expertise (see also Churchill, 2003; Gallagher & Mayer, 2008; Nyland, 2004; Parker-Rees, 2007; Rolfe et al., 2002) and Smith (1999) added that

teachers also need to reflect on the special significance of joint attention and family engagement. In other words, this body of literature suggests that such practices are not intuitive and that they are, in fact, highly specialised.

Further evidence in support of the argument for relevant teacher preparation, and the importance of specific teacher qualities, is provided in Manlove, Vazquez and Vernon-Feagans's (2008) report of a study that investigated the nature of teachers' thinking about child development and their observed interactions with infants and toddlers. Manlove et al. reported that in supportive work environments, trained teachers provided higher quality care regardless of the levels of complexity of their thinking. In other words, complexity of thinking about child development, in itself, was not related to overall rating in caregiving interaction. However, in working environments which were described by teachers as "unsupportive", greater complexity of thinking was associated with significantly more sensitive care. These results suggest that (i) teachers' complex thinking can help teachers overcome the effects of an unsupportive working environment, and that (ii) in seeking to enhance pedagogical environments for children, it is important to consider the teachers' working environment as contributing to the equation.

The working contexts of adults in early childhood settings for under-two-year-olds have been addressed from yet another focus by Goodfellow (2008) in the Australian context and Manning-Morton (2006) within the English one. Both have highlighted that adults who work with infants and toddlers face a dilemma in reconciling high levels of emotional engagement and physical labour with notions of educational professionalism that promote optimal distance from "the client" as a way of working.

In sum, research reviewed in this section supports the findings from a national survey of a stratified random sample of licensed New Zealand early childhood centres (Dalli, 2008) in which teachers working in education and care centres reported that a high quality "professional" approach to their work required a high degree of professional knowledge that spanned a range of competencies, including the ability to build collaborative relationships with families, colleagues and outside agencies, and a clearly articulated pedagogical style. In elaborating on the pedagogical style they saw as professional, the following response was typical:

> Get down to [children's] level, using calm and appropriate language with children. Showing respect by listening and planning from observations recorded; Focusing on them at all times possible, varying their [teachers'] style depending on situations, guide rather than show, learn rather than teach. (p. 148)

This practice-based evidence of what New Zealand teachers perceive to be quality professional practice emphasises the same concepts of sensitive responsiveness that child development research has shown to facilitate good outcomes for children, and in particular children aged under two years. This suggests that there is a good basis of understanding within the New Zealand early childhood teaching community of what constitutes high quality practice.

4.4.2 Structural supports and constraints

Infant and toddler pedagogy, with its emphasis on intersubjective relationships, takes place in a range of early childhood education contexts.

Recognition that the early childhood context is a key contributor to quality pedagogy in longstanding. High staff turnover (Gallagher & Mayer, 2008), status and working conditions (Sims, Guilfoyle & Parry, 2005), adult:child ratios (Gallagher & Mayer, 2008; Gevers Deynoot-Schaub & Riksen-Walraven, 2008; Lee, 2006; Nyland, 2004) and group size (Frank, Stolarski & Scher, 2006; Girolametto, Weitzman, van Lieshout & Duff, 2000; Lee, 2006; Thomason & La Paro, 2009) have consistently been reported as having a significant impact on teachers' ability to demonstrate the practices necessary for effective infant and toddler pedagogy. Johansson's (2004) experimental research, combined with the work of Rolfe et al. (2002) and Smith (1999), support arguments in favour of improving ratios, and limiting group size. Additionally, Parker-Rees' (2007) suggestion that specialised training programmes are needed to support teachers

in engaging in infant and toddler pedagogy which emphasises intersubjectivity, is supported by a number of other writers (Gevers Deynoot-Schaub & Riksen-Walraven, 2008; Klein & Feldman, 2007; Manlove et al., 2008; Thomason & La Paro, 2009). Klein and Feldman have added that teachers need to structure infant and toddler programmes to maximise one-to-one interactions, which, as argued earlier (see Chapter 3) have been found to facilitate the successful 'reading' of infant and toddler cues and joint attentional initiations (Lee, 2006; Liszkowski et al., 2007).

In many New Zealand settings, infants and toddlers are separated into different rooms or buildings where age-specific learning is expected to take place; in others a mixed-age context is promoted in which infants and toddlers engage in family-like multi-age learning contexts. There is little evidence to suggest one is better than another for infant and toddler pedagogy, despite assertions to the contrary (O'Hara-Gregan, 2010). In what remains one of the few New Zealand studies on this issue, White's (1995) study with toddlers across 100 New Zealand centres suggested that mixed age settings (described as those catering for combined groupings of infants, toddlers and young children aged birth to five years) scored significantly higher in peer interactive opportunities while single-age settings (described as separate age groupings) performed better in relation to safety features. White's study concluded that the quality of each centre is not solely determined by age composition, and that other variables such as adult:child ratios, teacher training, experience and education, teacher involvement, as well as the organisation of the environment, all have a major impact.

In 2009, the New Zealand Education Review Office (ERO) reported on the quality of education and care in infant and toddler centres. While acknowledging the diversity of service types for the different age groups of children, the report looked specifically at children under the age of two years in infant and toddler centres. Their findings were reported from a review of 74 centre-based early childhood services, licensed to take only children under the age of two, with ERO reports completed between February 2005 and January 2008. The majority of services were in private or corporate ownership with limited parent involvement in the management of the centre. The report stated that while most teachers used their interactions to encourage children's language and social skills and to respond to their interests, in some centres teachers were more focused on managing tasks:

> In a few centres routines were not so responsive. In these centres, teachers were often unaware of the needs of individual children for sleep, food and toilet, and routines were based on managing groups of children. (p. 6)

The report noted that there was no requirement for teachers in infant and toddler centres to be specifically trained in this area yet teachers sought to participate in professional development designed to develop practice with this age group. ERO identified the need for teachers to improve teaching practices through more critical reflection and evaluation of the programme. Structural features of these education contexts, however, were not considered. This is despite the fact that ERO's earlier methodologies emphasised these aspects of quality in their reviews (Collins, 2007) and an earlier study of quality for under-two-year-olds (Smith, Ford, Hubbard, & White, 1995) had previously and compellingly identified the relationship between structural elements and quality early childhood education.

White's (2009) study has highlighted the point that teachers can be so committed to their external accountabilities to the state and/or management that they spend a disproportionate amount of time on paperwork and structures, such as rosters and efficiency schedules, which can have a negative impact on their relationships with very young children. This point was also discussed by Deans and Bary (2008) as they described their discovery during their COI project that the roster system in place at their centre was constraining their ability to engage in quality pedagogical relationships with the infants and toddlers in their care:

> Almost anyone can follow a roster; in fact it is easy to follow a roster. They define and direct our movements, but you have to be a sincerely passionate, attached, 'in tune' teacher to hear and see infant and toddler communication. (p. 33)

It seems that there is a tension between structural elements of the teacher's work environment and processes that support or thwart effective pedagogy. Lessons from research reviews carried out in Scotland (Stephen et al., 2003), Canada (McCain & Mustard, 2007) and the United Kingdom (David et al., 2003), combined with evidence from within New Zealand, suggest that it is important to consider the role the environment plays in children's experiences in early childhood settings.

4.5 Concluding comments

Various studies are providing insights that are beginning to move our understandings about quality interaction and pedagogy beyond baseline descriptions of desirable interactions as being "warm and responsive" to the broader concept of intersubjectivity. Reflecting on the Australian context, Goodfellow (2008) warned that if there is a limited understanding about what the nebulous phrase "warm and responsive" refers to, particular interventions to improve the quality of interactions may not be specifically focused or appropriately informed and, as a result, may not effect desired change. Thomason & La Paro (2009), in the development of the quality interaction measure *CLASS* (Pianta et al., 2008) designed for use across the toddler to Grade three age group, also identified limitations in current understandings and constructs of 'quality interaction' as represented in existing widely-used measures of interaction quality. Degotardi and Davis (2008), who examined teacher interpretations of infant behaviour, found much in this area that is under-studied in relation to the thinking that informs teachers' actions.

Within the New Zealand context, evidence from ERO reviews shows that serious gaps do exist in the provision of high quality early childhood provision for under-twos. Yet, there is also research evidence of very good practice in some specific local settings (Bary et al., 2008; Dalli & Kibble,2010; Podmore et al., 2006) and of a good understanding among the early childhood teaching community about what high quality pedagogy should look like (Dalli, 2008).

Research reviewed in this chapter points to the impact that structural and qualitative process variables can have when they work together to support (or undermine) an early childhood environment characterised by intersubjective, engaged, and supportive teachers.

A key message from the research reviewed is the overwhelming desirability of a relationships-based approach to pedagogy with infants and toddlers. Both New Zealand and international research and scholarly writings emphasise that relational practices that build a sense of security, through attachment figures, can be relied on to be attuned and attentive.

Such pedagogy calls for knowledgeable adults who have the skills, capacity and emotional literacies essential to 'read' and respond to infants and toddlers.

The body of literature reviewed in this chapter demonstrates that merely noticing or even acknowledging the attentional focus of an infant or toddler, albeit in a warm manner, is an insufficient response, since it is now evident that infants are aware of the psychological state of others (Meltzoff et al., 2009) and are keenly watching, imitating, interpreting and re-interpreting the acts of adults (White, 2009) as well as peers (Løkken, 2000). Instead, what is needed are attuned adults who are present to the child and willing and able to engage with them. In this way, teachers are influenced as much by the learners as the learners are influenced by them – a concept embodied in the New Zealand term 'ako' (Tamati, 2005).

White & Johansson (in press) argue that the amount of research undertaken with infants and toddlers as learners to date has been thwarted by perceived difficulties in accessing infant and toddler 'voice'. However, as shown in Chapter 3, innovative new methodologies are revealing the full potential of infants' and toddlers' capabilities at the same time as we are learning more about the impact of teachers' pedagogical actions. Neurobiological research findings, in particular, suggest that there could be serious consequences for future society if adults don't get it right. Shonkoff

(2010) urged that we have a clear sense of direction, and empirical evidence is growing in support of these new ideas. As Sands and Lichtwark (2007) stated: "the time to remove the glass ceiling on infant and toddler capacity to be learners-in-action is now" (p. 7).

4.6 Summary points

This section summarises the points made in this chapter by framing them as factors that are recognised to impact on quality pedagogy are listed below either as enablers of, or barriers to, quality pedagogy.

4.6.1 Enablers of quality pedagogy

1. Teachers who act as intersubjective partners (Elliot, 2007; White, 2009) optimise opportunities for learning and development and foster infants' and toddlers' capacity to learn. This includes through interactions that promote heightened levels of intimacy (Dalli & Kibble, 2010); a caring ethic (Rockel, 2010), and joint attention (Barton & Tomasello, 1991; Liszkowski et al., 2007; Tomasello, 1988; Tomasello & Farrar, 1986; Wright, 2007).
2. Teachers who employ distinctly specialised practices for infants (e.g., under one year) and toddlers (Chapman, 2007; Dalli et al., 2009; Degotardi & Davis, 2008; Fleer & Linke, 1999; Stephen et al., 2003; White, 2009) are present to them (Goodfellow, 2008) and pay attention to the learning opportunities within routines (Deans & Bary, 2008) and rhythms of and everyday experiences (Nimmo, 2008;Warner, 2002).
3. Teachers who are knowledgeable about contemporary theories of development and learning (including neuroscience) and provide curricula that are individually, socially and culturally relevant (David et al., 2003; Degotardi & Davis, 2008; Lagercrantz, 1997; Meltzoff et al., 2009).
4. Teachers who understand the role of play in learning for these specific age groups (White, et al., 2009), are aware of the interactive atmosphere that they can create (Johannson, 2004; Parker-Rees, 2007), and have the ability to interpret and respond to the subtle cues offered by infants (Tomasello et al., 2007) and toddlers (Løkken, 2000; White, 2009) across diverse cultural contexts (Gonzalez-Mena, 2009; Walker, 2008).
5. Ongoing, consistent and stable relationships (attachments) between teachers and infants and toddlers, as well as with their families (Ahnert et al., 2006; De Wolff & van IJzendoorn, 1997; Lee, 2006; Liszkowski et al., 2007; O'Malley, 2008; Rogoff, 2003; Walker, 2008). This includes the use of diverse communication strategies to build infant-toddler learning capabilities, confidence and competence, and support for families.
6. Specialised teacher education or professional learning opportunities that emphasise intersubjectivity in infant and toddler pedagogy (Gevers Deynoot-Schaub & Riksen-Walraven, 2008; Klein & Feldman, 2007; Manlove et al., 2008; Thomason & La Paro, 2009), and equips teachers with the ability to be reflective/reflexive practitioners (ERO, 2009; Gallagher & Mayer, 2008; Honig 2002; Johansson, 2004; Lee, 2006).
7. Positive working environments for teachers (Goodfellow, 2008; Manlove et al., 2008) which facilitate low turnover of staff, enhance the status of teachers (Gallagher & Mayer, 2008), and are conducive to attunement with infants and toddlers within ongoing relationships.
8. Small group sizes (Frank, et al., 2006; Girolametto et al., 2000; Lee, 2006; Thomason & La Paro, 2009).
9. High adult:child ratios (Gallagher & Mayer, 2008; Gevers Deynoot-Schaub & Riksen-Walraven, 2008; Lee, 2006; Nyland, 2004) with a recommendation of 1:3 (Gevers Deynoot-Schaub & Riksen-Walraven, 2008).
10. Professional teacher education programmes to promote the study of relationships and emotions in conjunction with practicum courses to integrate theory with practice (Lee, 2006); to focus on the ways infants and toddlers develop their working theories as they learn more in relation to knowledge domains (Sands & Lichtwark,

2007), and to increase the quality of the *learning encounters* (Johansson, 2004) rather than deliver a prescribed *programme of activity*.

4.6.2 Barriers to quality pedagogy

1. There is a lack of empirical research in relation to a specialised pedagogy of care in the New Zealand local context; and a need for a more specialised focus on under-ones' and twos' in pre-service teacher-education programmes and professional development (Degotardi & Davis, 2008; Lokken, 2006; Nyland, 2004; Rockel, 2009).
2. Structural (external) conditions undermining or not working together to support process elements of quality that derive from teachers' knowledge (Johansson, 2004);this includes the whole package of variables such as adult:child ratios, teacher training and experience, teacher involvement along with the organisation of environments and philosophies of practice (ERO, 2009; Johannson, 2004; Rockel, 2009; White, 1995);
3. High staff turnover (Gallagher & Mayer, 2008), low status and poor working conditions (Sims, et al., 2005), as well as inadequate adult:child ratios (Gevers Deynoot-Schaub & Riksen-Walraven, 2008) which have a significant impact on teachers' ability to demonstrate effective infant and toddler pedagogy.
4. Inconsistent care by one or a small number of adults interferes with infants' ability to experience sensitive responsive care that attends to their changing needs, communication and language (Stephen et al., 2003).

As several authors have pointed out, quality pedagogy is the outcome of a holistic constantly evolving process. It is not merely the product of actions by one teacher but rather comprises a whole membrane of supportive connections among i) teachers and children, ii) teachers and teachers, iii) the structure/organisation of the centre, iv) the philosophy, and v) the environment – all of which are located within a broader policy infrastructure. In the chapter that follows, research evidence is reviewed about the organisational and structural aspects of quality that create this membrane of supportive connections.

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Chapter 5: Quality Outcomes for Under-two-year-olds: Updating the data on structural dimensions of quality

Abstract

This chapter is organised around a set of questions that provide an easy entry point for considering the impact of different structural factors on the quality of centre-based early childhood services. The factors considered are: adult-child ratios; group sizes; quantity of care; teacher qualifications, education and experience; aspects of the physical environment such as noise levels and nutritional food. It is noted that these elements do not function independently. As discussed elsewhere in this report, research now recognises that quality is a multi-dimensional construct rather than a list of ingredients. The chapter concludes with summary points on: structural indicators of quality, factors that are recognised as barriers to positive outcomes for under-two-year-olds in early childhood provision, and what is known about the effects of ECE on under-two-year-olds.

This chapter addresses the broad question: "what is new knowledge about the links between regulable elements of early childhood education and care programmes and outcomes for under-two-year-olds?" This is to support the material provided in Chapter 4 in answering question 1 of this review:

> What does research evidence suggest about what quality early childhood education for under-two-year-olds should 'look like'? What are the features or dimensions of quality? How should these vary according to the age of the child and other key factors?

Regulable elements are understood to mean structural elements of early childhood provisions and settings such as adult:child ratios, group sizes, teacher/educator characteristics like qualifications, education, and specialised training, and the physical environment of early childhood education and care settings. It bears noting that, as discussed in Chapter 2, structural characteristics are only one dimension of the equation of quality; ecological understandings of quality (e.g., Goelman et al., 2006) emphasise that structural characteristics work in conjunction with process characteristics (e.g., warmth of interaction; joint attention etc., as discussed in Chapter 4). Process characteristics ought to be considered as interacting with other contextual factors, such as philosophical beliefs within the local context, attitudes of staff, auspices of the centre, as well as organisational structure.

Goelman et al. (2006) have suggested that an alternative way of describing quality factors is to see them as elements on a continuum that ranges from proximal to distal factors. In Goelman's continuum of quality, proximal factors have a direct influence on the quality of teacher-child interaction at any given time and include teacher attitudes to their workplace and colleagues, adult:child ratios, and number of staff. Distal factors, such as government regulations, funding levels and practices like teacher registration requirements, influence quality in a less immediate way by creating "the parameters and possibilities that either facilitate or frustrate the delivery of quality child care" (p. 293). In between proximal and distal factors there are intermediate factors like staff wages, parent fees, and subsidies. Goelman et al. explained that these intermediate financial factors are not set by regulation but are decided at the level of the centre administration and organisation, and "help to define the possibilities and limitations of the actual classroom experiences of the children and staff. These three factors will logically lead to higher levels of staff satisfaction, better adult:child ratios, and the ability to put more paid staff into the classrooms" (p. 292).

This chapter deals with what is understood about the links between the elements of quality that are susceptible to regulatory or direct policy action; this covers some of what Goelman et al. (2006) have called proximal factors (i.e., adult:child ratios, but not staff attitudes) as well as distal factors like requirements about qualifications. Factors at the

intermediate level of Goelman et al.'s continuum are also discussed when they are implicated in findings related to regulable elements of early childhood education and care.

Chapter 2 noted that much of what is understood about the links between structural elements of early childcare programmes originated in the findings of "second wave" childcare research published in the 1980s and 1990s. That research remains in citation in policy and pedagogical documents of various state jurisdictions (Arkansas Framework for Infant and Toddler Care Work Group, 2002; David, Goouch, Powell & Abbott, 2003; Kentucky State Department of Education, 2009; Marshall et al., 2004), in recommended standards by professional bodies like the American National Association for the Education of Young Children (NAEYC, 2008) and in manuals of quality assessment tools such as the ITERS and the more recent Classroom Assessment Scoring System or *CLASS* (Pianta, Le Paro, & Hamre, 2008). An extensive review of research on ratios, group size and staff qualifications and training compiled by researchers at the Thomas Coram Research Unit of the Institute of Education at the University of London (Munton et al., 2002) included a comprehensive update of that literature to the end of the 1990s.

Most recently, the National Institute for Child Health and Development (NICHD) longitudinal *Study of Early Child Care*[11] (NICHD Early Child Care Research Network, 2005) has provided regular reports on its findings about "how the different aspects of care- such as quantity and quality - are related to various aspects of children's development" (Peth-Pierce, 1998, p. 2). As noted in Chapter 2, the NICHD study was set up specifically to answer such detailed questions and to go beyond global issues of whether early day care was good or bad for children.

The NICHD findings are therefore of particular interest in this chapter as they constitute some of the newest wave of 'childcare effects' literature which, as predicted by Melhuish (2001, see Chapter 3), has emerged over the last decade from longitudinal research. Fox and Rutter (2010) describe this wave of research as employing "improved developmental and statistical methods for studying the effects of early experience" (p. 23). According to the NICHD (2005), earlier methods had not studied developmental and other consequences for sufficient lengths of time. They also had employed simplistic analytical methods that did not statistically control for other factors that might predict children's performance or adjustment - such as family or parental characteristics, or quality of the home environment. Additionally, the NICHD noted that earlier studies tended to assess information about one or other aspect of childcare while neglecting others that were theoretically important to the prediction of developmental outcomes. For example, information might have been collected about the quality of childcare or the types of childcare, or the number of hours children spend in childcare, but not all three simultaneously. Consequently, it was not possible to be certain whether observed effects on children's behaviour or development were due to the unique contribution of quality, or of the number of hours spent in the childcare centre, or the interaction of the many features of the childcare experience (NICHD Early Child Care Research Network, 2005a).

Another limitation of earlier studies identified by the NICHD Early Child Care Research Network (2005a) was that in assessing childcare, researchers often relied on indirect measures of quality, such as the ratio of children to adults, or the educational training of the childcare providers. Even when studies investigated qualitative processes, including the actual behaviour of the childcare providers, the quality of the setting was assessed as a whole rather than the quality of individual children's experiences, in spite of the fact that different children have different experiences in the same childcare setting, depending on their own characteristics and biases of the providers (a point noted also by Melhuish, 2001). Finally, studies of the effects of childcare on children's development did not focus on multiple domains of outcomes, thereby restricting the opportunity for finding that the effects of a specific feature of childcare (e.g., hours or quality) may appear in one domain, and not in another (as in fact proved to be the case in the NICHD data).

[11] Later renamed the *NICHD Study of Early Child Care and Youth Development* (NICHD Early Child Care Research Network, 2005)

As noted in Chapter 2, when the NICHD Early Child Care Research Network Study of Early Child Care initiated its large-scale prospective longitudinal study of the effects of early childcare arrangements on children's development, it tried to overcome these methodological limitations. In its initial developmental phase (1991-1994), the NICHD Early Child Care Research Network followed the development of over 1300 children at ten sites in the US from birth through age three. The results from this phase, published largely between 1999 and 2005, are the most relevant to answering the first question of this review (reproduced above) about what quality for under two's should look like. Subsequent phases of the study (Belsky, 2006; Belsky et al., 2007) followed the same children with the newest results reporting findings at age 15 years (Vandell et al., 2010).

This chapter is organised around a set of questions deemed of interest in the commissioning of this report. This is to provide an easy entry point for considering different elements of quality and is not intended to suggest these elements function independently. As noted already, research now recognises that quality is a multi-dimensional construct rather than a list of ingredients.

5.1 Adult:child ratios

5.1.1 What is the ideal adult:child ratios with under-twos?

Recommendations for staff:child ratios in settings for under-two-year-old children can be found in numerous advisory documents prepared for policy makers in different jurisdications after substantial literature reviews (e.g., the Australian Expert Advisory Panel on Quality Early Childhood Education and Child Care, 2009; Fisher & Patulny, 2004, in New South Wales; Muenchow & Marsland, 2007 in North America; Munton et al., 2002 in the UK).

The recommendations are for a preferred adult:child ratio of 1:3 (Expert Advisory Panel on Quality Early Childhood Education and Child Care, 2009; Gevers Deynoot-Schaub & Riksen-Walraven, 2008; Muenchow & Marsland, 2007; Munton et al., 2002), or for a "good enough" ratio of 1:4 (Fisher & Patulny, 2004).

Within the Canadian context, Goelman et al. (2006) noted that while an adult:child ratio of 1:4 is good, a ratio of 2:8 is better because the teachers can confer and discuss the children's activities and behaviour, a feature of infant and toddler pedagogy that they consider to be of central importance.

Munton et al. (2002) provided a comprehensive list of recommended ratios across English-speaking countries. Despite variation by country and local authorities between recommended and enforced ratios, the optimum ratio for under two-year-olds in education and care settings was consistently stated as 1:3.

5.1.2 Why are adult:child ratios important?

The recommendations derive from research in which staff:child ratios, or group sizes, have been found to be predictive of sensitive, positive caregiving and of children's early socio-emotional development (e.g., Campbell & Pungello, 2000; Leach, Barnes, Malmberg, Sylva & Stein, 2008).

Adult:child ratios are related to other measures of childcare quality. For example, the NICHD Early Child Care Research Network (2000), among others (deSchipper, Rieksen-Walraven, & Guerts, 2006; Howes, 1997), identified that the strongest and most consistent predictor of observed positive caregiving in group-based early childhood settings was the adult:child ratio. That is, caregivers provided more sensitive, frequent, and positive care when they were responsible for fewer children. The NICHD Early Child Care Research Network suggested that if parents, researchers or policymakers were searching for the single best structural indicator that would suggest that young children were receiving warm, sensitive, stimulating attention from their caregiver, the adult:child ratio would be the ideal choice (2000).

Caregivers with fewer children in their care are more sensitive, responsive, warm, nurturing, and encouraging toward the children, exhibit more positive and less negative affect, exert less negative control, and provide more varied and developmentally appropriate activities for the children than caregivers with more children in their care (Ghazvini & Mullis, 2002; Whitebook, 2003).

The NICHD (2005a) reported that the extent to which children's childcare centre settings met professional guidelines was related to developmental outcomes at 24 and 36 months; children in settings that met the guidelines for child:staff ratios had fewer behaviour problems and more positive social behaviours at both ages.

Somewhat closer geographically, Australians Milgrom and Mietz (2004) rated the quality of the interactional behaviour between twenty infants and their centre-based caregivers and noted that adult:child ratios are particularly important because of the developmental needs of infants (see also Sosinsky, Lord, & Zigler, 2007). Milgrom and Mietz found that in centres with fewer infants per caregiver there were more reciprocal and synchronous interactions signifying the importance of low ratios for responsive interactions. However, the authors highlighted that the most striking result was that positive micro-interactional behaviours between particular children and caregivers were rare. Similarly, emotional displays by infants were few and far between irrespective of the infant:caregiver ratios. This suggested that ratios by themselves were not a sufficient indicator of quality. Rather, favourable ratios provide the pre-conditions for positive interactions but the nature of the interactions may be determined by other factors, a point that strikes a chord with the comments made by Goelman et al. (2006). Milgrom and Mietz argued that while staff:child ratios are particularly important because of the developmental needs of infants, further research was needed on infant-caregiver interactions in Australian childcare settings in order to inform policy on quality childcare indicators. Goelman et al.'s (2006) findings are consistent with this argument: Using path analyses within a large Canadian study, that adult:child ratios (along with parent fees and the use of the centre as a student teacher practicum site) were an indirect predictor of quality. The direct predictors of quality for infant and toddler rooms in Goelman et al.'s study were the number of adults in the observed rooms and their education levels. In combination these findings highlight the interactive nature of structural elements of quality with other characteristics.

The issue of adult:child ratios has been particularly debated in Australia over recent years where a national policy about minimal adult:child ratios in childcare settings only came into force in December last year. In a historic announcement at its Brisbane meeting the Council of Australian Governments issued a communiqué (COAG, 2009) which set the minimum adult:child ratio for under-two-year-olds at 1:4 with an implementation date of 1 January 2012. In a study on the likely impact of the introduction of this ratio on the experiences of children and staff, and the impact on costs, fees and the supply of childcare places for children aged under two years at a time of staff shortages, Fisher and Patulny (2004) argued that a 1:4 ratio would support a "good-enough" level of quality for under-twos (p. 10). They also argued that while the direct cost of staff under an improved staff:child ratio would increase salary expenditure, the indirect cost of staff turnover might decrease, mitigating some of the salary increase.

Another study carried out by Phillips et al. (2000, cited in Fisher & Patulny, 2004) also showed that two of the most significant predictors of better classroom/centre quality for infants and toddlers are lower numbers of children per adult and higher parent fees. Consistent with Phillips et al., an English study by Leach, Barnes, Malmberg, Sylva, & Stein (2008) reported that ratios of children to adults have a significant impact on quality of care. That is, the more infants or toddlers each adult has to care for, the lower the quality of care.

Do better quality ratios increase costs to parents and affect staffing supply?

Fisher and Patulny (2004) argued that although change to a better ratio in New South Wales would lead to an increase in the operating cost of services, the results of a survey of long day care centres (PriceWaterhouseCooper, 2003) suggested that the link between cost and fees was not direct and that centres were likely to mitigate that possible cost

increase in a number of ways. The PriceWaterhouseCooper (PWC) study suggested three main reasons why parental fees were unlikely to increase: Firstly, many centres already voluntarily operated a 1:4 ratio and thus would experience little or no cost increase. Secondly, competition in NSW between privately-owned and community-based centres would constrain fee increases; and thirdly, centres were likely to cross-subsidise fees across ages which the authors noted was already a common practice in centres that operated with a better than minimum staff:child ratio. Lastly, the PWC report noted that the historic increase in demand for community-based under-two places indicated that families appeared willing, and had the capacity, to pay some fee differential for care for younger children. The authors interpreted this as suggesting that a small increase in fees could be managed by these families, without affecting demand.

Commenting on whether adopting a better ratio would decrease the supply of childcare, Fisher and Patulny (2004) acknowledged that this was a short-term danger of moving from a ratio of 1:5 to a ratio of 1:4 (especially for NSW which already had low rates of provision, and such a move could reduce supply further). However, they added that the PWC report (2003, cited in Fisher & Patulny, 2004) had already demonstrated that a large reduction in the supply of places was unlikely. The report provided further details of the type of centres likely to be affected.

Fisher and Patulny (2004) argued that their research suggested that a better staff:child ratio could improve the working conditions of staff and their job satisfaction as well as reduce stress which would thus address problems that aggravate staff shortages.

5.2 Group size in under-two settings

5.2.1 What is the ideal group size with under-twos?

Goelman et al. (2006), in discussing the need for a predictive model of early childhood education in Canada, emphasised that quality with infants and toddlers depends on "maintaining the balance between adult:child ratio, the number of adults, and smaller group size" (p. 290).

In the United States, the American Public Health Association and the American Academy of Pediatrics (1992, cited in NICHD Early Child Care Research Network, 1996) advocates that group sizes in settings for under-two-year-olds should not exceed six (6) children. Experts in American childcare writing for *Working Mother* magazine (Cadden, 1994, cited in NICHD Early Child Care Research Network, 1996) also focused on structural characteristics (i.e., group sizes not exceeding six to eight infants and adult:child ratios not higher than 1: 4). Their argument is based on the fact that small groups and familiar caregivers provide the consistency and familiarity of interaction that is necessary for this age group.

5.2.2 Why is group size important for childcare quality?

The increased interaction and communication possible in smaller classes have been shown to affect children's outcomes. In its revised accreditation criteria NAEYC (2008) states that smaller group sizes and larger ratios of staff to children are related to positive outcomes for children, reiterating that there is a substantial amount of evidence to support this. For example, Bowman, Donovan and Burns (2000) found that children in smaller groups were more likely to participate in child-initiated activities, and that when there are fewer children in the room, teachers can more closely mediate children's social interaction.

Similarly, Vandell and Wolfe's (2002) and Phillipsen, Burchinal, Howes and Cryer's (1997) studies both found that when groups are smaller, teachers provide more stimulating, responsive, warm, and supportive interactions. They also provide more individualised attention, engage in more dialogues with children, spend less time managing children and more time in educational activities.

In the still-cited National Day Care Staffing study (Ruopp, Travers, Glantz & Coelen, 1979, cited in NAEYC, 2008; Elicker, Langill, Ruprecht & Kwon, 2007), children in smaller classes had greater gains in receptive language, general knowledge, cooperative behaviour, and verbal initiative, and showed less hostility and conflict in their interactions with others. The NICHD Early Child Care Research Network (1999) also reported a link between smaller group sizes, higher levels of caregiver education and training, and lower ratios, and higher scores on measures of cognitive and language development, and lower behavioural problems at 24 months old. Combined, these studies clearly suggest that smaller group sizes play a significant role in quality early childhood education for under-two-year-olds.

5.3 Quantity of care

5.3.1 How is quantity of care implicated in outcomes for under-two-year-olds?

The effect of quantity of care in childcare during the first two years of life has been complex to untangle and subject to hot debate.

The NICHD Early Child Care Research Network (2003; 2004) reports indicated that longer hours in childcare centres had both positive and negative effects for children**.** Specifically, the NICHD Early Child Care Research Network (2003, 2004) reported that more time in centre-based childcare was related to better cognitive and language outcomes and to more positive peer interaction/social competence (at 4½ years), but it was also related to higher caregiver reports of behaviour problems (from 3 months to 54 months) (see Harrison, 2008, as a review; Jacob, 2009; Vandell et al., 2010). Reporting on a childcare study in Haifa, Israel, Sagi, Koren-Karie, Gini, Ziv & Joels (2002) also noted the possibility that infants may develop a less secure attachment to their mothers from longer hours in childcare.

A later report (NICHD, 2005a) from the NICHD Early Child Care Research Network pointed out that the quantity of non-maternal care was a significant predictor of some child outcomes and these effects of quantity of childcare are mediated by the age of the child, and the quality of care. Their findings suggest that it is not simply a question of how much is enough, but how good is the quality of education and care, in determining outcomes for under-two-year-olds.

In an evaluative review of the NICHD (2003) data as part of assessing how temperament and gender might be implicated in reported effects of out-of-home childcare in infancy, Crockenberg (2003) commented that:

> the amount of time in child care is associated with differences in child aggression and social competence, independent of the quality of caregiving at home and in child care. This may mean that longer hours in child care during infancy and early childhood adversely affect development even when quality of care is high, *but as the interactive effect of amount and quality of care was not tested, we cannot be certain that this is the case*. However, given that most of the variance in child behavior that is associated with amount of care is shared with quality and type of care (compare conservative and liberal effect sizes in Table 4 in NICHD Early Child Care Research Network, this issue, p. 976–1005), *it appears that negative effects occur primarily when children spend long hours in poor-quality, center-based care.* Moreover, the relatively small effect size of amount of care as a predictor of externalizing behavior and social competence is compatible with the view that only some children are negatively affected by longer hours in child care. (p. 1034, italics not in original)

Another NICHD report (2005b), however, noted that the relations between amount of time in childcare and teacher-reported externalising (behaviour expressing negativity) problems and conflict were no longer significant by the time children were evaluated in third grade (age=seven to eight years). This suggested that the early-reported negative effect dissipated over time. At the same time, the NICHD Early Child Care Research Network (2005b) found some new sleeper effects that emerged over time. For example, children who spent more hours in early childcare had poorer work habits as measured via items such as “works well independently”, “uses time wisely”, and “completes work promptly”.

The most recent paper published from the NICHD project (Vandell, Belsky, Burchinal, Steinberg, Vandergrift and the NICHD Early Child Care Research Network, 2010) reported another sleeper (or non-linear) quality effect. The study found that both quality and quantity of childcare remained linked to adolescent functioning. Additionally, they reported that "larger gains in cognitive-academic outcomes appear to accrue when children experience care of high quality" (p. 750). Reflecting on why this finding had not been detected at an earlier age, the researchers suggested the possibility that as high school students have to work more independently than at younger school grades, those who had attended higher quality early childhood centres might "be better positioned to oversee their own achievement in high school" (p. 751).

Vandell et al. (2010) argue that this evidence of the long-term effect of early childcare quality is one of the most important findings of the 15 years report because "it occurred in a large economically and geographically diverse group of children who participated in routine non-relative childcare in their communities" (p. 750) rather than in high quality interventions, and this suggests that "the quality of early childcare experiences can have long-lasting (albeit small) effects on middle class and affluent children as well as those who are economically disadvantaged" (p. 750).

With regards to the effects of quantity of childcare, the 15 years results showed that the link between more hours of childcare and behaviour problems found at four and a half years, was maintained. In other words, more hours of early childcare predicted reports by adolescents of more risk taking. However, a relation was not found between longer hours of non-relative childcare and more externalising behaviour. Rather, high quality non-relative childcare was related to less externalising behaviour; this finding had been detected when the children were toddlers but not at four and a half years and middle childhood.

The authors concluded that although effect sizes were small, the findings were important because of the link they established between childcare effects and cognitive-academic achievement and risk-taking more than ten years after the children had left childcare.

Adi-Japha and Klein (2009), using data from the NICHD database, additionally noted that children with high quality parenting were better prepared for school and had better language skills than those with less optimal parenting. That should not be a surprise. But what was surprising was the finding that young children who had good parenting and had spent a medium amount of time in childcare (10–32 hrs) did much better on basic preschool concepts than children who had been in childcare for longer amounts of time. The results suggest that the quality of parenting and the amount of time children spend in non-relative childcare are not independent of each other; rather they interact to shape children's development, a comment repeated by Vandell et al. (2010).

In summary then, the current picture from the NICHD prospective longitudinal study in relation to the effects of quantity of care, seems to be that measures taken when children were between three months and four and a half years indicated some negative impact on the security of attachment of the children, but this was primarily when the children were in poor quality centres for long hours, and the effect was only for some of these children. By 2005, the NICHD reports showed that these negative effects had dissipated over time and some sleeper effects from long hours in childcare emerged in relation to work habits when the children were in Grade 3 (aged seven to eight years) of school. The most recent results reporting measures taken at age 15 years show that long hours of out-of-home childcare were linked to more risk-taking behaviours in adolescence. A link between high quality childcare and cognitive-academic achievement was also found. Additionally, the NICHD data show that the amount of time spent in childcare interacts with quality of parenting. As a result, it is difficult to separate these effects from one another.

5.4 Teacher characteristics: qualifications, education and experience

5.4.1 What difference does training make to quality outcomes for infants and toddlers?

Much of the literature considering effects pays attention to the notion of training as a key variable. It is important to note that when considering the impact of training on quality education for under-two-year-olds the nature of the training referred to differs by cultures, countries, states and statutes which promote specific benchmarks or thresholds to determine what constitutes 'quality' (Munton et al., 2002; Tout, Zaslow & Berry, 2005; Pessanha, Aguiar & Bairrão, 2007). 'Training' may or may not incorporate certification; and be credit-bearing at either a low or higher levels (or anything in between). Training can refer to a teacher-education qualification such as a certificate, diploma or bachelor's degree; or it may involve the ongoing, on-the-job process of professional development. Thus, the variability of training must be taken into account when reporting on studies regarding effects such as impacts on the status, working conditions and pay for the 'trained' member of staff. As Munton and her colleagues (2002) stated:

> The weight of evidence suggests that the sheer complexity of early years environments makes it difficult for research to identify independent effects of individual elements including qualifications and group size. The same conclusions apply across settings and age groups. (p.109)

Despite these difficulties reported research has consistently demonstrated that high levels of training – both pre-service and in-service – are necessary for quality outcomes with infants and toddlers (Munton et al, 2002). In examining the impact of training on quality, two key aspects are implicated: firstly, the necessity for it to provide specialised professional knowledge for teachers with infants and toddlers; secondly, the need to investigate whether there is appropriate and specialised content regarding infant-toddler care and education in the relevant training or professional development programme that has accreditation, i.e., the type of qualification. A third, largely forgotten, aspect of training that was brought to the debate during the eighties, is the point that education that is not specifically early childhood related may also contribute to quality education and care for under-two-year-olds. The evidence for this argument lies primarily in the literature related to parents (or home-based educators) rather than teachers in centres and is therefore beyond the scope of this report. In contrast Howes, Whitebook & Phillips (1992, cited in Tout, et al., 2005) found that when data were analysed according to age group, education *with an early childhood education focus* was found to be a predictor of appropriate caregiving for infants: "For infants, education with ECE content appeared to be a more important factor in appropriate caregiving than education alone" (p. 95). This analysis showed that "training alone did not bring teachers with lower ECE educational qualifications (i.e., less than a bachelor's degree) up to the level of sensitivity and classroom quality observed by teachers holding a bachelor's degree with ECE content" (p. 92). The authors noted the limited data available about training for work with under-two-year-olds and that further study is required in the area.

Ireland (2006) made a strong argument that "it is important to recognise that education for infants and toddlers should not look like education for children of other ages" (p. 4). She draws on the caution from Katz (1999, cited in Ireland (2007) that teachers need to carefully establish what would be learned and when. In addition, she advocates that group infant-toddler education should mirror high quality home environments that provide a sense of belonging for the child with caring adults who are in tune with each child.

In a study by Hestenes, Cassidy, Hegde & Lower (2007) the higher quality provision in inclusive infant toddler classrooms compared to non-inclusive classrooms was attributed to teacher education and staff/child ratios. The study involved 466 classrooms across 82 counties with children aged 12 months to 21 months; data were gathered between 2003 and 2004 and quality was gauged using the ITERS-R scale with the higher quality measures related to differences in language/interactions, safety/organisation and parents/staff variables rather than activities in the classroom.

In a recent discussion of the challenges in relation to the design and practices in infant-toddler group programmes, Nyland (2007) stated that as the curriculum is relationship driven, adequate numbers of staff need to be involved and more time is needed to spend on interactions. She argued that trained staff (with supportive work conditions and good remuneration) are part of the quality provision involving ratios, space and group size. She expressed concern that despite research regarding intersubjectivity (see Chapter 4) and claims that the infant's growth between birth and second year is formidable (see Chapter 3), the minimum standards set by regulations have become accepted as the measure of quality.

5.4.2 Research regarding teacher qualifications

A research team based at the Thomas Coram Research Unit Institute of Education at the University of London (Munton et al, 2002) carried out a comprehensive review of the known relationships between ratios, staff qualifications and training, group size and the quality of provision in early years and childcare settings. Munton et al. (2002) concluded that teacher education and training has a mediating effect on positive child outcomes along with a number of other important variables, such as ratios, group size, staff salary, management practices and the "organisational characteristics of the setting" (p. 104). The authors note, for example, that the evidence overall suggests that group size, qualifications and training can be understood to have: "a positive influence on developmental outcomes for children. Small group sizes and better trained staff are more likely to provide environments for effective child development" (p. 10). The authors concluded with a reminder that:

> while there are clearly some differences between early years sectors in the US and UK, there are important similarities. Both are heavily influenced by the same underlying philosophy: attachment theory, and both have a burgeoning private sector. Early years services in the US and the UK both have a structure of staffing based on a split system. Consequently, findings from US research are often relevant to the situation facing early years provision in the UK. In contrast, early years research and practice in mainland Europe is often based on different philosophies, and more relevant to countries with integrated services and little or no private provision. (p. 11)

In their review the authors emphasised that the types and levels of qualification among early years workers in different countries varied considerably. For example, the authors noted that changes in New Zealand and Spain – resulting from the shift from a split system (education and welfare) to an integrated system based on education – had developed a new type of early childhood professionalism (see also Dalli, 2008; Miller & Cable, 2008). This resulted in a shift in terminology from the early childhood worker to the early childhood teacher. The review described the split workforce model of teachers and childcare workers that is still found in countries such as Brazil and Britain and highlighted the differences for both groups in terms of training, pay and status. Munton et al. (2002) pointed out the disproportionate numbers of 'workers' as opposed to 'teachers' who work with infants and toddlers, suggesting that the underpinning ideologies are worth consideration:

> What are the purposes of early childhood institutions and the work they undertake? How do we conceptualise or construct the young child and the early childhood worker? How do we understand concepts such as care, knowledge and learning? What pedagogical theories and practices underpin services? Different countries (or even groups within countries) do, and will, come up with different answers to these questions. (p. 72)

Dahlberg, Moss and Pence (1999, cited in Munton et al. 2002) challenged the idea of the "worker as a technician" (p. 74) as one who transmits predetermined knowledge and culture to the child, facilitating the child's development, ensuring milestones are reached with use of appropriate activities for the child's stage of development. They contrast with this the idea of the worker as a "co-constructor of knowledge and culture" (p. 74) (both the children's and their own), viewing the child as an active rather than a passive learner. Munton et al. suggest that the latter idea is consistent with Swedish reforms where all early childhood education staff working with children were, from 2001, to be trained as teachers with a minimum period of three and a half years at degree level. This included 18 months of specialised

training relevant to the professional knowledge required to work with a specific age group and type of teaching. Infants and toddlers are one of those specialisations.

What difference does professional development make to quality?

Tout, et al. (2005) provided a rigorous analysis of 16 large-scale studies conducted in the United States and published in peer reviewed journals (while the datasets the studies drew on may not have come from the US) that considered the relationship between professional development and observed programme quality. They found that more professional development is associated with better quality early childhood education programmes, commenting: "the work to date is clear that more education, more education with early childhood education content, and more training, are each associated with better quality early childhood environments" (p. 105). However, it was noted that "it is not clear with respect to the threshold (or absolute level) of professional development needed to obtain a particular level of quality in the early childhood setting" (p. 94).

Tout et al. (2005) noted a range of challenges and limitations in existing research on professional development; these limit the ability to draw refined conclusions from the evidence. For example, there is a lack of specification of the content of bachelor degrees and thus a lack of comparability, along with problems with generalising findings to other environments. They proposed that greater attention was needed in the study of the *input,* including a closer examination of the content of various types of professional development and its effect on the *output* (programme quality) and greater specification about *desired teacher practice*.

Tout et al. (2005) concluded that the evidence, to date, suggested that quality is affected by both training and certification and argued that:

> The ECE field urgently needs better specification of the features of training that are important to quality of the early childhood environment, including an examination of content, intensity, and the auspices offering the training … the ECE field will only gain a clear understanding of the levels of each of these that are critical to quality when professional development terms (e.g., a bachelor's degree in ECE) are more specific about the content and extent of course work that are needed and the requirements to demonstrate that knowledge translates into practice. (pp. 105, 106).

Degree study and a positive attitude towards infants and toddlers as learners

An important attribute that is gained as a result of a higher level qualification, according to the literature, is that of a positive attitude towards infants and toddlers and their learning. In a Sydney study Kowalski et al. (2005) examined the influence of the long-day childcare environment within a curriculum centred on play, on 48 toddlers and 37 pre-schoolers. They found that it was highly beneficial for young children's cognitive development when positive attitudes were displayed towards children by the teachers. The importance of specific education in developmental principles as a component of teacher training led to strategies employed when guiding the young children's pretend play. The authors cited another study by Arnett (1989) where teachers who gained a four-year university-based degree in early childhood education also displayed more positive behaviours.

Reporting on a case study that gave priority to employing degree qualified teachers for infants and toddlers in three community-based centres in New South Wales, Australia, Ireland (2006) points out that it is common for a university qualified teacher to be in the three to five age year group of children but not with infants and toddlers. She explains that there has been substantial discussion, research, and increasingly, practice within the field, advocating that qualities of children's experiences are affected by the staff qualifications, yet she is concerned that this is not reflected in regulations.

Ireland (2006, 2007) also provided a comprehensive review of the literature indicating strong evidence between the quality of a programme and the level of teacher education. She identified barriers to providing university qualified

teachers and explored the tensions evident among service providers, government, parents and the wider community as to who pays for the funding required. Ireland added that "poor employment conditions are disincentives for early childhood professionals to remain in the workforce" (p. 5) and that the 2000 OECD Thematic Review (Press & Hayes, 2000, cited in Ireland, 2007, p. 23) cited industrial issues that indicate disparities between long-day care, preschool and school teaching. Ireland (2006) quoted McMullen and Alat (2002) who suggest that: "the knowledge and skills that are more likely to lead to the provision of high quality early care and education may more readily be present in well-educated individuals, those with 4-year degrees" (p. 3). In acknowledging that elements of the profession are moving beyond parameters set by policymakers to improve quality outcomes, she commented on emerging evidence that "about 50 percent of services which provide infant-toddler education have already improved their ratio of adults to children (Department of Community Services, 2003; Fisher & Patulny 2004)" (2006, p.5). Ireland also cited data from the *Growing up in Australia longitudinal study of Australian children* that showed that: "of the 221 participating infants being cared for in long day care centres across Australia, 19.7 percent had a staff member who held a bachelor degree or above working in the infants-toddlers' room" (Harrison, pers.comm., 1 February 2006, cited in Ireland, 2007).

5.4.3 Time for ongoing reflection on practice

The absence of time for ongoing and continuous training for staff to reflect on their practice, no matter which level and quality of the initial training, was raised as an additional issue in Munton et al.'s (2002) review. The authors argued that this lack of provision for ongoing training reflects an understanding of the early childhood worker as technician, rather than a reflective practitioner and researcher (as discussed above). They suggested that the provision for continuous training should be examined in relation to basic and initial training, and how these types of training might intersect. The issue of teacher motivation and beliefs responsible for relationships between ongoing professional development and quality was also raised by Tout, et al. (2005) as an area for further research.

Professional development that takes into account ongoing new ideas based on current research was also seen as essential to inform the professional understandings of teachers of under-two-year-olds, since (as outlined in Chapter 3) new knowledge is being generated constantly and, as a result, teachers of under-two-year-olds face additional challenges in their pedagogical practice (as outlined in Chapter 2). In their *Early Years Report* McCain & Mustard (1999) stated that:

> Young children deserve the best-prepared staff to work with them. All those who work with young children and parents must understand the brain story and the relationship of play-based problem-solving learning to early brain development. The competencies that are required can be attained through different educational and experiential pathways. (p. 145)

An infant caregiving mentoring project by Fiene (2002) in Pennsylvania, US compared the intensive one-on-one mentoring approach to the more commonly used workshop training. Training interventions were found to be necessary in infant toddler programmes because of the low scores on various programme quality measures. The study employed a randomised design with two self-selected groups, either the mentoring group (with an experienced early childhood professional of five to seven years' experience as both director and teacher) or the comparison non-mentoring control group over a four-month period. The results indicated that the mentoring programme positively improved the overall quality of the classroom with caregivers becoming more sensitive to infants' needs.

5.4.4 A career structure to enhance a quality workforce

McCain and Mustard (1999) stated that staff expertise for a quality programme will require "appropriate recognition, clear career pathways and remuneration commensurate with the importance of early child development" (p. 146). To this end the authors made a policy recommendation to the Canadian government to require that "professionals who

work with children are aware of the new knowledge about early child development and learning, and that new professional training programs are developed that reflect this new knowledge" (p. 158).

To support the notion of a career structure with high status and appropriate pay in recognition of professional expertise in working with infants and toddlers, Pessanha et al. (2007) argued that it is also important to have leadership from knowledgeable and experienced directors and teachers. Findings from a number of studies focusing on 0–2 or 0–3 years cited by Pessanha et al. (2007) examined the impact of structural indicators of quality such as teacher experience, pay, and director leadership experience on levels of process quality. For example, Phillipsen et al. (1997, cited in Pessanha et al. 2007) found that process quality was higher in settings for 0–24 month old infants and toddlers when teachers were more experienced, better paid, and under the leadership of experienced "directors" (p. 206).

Reflecting on her research investigating barriers to the employment of university-qualified teachers to work with infants and toddlers in Australian childcare centres, Ireland (2007) referred to the need for leadership from a leader who focuses on the service's philosophy and goals. She concluded that:

> … research makes a clear link between a university qualified teachers' contribution to high quality interactions with children and staff, increased knowledge of child development, improved pedagogical outcomes and early childhood practices. (Ireland, 2007, p. 12).

Ireland also added that professionals need maturity to be able to deal with the unique, complex and ethical decisions required in working with infants and that this will only occur if competent people are brought into the field and retained by improving work and pay conditions.

5.4.5 What is appropriate content for training, teacher-education qualifications and professional development programmes?

Debates on quality in Germany have also focused on the nature of staff training (Oberhuemer, 2004) necessary to promote high quality education and care for under-two-year-olds. While it is evident that the research base is still slim, a number of qualities and attributes have been identified as highly significant in terms of preparing adults to work effectively with infants and toddlers. These identify a need for all training programmes to address the specialist pedagogies, developmental needs and structural features that are required for under-two-year-olds. For example, awareness of the implications of emotional engagement and attachment relationships for the well-being of under-two-year-olds (as discussed in Chapter 4) illustrates the important role that intimate emotional experiences play in the first years, and the significance of reflective practice for teachers as they examine their practice in this instance. Five identified areas in the training of under-two-year-old teachers are i) emotional engagement; ii) critical reflection; iii) awareness of diversity; iv) a research/evaluation focus; and v) child development knowledge.

Emotional engagement

Support for the argument that emotional aspects of a teacher's practice with infants and toddlers need to be catered for in training and professional development comes from an action research project described by Elfer and Dearnley (2007). The project involved a group of nursery staff participating in a professional development programme that specifically explored emotional experiences in professional work. The research concluded that there is a need for an ongoing culture of attention to the emotional experience of nursery staff as an increasing emphasis is currently being placed on the emotional well-being of infants and toddlers. This study, coupled with the overwhelming number of pedagogical studies (cited in Chapter 4) and the implications of attuned caregiving for development (discussed in Chapter 3), provide a strong argument for training programmes to introduce infant and toddler pedagogy as a unique and specialist framework.

Critical reflection, shared inquiry and dialogue

Macfarlane, Noble and Cartmel (2004) noted that the fast increase in women in the paid workforce has created a dilemma regarding the necessary training to prepare practitioners for important pedagogical work with infants and toddlers. The authors explain that traditional approaches to training and preparation of practitioners for work in this field do not always highlight the significance of relationships. They point out that adherence to the traditional rather than contemporary understandings of childhood, mothering and institutional care has caused much debate and contributed to a caregiving-teaching paradox that is unhelpful (a point already discussed in Chapter 4). Because of the enormous cognitive, emotional and social developments that take place in the first years, the authors call for research into teachers' experiences in infant and toddler care and education; and to reform training. They state that, as a result of this and other complexities, staff who work with infants and toddlers require specialised training and support. They call for critical reflection, and self-directed learning through shared inquiry and dialogue as a key mechanism for teachers to employ in addressing these dilemmas and promoting high quality pedagogical practice.

Understanding the contemporary diversity of children's lives

Another important subject area for infant-toddler education, as evidenced in a study of undergraduate early childhood programmes in the United States (Hallam, Buell & Ridgley, 2003), is the inclusion of subject matter in infant-toddler programmes related to young children and their families living in poverty. Findings from this study point out that while most programmes provide some type of field-based experience, the preparation of students in coping with the issues faced by children and families in poverty is not always provided. The focus on family systems and context as a microsystem for child development would suggest that a focus on adult development and methods of interacting with parents/caregivers to support children's development would exemplify ecological theory in the early childhood curriculum. The increase in early care and education services for children and families in poverty requires advocacy for child achievement and family cohesion in the long term (Gammage, 2003).

Morgan and Fraser (2007), in their overview of the current state of professional development, state that teachers need to understand the lives that children and parents lead. They cite Fuller and Kagan (2000, cited in Morgan & Fraser, 2007, p. 169) in stating that mothers living in poverty with infants in full-time, high quality childcare, "showed more positive involvement with their six-month-old children compared with poor mothers raising their children at home or those using full-time, lower quality infant care". The authors discuss how American families are fast becoming increasingly culturally diverse and that the teachers with bachelor degrees may not be from such diverse backgrounds as the children so teacher preparation may not be keeping up with the multiple needs of the increasingly diverse population of children and families. They acknowledge that systemic changes made over the last decade are dynamic, but that this needs to continue. They also recommend offering other types of qualifications such as the infant-toddler credential, which is reported as being established in 18 states in the US.

In relation to teachers understanding the lives of children and their families, Nyland's (2004) study of infants in centre contexts that hold the notion of a childcare centre as a developmental niche is promising. This notion endorses the importance of the subjectivities of caregivers' lives needing to connect with the values and beliefs of families to benefit the daily lived experiences of infants and toddlers in the context of the early childhood centre. The author points out that "children learn whatever is happening in the context and therefore the context is continually promoting experiences that help children make sense of their lives, either good or bad" (p. 35). The beliefs and values of caregivers impacted on children through the different views of infants and toddlers within this developmental niche. This same point is also highlighted in White's (2009) New Zealand study in which the subjectivities of the teacher were found to limit what she was able to recognise as learning. In this case the teacher was diploma trained but her qualification did not sufficiently take account of specific knowledge of infants or toddlers.

A research/evaluation focus

In a study investigating the impact of participation in a research mentorship team on early childhood teachers' professional identities, Nimmo and Park (2009) argue for the role of teacher as active researcher. Their study was conducted from 2003–2006 at a university laboratory childcare centre with 124 children, infants through to kindergarten, in rural New England with goals to foster collaborative inquiry. There have been increased efforts over the last two decades to understand the contribution of teachers' reflective practice to professional development and educational improvement. The authors point out that when there is an emphasis on caring for children the job is viewed more as babysitting and not as real teaching, which is also reflected in the low wages. This narrow view of teaching places emphasis on the technical role of an early childhood teacher, rather than as a reflective teacher to support pre-service teachers under their supervision to form a disposition of inquiry.

The findings of this study are particularly significant for teachers engaged in supervising preservice student-teachers in a process that facilitates respect for multiple perspectives and takes a metacognitive stance toward practice, in order to model reflective thinking. The notion of mentorship within a team approach is an effective method for promoting an inquiry approach to ongoing professional growth and lifelong learning and provides a model of how practice and research should be intertwined (Nimmo & Park, 2009).

The outcomes generated from those projects funded under New Zealand's COI action research programme that have focused on under-two-year-olds tell a similar story, as reported in Chapter 4. As Meade (2010) has pointed out, such engagement not only enhances practice within services, but provides important pedagogical information for wider dissemination. As a result, it is possible to generate new knowledge about what works for very young children in early childhood education (A summary of this new knowledge is included in Chapter 4).

5.5 What impact do factors in the physical early childhood environment have on health issues?

5.5.1 Noise levels, infections, otitis media (middle ear infection)

New Zealanders Bedford and Sutherland (2008) have drawn attention to the need to consider the effect that elements of the physical environment of early childhood settings, like crowded settings and noise levels, can have on the health of infants and toddlers, such as ear infections and other childhood illnesses. Their critique of current space requirements for infants and toddlers in New Zealand, in comparison with other countries, suggested that current standards need to be improved.

A doctoral study by McLaren (2008) investigated the noise levels in early childhood centres and the effects on children and their teachers. He found that reverberation times in most centres typically exceeded the 0.6 seconds prescribed by the Australasian standard for schools and learning spaces. Very high levels of noise were recorded in a number of centres with a significant number of children and staff members exceeding the maximum daily sound exposure of 100 percent permitted for workers in industry. Some children with a range of special needs were identified as being particularly at-risk to noise, with the most adverse outcomes reported for those experiencing sensory integration disorder. McLaren noted that while there are little or no data on how sound affects a child, compared to an adult, the early years of life are critical for the development of speech, hearing and auditory processes, as well as being the most vulnerable time for middle ear infections.

McLaren's findings support Bedford's (1999) conclusion from his investigation of the physical environments in Wellington early childhood education services, based on analyses of reports, interviews and questionnaires sent to early childhood education services that high noise levels in early childhood settings can have a significant impact on young children's stress, a point consistent with research reviewed in Chapter 3. He also concluded that:

> Early Childhood Centre environments are capable of increasing the spread of non vaccine-preventable communicable diseases among the under five population and their families, with major associated costs. Gastrointestinal infections, upper respiratory infections and otitis media as a consequence of upper respiratory tract infections, are of particular concern. New Zealand notifiable diseases data, combined with Early Childhood Centre staff and parent comments, indicate that these infections are a significant quality of life issue for the Early Childhood Centre community. (p. i)

Vernon-Feagans and Manlove (2005) noted that many young children suffer from frequent and long bouts of otitis media (OM) or and accompanying mild-to-moderate hearing loss. They argued that OM is a risk factor for children's overall development because infants (aged 12–18 months old) with chronic OM have been found to attend less to language in childcare, are rated by their mothers as having poorer attention, and are observed to use fewer gestures in interaction with their parents (Feagans, Kipp, & Blood, 1994, cited in Vernon-Feagans & Manlove, 2005). Furthermore, children who experienced chronic OM during the first three years of life initiated fewer verbal exchanges and played more by themselves in childcare during free play, even when they were well, compared to children who did not have chronic problems with OM (Vernon-Feagans, Manlove, & Volling, 1996, cited in Vernon-Feagans & Manlove). In a study that investigated the combined effects of OM and the quality of childcare, Vernon-Feagans and Manlove followed 72 children with OM who began childcare in infancy (i.e., before the age of 1 year) to 24 months when they were observed when they were well. They reported that children with chronic OM and low quality care exchanged more negative gestures with peers, initiated fewer verbal approaches to teachers and peers and were spoken to less by teachers and peers in comparison to all other children.

Vernon-Feagans and Manlove (2005) concluded that research needs to explore the quality of the childcare context as a possible moderator of the effects of OM because this context is an increasingly common one for infants and young children (Vernon-Feagans & Manlove, 2005). They also emphasised that future research seeking to understand the conditions under which OM might have effects on development needs to use a "cumulative risk/moderator model" because:

> otitis media, like other early childhood risk factors may only lead to negative outcomes in combination with other adverse conditions, as has been found in other cumulative risk studies… It is not clear all the processes in low quality child care that might be implicated in the effects found in this study…It would be important in future studies to understand not only the factors in low quality care that might exacerbate the effects of chronic otitis media but the possible buffering effects that high quality child care and rich home environments might have on children's communicative behavior. (p. 324)

In other words, early experience with OM may not always produce negative effects because supportive environments could buffer children against negative outcomes. For example, children with chronic OM may do well in language rich environments where there are many high quality one-to-one interactions with adults that help children compensate for the hearing loss associated with OM. On the other hand, poor environments that do not promote high quality language interactions may actually exacerbate the negative effects of OM, producing an interaction between the quality of care and experience with OM. Vernon-Feagans and Manlove concluded that children with chronic OM who are also in poor environmental settings may be the group at highest risk of poor outcomes.

Within the longitudinal NICHD Study of Early Child Care (2005) (total sample=1364) researchers have confirmed that children attending childcare centres and childcare homes had more ear infections and upper respiratory illnesses than children cared for at home, especially during the first two years of life. Furthermore, the number of other children in the childcare setting was also positively related to frequency of upper respiratory illnesses and gastrointestinal illnesses through to age three years. However, these heightened rates of illness did not seem to have significant adverse developmental consequences over the first three years of life.

Is there evidence of long-term impact from the increased rate of childhood illnesses in the first two years?

According to the longitudinal NICHD (2005) study, although attending non-parental care centres increases the possibility of having communicable illnesses, there was no evidence that this led to later health problems. Rather, the NICHD (2005) report indicated that at age two, children who were being cared for in childcare centres and childcare homes did better on measures of cognitive and language development than children in other forms of care. By age three, greater cumulative experience in centre care and early experience in childcare homes were both associated with better performance on cognitive and language measures than other forms of care, assuming comparable quality of the caregiving environment. At 54 months cumulative experience in centre care continued to be positively associated with performance on cognitive and linguistic measures. Furthermore, experience with group care (settings with at least three other children, not counting siblings), whether in centres or childcare homes, made some difference in several social-emotional outcomes at age two and three years. Specifically, children with more cumulative experience in group care showed more cooperation with their mothers in the laboratory at age two, less negative laboratory interaction with their mothers at age 3 and fewer caregiver-reported behaviour problems at both ages. However, greater group experience before 12 months was associated with more mother-reported behaviour problems at age 3. This has been interpreted as suggesting that benefits from group care may begin in the second year of life.

5.5.2 Food, obesity and physical activity

The increasing health issue of obesity among American children led Story, Kaphingst and French (2006) to argue that more attention should be directed to the food and physical activity offered in childcare settings to help stem childhood obesity. They reported that The *Feeding Infants and Toddlers Study* in the US, with a national random sample of 3,022 infants and toddlers aged four to twenty-four months, showed that energy intakes were higher than recommended (Devaney et al., 2004, cited in Story et al., 2006). Specifically, up to a third of children aged seven to twenty-four months ate no vegetables or fruit on the day of the dietary survey. For fifteen- to eighteen-month-olds, the vegetable most commonly eaten was French fries. Although Devaney et al. did not distinguish between foods and beverages consumed at home and at childcare, the results of their study suggest the need to be alert to young children's diets.

Making a similar point within the Australian context, Smith (2003) argued that food eaten in childcare centres is important not only to young children's nutritional intake but also to the development of good eating habits. She outlined some strategies adopted in Australian childcare centres to promote healthy eating, arguing that many childcare centres still had menus that were low in calcium, iron, zinc, and energy. Referring to research from the US, Smith argued that nutrition education delivered through health services to caregivers can decrease the prevalence of malnutrition in childcare settings where access to food is not a limiting factor (Penny, et al. 2005). At the same time, she argued that some staff-parent interactions, such as involvement in menu planning, nutrition policy development, and provision of information to parents in newsletters and pamphlets, should be encouraged (Smith, 2003).

With regards to the links between obesity and specific foods, the American Academy of Pediatrics (American Academy of Pediatrics, Committee on Nutrition, 2001, cited in Story et al., 2006) recommends that children aged one to six should drink no more than four to six ounces (approx. 118–177ml) of fruit juice a day. Although evidence about the link between juice consumption and overweight is mixed, Story et al. point out that fruit juice and fruit drinks are easily overconsumed by toddlers and young children due to many reasons. For example, because juice is viewed as nutritious, childcare providers or parents may not set limits. However, like other sweetened drinks, too much juice can contribute to obesity. Story et al. suggest that whole fruit should be encouraged as an alternative because of the fibre benefit and because whole fruit takes longer to eat.

Story et al. (2006) called for more research on the current food environment in childcare centres, including what foods are served, their nutritional quality, and staff training on nutrition. At the same time, to prevent obesity, Story et al. suggested that physical activities in childcare settings need to be promoted through structured and unstructured play.

Breastfeeding

The finding by Arenz, Rückerl, Koletzko and von Kries' (2004) that "breastfeeding might have a small but consistent protective effect against obesity in children" (p. 1247) offers another possible pathway through which obesity might be prevented. Arenz et al. arrived at this conclusion through a systematic review and meta-analysis of published epidemiological studies comparing early breast-feeding modes and adjusting for potential confounding factors. While the exact mechanisms for this effect remain unknown, the authors are clear about the "role of breastfeeding in the reduction of the prevalence of obesity in later life" (p. 1254).

The association between breastfeeding and prevention of obesity is only one of many claims about the benefits of breastfeeding which has led to advocacy for better support in childcare centres for mothers who wish to continue breastfeeding their child in early childhood education and care services (Akitt, 2007; Banks, 2005; Bartle & Duncan, 2009; Farquhar & Galtry, 2003; Mortlock, 2009; National Breastfeeding Advisory Committee of New Zealand, 2009). Beyond the numerous documented health benefits (e.g., pediatric immunological benefits and fewer gastrointestinal disorders – see Arenz et al., 2004) there are more controversial claims of a connection between breastfeeding and cognitive gains, including by the American Academy of Pediatrics (Soliday, 2007). Soliday, however, has cautioned that advocacy for breastfeeding on the basis of cognitive benefits is "premature" (p. 19) and "unwarranted" (p. 23); she calls for "a stronger developmental perspective" that among other aspects would include research designs "precisely defining infant feeding practices, establishing the mechanisms of feeding effect on cognition, ...addressing the stability of infants' cognitive test scores, as well as the clinical significance of test score differences among various feeding groups" (p. 19). Soliday does, however, agree that there are important practice and policy implications from research on breastfeeding; she urges that when these are drawn they must also take account of the cultural context in which particular infant feeding practices have their history.

5.6 Are boys and girls affected differently by the quality of childcare in the first two years?

One study (Crockenberg, 2003) within our search data argued that the issue of gender (and temperament) differences in responses to childcare needs more attention by researchers. Crockenberg pointed to earlier research by Howes and Olenick (1986, cited in Crockenberg, 2003) and the NICHD Early Child Care Research Network (1997, cited in Crockenberg, 2003) which had reported that boys of a toddler age were more adversely affected by lower quality childcare than girls after controlling for a number of other predictors.

The NICHD study had also reported that boys were more likely than girls who experienced more than 30 hours a week of nonparental care to be insecurely attached at 15 months. Crockenberg argued that although the gender differences in the attachment results had failed to be replicated at later ages (p. 1035), they seemed consistent with other evidence that boys responded to some aspects of early daycare (e.g., in measured cortisol levels over the day) differently to girls. She linked this to evidence that by the middle of the first year, girls have been found to be better able to regulate negative arousal than boys (Weinberg, Tronick, Cohn, & Olson, 1999, cited in Crockenberg, 2003); this may allow girls to behave more competently when they are stressed. Crockenberg noted further that untangling the way that different variables worked to produce these results was complex and suggested that existing measures of quality may not be sophisticated enough to distinguish the effect of the environment on infants and young children who are "easily stressed and lack the capacity to calm themselves" (p. 1036). She suggested that changes in full-time, center-based childcare are needed to reduce stress experienced by some children and their providers. In the meantime, she recommended that "professionals have an obligation to inform parents and childcare providers that males and reactive children who lack adequate regulatory abilities may be adversely affected when they spend long hours in certain types of nonparental care" (p. 1036).

Exploring whether there were associations between patterns of childcare centre activities and the ethnicity, gender and age for 2,194 children from 192 randomly selected centres in Florida, Tonyan and Howes (2003) found no significant gender differences for children aged between 10 and 36 months. For older children, a gender difference was found with boys favouring activities that involved "slightly higher levels of gross motor play" (p. 138). Similarly to Crockenberg, Tonyan and Howes call for more research to explore what contributed to such findings.

In the most recent report from the NICHD project (Vandell et al., 2010) gender was not found to be a significant moderator of childcare effects either in cognitive-academic performance or problem behaviours. The authors hypothesise that "perhaps secular changes in the 1990s, when maternal employment and nonmaternal childcare became normative (i.e., characteristic of the majority of households in the United States) contributed to the similar developmental pathways among adolescent boys and girls observed in this study" (p. 752).

5.7 Summary points

In answering the question "what is new knowledge about the links between regulable elements of early childhood education provision and outcomes for under-two-year-olds?" this chapter has emphasised that structural elements of quality are only one dimension of the equation of quality. Ecological understandings of quality (e.g., Goelman, et al., 2006) emphasise that structural characteristics work in conjunction with process characteristics and interact with other contextual factors in a web of influences, such as philosophical beliefs within the local context, attitudes of staff towards children, auspices of the centre, as well as organisational structure. This is in tune with findings from the last decade of NICHD studies which have provided detailed understandings on how different aspects of care are related to various aspects of children's development.

5.7.1 Structural indicators of quality

Focusing on research indications about how specific structural, and regulable, components of provision enable higher quality provision for under-two-year-olds in early childhood centres, the following findings are relevant:

1. Adult:child ratios of 1:3 are considered ideal (Expert Advisory Panel on Quality ECE and Child Care, 2009; Muenchow & Marsland, 2007; Munton et al., 2002) to enable the style of interaction needed for optimal outcomes for children (see Chapter 4). But ratios by themselves are not sufficient to guarantee good outcomes; they interact with other factors.
2. Ratios provide pre-conditions for positive interactions, but the nature of the child-teacher interactions may be determined by other factors (Goelman et al., 2006; Milgrom & Mietz, 2004). Ratios interact with higher levels of staff satisfaction, which interact with other factors like appropriate levels of remuneration (Goelman, et al., 2006). Together, these factors help define the possibilities and limitations of experiences for children and staff.
3. The higher cost of staff with an improved staff:child ratio can be mitigated by low staff turnover as improved working conditions and job satisfaction reduce stress (Fisher & Patulny, 2004).
4. Qualified staff with up-to-date professional understandings of under-two-year-olds have positive effects: "All those who work with young children and parents must understand the brain story and the relationship of play-based problem-solving learning to early brain development" (McCain & Mustard, 1999, p. 145).
5. High levels of training – both pre-service and in-service – are necessary for quality outcomes with infants and toddlers (Munton et al., 2002).
6. Content for training, teacher-education qualifications and professional development programmes for work with infants and toddlers must be relevant to the age group and reflect what is known about infant learning and development (Elfer & Dearnley, 2007; Hallam, Buell & Ridgley, 2003; Macfarlane, Noble & Cartmel, 2004).

7. The content of undergraduate programmes of early childhood teacher education should additionally (to preceding bullet point) include: (i) critical reflection; (i) a focus on understanding the diversity of children's and families' contemporary lives (McFarlane et al., 2004); and (iii) a research and evaluation focus (Nimmo & Park, 2009).
8. Mentoring of less experienced staff by more experienced staff can be an effective professional development model in enhancing sensitivity to infants (Fiene, 2002).
9. There is a link between higher level qualifications and a positive attitude towards infants and toddlers and their learning (Arnett, 1989; Kowalski et al., 2005).
10. Inclusive practices with infants and toddlers are associated with higher levels of teacher education and ratios (Hestenes et al., 2007).
11. Having the possibility of a career structure, with high status that recognises the professional expertise of staff, is seen as benefitting quality (McCain & Mustard, 1999).

5.7.2 Factors that are recognised as barriers to positive effects

1. Large group size, untrained staff, high child:staff ratios (Munton et al., 2002).
2. Variability of levels of training. 'Training' can refer to a certificate, diploma or bachelor's degree, or involve on-the-job professional development.
3. Low status, lack of appropriate pay in recognition of professional expertise in working with infants and toddlers leading to high staff turnover, and therefore lack of career structure and leadership from knowledgeable and experienced directors and teachers (Ireland, 2007; Nyland, 2007; Pessanha, Aguiar & Bairraeo, 2007).
4. Lack of professional development of staff is related to lower programme quality (Ireland, 2007; Tout, et al., 2005).
5. Lack of optimal environmental factors, such as high noise levels, infections, otitis media (Bedford & Sutherland, 2008; McLaren, 2008; Vernon-Feagans & Manlove, 2005); along with lack of knowledge about appropriate nutrition for infants and toddlers (Story, et al., 2006).

5.7.3 Indications from recent research about the effects of early childhood education in the first two years

1. Higher quality care is associated with more positive outcomes and fewer negative ones (Jacob, 2009; NICHD, 2004). Quality in these studies is defined as:
   - more highly-educated caregivers
   - lower ratios of children to caregivers
   - positive social interactions promoted.
2. The NICHD study has shown that high quality centre-based early childhood education and care is related to larger cognitive-academic outcomes for children at age 12 years (Belsky et al., 2007), and higher quantity of care predicts more teacher reported externalising (negative) behaviours (Belsky et al., 2007). These outcomes are maintained into adolescence (Vandell et al., 2010).
3. This finding is important because it shows the benefits of routine high quality early childhood education for all children not just those enrolled in intensive high quality intervention programmes (Vandell et al., 2010).
4. Recent results from the longitudinal NICHD study (Adi-Japha & Klein, 2009; Belsky et al., 2007; Vandell et al., 2010) emphasise that parenting quality is also connected to the effects of centre-based childcare.

5. Reports of more behaviour problems associated with increased use of childcare in infancy appear mediated by the age of the child and quality of care (Jacob, 2009; NICDH, 2005). Small effect sizes of the connection between quantity of hours in childcare and more externalising behaviour (expressed as risk-taking behaviour) are maintained into adolescence (Vandell et al., 2010).

Given the interrelated nature of different structural elements in the construction of a quality experience for children and their families within centre-based early childhood provision, a key implication from the studies reviewed in this chapter is that any changes to regulable elements of quality are likely to have repercussions beyond the immediate change of the element itself.

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Chapter 6: Narrative review of the effects of high quality centre-based early childhood education and care on the developmental outcome of at-risk children

Abstract

This chapter reviews recent reports about the effects of early intervention programmes for children living in adverse conditions, including poverty, low income families, and prenatal exposure to cocaine. The programmes reviewed are the Abecedarian project and Early Head Start based in the USA and Sure Start, based in the UK. The chapter focuses on highlighting elements of the programmes found to be associated with positive developmental outcomes for children and families; these are summarised at the end of the chapter.

The focus in this chapter is on quantitative studies published over the last decade that have reported results about the effects of quality centre-based early childhood services during the first two years of life on children considered "at risk". Most of these are early intervention studies in which data have continued to be gathered longitudinally until young adulthood (e.g., at age 21 years within the Carolina Abecedarian project).

Three key longitudinal projects with at-risk populations were identified as relevant to the age group covered by this review. Two of these were conducted in the USA: (i) the Abecedarian project; and (ii) Early Head Start. The third longitudinal study, the Sure Start project, is based in the UK12. All three are described as intervention studies with children from disadvantaged or "deprived" (Melhuish et al., 2008a, p. 1641) backgrounds (low income families in high poverty neighbourhoods) enrolled in programmes designed to promote health and development, improve children's educational chances, and reduce inequality.

Also included in this chapter is a selection of studies from outside these longitudinal programmes that have investigated the effects of quality childcare on 0–2-year-olds considered at risk of poor developmental outcomes from adverse conditions such as low birth weight, and prenatal exposure to cocaine. The latter has been a focus of interest in many studies as maternal drug use is associated with collective risk factors, and thus functions as a marker for an early-identifiable at-risk population (Bolzani Dinehart, Yale Kaiser & Hughes, 2009).

Although, as Melhuish et al. (2008b) have noted, "studies with disadvantaged populations may have little relevance for the general population" (p. 1161), this selection of studies is included in this report because this area of research was deemed of interest to the Ministry in the commissioning of this report.

No specific New Zealand intervention studies with under-two-year-olds were identified in the systematic search conducted for this literature review.

A key focus of this chapter is to highlight the elements of the programmes found to be associated with positive child and family impacts.

[12] Studies related to other well-known longitudinal studies, such as the High/Scope Perry Preschool Project, and the Chicago longitudinal study in the US, and the Effective provision of Pre-school Education (EPPE) in the UK were excluded from our review as children were enrolled in these programmes from the age of 3 years, beyond our target group of 0–2 years old.

6.1 Interventions with children living in poverty

The *Carolina Abecedarian project*, *Early Head Start* and *Sure Start* have all worked with children living in poverty; each has reported results over the last decade that indicate the positive effect of intervention through the use of centre-based early childhood services accompanied by other support services for families.

6.1.1 The Carolina Abecedarian Project and the Carolina Approach to Responsive Education (CARE)

The Carolina Abecedarian project remains one of the few model programmes that was delivered in a full-time childcare setting which was open all year round from early morning to late afternoon. It was a randomised trial that involved 111 infants enrolled in four cohorts between 1972 and 1977. The children were from low-income families of primarily African-American background, with eligibility determined on the basis of a High Risk Index (Ramey & Smith, 1977, cited in Campbell & Pungello, 2000). Of these, 57 were randomly assigned to receive (centre-based) early educational intervention, and 54 were the control group (no intervention). The parents of the participant children had to agree before the start of the project to the condition of random assignment; the control group became known as the "milk and pampers" group as families within it received iron-fortified formula and free disposable nappies for the first 15 months of the study; the formula was to control for differences in the nutrition of the children, and the nappies were an incentive for participation. Children within the "treatment" group received free full-time childcare all year. When the children entered state kindergarten the treatment and control groups were each split into two; of the four resulting groups, two received additional educational support from a home-school resource teacher. Campbell and Pungello explained that in the three intervention groups:

> ...treatment thus varied in timing and duration from 8 years in preschool and early elementary (EE group), to 5 years in preschool only (EC group), to 3 years in early elementary school only (CE group). When long-range outcomes are discussed they may be examined as a function of either the preschool (2-group) assignment originally made or in terms of the four-group assignment made at kindergarten entry. (p. 7)[13]

The *Carolina Approach to Responsive Education* (CARE) was a second study that expanded on the Abecedarian research by modifying the early intervention treatment to include (i) weekly home visits from the child's teacher for children within the centre-based treatment group; and (ii) an intervention group where children received home visits but no centre-based early childhood education. The no-treatment control group was maintained (Campbell, Ramey, Pungello, Sparling & Miller-Johnson, 2002; Campbell et al., 2008). The participants in CARE were born between 1978 and 1980 with half the spaces in the programme reserved for low-risk infants to ensure more diversity in the childcare centre during the project. This resulted in smaller numbers of children at the centre who met the high-risk criteria with the result that: (i) the centre-based and home-visits intervention had 16 families participating; (ii) the home-visits intervention without centre-based childcare had 25 families; and (iii) the control group (no intervention) had 23 families. The main factor on which the participants in the Abecedarian and CARE participants differed was the higher average education level of the CARE mothers; the percentage of teen parents was 31–68 percent across both studies.

Ramey et al. (2000) described the Abecedarian project as a "comprehensive education, healthcare and family support program that provided an individualised approach to at-risk children and their families, drawing as needed on a pool of available resources" (p. 4). Children attended the centre from infancy with the average age at entry being 4.4 months; the youngest child in the study started at six weeks.

Characteristics of the centre-based intervention (ages zero to five years)

Summarising the characteristics of the original centre-based childcare programme received by the children in the Abecedarian treatment group (2-group design), Campbell and Pungello (2000) reported the following:

[13] A helpful visual representation of the design of the Abecedarian study is presented in Ramey et al. (2000).

- caregiving staff who from infancy were seen as "teachers" (p. 5)
- curriculum activities called *learning games* (p. 5) that were specifically designed for the Abecedarian project to target language, cognitive, motor, and social-emotional development; these were systematically assigned to each infant, toddler or preschooler
- the regular presence of one of the developers of the curriculum activities at the childcare centre working with the teachers to assign *learningames* and deciding when the children were ready for new ones
- an eclectic curriculum model that included both child-directed and teacher-directed activities
- child-staff ratios[14] that exceeded the minimum requirements within the state of North Carolina
- daily availability of medical staff (primary pediatric care) to ensure child well-being and to counsel parents on developmental milestones and childcare
- virtually no turnover of staff
- staff salaries at a level comparable to teachers in public elementary schools.

Commenting on the salary levels of the staff, Campbell and Pungello (2000) credited them as the reason for the low staff turnover and with greater stability in the children's lives. They noted also that all staff were highly experienced and all came from the same background of the children with some staff qualified at degree level.

Effects of intervention on children

Children in the Abecedarian project were periodically assessed during the early childhood and primary school grades, and home visits at 6, 18, 30, 42 and 54 months of age were done to evaluate parent and child interactions, available toys and educational materials, parental support for the child's learning, stability of family routines, and the variety and breadth of stimulation available to the child. In a series of articles published between 2000 and 2008, the results of follow-ups between the ages of 3 years and 21 years indicated better outcomes for the childcare treatment group in comparison to the control group. For example, Campbell and Pungello (2000) found better results for the treatment group in the two-group study:

- on tests of cognitive functioning
- in mathematics scores
- in rates of being at school at age 21
- in having attended a four-year college
- in being a year older when their first child was born.

There were no differences in rates of high school graduation and employment; and, likewise, no reduction in law breaking that could be associated with having been part of the Abecedarian project.

The earlier results from the same projects had indicated that centre-based early educational intervention significantly increased children's performance in early childhood intellectual tests, both in the Abecedarian and CARE studies, as well as academic outcomes at age 8 years (Burchinal et al., 1997).

The pattern of positive effect on children's cognitive and academic achievement differences from the centre-based treatment was evident also in the data from the four-group assignment study (Ramey et al., 2000). Additionally, Ramey et al. reported that there were positive effects on the educational attainment of the children's mothers. The authors

[14] Exact ratio not stated in Campbell & Pungello (2000).

concluded that the availability of high quality, consistently available childcare was associated with greater educational achievement for the mothers as well as higher levels of employment especially for the teenage mothers.

Persistence of effects into adulthood

The persistence of beneficial effects of the centre-based treatment on reading and mathematics skills into young adulthood were also reported by Campbell et al. (2002) together with a lower level of reported marijuana use among Abecedarians who had been part of the treatment group. Comparing the outcomes of the Abecedarian project with the adult benefits of Project CARE, Campbell et al. (2008) concluded that the CARE results replicated the Abecedarian ones. In other words children in the centre-based treatment groups did significantly better on measures of educational and vocational attainments in young adulthood. Specifically, those adults who as children had received the full five years of centre-based early intervention in the CARE programmes, by comparison to the control groups, were:

- 7.06 times more likely to be in an educational programme when interviewed in early adulthood
- 3.99 times more likely to be attending a baccalaureate college
- 1.95 times more likely to be in skilled employment relative to those who had not received the treatment.

Campbell et al. (2008) further reported that there were no significant educational and vocational benefits for the home-visits/family-education only group compared to the control group, a finding that surprised them and which they hypothesised might be attributable to insufficient intensity or comprehensiveness of the home-visits/family-education treatment.

Summarising the significance of their findings, Campbell et al. (2008) noted that:

> The results show that early childhood programs can make a lasting difference in the lives of poor children. (p. 464)
>
> These longitudinal studies demonstrate that some of the most important societal gains to be realized from early childhood programs may not be seen until late adolescence or early adulthood. (p. 464)
>
> Economists have estimated that the program should return approximately $3.66 for every dollar spent on the preschool program. (p. 464)

Commenting on the implications from their study, Campbell et al. (2008) make the following statements:

> Money spent on quality early childhood education for poor children pays off with long-term educational and vocational benefits. (p. 464)

and

> Teachers of the very young should be fully aware of the importance of their task. What they do in their classrooms can have long-term positive effects on the lives of the children in their care, especially for children growing up in low-income households. (p. 464)

6.1.2 Early Head Start (EHS)

Early Head Start was set up through legislative action by the United States Congress in 1994 as an extension of Head Start, the compensatory early education programme initiated in 1965 as a targeted provision for four-year-olds. EHS was a response to growing awareness of the important role of the first three years of life (Gray & Francis, 2007). It has been described as a "national laboratory for responding to the unique needs of low-income [15] infants, toddlers and their families" (Chazan-Cohen, Stark, Mann & Fitzgerald, 2007, p. 100). Taking a two-generation approach, EHS projects prioritise children's development at the same time as aiming to strengthen families through a model of community collaboration. This includes provision for EHS staff to receive professional and personal support to provide "high

[15] having incomes at or below federal poverty level

quality environments and experiences, and engage in responsive relationships that promote the healthy development of infants, toddlers and their families" (Chazan-Cohen et al., p. 99).

Characteristics of the EHS projects

EHS operates through programmes of different designs that are either run by EHS itself or contracted to community childcare agencies as grantees in partnerships with the EHS Program (Ontai, Hinrichs, Beard & Wilcox, 2002; Paulsell et al., 2002). Three models are possible: home-based, centre-based and a combination option (Love et al., 2004). High quality performance standards developed at the start of the programme provide guidance for all three models of the program across states. [16] For example, the standards issued in 1998 required:

- A staff:child ratio of 1:4, and a maximum group size of eight infants and toddlers in centre-based childcare settings;
- Childcare staff to have a Child Development Associate (CDA) credential within one year of being hired as an infant-toddler teacher
- Draft standards within family day care homes issued in August 2000 limited groups to 6 children per teacher when two or fewer children were under age two. If more than two children were under age three, the maximum group size was four children with no more than two children under age two years.

Home-based programmes are charged to provide child development services to families mainly through weekly home visits and at least two parent-child group socialisation activities a months for each family. The centre-based programmes are expected to provide child development services mainly in centre-based childcare centres along with parenting education and a minimum of two home visits a year to each family. The combination/ mixed-approach option provides home-based and centre-based services including a combination of home visits and centre-based experiences (Love et al., 2004).

Effects of the EHS programme on availability of services for infants and toddlers in poor neighbourhoods

Reporting on the community collaborative strategies that were being implemented to improve access to the EHS programmes, Paulsell et al. (2002) identified a number of barriers for low-income families to access and maintain attendance at infant and toddler programmes, including: insufficient supply of infant-toddler services; low quality provision; high cost of services; insufficient childcare subsidies for eligible families; lack of knowledge about available services; and transport difficulties to reach services. Looking at the initiatives taken to date, the evaluation reported that a number of partnership arrangements had emerged in different communities varying from (i) comprehensive partnership; subsidy enhancement partnerships, and technical assistance partnerships. Differences in the way that the partnerships; organised their staffing, financial arrangements and intensity of technical support impacted on how the programs were implemented. Paulsell et al. concluded that the quality of infant and toddler services had improved through changes in structural arrangements of childcare such as reduced ratios and group sizes, enhanced professional development of staff, an improved curriculum, greater continuity of care and licensing of informal providers. Additionally, there was an expansion in supply of childcare services which improved access, and increased resources in the form of funding. Increased community collaboration through new relationships and improved support for services, as well as increased community awareness of early childhood issues were also considered to have improved. At the same time, tensions remained related to: improving quality and complying with the performance standards; achieving and maintaining continuity of care in a context of staff turnover; subsidy entitlements; staffing supervision issues across providers; and matching childcare arrangements to family needs.

Evaluations of EHS are ongoing. Preliminary results of an evaluation of the implementation of the EHS in 17 sites, commissioned by the Office of Planning, Research and Evaluation Administration for Children and Families of the

[16] Regulations for the provision of early childhood services vary from state to state in the US

United States Department of Health and Human Services, similarly reported that grantees often found it challenging to meet the EHS performance standards (Love et al., 2004). Love et al. focused on patterns of childcare use by EHS families and the impact of the EHS programme on families and on the quality of the childcare they used. Key findings of this evaluation were that:

- the EHS had "dramatically" (p. xviii) increased the access of low-income families to good quality early childhood services, particularly centre-based services
- the amount and quality of centre care experienced by the programme children was associated with positive developmental outcomes for the children
- there was an improved adult-to-child ratio in programme classrooms by comparison with the control classrooms measured when children were 14 and 24 months: the difference was more than one adult per child in favour of the programme classrooms.

Effects of intervention on children and parents

Reporting specifically on the effects of the EHS on three-year-old children and their parents, Love et al. (2005) highlighted that the overall effect of the programme was beneficial in a range of domains for both children and their parents. The average age of the children for whom data were reported was 5 months (with a range up to 12 months) with an average of 20 months stay in the centre-based programme.

The positive impact of EHS program consisted of:

- higher performance in children's cognitive development (measured by Mental Development Index from the Bayley Scales of Infant Development)
- higher language functioning (measured by Peabody Picture Vocabulary Test)
- fewer displays of aggressive behaviour (measured by Child Behavior Checklist) as rated by their primary caregiver – usually a parent
- higher sustained attention with play objects (i.e., the duration and quality of the child exploring and playing with toys).

Positive effects on parenting from the EHS were in the form of emotional support to the parents from the programme and support for language and learning, which make the parents in the intervention group more responsive to the child's bids for attention and more positively inclined towards the child. EHS parents also read to their infants and toddlers more than the control parents, and were less likely to have spanked their children in the week leading up to the study.

The study also found greater impact for participants in the mixed, or combined, programmes which included home- and centre-based services. When the key performance standards were substantially implemented during the early period of the projects, this increased the number and magnitude of impacts. Significant impacts in mixed programmes occurred in language and social-emotional domains (e.g., sustained attention with objects in play). The effects for centre-based programmes did not differ significantly for those in the other programme approaches on many of the child and parenting outcomes.

Overall, EHS is considered to be having positive effects on low-income infants and toddlers in the United States (Herrod, 2007). Findings from the project evaluations point to important implications about the conditions that support programme effectiveness, namely:

- having a set of programme standards was a useful mechanism to improve quality of infant and toddler services across the EHS programme

- low-income families face a range of complex barriers to accessing high quality services for their infants and toddlers, necessitating creative solutions to form programmes aimed to improve access for children from communities in poverty neighbourhoods
- community partnerships models took various forms with various challenges encountered and remaining
- community partnerships that substantially implemented the required performance standards had a bigger impact on more measures of child and family outcomes.

6.1.3 Sure Start in the United Kingdom

Established between 1999 and 2003 to improve the health and well-being of young children living in disadvantaged neighbourhoods, Sure Start Local Programmes (SSLP) were enthusiastically greeted in the United Kingdom and expanded rapidly (Gray & Francis, 2007). In 2004, the UK's Labour government's ten-year strategy for childcare (HM Treasury, 2004) stipulated a goal of 3500 Sure Start (SS) Children's Centres by 2010.

Like EHS, SS was set up as an intervention that would work through partnerships among different agencies in a local community to enable programmes to respond to local priorities through the provision of health advice and support for parents moving into employment.

Characteristics of SSLPs

As an intervention the SSLP initiative was area-based rather than targeted at specific parents or children so that all children in an SSLP area could be involved. The national evaluation summary (Sure Start, 2008) said that this was unlike almost any other intervention aimed at improving children's life chances and "had the advantage of services within a SSLP area being universally available, thereby limiting any stigma that may accrue from individuals being targeted" (p. 2). This view of the programme has not gone unchallenged both philosophically (Clarke, 2006) and in terms of the ability of the programme to reach its intended participants (Coe, Gibson, Spencer & Stuttaford, 2008).

The SSLPs had a great deal of flexibility in the way programmes were set up around the following core services:

> outreach and home visits; support to families and parents; support for good-quality play, learning, and childcare experiences; primary and community health care; advice about child and family health and development; and support for children and parents with special needs, including help in accessing specialised services. (Belsky et al., 2006, p.1)

However, unlike the Abecedarian, or the EHS, there were no manualised guidelines to "promote fidelity of treatment to a prescribed model" (Melhuish, Belsky, Leyland, Barnes & the National Evaluation of Sure Start Research Team, 2008a, p. 1641).

The effects of Sure Start Local Programmes (SSLPs)

Early impact results from the SSLPs published in 2006 showed disappointing results about the value of the programmes for the most disadvantaged population they were aimed to benefit (Belsky, et al., 2006; Gray & Francis, 2007; Reading, 2006). Belsky[17] et al.'s evaluation investigated the effects of SSLPs on children and their families in 150 communities with ongoing SSLPs by comparing results from home visit interviews and standardised assessments of cognitive and linguistic functioning for children with those gained in 150 comparison communities in which SSLPs were yet to be established. This quasi-experimental cross-sectional design was necessary because "the government had ruled out a randomised control trial" (Belsky et al., p. 1). The evaluation found that SSLPs benefited:

[17] Jay Belsky is currently based at Birkbeck College at the University of London, and continues to also be involved in ongoing analysis of the NICHD study of early child care and youth development.

> the relatively less socially deprived parents (who have greater personal resources) and their children but seem to have an adverse effect on the most disadvantaged children. Programmes led by health services seem to be more effective than programmes led by other agencies. (p.1)

Specifically, Belsky et al. (2006) found:

- that non-teenage mothers in SSLP areas showed less negative parenting than those in comparison communities, resulting in positive effects for children of non-teenage mothers in SSLP areas at 36 months, indicating fewer behavioural problems (e.g., conduct problems, emotional difficulties, hyperactivity etc.) and greater social competence (e.g., pro-social behaviour, independence)
- an adverse effect for teenage mothers. Children of teenage mothers, like those who lived in workless or lone parent households, scored lower on tested verbal ability (i.e., language expression and comprehension abilities) relative to the comparison group and relative to children of non-teenage mothers.

Belsky et al. (2006) suggested that children from relatively less socially deprived families (non-teenage mothers) benefited from living in SSLP communities, probably because of the beneficial effects of SSLPs on parenting. The authors explained that children from relatively more socially deprived families with fewer personal resources (teenage mothers, lone parents, workless households) were adversely affected because they may have been less able to take advantage of SSLP services and resources by living in SSLP areas, in comparison to socially deprived families with greater personal resources. Commenting on the results of the evaluation Reading (2006) noted that the results were both disappointing and reassuring: it was reassuring because most families benefitted (there were fewer teenage mothers than non-teenage mothers, so fewer did not benefit), but disappointing because the most vulnerable families did not.

However, more recent results (Melhuish, et al., 2008a) have indicated significantly better outcomes for children as well as their families.

Between 2004 and 2006 SSLPs changed and became Sure Start Children's Centres (Melhuish et al, 2008a; Sure Start, 2008). They specified their services in more detail with a strong emphasis on child well-being and the need to reach the most vulnerable, and with adjustment of their service provision to the degree of family disadvantage. The evaluation by Melhuish et al., (2008a) included participants affected by this change. Melhuish et al. found that after controlling for pre-existing background characteristics of children, families, and areas, and time of measurement, comparisons of children and families living in SSLP and in non-SSLP areas indicated beneficial effects for developmental outcomes of children living in a programme area. Children in the SSLP areas showed:

- better social development than those in the non-SSLP areas
- more positive social behavior [18]
- greater independence [19]
- less risk of negative parenting
- parents provided a more stimulating home-learning environment.

The (small to moderate) effects of SSLPs seemed to apply to all sub-populations and SSLP areas, with "almost no evidence of adverse effects" (Melhuish et al., 2008, p. 1605). The authors suggested that the different findings in the second evaluation might indicate an increased exposure to programmes that had become more effective. The authors

[18] Child positive social behaviour: child is generally obedient, can stop and think before acting, sees tasks through to the end, has a good attention span, thinks about other people's feelings, shares readily with other children, is helpful if someone is hurt, upset, or feeling ill, is kind to younger children, often offers to help others.

[19] Independence: child likes to work things out by himself or herself, does not need much help with tasks, chooses activities independently, persists with difficult tasks, and can move to a new activity after finishing a task.

repeated their comment from the first SSLP evaluation (Belsky et al., 2006) that "a randomised controlled trial would have been the strongest evaluation strategy" (Melhuish et al., p. 1646); however, they expressed confidence that the latest evaluation results indicated improvements in the programme after seven years of bedding down of the programme, increased knowledge and experience, and a reduction in staff-skills shortages. Thus the children, on whose outcome measures the report relies, would have experienced better developed programmes that in the first evaluation.

Peer responses to this second evaluation of SS were again mixed: Kane (2008) drew attention to the fact that a randomised controlled trial had not been done, but Reading (2008) noted that the research team had gone to a lot of trouble to ensure meaningful results within a quasi-experimental design, and that the results were in the long term important. The evaluation team responded that they were confident of policy implications from their findings and that they would be continuing to follow up the children and families "to determine whether at age five years, the effects detected at age three years have been maintained, dissipated, or changed in some manner" (Belsky, Leyland, Barnes & Melhuish, 2009 p. 381). Pemberton and Mason (2008), taking another tack, and using the experiences of Sure Start Children's Centres in the Greater Merseyside area, argued that not enough time had been allowed to implement and develop trust within the new arrangements and that the consequence of this might be that the needs of the most disadvantaged might not be addressed.

In summary, the studies about SS identified in this review provide a useful commentary on a different way of implementing interventions with children living in poverty in the early years. The insights from this initiative highlight a number of important points related both to the model of community partnerships, and the need to ensure that programmes are able to be evaluated in meaningful ways.

6.2 Early interventions with other at-risk populations

6.2.1 The Infant Health and Development Program (IHDP): Low-birth-weight children

The *Infant Health and Development Program* (IHDP) is grounded in the design and curriculum of the Abecedarian project. It was implemented in the 1980s and focused on low-birth-weight infants not only those from low-income backgrounds or from a particular racial group. Conducted at eight sites nationwide, it involved a total of 985 LBW infants divided into two weight strata: "heavier" at birth (2001–2500g), and lighter (less than 2000g) (McCormick et al., 2006).

Characteristics of the Infant Health and Development Program (IHDP)

The intervention began in infancy with home visits in the first year and centre-based care added in the second year and into the third year. Intervention outcomes at age of 36 months, 5 years and 8 years were published in the 1990s and showed that children who received the intervention had more favourable outcomes on cognitive and behavioural measures (e.g., higher IQ scores, lower behavioural problems etc.). The reports highlighted that being a LBW children asserts a higher risk of neurodevelopmental disability that may make academic achievement difficult.

Effects of IHDP on children

At 18 years old, the results reported by McCormick et al. (2006) suggested an ongoing benefit of the intervention for the heavier LBW children but not for the lighter LBW children. Heavier LBW children in the intervention group showed better reading skills and mathematics achievement, higher IQ scores, and fewer risky behaviours. Statistically significant intervention effects for children in the lighter LBW group at age 18 appeared only regarding reading scores. Earlier assessments (at three years old) of lighter LBW children had shown intervention effects for the IQ scores in favour of children in the intervention group. However, differences had disappeared by the age of five. The authors argued that the lack of observable benefits in the lighter LBW children group presents a challenge in determining who

benefits most from intervention and who would need to receive continuing support for better developmental outcomes. No statistically significant differences appeared in juvenile arrest for either of the LBW groups.

Working with the same data, and using a new methodology that found a matched comparison group within the follow-up group for those with high participation rates, Hill, Brooks-Gunn and Waldfogel (2003) found "some of the first evidence that higher levels of participation in early intervention for at-risk children can result in larger and long-lasting effects than can lower levels of participation" (p. 742). They argued that the reason for the different persistence levels of the effect of participation may be lack of intensity in participation rather than other factors. They suggest that in future, studies need to focus on the gains to children's development from increased intensity of participation, and possibly also longer programme duration.

6.2.2 Interventions with children prenatally exposed to cocaine

One intervention reported over the last decade as demonstrating a positive effect on the development of children prenatally exposed to cocaine is the Linda Ray Intervention Project (LRIP) (Bono et al., 2005; Bono & Sheinberg, 2009; Claussen, Scott, Mundy & Katz, 2004). As an intervention, the programme is one described as maintaining "an ecological approach addressing family and contextual risk factors by coordinating intervention services with drug treatment and parent support without making those components mandatory" (Claussen et al., p. 207).

Characteristics of the LRIP

Using a public health model of risk-focused strategy[20] the LRIP is a programme of developmental stimulation delivered at three different levels of increasing intensity (1) *primary care*, involving comprehensive social work services, primary medical care, and scheduled developmental assessments but no educational intervention; (2) *home-based intervention,* providing all primary care services plus two 1.5 hour child-focused home visits by a teacher per week; and (3) *centre-based intervention*, which also provides primary care services plus centre-based intervention for children for 5 hrs per day, 5 days per week. It is an ongoing long-term multi-cohort project initiated in 1993 with spaces available for 60 infants in each cohort intake; a new cohort is designated approximately every three years (Bono et al., 2005). Infants are enrolled in the intervention in their first year. In both the home-based and centre-based intervention, an outcome-based curriculum is used organised around the domains of "social/emotional, language, cognitive, fine motor, gross motor and self-help development" (Claussen et al., p. 207) either one-on-one (home-based) or in 1:3 adult:child ratio (centre-based) situations. Within the centre-based intervention, transport to and from the centre is provided, as well as a predictable daily routine including: breakfast and lunch to ensure good nutrition; nap time; small and large group activities; and taking turns at art, functional play, and symbolic play areas. To offset the impact of frequent moves and custody changes, the children are allocated to the same teachers for the duration of the intervention.

Effects of the LRIP on children

Claussen et al.'s (2004) study investigated the relative effects of the three different levels of intervention on 130 children from the first cohorts of the project. The study showed that measured at age 36months, both the centre and home-based programmes were similarly effective in enhancing cognitive development and behaviour, but that the centre-based programme showed larger effects in (i) enhancing language skills; and (ii) gross motor skills, compared to the home-based and primary care conditions. The larger language effects from the centre-based intervention suggested that longer exposure to language input in the centre-based intervention was beneficial; the gross motor effects were explained as reflecting the opportunities for outdoor and indoor play activities within the centre-based intervention on a daily basis – something which was not guaranteed under the other conditions. The authors made a strong case about the effectiveness of early intervention programmes for children at risk from prenatal exposure to cocaine, especially for

[20] A risk is identified and a strategy developed to target its prevention.

enhancing language development. They further argued that these children were not inherently different from other at-risk children and suggested that results of this study might be applicable under other risk conditions as well.

Three subsequent recent evaluations of interventions within the LRIP framework (Bono et al., 2005; Bono & Sheinberg, 2009; Bolzani Dinehart, Yale Kaiser & Hughes, 2009) used additional cohorts to those in the first study (Claussen et al., 2004) and have expanded on Claussen's original findings to provide further evidence of the overall effectiveness of the LRIP, and of the impact of specific components within it.

For example, measures of language and cognition taken at 12 months across the three intervention conditions (centre-based, home-based, primary care) by Bono et al. (2005) when the children had not been in the intervention for very long (cohort mean age at enrolment 9.5 months), established no statistical differences across the groups. This meant that the improved measures on cognition and language at age 36 months reported by Bono et al. could be more confidently attributed to the intervention. As in the earlier study (Claussen et al., 2004), both centre-based and home-based intervention improved the children's language and cognition scores at 36 months relative to the children who had only primary care (health and social work) services, and language skills were more improved by the centre-based interventions versus the home-based one. The latter led the researchers to conclude that while the different levels of intensity of intervention in the centre-based and home-based intervention seemed to work equally well for cognitive improvements, language skills appeared to require more intensive interventions. They also commented that despite the improvements at age 36 months, language scores across the intervention groups remained "lower than language scores for the sample of typically developing children" (p. 280).

Bolzani Dinehart et al.'s (2009) study reports the results of implementing Milieu Teaching (MT) as an additional language intervention with four children (18–20 months old) within the centre-based intervention group of the LRIP to test if this would improve language skills above those obtained to date. Over a 16-week period each child received three individual intervention sessions a week for the first four weeks, and four sessions a week from weeks 5–16. The results demonstrated "impressive gains" (p.15) and were seen by the researchers to support the effectiveness of MT in improving language development for children exposed to cocaine prenatally. However, they also pointed out that it was very costly of time. Additionally, they highlighted that (i) the interventionists who worked with the four children "were all educated individuals with a background in child development"; that (ii) the children were also receiving the LRIP intense intervention to improve overall developmental outcomes; and (iii) the children had been selected on the basis of their age and language deficits. They cautioned that the intervention effects could differ "depending on the qualifications of the interventionists, the environmental circumstances of the child, and the child's initial abilities" (p.17).

A further recent study from the LRIP project (Bono & Sheinberg, 2009) investigated the moderating role of LBW in the relationship between early intervention for children exposed to cocaine prenatally and developmental outcomes. For this study, the children in centre-based and home-based interventions were grouped together as one intervention condition and then compared to children in the primary care group. The analysis showed that the intervention condition benefited the cognitive and language abilities of all the infants regardless of their birth weight, but it was most helpful for those with LBW. Additionally, children of LBW who were in the intervention group exhibited fewer behavioural problems and higher levels of prosocial behaviours compared to children of low birth weight who were not in the intervention group; children of normal birth weight did show behaviour problems and prosocial behaviours irrespective of whether they were or were not in the intervention group. The authors concluded that their results supported the notion of the "cumulative effect of risk" (p. 498) and strengthened the argument that children with multiple risk factors should be especially targeted for participating in early interventions.

6.2.3 Early intervention in multiple risk-factor contexts: early childhood education and care as a protective factor for academic outcomes in children

Burchinal et al. (2006) argued that given that social risk factors during early childhood are often associated with academic difficulties, it is important to identify whether high quality early childhood education can be a protective factor. Their study assessed six risk factors (i.e., poverty, father absent in household, large household size, low maternal education, high maternal depression, and high life stress) which were then collated in one multiple risk index (averaged over several data collection points during early childhood).

Burchinal et al.'s study (2006) used a sample of 75 children from low-income African American families, who were all enrolled in childcare centres full time or in Head Start programmes prior to entry to kindergarten. Infants were included in the study if they had attended community-based childcare centres and were initially enrolled aged in their first year of life (between 1 to 11 months; mean 5.4 months). Later outcomes on child development were assessed at four different time points (i.e., at entry to kindergarten, and at each of grade 1 to 3 in elementary school).

The results suggested that childcare quality (measured by the ITERS and ECERS) emerged as a protective factor over time in the area of mathematics skills, though not for reading scores or social skills. For children who attended higher quality childcare, exposure to risk was negatively related to *mathematics skills* in first grade much more strongly than in third grade, showing that the effect of risk decreased with time for these children. In contrast, risk became a stronger negative predictor over time for children who attended lower quality childcare centres.

The effect of risk on *behaviour problems* also decreased from kindergarten to third grade, whereas the effect of risk among children who attended lower quality childcare programmes increased from kindergarten to third grade.

In sum, these findings provide evidence that quality childcare might be an important protective means to reduce behaviour problems and increase academic skills among a group of children who are at risk from multiple factors.

Similar findings about the protective or buffering effect of higher quality centre-based childcare provision for under-two-year-olds were reported by McCartney, Dearing, Taylor, and Bub (2007). Using data from the longitudinal NICHD Study of Early Child Care and Youth Development, McCartney et al. (2007) investigated direct and indirect pathways between childcare quality and child outcomes, and between improvements in the home environment and child outcomes. The authors hypothesised that higher quality childcare buffers children from the negative effects of low income when it provides learning supports and when it leads to improvements in the home environment.

The study sampled infants from low income families who were in non-parental care during the first 36 months for at least 10 hours per week (M = 34.01). Childcare quality was assessed by the Observational Record of the Caregiving Environment (ORCE) with scores at four time points (6, 15, 24, and 36 months), averaged across. The qualitative ratings consisted of sensitivity to child's non-distress expressions, positive regard, stimulation of cognitive development, detachment, and flat affect; at 36 months fostering exploration and intrusiveness were also added. Based on a composite variable of total observed childcare quality, children in childcare were divided in half (below and above the mean). Thus, there were three groups of children: those in higher quality childcare, those in lower quality childcare, and those not in childcare. The children's performance on a measure of school readiness (i.e., Bracken Basic Concept Scale; Bracken, 1984), and on language competence (i.e., Receptive Language and Expressive Language from Reynell Developmental Language Scale; Reynell, 1990) were assessed at 36 months.

The results indicated both a direct and indirect relationship between higher quality childcare and children's outcomes for cognitive and language development, with higher quality childcare acting as a buffer for children from the negative impact of lower family economic resources. After controlling for nine child and family covariates, an interaction between family income-to-needs ratio (family income divided by the state poverty threshold for the appropriate family

size) and childcare quality was found to predict school readiness, receptive language, and expressive language, as well as improvements in the home environment. Children from low-income families benefited from observed learning supports such as sensitive care and stimulation of cognitive development, and their parents profited from unobserved informal and formal parent supports.

McCartney et al. (2007) reported that children from low-income families in higher quality childcare performed better than children in lower quality childcare, and better than children who did not use childcare. Children in higher quality care scored highest on the test of School Readiness compared with children in either lower quality care or no care. Similar results were obtained for Receptive Language and Expressive Language; children in higher quality care scored highest on these two language subtests compared with children in the remaining groups. Even lower quality care showed some positive effects, relative to no care, for children at the poverty level. The authors concluded that childcare experience of any quality affords advantages to children living in poverty with respect to language comprehension and expression. Effect sizes increased as childcare quality increased.

McCartney et al. (2007) emphasised that children in higher quality childcare experienced teachers who were both sensitive and stimulating of children's cognitive development. Children were assumed to receive more verbal interaction in higher quality as well as lower quality childcare than they would have at home. The authors stressed that because vocabulary is one of the best predictors of literacy, the results for receptive language were the most important. Therefore, according to the authors, practitioners in early childhood settings should be trained to support language skills by offering language-rich activities, including reading, circle-time discussions, and one-on-one conversations.

Exploring further the buffering effects of higher quality early childcare, and again using data from the NICHD study, Dearing, McCartney and Taylor (2009) investigated whether the relationship between family economic status and children's achievement in maths and reading during the middle childhood was moderated by higher quality childcare in the first years of life.

As in all the NICHD analyses, the quality of the childcare centres attended by the study children was measured using the ORCE with high quality within non-maternal childcare described as ten or more hours per week in a childcare centre from the age of 6 to 54 months in which the children experienced:

- high levels of language stimulation
- access to developmentally appropriate learning materials
- a positive emotional climate with sensitive and responsive caregivers, and
- opportunities for children to explore their environments.

Dearing et al. (2009) emphasised that higher quality care for low-income families can offer material (e.g., access to learning materials) as well as psychosocial (e.g., stimulating and responsive caregivers) benefits. They further noted that providing social support to the parents is another aspect of how high quality care can benefit low-income families indirectly.

The results of Dearing et al.'s (2009) study showed that for children from low-income families higher quality childcare was associated with early school readiness, and reading and mathematics achievement through middle childhood. The authors commented:

> We found that higher quality care during early childhood appeared to protect children in low-income families, promoting their reading and mathematics achievement through middle childhood. The more episodes that children spent in higher quality care between 6 and 54 months of age, the weaker the association between family income-to-needs and middle-childhood achievement. In some cases, in fact,

> the achievement of low-income children who experienced three or more episodes of higher quality child care was nearly as high as, and was statistically indistinguishable from, the achievement of affluent children. (p. 1344)

The authors concluded that future discussions on anti-poverty policy should place more importance on the role that higher quality early childhood education can have in ameliorating the effects of poverty.

6.3 Concluding summary

A key aim of this chapter has been to highlight the general findings from studies of the effects of high quality centre-based early childhood education for at-risk children and to identify the elements within different programmes that worked well.

Within the studies reviewed, the following characteristics are also worth highlighting as impacting on the effectiveness of early intervention programmes.

1. Central-government-supported programmes, like Early Head Start (EHS) and Sure Start (SS), have the capacity to make the biggest difference most quickly. This was evident in the increased access to high quality childcare for infants and toddlers identified by the first evaluations of EHS (Love et al., 2004), and in the rapid expansion of SS (Gray & Francis, 2007).
2. The different implementation protocols of the EHS and SS, and the developmental trajectory of SS, suggest there are lessons to be learned about the benefits of clear programme protocols, as well as models of community partnerships.
3. Structural features of high quality identified within the studies reviewed in this chapter mirror those identified in earlier chapters. Specifically, low adult:child ratios, staff qualifications and a well-articulated curriculum are related to sustained interactions between adults and children and positive outcome measures for children (Love et al., 2005).
4. Interventions with children prenatally exposed to cocaine showed that qualified interventionists were essential to the success of the intervention programme, and that additional language intervention (e.g., Milieu teaching) while expensive, was also very effective (Bolzani Dinehart et al., 2009).
5. Centre-based programmes, and programmes that combine centre-based intervention with home-visiting work are better than home-visiting alone.
6. There is a range of interrelated factors that impact on the effectiveness of an intervention, including ensuring access through the provision of transport for children and parents to a centre-based facility.
7. Most of the interventions were multi-service provisions that met health as well as educational needs.
8. Meaningful evaluation approaches need to be planned alongside the intervention (Love et al., 2005; Melhuish et al., 2008a).

This list is supported also by Herrod (2007) who summarised the characteristics of successful early intervention programmes he reviewed as:

1. being relatively intensive
2. at least one year long if not longer
3. employing teachers who have higher qualifications than those in regular programmes
4. providing better pay for teachers

5. having lower student-to-teacher ratios than the norm and a limited total classroom size
6. being generally research based and designed to have a control group and specific outcome measures
7. having greatest impact where there is greatest risk.

With regards to the effects of early intervention studies on children, studies reviewed in this chapter have shown that:

1. high quality early childcare in the first years of life had beneficial effects that persisted into adulthood (e.g., Campbell et al., 2008; McCormick et al., 2006)
2. effects from high quality early childhood programmes were discernible in adult cognitive and academic achievements, including reading and mathematical skills, and in vocational outcomes in adulthood (Campbell et al., 2008)
3. benefits to children include better social development, positive social behaviour, and greater independence (Melhuish et al., 2008)
4. some of the gains from quality childcare in the first years of life may not be seen until late adolescence and early adulthood
5. children benefit from less negative parenting (Melhuish et al., 2008)
6. low-birth-weight infants can benefit from early intervention in both cognitive and behavioural domains (McCormick et al., 2006) and high participation rates in early intervention may be more effective for lighter low-birth-weight infants (Hill et al., 2007)
7. both centre-based and home-based intervention had beneficial effects on children prenatally exposed to cocaine who were enrolled in the Linda Ray Interventon Project with the best outcomes for language skills and gross moter skills experienced by children enrolled in the centre-based intervention
8. with children who are multiply at risk, higher quality early childhood education acts as a buffer from the effects of the risk factors in relation to academic achievement at school and in relation to behaviour problems (Burchinal et al., 2006; Dearing et al., 2009; McCartney et al., 2007)
9. for children in poverty, high quality childcare had the best buffering effects, and for these children the buffering effect also applied in childcare of lower quality.

With regards to the effects of early intervention studies on parents and families, this review found that:

1. parents benefit from the support for their children's learning and language which make the parents more responsive to the child's bids for attention at home
2. parents benefit from programmes that provide targetted access but challenges can remain in some neighbourhoods due, for example, to transportation issues, or lack of information (Love et al., 2004)
3. parents in EHS read more to their infants than parents in the control group (Love et al., 2005) and provided a more stimulating home-learning environment (Melhuish et al., 2008a)
4. early intervention programmes can provide practical support as well as emotional support, such as by 'minimising the chaos' while the youngest child is at the centre (Dearing et al., 2009; Melhuish et al., 2008a).

Overall, the combination of these findings lends credence to the conclusion reached separately in a number of the studies reviewed, namely that high quality early childhood education can make a lasting difference and act as a protective factor for children at risk. It therefore makes sense for future policy to take account of this role of high quality early childhood education in planning strategies to enhance children's life chances.

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Chapter 7: Synthesis of Review Findings

Abstract

Three key messages summarise the findings of this report: (1) Early childhood settings for under-two-year-olds should be places where children experience sensitive responsive caregiving that is attuned to their subtle cues, including their temperamental and age characteristics; (2) Early childhood settings for under-two-year-olds should be low-stress environments because low stress environments are correlated to healthy brain development. Calm quiet environments are amenable to policy intervention through regulable elements such as adult:child ratios, and teacher preparation; (3) Environmental conditions and teacher action interconnect in creating quality ECS for under-two-year-olds. The achievement of attuned teacher-child relationships requires a holistic pedagogical approach and environmental and policy conditions that act as a supportive membrane for pedagogical interaction. This concluding chapter draws together the key findings into a synthesis around the key and subsidiary questions that framed this review.

This review has presented the argument that the number of discourses from which to view *quality* has grown substantially over the past decade. Studies that illustrate this growth range from positivist ones that seek to quantify the effect of discreet variables in determining *quality*, to others within ecological and socio-cultural paradigms which foreground the contextualised nature of *quality* within a system or activity. There are also studies that adopt poststructuralist interpretations of *quality* and thus reject any universal definitions to emphasise uncertainty, contingency and the importance of perspective. As such, quality can no longer be seen merely as an isolated phenomenon that can be measured but rather as a construct that is embedded in layers of meaning that are interpreted within the lived experiences of infants and toddlers in relationship with others and their environments. Since it is now understood that no one discipline can make claims about the complex phenomenon of *quality* without considering its situatedness as a notion, this review has adopted the position that multiple scientific bodies of knowledge play a part in explaining it. This is consistent with the translational research approach identified by Meltzoff (2009) and ohers (see Cicchetti & Gunnar, 2009).

The expansion of research methodologies for understanding human functioning over the past decade has brought about a heightened appreciation of the unique and sophisticated social, cognitive, and emotionally complex nature of infant and toddler communication as a dialogic phenomenon. Taking the view that the under-two-year-old is more socially competent than was previously understood, there has been an increased interest in under-two-year-olds as social beings, in relationship with others – the people, places and things that comprise their learning experience – and the centrality of these relationships to learning and development.

In this concluding chapter, the insights gained from the research reviewed are drawn together into a synthesis around the key and subsidiary questions that framed this review. The questions of the review are addressed sequentially.

Question 1:

What does research evidence suggest about what quality early childhood education for under-two-year-olds should 'look like'? What are the features or dimensions of quality? How should these vary according to the age of the child and other key factors?

1.1 What does research evidence suggest about the conditions/factors which support the positive development of children under two years of age? What are the implications of this for providing high quality care and education at early childhood centres for under-two-year-olds.

1.2 If an early childhood centre was to be regarded as providing high quality early childhood education for under-two-year-olds, what do we know from research about what this would look like?

Quality is now understood as a multi-dimensional, value-laden and situated concept while pedagogical research points to a dynamic interaction between structural and interactional factors in creating quality experiences in early childhood settings. Goelman et al.'s (2006) conceptualisation of quality as a continuum of factors that includes distal features (e.g., regulations, policy and teacher registration requirements) and proximal ones (e.g, child's interactions with teachers, ratios, group size etc), provides a useful tool with which to consider this dynamic interaction. For example, distal features such as regulations and other mandatory requirements stated in policy, may be conceptualised as creating a supportive membrane for the more dynamic elements of early childhood provision.

This literature review points to two dimensions that are essential for a quality early childhood educational experience for under-two-year-olds:

1. Attuned interactions that establish secure relationships which stimulate emotional and cognitive growth; and
2. An environment that is free of toxic stress (eliminated by small group sizes, high adult:child ratios, a calm relaxed atmosphere with unhurried, individualised routines and a healthy environment).

Specific features identified in the literature as enabling these dimensions are:

- a sufficient number of adults per child in line with the benchmark of 1:3 recommended as the ideal, and 1:4 or 2:8 as the back-up options (see Chapter 5)
- qualified adults who are knowledgeable about contemporary theories of development and learning including an awareness of the impact of their behaviours on brain development
- qualified adults with specialist knowledge of infants and toddlers and with access to ongoing professional development from providers who are also specialists in the field
- teachers who are skilled in creating a calm environment and provide a relaxed pace/rhythm to the day
- teachers who take a stance of respect towards children, seeing them as learners with capabilities to actively participate in social processes of learning, capable of memory, fully functioning cognitively
- an environment whose physical characteristics meet or exceed regulation standards (including low noise levels and opportunities for quiet rest as well as more energetic play opportunities)
- an environment that maintains hygienic and nutritional conditions that support the well-being of the infants, toddlers and families
- favourable working conditions (e.g.,salary, status, qualifications, ongoing professional development) that enable continuity in relationships between teachers and infants, toddlers, and families.

Specific programme requirements for under-one-year-olds as opposed to under-two-year-olds have been identified by some authors (e.g., Stephen, Dunlop, & Trevarthen, 2003) but this is an area that warrants further investigation. This is especially pertinent in Aotearoa New Zealand given the mixed-age compositions in many early childhood educational contexts which make direct translation of research findings from other contexts very difficult to achieve.

Child development and neuroscientific research provides a consistent message that responsive interactions and intersubjective attunement are the foundations for children's emotional, cognitive and overall developmental well-being. Social interactions in which there is a 'serve-and-return' dynamic act as a catalyst for learning. Neurobiological research also suggests that neural mechanisms for cognitive and emotional development might be the same.

The implication of such findings is that high quality early childhood settings for under-two-year-olds should be places where children encounter adults who are skilled in establishing and maintaining attuned interactions. With under-two-year-olds, such attunement is achieved in relationships that are facilitated through a sophisticated reading of children's body cues, such as movement, gestures, vocalisations and subtle changes in any of these. Additionally, early childhood programmes for this age group need to strike a balance between cognitive stimulation and emotionality.

In high quality early childhood settings children experience continuity of care evident in practices such as primary caregiving relationships. This is especially significant for the very young child because of the known positive impact of secure attachment relationships on learning and development. With secure attachment relationships in place the infant and toddler can gradually go on to enjoy multiple relationships with others.

These dimensions of quality environments are important because neurobiological and child development research shows that unresponsive, inconsistent, unhealthy, unstable relationships, coupled with ongoing exposure to highly stressful environments in the first years of life are known to negatively affect brain development with potential long-term consequences.

The following excerpts from recent New Zealand research provide illustrative descriptions of what a high quality early childhood education setting for under-two-year-olds might look like.

An environment where:

> ….the ebb and flow of the environment, with its unhurried pace, set the scene for children to explore freely. Children moved in and out of spaces and played in their own world alongside others, supported by periodic cultural cues that served as a "punctuation mark" to the day. The children occasionally returned to familiar spaces and used these as a base from which to explore. Adults were always close by and keen to respond to the children when they were invited into their world. …
>
> … In play this meant being attuned to each other, and to the child, through careful observation and interpretation. (White et al., 2009, pp. 46, 47)

A teacher who learns to 'read' young children's cues and appreciate and respond to their cues:

> … like, at the beginning I didn't know this child and I think now, because we've built that relationship … I've got to know her a bit more …. At the beginning Zoe was like a book that I had never read … and as it's gone on I feel as if I have read that book so many times and I sort of know what is in each part.
> *Alicia, teacher in Jayne White's PhD study.*
> http://www.educate.ece.govt.nz/learning/exploringPractice/Literacy/ReadingToddlers/AdultsReadingToddlerLanguage.aspx?p=2%20&%203

Teachers who might say:

> The teacher's role then is a finely balanced role, an intuitive role that sees each teacher making decisions 'in the moment' poised as provocateur, as listener, as learner, as teacher, ever vigilant for opportunities to widen and deepen knowledge… It is a highly skilled position and one that can enhance and constrain learning in the blink of an eye. (Greerton Early Childhood Centre's Centre of Innovation Research project final report, cited by Sands & Weston, 2010)

A parent who would say:

> I remember getting there at the end of the first day feeling very anxious as to how it would be and finding him snuggled on Bridget's shoulder and he was nestling into her neck. On the one hand [I thought] Oh poor little guy – but they're looking after him – he's getting one-to-one care … letting him snuggle into her. It was really helpful when I got there on the first day, they had taken photos of him, showing photos of him happy in the outdoors, and they had the notebook where they recorded what he was doing, and it was good for me too. … there was something very gentle about Bridget. She was very much into sitting with them and being there for them. (Juliette, mother of Samuel, 12 months. (personal conversation, 17 March 2009, cited in Rockel, 2010)

A teacher who will explain to parents:

> Primary caregiving at a centre is different to the primary caregiving that you do as a parent. For a start parents are there for the child and have a shared future for that child, so everything that happens within the relationship is with that future in mind. At the centre it is a little different: our future is not shared with the individual children, although we still want what is best for each child while they are with us. That means that our job is to be in partnership with the child and their families and find out what is important for each particular family and work out how that fits within the centre and our philosophy. (Bridget, teacher at Childspace Ngaio Infant and Toddler Centre of Innovation http://www.educate.ece.govt.nz/Programmes/CentresOfInnovation/RoundFour/ChildspaceNgaioInfantsandToddlers.aspx

1.3 What else needs to be in place ideally to reflect other characteristics of the child beyond age, such as gender, ethnicity, socio-economic status, family background, health or disabilities etc?

Issues related to gender did not feature to any significant level in the literature sourced for this review, and research related to health and disability issues in the first two years of life was too extensive to be included in this report beyond that encompassed within the literature related to early intervention programmes. The latter typically considered factors such as ethnicity/race, low socio-economic status, father absence, low birth weight and prenatal exposure to cocaine as risk factors which early childhood programmes aimed to neutralise. In these contexts, early childhood education programmes typically perform a holistic parent/family support function with early childhood provision conceptualised more as a family multi-service affair and less as a centre-bound experience between the infant and the teacher. Teachers who can establish good working relationships with parents, mindful of values, and drawing on parents' experiences are essential to the success of these programmes.

Results from early intervention studies highlighted the following other factors (see Chapter 6) as essential to achieving high quality outcomes:

- home-visiting components within centre-based programmes
- multi-service early childhood centres (Belsky et al., 2006; Melhuish et al., 2008)
- the provision of transport to ensure children attend the early childhood centre
- focused curriculum experiences such as language enrichment interventions (e.g., Bolzani-Dinehart et al., 2009)
- provision of primary health care facilities (Campbell & Pungello, 2000).

Early intervention studies sourced in this study additionally nominated the usual structural components associated with high quality provision as essential for effective programme outcomes, namely:

- caregiving staff who from infancy were seen as "teachers" (Campbell & Pungello, 2000, p. 5)
- a linguistically and cognitively stimulating curriculum that values the pedagogical power of play

- staff:child ratios that exceed minimal state requirements
- staff salaries comparable to those of teachers in public elementary schools (Abecedarian project, Campbell & Pungello, 2000).

Furthermore, temperamental differences among children were seen to impact the ease with which some children handled transitions between staff and in the early childhood setting generally, with slow-to-warm children finding these harder. This highlights once more the importance of knowledgeable adults being able to interpret children's messages.

1.4 From what age do children experience educational and social gains from entering early childhood education? How do duration and characteristics of the child and their family/whānau relate to this?

The literature does not recommend an optimal age for entry into early childhood education settings. Both the New Zealand *Competent Children Study* and the *Dunedin Multidisciplinary Longitudinal Study* recruited children at age 3 years, which is above the target age of this review. However, the most recent findings from the prospective longitudinal NICHD study (NICHD 2005a-2005b; Vandell et al., 2010), involving 1364 children recruited in infancy, show that high quality early childhood attendance has immediate cognitive and social benefits that are maintained into adolescence. The NICHD studies also reported 'sleeper' effects from moderate amounts of time in childcare (10–32 hours a week) during infancy with more time in childcare during infancy being associated with better adjustment to school in adolescence (Vandell et al., 2010). These findings are important because they applied to children attending "routine non-relative child care in their communities" rather than intensive early intervention programmes such as described in Chapter 6. As the authors state, the findings "suggest that the quality of early-care experiences can have long lasting (albeit small) effects on middle class and affluent children as well as those who are economically disadvantaged" (Vandell et al., 2010, p. 750).

The most recent findings from the NICHD *Study of Early Child Care and Youth Development* further emphasise that parenting quality is connected to the effects of centre-based childcare. (Adi-Japha & Klein, 2009; Belsky et al., 2007; Vandell et al., 2010). Studies now note that the role of parenting quality as a mediator of the effects of childcare has been under-studied. In a comparison between three groups of children who all had high quality parenting but different quantities of attendance in childcare (Adi-Japha & Klein, 2009), the associations between school readiness and receptive language were strongest for those children who attended a medium number of hours per week (up to 30 hrs) of centre-based childcare. Brooks-Gunn and Markman (2005), among others, have found that a parenting component added to home- and centre-based programmes can alter parenting to improve nurturance and discipline, and thus children's school readiness.

It is important to emphasise that studies have consistently shown that only high quality education and care settings - characterised by high adult:child ratios (1:3), small group sizes and qualified staff - are of developmental benefit to children. An exception to this is the finding reported by McCartney et al. (2007) that for children at the poverty level, even low quality care showed some positive effects, relative to no care.

For at-risk populations, the research base clearly states that high quality early childhood education acts as a buffer against the deleterious effects of adverse life conditions. This is especially the case for children in multiple risk contexts (Burchinal et al., 2006; Dearing et al., 2009; McCartney et al., 2007) such as poverty, father absence, large household size, low maternal education, high maternal depression, and high life stress. As detailed in Chapter 6, both McCartney et al.(2007) and Dearing et al.(2009) reported that children from low-income families performed better in higher quality childcare – compared to children in lower quality childcare, and to children with no childcare – on tests of school readiness and language competences. Additionally, the parents of these children benefited indirectly from the support received by their child. The data reported by McCartney et al. and Dearing et al. related to children aged 6 to 54

months, while the children in Burchinal's study were enrolled in childcare at a mean age of 5.4 months with the youngest being 1 month old.

As with the general population, specific starting ages for children from at-risk populations were not identified as more favourable than others in the research accessed for this study.

Campbell et al. (2008) also noted that "longitudinal studies demonstrate that some of the most important societal gains to be realized from early childhood programs may not be seen until late adolescence or early adulthood" (p. 464).

1.5 What are the best indicators or measures for examining the degree of quality being provided to under-two-year-olds attending early childhood education?

Different studies continue to use the ITERS as a measure of the quality of the early childhood environment with the NICHD using its own measure called the ORCE. The new tool called the CLASS (Pianta, La Paro & Hamre, 2008) is also being increasingly discussed at conferences where it is gaining favour as a research tool as well as a self-review tool for practitioners. The literature shows that while overall measures of quality have provided a good starting point for many studies, these tools often have had to be amended to respond to local conditions (e.g., the ECERS has been amended for use in New Zealand). In keeping with the broadened methodological and theoretical bases being applied to research with under-three-year-olds, it is increasingly being argued that visual means of data generation, and emphasis on the capability of teachers to recognize and respond to infant communication, hold the key to an appreciation of quality early childhood education for this age group (e.g., Johansson & White, in press).

Question 2:

To what degree does the current provision of early childhood education in New Zealand for under-two-year-olds reflect what is known from research evidence about the features/dimensions of quality for this group? What can support as close an alignment as possible to these features in the future?

2.1 What is known about the current situation in New Zealand? How closely does the current situation reflect or align with what is known from the research evidence about the features of quality early childhood education for under-two-year-olds?

What we know about the current situation for under-twos in New Zealand, apart from the ERO (2009) report, comes from a small number of doctoral research studies and one-off qualitative projects funded either under the discontinued COI action research programme (see Chapter 2) or the *Teaching and Learning Research Initiative* (TLRI).

For example, White's (2009) doctoral study showed that a mixed-age centre considered to be of high quality (according to ERO reports and contemporary quality criteria such as ratios, group size, teacher access to non-contact time etc) still struggled to facilitate optimum relationships with the 18–22-month-old toddlers. The turning point for them was in moving away from strict timetables and rigid templates for assessment towards engaging in dialogic relationships that were characterised by attuned interactions- an insight also reported by Deans and Bary (2008) in their COI-funded project.

COI projects typically focussed on one or two aspects of pedagogical practice and were funded to investigate pedagogical practice to a level well beyond the regular capacity of other early childhood education services. The fact that the TLRI funding pool has nominated the area of infant and toddler provision as an area of priority for early childhood education research over the last two years confirms that infant and toddler pedagogy has been marginalised

as an area of research. A current research project funded by the TLRI in which three of the writers of this report are involved (Dalli, Duhn and Rockel) is showing that there is much interest among the early childhood teaching community working in infant and toddler contexts in pursuing a research agenda that would support them to improve their practice.

Several countries have responded to the marginalisation of under-two-year-olds in policy reports over the past decade. These include Australia (Cass, 2007), Canada (McCain & Mustard, 1999), Scotland (Stephen et al., 2003) and the United Kingdom (Abbott & Langston, 2004; David, Goouch, Powell, & Abbott, 2003; see also Fox et al., 2010). In their commissioned literature reviews similar messages can be found about the benefits of social and economic investment in the education and care of under-two-year-olds. McCain and Mustard pointed out that policy makers have two potential pathways that they can take – either (i) centres are funded adequately to provide the high quality education and care that is now known to be essential for infants and toddlers; or (ii) families are supported to remain at home. For at-risk populations, the strong recommendation is to support families and their infants and toddlers through targeted intervention programmes.

2.2 What are the enablers to high quality early childhood education for under-two-year-olds?

The literature consistently points out the importance of intersubjective relationships as the key to high quality early childhood education for this age group. These are enabled by the provision of structural variables pointed out in Chapter 5 and are outlined as follows:

- Caregiving practices that promote secure attachments supported by systems such as primary caregiving and employment conditions that encourage staff to feel valued and therefore stay in the job, thus avoiding high turnover and transition that interrupt caregiving relationships.
- Individualised care may be supported by a flexible programme that enables teachers to follow the child and their routines, rather than a roster.
- Teacher-child relationships that are characterised by attunement, intimacy, interactional synchrony, sensitivity and self awareness on the part of the teacher, coupled with keen observational skills and the ability to 'read' cues and subtle nuances in infant and toddler communication.
- Degree-level, specialised, training for work with infants and toddlers and ongoing professional development that takes into account new knowledge.
- Attuned caregiving across the curriculum may be supported by teachers who have the capacity to engage in indepth caregiving relationships with infants and toddlers, who have expert, specialised knowledge and the capacity to reflect and review their practice .
- Supportive working environments that facilitate low staff turnover may be supported by optimum working conditions, recognition and status of the specialised nature of this work, coupled with high ratios and small group sizes.
- Stress-free environments may be supported by higher ratios, group size, nutritional awareness, space and, most importantly, pedagogical practices that are calm and peaceful.
- Partnerships with families may be supported by programmes that invite parent/whānau involvement and see themselves as working in tandem with families. Studies with at-risk populations suggest that intervention may need to be active in supporting positive parenting practices in the home as well as modelling positive interactions at the centre. Parents may also benefit from additional funding support to make good choices about the quality of education their infant or toddler receives.

Cumulatively, the findings of this review suggest the following equation:

Knowledgeable teachers + optimum structural variables + supportive environments for teachers, children and parents = optimum pedagogical interactions= optimal developmental outcomes for children

Optimal pedagogical interactions lead to infants and toddlers who have their care and learning needs and interests met in a consistent manner.

2.3 What are the barriers to high quality early childhood education for under-two-year-olds? What can help address or ameliorate these barriers?

Identified barriers for high quality education are the opposite to those outlined under 2.2 above. For instance, when teachers do not have specialised knowledge they are not in a position to provide programmes which are appropriate for this age group, nor are they able to support families in the most appropriate ways. When the ratios are insufficient and group sizes too large, a teacher is unable to develop the kinds of relationships necessary for optimum learning, despite a desire to do otherwise. When teachers do not work in conditions that enable them to reflect deeply about their practice, it is likely that current practices will be sustained and become unresponsive to new knowledge that emerges in the field. When working conditions and status are undermined, it is difficult for teachers to remain positive, committed and sustained in their relationships with under-two-year-olds and their families. Clearly, for every positive there is a negative that can be interpreted as a barrier.

In addition, the literature has identified family characteristics that act as barriers to accessing high quality. As illustrated in Chapter 6, these characteristics are described in terms of the following disadvantages: poverty, father absent in household, large household size, low maternal education, high maternal depression, and high life stress.

The literature has suggested that teachers need specialist training to work across diverse cultures and communities. Since infants and toddlers have limited ability to speak for themselves, advocacy from parents and teacher relies on these adults' ability to communicate effectively with one another in the shared care and education of the child.

2.4 What skills, experience, qualifications and other characteristics do early childhood education teachers need for working with children at varying ages up to two years of age?

The reviewed literature overwhelmingly emphasises five key areas of competence for early childhood education teachers working with under-two-year-olds. These are in addition to generic teacher qualities (as outlined by NZ Teachers Council):

- emotional engagement;
- critical reflection;
- awareness of diversity;
- a research/evaluation focus; and
- child development knowledge.

Recommended qualifications in the literature base suggest that an undergraduate degree with specialist components, combined with ongoing professional development is optimal. The neurobiological knowledge that is emerging suggests that specialist knowledge must include a multi-disciplinary orientation.

Question 3:

What do we know about the capacity of ECE to improve outcomes for under-two-year-old children from low SES, Māori, Pacific or other backgrounds that include risk factors or vulnerabilities? What is meant by quality in these projects and what are the variables at play? What worked?

Correlational research of the type sourced in Chapter 6 for at-risk populations in the US and the UK is not available for equivalent New Zealand populations within the 0- to 2-year-old age group. Thus the best indications about what works, to date, continue to come from early intervention programmes implemented overseas using an early intervention methodology, as discussed in detail in Chapter 6.

Alongside these data, it is important to note Shonkoff's (2010) argument that disparities in learning and development for very young children are a result of the complex interplay between the kinds of relationships infants and toddlers are able to enjoy with adults, and the social, economic, psychological (and nutritional) state of the adults who care for them. Research is providing new information about the short and long-term consequences of deficit experiences and the factors which impact on these.

This literature is neatly summarized by Perez-Johnson and Maynard (2007):

> Early, vigorous interventions targeted at disadvantaged children offer the best chance to substantially reduce gaps in school readiness and increase the productivity of our educational system. The available evidence fails to provide a complete road map for future investments, however. Hence we propose a program of challenge grants to states and their sub-units, coupled with waivers from regulation, to spur innovation and experimentation within this important research area. (p. 587)

Perez-Johnson and Maynard's concluding comment presents a provocation to researchers and policy-makers alike.

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