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Preschool and children's readiness for school

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Starting primary school is an important time in the lives of children and their families. This transition can be an exciting but challenging time in a child's life, with many new expectations and demands. The development of appropriate skills and capabilities in early childhood can help children to negotiate the transition to school and meet these new demands (Duncan et al., 2007). Children's early development as they begin school is vitally important to their educational pathways – those who begin school with strong academic skills generally continue to perform well, while children who start school with weaker skills tend to continue to struggle (Goldfeld, O'Connor, Quach, Tarasuik, & Kvalsvig, 2015). Therefore, it is critical to support children's early development so that they begin school with strong skills that can set them on a path to success.

Helping children to thrive at school requires supporting their development well before they enter the school setting. One way to promote learning and social-emotional development before children start school is through attendance at preschool.

This chapter explores the relationship between attendance at early childhood education and care at ages three and four and children's developmental outcomes when they start school, using data linked to LSAC from the Australian Early Development Census (AEDC).

Disclaimer: *This chapter uses data from the Australian Early Development Census (AEDC). The AEDC is funded by the Australian Government Department of Education and Training. The findings and views reported are those of the author and should not be attributed to the Department or the Australian Government.*



8.1 Attendance at preschool and long day care

In Australia, 'preschool' (known as 'kindergarten' in some states and territories) refers to structured, play-based education, provided by a qualified early childhood teacher prior to starting compulsory schooling (Council of Australian Governments Productivity Agenda Working Group, 2008). A large body of research suggests that attending high quality preschool settings before starting school can promote children's readiness to begin school (Goldfeld et al., 2016; Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2010).

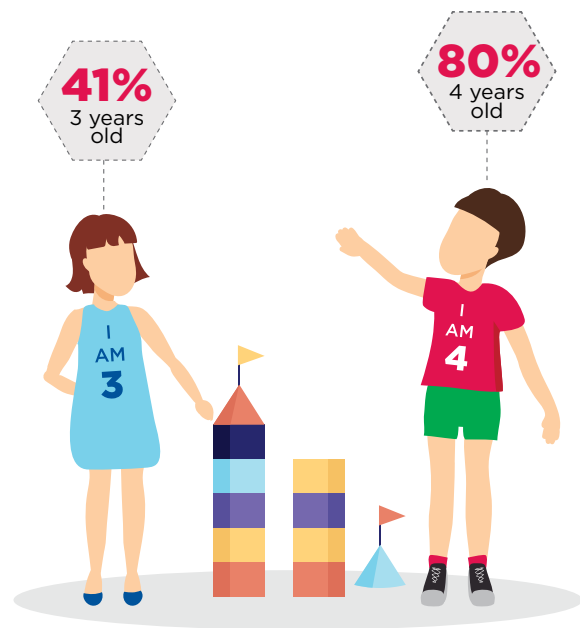
In recognition of the importance of early childhood education, preschool education in Australia has undergone a significant restructure in recent years. In November 2008, the Council of Australian Governments (COAG) endorsed a new National Partnership Agreement on Early Childhood Education. Under this agreement, the Commonwealth, state and territory governments committed to ensuring that by 2013, all children in the year before formal schooling would have access to high quality early childhood education programs delivered by a degree-qualified early childhood teacher, for 15 hours per week, 40 weeks of the year (COAG, 2009).

Prior to this commitment, there were no nationally agreed or consistent standards for staffing across the child care and preschool sector. Previous studies have shown that, at the time, there was a considerable amount of variation in the early childhood education and care experiences of children before starting school. This was partly due to distinct state and territory provisions, but also due to the need for parents to make manageable and affordable arrangements for work-related child care (Harrison & Ungerer, 2005). The type and level of qualification of the teacher or carer was linked mainly to the age of the children, the size of the group and the type of setting, with older preschoolers typically being cared for by better qualified staff, but only in some settings and some states (Elliott, 2006).

While there is still considerable variation in the quality of preschool programs offered today, the LSAC study children started school before the introduction of funding for universal access to preschool for four year olds; and they are likely to have had widely varying experiences in terms of both attendance at early childhood education and care, and the quality of the

programs they attended. The LSAC data show that the B cohort children had a range of early childhood education and care experiences before starting school. Most children who started school in 2009 (80%) attended a preschool program when they were four years old (Table 8.1, page 75). At three years of age, attendance at preschool was lower, at 41%, with a further 38% of three year olds attending a long day care program.¹

Figure 8.1: Percentage of children attending preschool at ages three and four



Note: Children who started school in 2009.

Box 8.1: Information about preschool attendance in LSAC

In LSAC, the study child's main carer (usually their mother) is asked a series of questions about the study child's attendance at early childhood education and care (ECEC) settings. When study children were aged 4–5, parents report about the child's ECEC arrangements at the time of interview. Parents also provide information retrospectively, about the ECEC programs their child had attended in the previous year.

Parents report about children's attendance at a range of different types of early childhood education and care settings, such as stand-alone preschools, preschools attached to a school, and preschool within long day care centres.

¹ Note that these rates of preschool attendance of four year olds are lower than current attendance rates. In 2014, 95% of four-year-old children were enrolled in a preschool program in the year before full-time schooling, an increase from 91% in 2013 and 86% in 2012. However, the percentage of three year olds attending preschool in Australia has dropped slightly in recent years, from 18% in 2012 to 15% in 2012 and 2013. (Warren, O'Connor, Smart, & Edwards, 2016).

In this chapter, we do not differentiate between stand-alone preschool and preschool programs provided within a long day care setting or at a school. These differences in setting are likely to reflect state provisions, and it is the learning opportunities provided by the preschool program that are expected to benefit children's development, regardless of the setting in which this occurs.

Table 8.1: Children's early childhood education and care experiences before starting school

	%
ECEC attendance at age 3	
No formal care	21.0
Long day care without a preschool program	38.2
Preschool ^a	40.8
Total	100.0
ECEC attendance at age 4	
No formal care	8.6
Long day care without a preschool program	11.7
Preschool ^a	79.7
Total	100.0
ECEC attendance at ages 3 and 4	
No formal ECEC - age 3 and 4	4.6
Long day care without a preschool program - age 3 and 4	10.5
Preschool ^a - age 3 and 4	38.1
No formal ECEC at age 3, preschool at age 4	15.6
Long day care without a preschool program at age 3, preschool at age 4	25.9
Other	5.2
Total	100.0

Notes: Sample restricted to children who started school in 2009, and had information about ECEC at age three and four (*n* = 3,035). Other includes those who had attended preschool or long day care at age three but not at age four. ^a Preschool includes stand-alone preschool and preschool as part of long day care settings.

Source: LSAC Wave 3, B cohort, weighted

Most children who were going to a preschool program at age three continued on to preschool at age four, with 38% of children who started full-time school in 2009 participating in two years of preschool. Just over a quarter went from long day care at age three to preschool at age four. A smaller percentage (16%) had not participated in any ECEC program at age three before starting preschool at age four. Around one in 10 children went to long day care without a preschool program at age three and age four. However, very few (5%) participated in no formal early education or care at all before starting school.



8.2 Characteristics associated with children’s attendance at preschool and long day care

The decision about whether a child attends a preschool or long day care program is not random. Parents who place a high value on their children’s education, and those who are more socio-economically advantaged, may be more likely to enrol their children in a high quality preschool program. Data from the 2008 Child Care Survey (Australian Bureau of Statistics [ABS], 2009) indicate that:

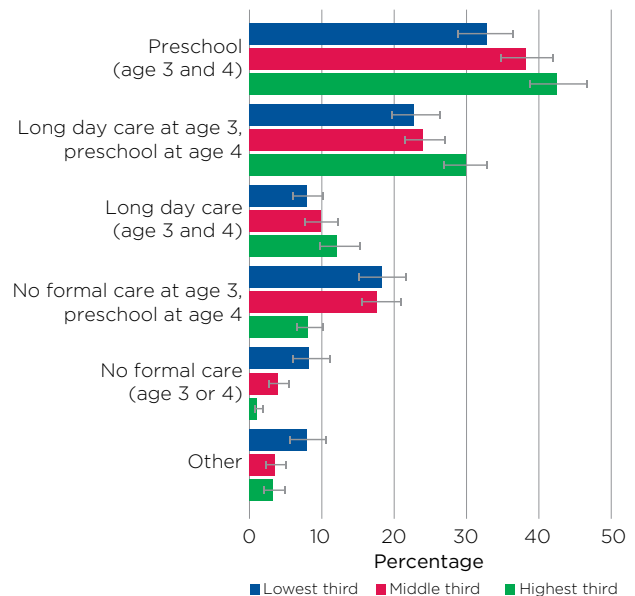
- Children living in more disadvantaged areas were less likely to attend preschool than children in less disadvantaged areas.
- Children who spoke English as their main language at home were more likely to attend a preschool program.
- Children in couple families were more likely to go to preschool than children in single-parent families; and, in couple families, the likelihood of a child attending preschool increased with household income.

Preschool participation rates have also been shown to vary according to the parents’ level of education, particularly the education level of the mother, with participation in preschool highest among children whose mother had a degree qualification (Australian Institute of Health and Welfare [AIHW], 2005). There is also evidence that children in rural and remote areas of Australia and children of Aboriginal and Torres Strait Islander background are less likely to attend preschool than other Australian children. In some cases, services in Indigenous or remote areas do not exist; while in others, transport or distance may be a significant barrier to attendance (AIHW, 2005).

Among LSAC study children who started school in 2009, there were significant differences in the combination of ECEC programs they had attended at ages three and four, depending on their household income, their parents’ education, as well as other factors such as their parents’ employment status, whether they had older or younger siblings, and whether they spoke a language other than English at home.

For example, attendance at preschool at ages three and four was significantly higher among children in households in the highest third of equivalised household income, compared to those living in households in the lowest third (Figure 8.2). While around 18% of children in households in the lower two thirds of the income distribution went to preschool at age four without any ECEC program at age three, less than 10% of children in households at the higher end of the income distribution attended no formal care at age three, before going to preschool at age four.

Figure 8.2: Participation in early childhood education and care at ages three and four, by equivalised household income at age four



Note: Sample restricted to those who started full-time school in 2009 (n = 2,944). Preschool includes stand-alone preschool and preschool as part of long day care settings. Long day care includes only long day care without a preschool program.

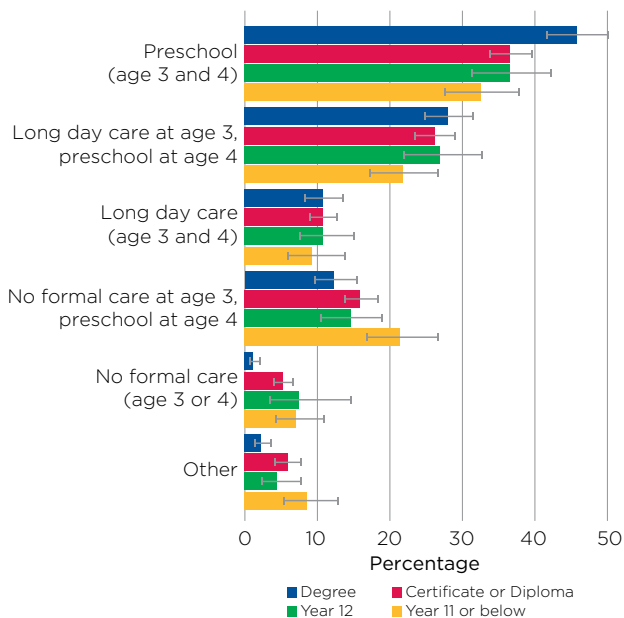
Source: LSAC Wave 3, B cohort, weighted

There were also clear differences in ECEC participation patterns depending on parents' education (Figure 8.3). Among children with at least one parent with a degree qualification, 45% attended preschool at age three and four, compared to 36% of children whose parents' highest level of education was a trade certificate, diploma or Year 12, and 32% of children with parents who had not completed Year 12.

Children who attended preschool at ages three and four might have had a more cognitively stimulating home environment than those who had other ECEC arrangements, as parents who put a high value on preschool are also more likely to 'invest' in the home learning environment, not only financially but also by spending time doing activities that are likely to be beneficial for their child's developmental outcomes. One of the most important aspects of the home learning environment is how often children are read to (Kalb & van Ours, 2014).

The LSAC data show that children who were read to at least six days per week at age 2–3 were more likely to have attended preschool at ages three and four than those who were read to only two days per week or less often (Figure 8.4).

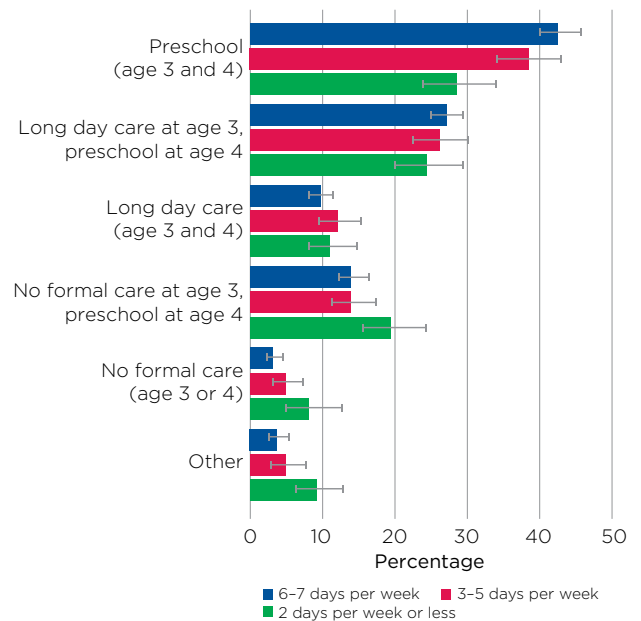
Figure 8.3: Participation in early childhood education and care at ages three and four, by highest level of parental education



Notes: Sample restricted to those who started full-time school in 2009 ($n = 3,034$). For children in two-parent households, this is the highest level of education attained by either the mother or the father. For children in single-parent households, this is the highest level of education of their resident parent. Preschool includes stand-alone preschool and preschool as part of long day care settings. Long day care includes only long day care without a preschool program.

Source: LSAC Wave 3, B cohort, weighted

Figure 8.4: Participation in early childhood education and care at ages three and four, by how often the study child was read to at age 2–3



Note: Sample restricted to those who started full-time school in 2009 ($n = 3,034$). Preschool includes stand-alone preschool and preschool as part of long day care settings. Long day care includes only long day care without a preschool program.

Source: LSAC Waves 2 and 3, B cohort, weighted



8.3 Preschool as an opportunity to promote healthy development

Today, most Organisation for Economic Co-operation and Development (OECD) countries have near universal coverage of preschool in the year before starting school (OECD, 2017). However, it has been suggested that attending high quality preschool programs for a longer duration may be even more beneficial. For example, data for 57 OECD countries from the Programme for International Student Assessment (PISA) in 2015 show that, after accounting for socio-economic differences, children who attended early childhood education for at least two years performed better, on average, than others at age 15. (OECD, 2017).

Most studies of preschool participation find a significant benefit for cognitive outcomes in the short term. However, evidence about the long-term cognitive and social benefits of preschool programs is mixed. Some studies, such as those of Siraj-Blatchford, Taggart, Sylva, Sammons, and Melhuish (2008) and Berlinski, Galiani, and Manacorda (2008), have concluded that preschool attendance has long-term academic and social benefits for all children. Others, including Magnuson, Ruhm, and Waldfogel (2007a, 2007b), have found that the academic benefits of preschool attendance tend to fade over time, and that preschool attendance may be associated with poorer behavioural outcomes in the long term.

In Australia, Warren and Haisken-DeNew (2013) used data from LSAC to examine the effect of attendance at preschool programs in the year prior to formal schooling on NAPLAN outcomes in Year 3. They found a significant positive association between preschool attendance and Year 3 NAPLAN test scores, with the most significant effects in the domains of reading, spelling and numeracy. Further, children who had a preschool teacher with a relevant degree or diploma qualification had significantly higher NAPLAN scores, on average, than those who had not attended preschool, suggesting that there are significant benefits to be gained from preschool teachers who are specifically trained in developmentally appropriate teaching practices for young children.

Much of the existing analysis of the impact of preschool programs on later developmental outcomes

has focused on programs that are designed for children aged 4-5 years. There is little evidence to suggest that the estimated benefits of these programs will be the same for three-year-old children. Based on the evidence presented to the 2014 Productivity Commission Inquiry into Childcare and Early Childhood Learning in Australia, the Productivity Commission (2014) recommended that ‘an analysis of the effectiveness of the existing arrangements in improving development outcomes and evidence drawn from relevant Australian and overseas research is necessary before any decisions can be made on the value of extending the universal access arrangement to younger children’.

Matched data from the Australian Early Development Census (AEDC) allows us to explore the association between attendance at early childhood education and care programs in the two years before starting full-time schooling and developmental outcomes at the start of school.

Developmental outcomes at the start of primary school

In 2009, Australia became the first country in the world to collect national data on the developmental health and wellbeing of all children as they start their first year of full-time school. The Australian Early Development Census (AEDC) is a national measure of children’s development. The data for the AEDC are collected every three years using the Australian version of the Early Development Instrument (EDI), adapted from Canada (Australian Government, 2016). The Australian version of the Early Development Instrument consists of approximately 100 questions across five key domains that are closely linked to child health, education and social outcomes.






As the first AEDC cycle was conducted in the year that the majority of the LSAC B cohort children started school, this provided a valuable opportunity to link children’s LSAC data with their AEDC results, allowing researchers to investigate associations between aspects of the early lives of the LSAC study children and their developmental outcomes.

Box 8.2: How early developmental outcomes are measured in the AEDC

The Australian Early Development Census (AEDC) is a teacher-rated checklist that provides information about children's development in their first year of school, conducted as a national census every three years. To date, there have been three cycles of the AEDC: in 2009, 2012 and 2015.

In each cycle, teachers have provided information about over 250,000 Australian children starting school, with over 95% coverage of eligible children. In 2009, 261,147 children completed the AEDC, representing 98% of the estimated population of five year olds in Australia (Brinkman, Gregory, Goldfield, Lynch, & Hardy, 2014).

Five important domains of children's early development are measured using 96 items:

Domain	Subdomains	Example question
 Physical health and wellbeing	<ol style="list-style-type: none"> 1. Physical readiness for the school day 2. Physical independence 3. Gross and fine motor skills 	How would you rate this child's proficiency at holding a pen, crayon or brush?
 Social competence	<ol style="list-style-type: none"> 1. Overall social competence 2. Responsibility and respect 3. Approaches to learning 4. Readiness to explore new things 	Would you say this child plays and works cooperatively with other children at the level appropriate for his/her age?
 Emotional maturity	<ol style="list-style-type: none"> 1. Prosocial and helping behaviour 2. Anxious and fretful behaviour 3. Aggressive behaviour 4. Hyperactivity and inattention 	If there is a quarrel or dispute, would you say this child will try to stop it?
 Language and cognitive skills (school-based)	<ol style="list-style-type: none"> 1. Basic literacy 2. Interest in literacy/numeracy and memory 3. Advanced literacy 4. Basic numeracy 	Would you say this child is able to write simple words?
 Communication skills and general knowledge	<ol style="list-style-type: none"> 1. Communication skills and standard knowledge 	How would you rate this child's ability to tell a story?

For each of the five AEDC domains, children receive a score between zero and ten, where zero is most developmentally vulnerable.

AEDC domain scores are calculated for each individual child where enough valid responses have been recorded. In the first data collection cycle (2009), a series of cut-off scores was established for each of the five domains:

- Children falling below the 10th percentile were categorised as 'developmentally vulnerable'.
- Children falling between the 10th and 25th percentiles were categorised as 'developmentally at risk'.
- All other children were categorised as 'developmentally on track'.

See Brinkman and colleagues (2014) for a comprehensive description of the items used in the AEDC. Domain images in this text box are sourced from the *AEDC National Report 2015* (www.aedc.gov.au).



The eligible LSAC sample for linkage to the AEDC data was 2,765 children whose parents provided valid consent at Wave 4 interviews, who participated in the study at the time of linkage and who started the first year of school in 2009. For these 2,765 children, the LSAC-AEDC data matching process successfully linked 2,459 records (Bandara et al., 2018).

The percentage of children who were considered developmentally vulnerable in the linked LSAC-AEDC cohort is smaller than that for the Australian population (Table 8.2). In each domain, less than 10% of LSAC study children in the matched AEDC sample were considered developmentally vulnerable;

and the percentage of children in the top half of the national AEDC distribution was higher, particularly in the domains of physical health and wellbeing, language and cognitive skills, and communication skills and general knowledge. However, in terms of demographic characteristics including sex of the study child, Indigenous status, language background, socio-economic status and state or territory of residence, there were only small differences between the matched LSAC-AEDC cohort and the national AEDC data. Because children needed to be in their first year of school in 2009 for matching to be possible, children with linked data were slightly younger, on average, than that of the national population.²

Table 8.2: Developmental vulnerability of children at school entry

AEDC domains	Developmentally vulnerable	Developmentally at risk	Developmentally on track		Total
	Below 10th percentile (%)	10–25th percentiles (%)	26–50th percentiles (%)	51–100th percentiles (%)	
Physical health and wellbeing	6.2 [5.3 – 7.3]	12.9 [11.5 – 14.3]	19.4 [17.8– 21.0]	61.6 [59.5 – 63.5]	100.0
Social competence	6.4 [5.5 – 7.5]	13.2 [11.9 – 14.7]	23.3 [21.7– 25.1]	57.0 [55.0 – 59.0]	100.0
Emotional maturity	6.9 [5.9 – 8.0]	13.9 [12.5– 15.3]	25.4 [23.7 – 27.2]	53.8 [51.8 – 55.9]	100.0
Language and cognitive skills	4.2 [3.5 – 5.2]	10.8 [9.6 – 12.1]	23.2 [21.5 – 24.9]	61.8 [59.8 – 63.8]	100.0
Communication skills and general knowledge	5.0 [4.2 – 6.0]	13.6 [12.2– 15.0]	19.4 [17.8 – 21.0]	62.4 [60.4 – 64.4]	100.0

Note: n = 2,289.

Source: LSAC Wave 3, B cohort with linked AEDC data for all five domains, unweighted³

Among Australian children who started school in 2009, 24% had AEDC scores that indicated they were developmentally vulnerable on one or more of the AEDC domains (CCCH & TICHR, 2009). Using the matched LSAC-AEDC sample, only 17% of children were developmentally vulnerable on one or more domains (Table 8.3, page 81). This suggests that children in the LSAC-AEDC linked cohort have slightly stronger early developmental outcomes than children across the Australian population.

About one in six children in the matched LSAC-AEDC cohort were vulnerable in at least one domain of their development as they started school, about 8% were vulnerable in two or more domains and just over 3% in three or more domains. Many more of these children

were in the category of ‘vulnerable or at risk’; that is, they had scores below the 26th percentile. Over 40% were vulnerable or at risk in at least one of the AEDC domains, 27% in two or more domains and 15% were considered vulnerable or at risk in three or more domains (Table 8.3).

It was much more common for boys than for girls to be developmentally vulnerable, or at risk of vulnerability, in more than one domain. For example, 11% of boys and 4% of girls were developmentally vulnerable in two or more domains; and 21% of boys and 9% of girls were either developmentally vulnerable, or at risk of vulnerability in three or more domains.

2 For further details about the LSAC-AEDC linkage process and the demographic profile of the LSAC-AEDC cohort, compared to the National AEDC sample, refer to Bandara, Siphthorp, Sufi, and Daraganova (2018).

3 Unweighted data have been used as LSAC-AEDC sample is a censored sample of children in a particular year level and does not include children who entered school earlier or later based on eligibility criteria. For details see Bandara et al. (2018).

Table 8.3: Developmental vulnerability and risk of vulnerability across AEDC domains

	Boys (%)	Girls (%)	Total (%)
Developmentally vulnerable (Scores below the 10th percentile)			
In at least one domain	22.8 [20.5 - 25.3]	10.3 [8.7 - 12.3]	16.8 [15.4 - 18.4]
In two or more domains	10.9 [9.2 - 12.8]	4.2 [3.2 - 5.5]	7.7 [6.7 - 8.8]
In three or more domains	4.9 [3.8 - 6.2]	#1.4 [0.9- 2.3]	3.2 [2.6 - 4.0]
Developmentally vulnerable or at risk of vulnerability (Scores in the 0-25th percentiles)			
In at least one domain	51.1 [48.3 - 53.9]	31.9 [29.3 - 34.7]	41.9 [39.9 - 43.9]
In two or more domains	34.1 [31.5 - 36.8]	19.1 [16.9 - 21.5]	26.9 [25.1 - 28.7]
In three or more domains	21.3 [19.0 - 23.6]	8.7 [7.2 - 10.5]	15.2 [13.8 - 16.8]

Notes: n = 2,289. #Estimate not reliable (cell count < 20).

Source: LSAC Wave 3, B cohort with linked AEDC data for all five domains, unweighted

Developmental outcomes at school entry, by preschool attendance at ages three and four

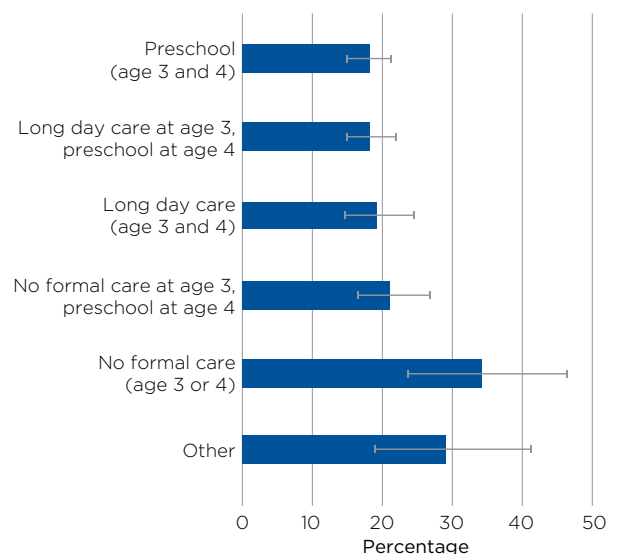
Across all AEDC domains, the percentage of children who were either developmentally vulnerable, or at risk of vulnerability, was highest among those who had not participated in any formal early childhood education and care at age three or four, and also among those who had attended some early childhood education but did not go to preschool at age four (those in the 'other' category). However, for the domains of social competence and emotional maturity, these differences were not statistically significant.

On the physical health and wellbeing domain, the percentage of children who were developmentally vulnerable, or at risk of vulnerability, was significantly lower among those who attended preschool at ages three and four, and those who went from long day care at age three to preschool at age four, compared to children who attended no formal ECEC program at age three or four (Figure 8.5). However, this difference may be due to the health limitations of children who are vulnerable in this domain. That is, some children may have not attended any ECEC program due to their health limitations.

For the AEDC domains related to cognitive skills (language and cognition; communication and general knowledge), the percentage of children who were developmentally vulnerable or at risk of vulnerability was significantly higher among those who did not

attend any formal ECEC program at age three or four, compared to those who attended either preschool or long day care at both ages, and children who went from no formal care at age three to preschool at age four (Figures 8.6 and 8.7, page 82). These differences suggest that participating in an early childhood education program may have a positive influence in terms of children's cognitive development.

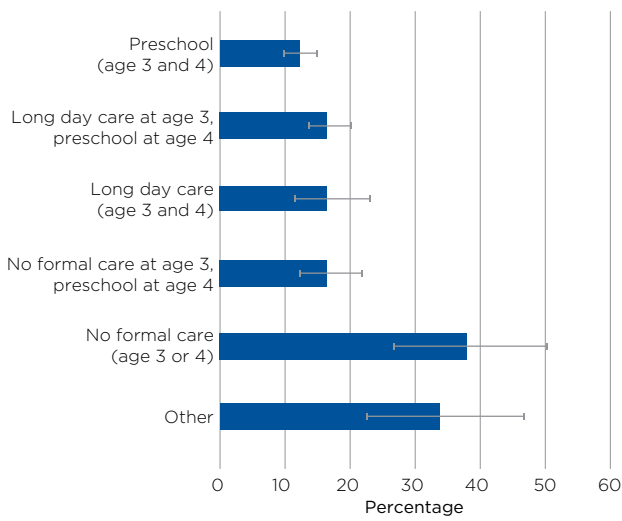
Figure 8.5: Children vulnerable or at risk on the physical health and wellbeing domain, by ECEC arrangements at ages three and four



Note: n = 2,279. Preschool includes stand-alone preschool and preschool as part of long day care settings. Long day care includes only long day care without a preschool program.

Source: LSAC Wave 3, B cohort, matched LSAC-AEDC sample, weighted

Figure 8.6: Children vulnerable or at risk on the language and cognitive skills domain, by ECEC arrangements at ages three and four



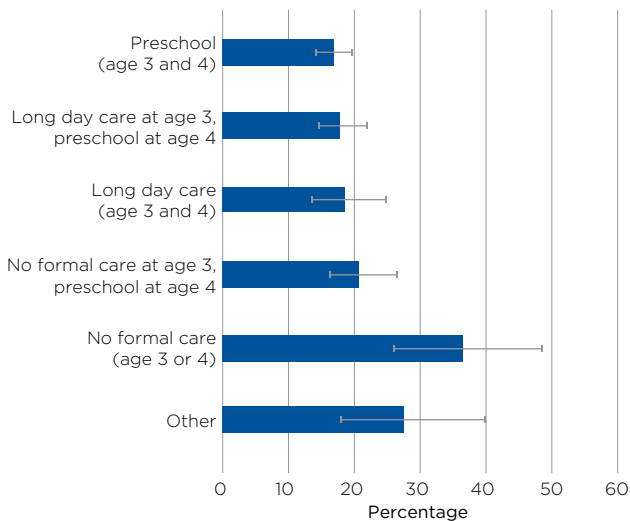
Note: $n = 2,279$. Preschool includes stand-alone preschool and preschool as part of long day care settings. Long day care includes only long day care without a preschool program.

Source: LSAC Wave 3, B cohort, matched LSAC-AEDC sample, weighted

In general, there was no significant difference in the percentage of children who were vulnerable depending on whether they attended preschool, long day care or a combination of both. This is likely to be at least partly due to the amount of variation in the quality of long day care and preschool programs at the time. In particular, before the introduction of universal access to preschool for four year olds, not all preschool programs were led by a degree qualified early childhood teacher.

After controlling for a range of other characteristics that are known to influence developmental outcomes, such as parental education, household income, gender of the child and whether the child was read to frequently in early childhood, there are significant associations between patterns of attendance at preschool and long day care at ages three and four and physical health, language and cognition, and communication and general knowledge when children start primary school (Table 8.4, page 83).

Figure 8.7: Children vulnerable or at risk on the communication skills and general knowledge domain, by ECEC arrangements at ages three and four



Note: $n = 2,279$. Preschool includes stand-alone preschool and preschool as part of long day care settings. Long day care includes only long day care without a preschool program.

Source: LSAC Wave 3, B cohort, matched LSAC-AEDC sample, weighted



Table 8.4: Association between preschool attendance at three and four years of age and vulnerability in children's development at school entry

	Odds ratios					
	Physical health and wellbeing	Social competence	Emotional maturity	Language and cognition	Communication and general knowledge	At least one domain
ECEC attendance at ages 3 and 4 (ref. = preschool ages 3 and 4)						
No formal care (age 3 or 4)	2.2**	1.3	0.7	3.3***	1.8*	1.8
No formal care at age 3, preschool at age 4	1.3	0.8	0.8	1.4	1.2	1.2
Long day care without a preschool program (age 3 and 4)	1.2	0.9	0.9	1.6	1.3	1.8**
Long day care without a preschool program at age 3, preschool at age 4	0.9	1.1	1.2	1.5*	1.0	1.2
Other	1.7	1.2	1.0	2.5**	1.5	1.7

Notes: $n = 2,049$. Odds ratios from Logistic Regression Model * $p < .05$; ** $p < .01$; *** $p < .001$. Estimates are adjusted for sex of study child, parents' highest level of education, equivalised household income, whether the study child speaks a language other than English at home, birth order (at age 4-5), parents employment status when the study child was aged 4-5, how frequently the study child was read to at age 2-3 and the number of out-of-home activities the parents did with the study child at age 2-3 (e.g. library, museum, cultural events) and whether the study child has an ongoing health condition at age 2-3. Preschool includes stand-alone preschool and preschool as part of long day care settings. Long day care includes only long day care without a preschool program.

Source: LSAC Waves 2 and 3, B cohort, matched LSAC-AEDC sample, unweighted

Compared to children who attended preschool at age three and age four:

- *The odds of being vulnerable or at risk on the physical health and wellbeing domain* were more than doubled; and the odds of being vulnerable or at risk on the communication and general knowledge domain were 1.8 times higher for those who had no formal care at age three or four.
- *The odds of being vulnerable or at risk on the language and cognition domain* were 3.3 times higher for those who had no formal care at age three or four; 1.5 times higher for children who went to long day care at age three and preschool at age four, and 2.5 times higher for those who had attended some early childhood education at age 3 but did not go to preschool or long day care at age four (those in the 'other' category).
- *The odds of being vulnerable or at risk on at least one of the five domains* were almost doubled for children who attended long day care without a preschool program at age three and age four.

Across all AEDC domains, the odds of being developmentally vulnerable, or at risk of vulnerability, were higher for boys than for girls, ranging from 1.6 times higher for physical health and wellbeing to 4 times higher for emotional maturity.

Other factors were also important for specific domains:

- Compared to children who had no ongoing issues at age 2-3, the odds of being vulnerable or at risk of vulnerability on the physical health and wellbeing domain were 1.5 times higher for children who had an ongoing health condition.⁴
- For the social competence domain:
 - Parental education was a significant factor. Compared to children whose parents' education level was Year 11 or lower, for those with at least one parent with a certificate or diploma, the odds of being vulnerable or at risk of vulnerability were 35 percentage points lower, and for those with at least one parent with a degree, the odds were almost halved.
 - Compared to children in households with equivalised income in the lowest quartile, for those in households in the second quartile, the odds of being vulnerable or at risk were 1.5 times higher.
 - Compared to children in households with two parents who were both employed, the odds of being developmentally vulnerable, or at risk of vulnerability, was almost doubled for children in single-parent households where their parent was employed.

⁴ Children were considered to have an ongoing health condition if their primary carer reported that they had a condition which has lasted, or is expected to last, for at least 12 months which causes the child to use medicine prescribed by a doctor (other than vitamins) or more medical care, mental health or educational services than other children

- For the emotional maturity domain:
 - Compared to children whose parents' education level was Year 11 or lower, for those with at least one parent with a degree, the odds of developmental vulnerability or risk of vulnerability were reduced by almost 40 percentage points.
 - Compared to children with no siblings, the odds of developmental vulnerability or risk of vulnerability were reduced by almost 40 percentage points for children who were the eldest child, middle child or a twin, and halved if the study child was the youngest child in the family.
- In terms of language and cognition:
 - Compared to children whose parents' education level was Year 11 or lower, for those with at least one parent with a degree, the odds of developmental vulnerability or risk of vulnerability were halved.
 - Compared to children who were read to by an adult on two days per week, or less often, at age 2–3, the odds of vulnerability or risk of vulnerability were 40 percentage points lower for children who were read to six or seven days per week.
- On the communication and general knowledge domain:
 - Compared to children whose parents' education level was Year 11 or lower, for those with at least one parent with a certificate or diploma, the odds of being vulnerable or at risk of vulnerability were 40 percentage points lower, and for those with at least one parent with a degree, the odds were more than halved.
 - Compared to children in two-parent families where both parents were employed, the odds of vulnerability or risk of vulnerability were 1.4 times higher for children in two-parent households where their father was employed and their mother was not in paid employment.
 - The odds of vulnerability on this domain was 1.7 times higher if the study child had an ongoing health condition, compared to children who did not.

While these results suggest that there is a significant association between participation in early childhood education programs and developmental outcomes at the start of school, it is important to keep in mind that these associations should not be considered causal. It may be that children who are developmentally vulnerable are less likely to attend preschool or long day care, rather than early childhood education having

a 'protective influence' in terms of developmental outcomes. More complex analysis, such as propensity score matching, would be needed to determine if these associations could be considered to be a 'causal effect'.

Further, while no significant associations between preschool attendance and social and emotional development were found, this does not necessarily mean that attendance at a high quality preschool or long day care program has no influence on these outcomes. That is, among children in the 'developmentally on track' category, children who attended a preschool or long day care program may have higher scores on the social and emotional development than those who attended no formal care. However, this can only be determined using a more precise measure of development (i.e. percentiles covering the whole distribution, rather than a single indicator of vulnerability).



Summary

This chapter describes participation in long day care and preschool programs at ages three and four for LSAC study children who started full-time schooling in 2009; and examines the association between preschool participation at ages three and four and school readiness, across the five domains of the Australian Early Development Census (AEDC).

These children started school before the introduction of funding for universal access preschool for four year olds, and therefore their levels of attendance at early childhood education and care programs were quite different to those of three and four year olds today. Almost 40% attended preschool at ages three and four, a quarter went from long day care at age three to preschool at age four; and a further 16% attended no formal care at age three before starting preschool at age four. Only 5% did not participate in any formal education or care program before starting school.

The decision about whether a child attends a preschool or long day care program is not random. The LSAC data show that children in higher income households, and those whose parents had degree qualifications, were more likely to have attended a preschool program at age three and also age four. Children who attended two years of preschool are also more likely to receive higher levels of 'parental investment' at home. For example, children who were read to on six or seven days per week at age 2–3 were more likely to have attended two years of preschool than children who were read to less frequently.

Matched data from the AEDC shows that there is an association between preschool experiences and children's development at school entry, particularly for those developmental domains closely related to learning. However, this relationship should not be interpreted as causal on the basis of the data presented here, as some factors associated with the decision to enrol a child in a preschool program are also strong predictors of children's developmental outcomes (e.g. parental education). However, considered in the context of others' work, these data reinforce that preschool is a potentially important policy lever for promoting children's readiness to take advantage of the learning opportunities in the school setting (O'Connell, Fox, Hinz, & Cole, 2016).

In recent years, the percentage of children attending preschool at the age of four has increased to over 95%, due to universal access. However, the percentage of three year olds attending a preschool program has fallen slightly. Further research is needed to assess

how universal access to preschool for four year olds might affect the mix of children attending ECEC programs at age three, and how preschool attendance will influence the longer term outcomes for a more contemporary group of children.

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