**The early learning experience**

Children’s experiences in the early years of their life, both within and outside the home, can have profound impacts on their longer term development. The early childhood period is a time of rapid brain development where the brain’s circuitry or ‘wiring’ is built. This process is particularly sensitive to the nature, extent and range of experiences provided by a child’s environment. This makes early childhood a period of both opportunity for enrichment and vulnerability to harm.

There has been extensive research as to interaction between genes and experience and the rapid development of the brain in the early years of life (National Scientific Council on the Developing Child 2007). The research has highlighted the importance of the quality of the interactions between the child and their caregiver(s) and how this provides the sensory stimulation affecting early brain development and later cognitive and social outcomes.

This relationship between infants and their parents and other caregivers that shapes the architecture of the brain is often termed ‘serve and return’. This occurs as infants reach out for interaction though gestures, babbling, facial expression and cries and adults respond back eliciting further interaction from the infant and so forth (National Scientific Council on the Developing Child 2007). It is through these interactions that a child’s ‘self regulatory’ system develops that enables the child to control their emotions and behaviour, interact with others and engage in independent learning. The young child’s relationship with adults and the environment and experiences provide the foundation of their early learning.

Virtually every aspect of early human development, from the brain’s evolving circuitry to the child’s capacity for empathy, is affected by the environments and experiences that are encountered in a cumulative fashion, beginning early in the prenatal period and extending through the early childhood years. The science of early development is also clear about the specific importance of parenting and of regular caregiving relationships more generally. (Shonkoff and Phillips 2000, p. 388)

In contrast, harmful experiences can have severe detrimental effects on brain development and longer term effects on physical and mental health into adulthood. Young children who experience poverty, continuous family chaos, recurrent emotional and physical abuse, chronic neglect and severe and long-term maternal depression without buffering adult support can develop toxic stress levels that impact on brain development. Because of this, the establishment of a nurturing relationship with a primary care provider is typically given the highest priority where intervention is required (National Scientific Council on the Developing Child 2007; Shonkoff and Phillips, 2000).

Family characteristics play a key role in facilitating children’s learning and development. The level of family income and parental, particularly maternal, levels of education have a major influence on child’s development. More affluent and better educated parents tend to invest more time in development activities with their children and be better positioned to provide stimulating environments for their children (Sawhill, Reeves and Howard 2013).

The cumulative effect of experiences and environment in early childhood makes further skill acquisition possible later in life. This has underpinned the investment by parents and governments, through the provision of early childhood education and care (ECEC) services, in early childhood learning.

**The impact of non-parental care on children’s learning and development**

The impact of non-parental care on children’s development has been subject to extensive research and debate (Buckingham 2007). This research has been undertaken extensively overseas and more recently in Australia and has been ongoing since the widespread development and use of childcare in the 1960s and 1970s. It has examined various angles including: the attachment between mothers and children and the impacts of separation; the effects of early intervention through the use of development programs for disadvantaged children; the impact of childcare and preschool on children’s cognitive, social and emotional development; and the effects of quality in childcare (Elliot 2006).

*Different impacts between childcare and preschool*

The research indicates that the impacts of attending childcare on the development and early learning outcomes of younger children (aged 0 to 3 years) are not as consistently positive as the impacts of attending preschool on children aged 3 yearsand older. In a literature review for the United Kingdom’s National Audit Office, Melhuish concluded:

While the research on pre-school education (3+ years) is fairly consistent, the research evidence on the effects of childcare (0-3 years) on development has been equivocal with some studies finding negative effects, some no effects and some positive effects. (2004, p. 3)

Similarly, the Centre for Community Child Health, The Royal Children’s Hospital Melbourne said:

In general the evidence indicates that ECEC programs (not including preschool) sometimes pose risks to young children, and sometimes confer benefits, but their impacts are best understood in conjunction with other potent influences (e.g. family resources, the quality of parental care). (sub. 308, p. 2)

*ECEC and development outcomes for younger children*

The findings from Australian and overseas research on the impact of ECEC or childcare on the learning and development outcomes of younger children are mixed. In regard to cognitive outcomes, studies from Sweden reported that children commencing childcare aged between 6 and 12 months achieved significantly higher scores on cognitive ability and academic tests at age 8 and 13 (Harrison et al. 2009). In contrast, a Canadian study found that attending childcare had no significant effect on cognitive outcomes on children at age 4 and 5 (Lefebvre and Merrigan 2002).

In Australia, children’s learning abilities in the first year of school were rated lower by teachers for children who had spent long hours in care before 3 years of age (Harrison et al. 2009). A recent Australian study (Lee 2014) concluded that non-parental care from birth through to 3 years did not have adverse effects on children’s cognitive outcomes at age 4 to 5, although children who spent longer hours in childcare or commenced at 18 months or older had lower cognitive scores at age 4 to 5. However, in Canada, an analysis of the national longitudinal study of children and youth found no correlation between school readiness and the number of hours spent in childcare (Gagne 2003).

Children’s socio-emotional development can also be affected by the amount of ECEC or childcare and the age of commencement. Research, both in Australia and overseas, indicates that long hours of care (more than 30 hours per week) for very young children (generally children under 12 months old) and multiple care arrangements were associated with behavioural problems later in childhood (Bowes et al. 2009; Loeb et al. 2007; Margetts 2003; NICHD 2006). Other research has concluded that the provision of high quality care may lessen the negative impacts of the time spent in care (Harrison 2008; Love et al. 2003). The research has tended to find that the potential risks from ECEC or childcare are less evident as the child ages, especially if the care is of high quality. However, the existing evidence is unclear as to the precise age these benefits, at least for the wider population, start to kick in and outweigh any potential negative impacts.

In summarising the research, UNICEF (2008) concluded that:

At present, therefore, the most important generalization to be made is that the younger the child and the longer the hours spent in child care the greater the risk. (p. 12)

For those children facing disadvantage or at risk of poor care in their home environment there may be benefits from early exposure to high quality ECEC or childcare and the additional income generated by parental employment. Melhuish found that:

The evidence on childcare in the first three years for disadvantaged children indicates that high quality childcare can produce benefits for cognitive, language and social development. (2004, p. 4)

*ECEC and developmental outcomes for preschool and older children*

In contrast, the impact of exposure to early learning and development programs provided through preschool programs for older children (generally 3 to 5 years) is unequivocal. The research has found that preschool education is beneficial to the development of the general population and there are greater benefits to those children from disadvantaged backgrounds.

The OECD found that the Program for International Student Assessment (PISA) reading assessment results of 15 year old students in most countries who had attended pre-primary or preschool for more than a year outperformed those who had not attended, even after accounting for their socioeconomic background. In other countries, such as the United States, Finland, Korea and Estonia, attending preschool had little or no relationship to the PISA results achieved by students from similar socioeconomic backgrounds (OECD 2011).

Australian research drawing on the longitudinal study of over 4000 Australian children, the Longitudinal Study of Australian Children (LSAC), found that after controlling for socio-demographic characteristics, there was a significant positive association between attendance at preschool and year 3 NAPLAN results (Warren and Haisken-DeNew 2013). Although the results from the PIRLS (Performance in International Reading and Literacy Standards) and TIMMS (Trends in International Maths and Science Study) scores indicate a link between additional years of pre-primary education in improved test scores for Australian children in year 4 (sub. 395), these results failed to take into account the socioeconomic backgrounds of the children who attended pre-primary education and those that did not (Mullis et al. 2012). Consequently, it is not possible to determine from this study whether better results at primary school are actually related to involvement in pre-primary education or to the family and household-specific factors which have been found in other studies to be critical for child development outcomes.

In the United Kingdom, a longitudinal study on the effective provision of preschool education drawing on 3000 children, the Effective Provision of Preschool Education (EPPE) study, found that preschool attendance compared to none, enhanced all round development in children. Disadvantaged children benefited significantly from quality preschool, especially where they were with a group of children from different social backgrounds (Sylva et al. 2004). In following up these children at age 14, attending high quality preschool predicted better outcomes for maths and science, but not for English, with the benefits of preschool being less evident than at younger ages (Sammons et al. 2012). The effects of attending preschool on promoting improved socio-behavioural outcomes were also found to have faded somewhat by age 14 (Sammons et al. 2012).

A further study in the United Kingdom drawing on the longitudinal study of Young People in England, found that preschool education improved test scores for children aged 11, 14 and 16 and was particularly beneficial for children from disadvantaged socioeconomic backgrounds. However, the impact of preschool on non-cognitive outcomes was more mixed with positive impacts on socialisation and attitudes towards education, but no significant effect on mental well-being and problematic behaviours (Apps, Mendolia and Walker 2012).

The research has been more limited as to the longer term benefits (into adulthood) for the general population from attending preschool and early education. A Norwegian study measured the effects, on those aged in their early 30s from the introduction of universal access to early childhood education and care for 3 to 6 years olds in Norway in the mid 1970s. It compared the differences in adult outcomes for children from Norwegian local government authorities in which the program was extensively implemented in the second half of the 1970s and those in which it was not. Drawing on a sample of nearly 500 000 children, the study found that the introduction of this program increased the chance of completing high school and attending college which in turn strengthened labour market attachment and delayed child bearing and family formation as adults. The benefits of educationAlthough the results from the PIRLS (Performance in International Reading and Literacy Standards) and TIMMS (Trends in International Maths and Science Study) scores indicate a link between additional years of pre-primary education in improved test scores for Australian children in year 4 (sub. 395), these results failed to take into account the socioeconomic backgrounds of the children who attended pre-primary education and those that did not (Mullis et al. 2012). Consequently, it is not possible to determine from this study whether better results at primary school are actually related to involvement in pre-primary education or to the family and household-specific factors which have been found in other studies to be critical for child development outcomes.

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*Targeted programs in the United States*

There has been a considerable literature surrounding a number of experimental early education and preschool interventions that targeted disadvantaged children in the United States. The most high profile of these is the HighScope Perry Preschool Program conducted in Yipsalanti Michigan in the 1960s. This was a randomised trial based on a sample of just over 120 African American children from disadvantaged backgrounds aged three to four years. The program involved a half day, five day per week centre based preschool attendance supplemented with weekly home visits by educators. After 2 years all participants left the program and entered the same public school as the control group and a range of data was collected for both the treatment group and the control group through to the age of 40 (Heckman, Pinto and Savelyev 2013; Heckman 2006; Melhuish 2004).

The positive outcomes from the Perry Preschool Program has seen it widely referred to in policy deliberations around early intervention, early childhood development and preschool programs. Studies on the program found that it significantly enhanced adult outcomes including education, employment, earnings, health and reduced participation in crime. Although the program did not produce long term cognitive gains, it did create persistent improvements in personality and character skills. This substantially reduced aggressive, anti-social and rule breaking behaviour which in turn improved labour market outcomes, health behaviours and reduced criminal activities (Heckman, Pinto and Savelyev 2013; Heckman 2006).

Another widely referred to intervention experiment in the United States is the Abecadarian project. This study commenced in North Carolina in 1972 and also involved a randomised trial of 300 children from disadvantaged backgrounds. The treatment group took part in a centre based early childhood development program from 3 months of age and home visits until the children entered school. Data on outcomes was collected until the subjects turned 21. The treatment group was found to have better cognitive outcomes, improved education and incomes and a later start to their own parenthood. It also provided family benefits, particularly to mothers of the children, from better educational and employment outcomes. However, there was no significant reduction in criminal behaviour (Melhuish 2004).

There is also the Chicago Child-Parent Centre (CPC) program, a large scale public preschool program aimed at disadvantaged 3 to 4 year olds that has been running in Chicago public schools since 1967. It involves a half or full day program focussing on basic numeracy, reading and writing skills and includes parent involvement tovisit the centres and receive support and advice. Those who participated in the program, in comparison to similar children who did not, were found at age 28 to have higher rates of high school completion, higher income, significantly lower rates of substance abuse and lower arrest rates (Heckman and Kautz 2013).

These targeted interventions in the United States, focusing on the provision of high quality early education and family visits, have been subject to cost benefit analysis. Such analysis indicates that the highest returns from preschool and other programs come from investing in the most disadvantaged young people as it raises the ‘payoff from future investments’ (Heckman and Kautz 2013). As Heckman noted:

You go where the marginal returns are the highest and they’re highest with disadvantaged children. (quoted in Solomon 2007)

The targeted interventions in the United States have demonstrated significant returns, in part due to reduced criminal behaviour and lower rates of incarceration (table 5.2). When targeted towards disadvantaged children, the early interventions had much higher returns than later interventions during primary school, in high school or in early adulthood through job training (Heckman 2006).

While the experimental programs and the large scale CPC program conducted in disadvantaged communities in the United States, were highly beneficial to the participants and their communities, it is unclear whether or not such programs would generate as significant benefits in a different cultural context and where the general quality of ECEC services and schooling is different to that of the United States.

*What counts as quality?*

A considerable focus of the research has been on quality in the provision of ECEC services. (How parents view the quality of ECEC is covered in chapter 7.) The research has found that high quality ECEC services can have positive effects on children’s development (Elliot 2006), although what constitutes quality is difficult to define and measure (Love et al. 2003).

Much of the research into quality has focused on the structural aspects of quality: staff to child ratios; the number of children in the group; and staff qualifications. There are also the process aspects of quality which involves the quality of the interactions between staff and children. Importantly, it is the structural aspects of quality, particularly child teacher ratios and child numbers, which underpin the one on one interactions with children and the process aspects of quality (Sylva et al. 2004).

The Australian policy focus has also been on the structural aspects of quality which are more amenable to regulation and are reflected in the National Quality Framework (NQF). The quality aspects of the NQF are discussed in chapter 7.

There is no consensus from the research on the structural aspects of quality as to the actual threshold effects, the marginal contribution from changes in variables or the optimal balance between them. For example, the impact of staff to child ratios has been widely researched and a vast body of research points to higher staff to child ratios as having a positive impact on the development outcomes of children. Huntsman (2008) concluded that in general, higher staff to child ratios pointed to improvements in quality, although the connection was stronger with younger children than those children over three years old. However, the research does not indicate or emphasise any linear connection between changes in ratios and changes in quality and the difference in outcomes from shifting to a lower ratio, say 1:10 to 1:8, is unclear.

The more children within the group or larger group size has generally been associated with poorer quality (Burchinal, Howes and Kontos 2002). Although group size was less significant than other structural variables, its impact was difficult to isolate and it was often combined with other variables such as staff to child ratios and educational qualifications (Huntsman 2008). Other studies have found none or only very small effects from group size on quality (Zaslow et al. 2010).

Staff qualifications are the aspect of quality that have been found to have the most substantial effect on children’s development outcomes. Huntsman (2008) concluded that the most significant effect on quality appeared to be the education levels of the staff, their qualifications and training. Warren and Haisken-DeNew (2013) found that year 3 NAPLAN scores were higher for those children whose preschool teachers had a degree or diploma qualification. Others have questioned the relationship between staff qualifications and quality of outcomes and whether higher staff qualifications will directly improve teacher quality. They have noted that increasing qualifications in isolation will not necessarily improve outcomes and that quality will also depend on the interactions between the teacher and the child (Early et al. 2007). Gialamas et al. (2013), drawing on LSAC data, found that higher quality carer-child relationships predicted improved cognitive ability and improved socio-emotional outcomes at age four to five years and less strongly at age six to seven years. The results of their study also suggested that the qualifications of the carer did not strongly influence the quality of the carer-child relationship, although smaller numbers of children in care appeared to promote high quality relationships. Cloney et al. (2013) pointed to the uncertainty as to what kind of qualifications best promoted classroom interactions and the role of professional development training in comparison to pre-service training for early childhood educators. Yoshikawa et al. (2013) concluded that guidelines on ratios of teachers to children and staff qualifications helped to increase the likelihood of, but did not assure, supportive and stimulating interactions.

While the importance of quality is widely recognised in early childhood development, the research indicates quality is a complex concept, based on the interplay between various factors which are not easily defined.

*Developmental outcomes from the different types of care*

There is little detailed research as to the impacts on childhood learning and development from the different types of care, for example the impacts of long day care in comparison to family day care, grandparent care, nannies or care by friends and neighbours.

Different types of care will facilitate different levels of interaction and development opportunities. For example, a child in group care, such as long day care or family day care, will have greater socialisation opportunities in comparison to say a child in the care of a grandparent or nanny. On the other hand, the child in the care of the nanny or grandparent is likely to have increased opportunities for one-on-one interactions with the carer.

Community based playgroups provide an opportunity for children who may not have the opportunity at home to engage with a larger group of children as well as providing different experiences for the child. These groups, while outside the formal ECEC framework, provide the opportunity for greater physical, language and social and emotional developmental for the children attending and an informal support network for the parents (sub. 255). Playgroup Australia were of the view that community playgroups have a complementary role in the provision of ECEC:

Community playgroups and early childcare and education are complementary and not competitive endeavours. The majority of the community playgroups members are also consumers of childcare and education services and utilise both services for the different beneficial aspects. (sub. 255, p. 4)

**The importance of family characteristics**

The research is clear cut as to the importance of family characteristics for childhood learning and development. Household income, parental and particularly maternal education and the home learning environment are the strongest predictors of children’s development outcomes. In Australia, an analysis of wave 1 data of the LSAC found that family factors such as being read to by a family member, the number of books in the home and the child’s access to a computer in the home were stronger determinants of learning and development outcomes than childcare and early education experiences (Wake et al. 2008).

In the United States, the National Institute of Childhood Health and Development (NICHD) in its longitudinal study concluded that parent and family characteristics were more strongly linked to child development than childcare features. It found that children demonstrated more cognitive, language and social development skills when parents were better educated, had higher incomes, provided home environments that were emotionally supportive and cognitively enriched and where mothers experienced little emotional distress (NICHD 2006).

Also, in the United States, Reeves and Grannis (2014), concluded that parenting skills were the key to social mobility given their findings that children from lower income homes with less educated mothers heard fewer words, read fewer books and received less stimulation than children from better off and better educated homes. Better educated and more affluent parents talked and read to their children more and provided a wider range of novel and stimulating environments such as parks, playgroups and other outings.

For example, a United States study found that children from higher socioeconomic status families had larger vocabularies than children from lower socioeconomic status families at age 4 due to the accumulated number of words heard (figure 5.1).

Parents with low levels of educational attainment (such as those who have not completed high school) and income were more likely to be struggling to make a living, may lack a partner for support in parenting and lived in areas with limited choices (Sawhill, Reeves and Howard 2013).

In the United Kingdom, the EPPE study found that the home learning environment and the activities that parents undertook with the children had a strong relationship with the development outcomes of young children. It noted that the home learning environment was only moderately associated with parental income and education and held that it was what parents did with their children rather than who the parents were that was important (Sylva et al. 2004).

In a literature review for the New Zealand Ministry of Education on the outcomes of early childhood education, Mitchell et al. (2008) found the impact of early childhood education on development and wellbeing was small compared to the income (or poverty levels) and education levels of the parents.

**Summing up what the research tells us**

Summarising the research on children’s development and learning, discussed above, the Commission has drawn preliminary conclusions that:

* Family characteristics are usually the strongest predictor of children’s developmental outcomes.
* There are positive development outcomes for all children from around 3 years and above from taking part in preschool and ECEC programs. The benefits are even greater for children from disadvantaged backgrounds and can persist into adulthood.
* The impacts of ECEC on younger children are mixed. – Quality ECEC even at a young age is likely to provide benefits for disadvantaged children from poor caring environments. The potential for negative effects are greater the closer to birth a child commences ECEC and the longer the time the child spends in care. These negative effects may be lessened by higher quality care and are less evident for older children.

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