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How has the relationship between parental education and child outcomes changed in Australia since the 1980s?

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Abstract

This paper examines how the relationship between parents' educational achievement (a marker of their socio-economic status) and children's early developmental outcomes has evolved in Australia since the early 1980s. The specific focus of this paper is whether the gradient in children's early developmental outcomes by parents' education has changed since the 1980s. A comparative analysis of two surveys is undertaken that follows Australian cohorts of children through their early years – the Australian Temperament Project (following children born in Victoria in the early 1980s) and the Longitudinal Study of Australian Children (following a representative sample of children born in Australia in 1999). The analysis shows that the relationship between parental education and children's early developmental outcomes does not in general appear to have changed greatly over the years. The gradient associated with behaviour difficulties, persistence in behaviour difficulties over time, and in reading skills has either remained the same or strengthened somewhat, while the gradient associated with social skills has weakened. The paper concludes with a discussion of issues that might explain these trends.

Keywords: Child development, Socio-economic status, Longitudinal studies, Trends, Australia

Introduction

Researchers and social theorists have long studied the relationship between parental socio-economic status – and its components: income, education, occupation – and child outcomes. In every developed country children from low socio-economic status backgrounds are likely to grow up to have lower measured cognitive ability, higher levels of social and emotional difficulties, and worse physical health than their counterparts from more affluent families (Bornstein and Bradley 2003; Welshman 2007; OECD 2008). However the degree to which parental socio-economic status is associated with disparities in child outcomes differs between countries and within countries over time (OECD 2008). The reasons for these variations are not well understood, nor are the mechanisms which produce different trajectories for children from different backgrounds at different times (Ermisch and Pronzato 2010). One of the motivators for the interest in early disparities is to better understand how early childhood experience contributes to social positioning in adulthood, and therefore by extension to intergenerational mobility.

The purpose of this paper is to add to the empirical literature by examining how the relationship between parents' educational achievement, a marker of their socio-economic status, and children's early developmental outcomes has evolved in Australia since the early 1980s. Over this period Australia has witnessed considerable social, cultural and economic change, and it is reasonable to expect that this has impacted on children's developmental outcomes. In order to address this question, we track changes in parents' education and their children's early developmental outcomes through a comparative analysis of two longitudinal studies of children's development: the Australian Temperament Project (ATP), a study of children born in Victoria in 1982 and regularly followed to the present; and *Growing up in Australia*, the Longitudinal Study of Australian Children (LSAC), which follows two cohorts of children born in 1999 and 2003 respectively (in this report we only use data for the older cohort). We examine the relationships between parents' education and children's developmental outcomes across three domains of child development – behavioural difficulties, social skills, and reading skills. We also examine the distribution of children who display either persistently high or low levels of behavioural difficulties between the ages of about 3 and 12 (ATP), and 4 and 11 (LSAC), according to their parents' educational achievements.

Our study complements work by Smart & Sanson (2005), who compare children's temperament and behavioural difficulties in the ATP and LSAC and find that despite the demographic and family changes that have occurred in Australia in the past 20 years, children's characteristics with respect to temperament and behavioural difficulties in the two surveys are similar. The small but significant shifts that have occurred during this period point to the LSAC cohort doing slightly better than the ATP children. However, Smart and Sanson compared outcomes for the entirety of both cohorts and did not study the variations among children from different backgrounds. We therefore complement their work in three ways: first, by examining disparities in three

developmental areas; second, by comparing changes for children from different backgrounds; and third, by considering persistence in children's experience of behavioural difficulties. With respect to children's behavioural difficulties – in cross section and in terms of persistence – we do not find any evidence that the relationship with parents' education has weakened between the 1980s and the 2000s: indeed, it may have strengthened. With respect to reading skills, the relationship with parents' education appears to be much the same. However the relationship between parents' education and their children's social skills has weakened.

The paper is divided into the following sections: the second section presents a review of the literature on socio-economic status and child development. In the third section we describe the survey data, the variables they contain and the methods we use in our analysis. Results are presented in the fourth section. The fifth, final section discusses the results and their implications for further research.

Parents' socio-economic status and children's outcomes

While many factors influence children's development towards adulthood, D'Addio's (2007) study of OECD countries shows that parental socio-economic status is among the most important background characteristics associated with children's income levels when they reach adulthood. Longitudinal studies in the United States and the United Kingdom that have tracked children's long-term trajectories from early childhood to adulthood have emphasised the significance of parental socio-economic status in predicting developmental trajectories, educational attainment and labour market outcomes (Johnson and Reed 1996; Duncan, Yeung et al. 1998; Feinstein 2003; Ermisch 2008). Differences in intellectual, emotional and behavioural development for children from different socio-economic backgrounds are shown to emerge at very early ages (Feinstein 2003; Ermisch 2008; Blanden, Katz et al. 2012). Using data from the UK Millennium Cohort Study, Ermisch (2008) shows that differences in children's cognitive, social and emotional development according to parents' socio-economic status emerge by the child's third birthday, and 'cast a long shadow over subsequent achievements.' (Ermisch 2008, p.62). He further argues that these differences are apparent throughout the income range and not only between the lowest income groups and the rest.

There have not been many Australian studies examining the long-term trajectories of children's developmental outcomes, mainly because of the lack of available data thus far. Nonetheless, a number of longitudinal surveys that commenced in the early 1980s have studied specific aspects of long-term child and youth development in the Australian context. The Mater–University of Queensland Study of Pregnancy (MUSP) is following the children of 8,556 women who attended the hospital while pregnant between 1981 and 1983 (see MUSP). Much of the focus of the studies from this survey has been on health outcomes. However, one study by Najman and colleagues (2004) has looked at socioeconomic inequalities in children's cognitive development and emotional health. They find that at ages five and fourteen cognitive development problems

and impaired mental and emotional health are more likely among children born to mothers in the lowest socio-economic group. Analysis using ATP data similarly concludes that children from higher socio-economic backgrounds have an advantage from a very early age, and that this has a lasting effect on their likelihood of success in school (Prior, Sanson et al. 2000).

In contrast to the voluminous literature on parents' socio-economic status and children's cognitive, social and emotional outcomes for specific cohorts, there is limited literature on how this relationship has changed over the past decades. Indeed, there is still very limited understanding of trends in children's *average* developmental outcomes, including whether children's Intelligence Quotients are improving (Flynn 1984; 1987; Herrnstein and Murray 1994), and whether mental health or emotional difficulties in children are increasing. In a comparative analysis of adjustment in 15 year-old Swedish girls in 1970 and 1996, Wångby and colleagues (2005) argue that there was remarkable similarity between the two samples, with the exception that self-esteem problems and anti-social problems were slightly more common in the 1996 sample. A number of Dutch studies similarly find stable trends in emotional and behavioural problems among children and young people between the 1980s and the 2000s (Verhulst, Ende et al. 1997; Tick, Ende et al. 2007a; Tick, Ende et al. 2007b). This generally stable trend is echoed in the Smart & Sanson (2005) study of young Australian children in the ATP and the LSAC described above.

Literature on changes in the relationship between parents' socio-economic status and outcomes across generations mainly focuses on comparisons of adults in successive generations – for example, the relative socio-economic status of sons and their fathers (Leigh 2007; Marks 2009; Checchi, Fiorio et al. 2013), or comparison of educational achievements of older children and their parents' socio-economic status (Rothman 2003). However, comparisons of adult and older child cohorts fail to address the question of the processes by which children from different backgrounds reach similar – or different – outcomes to those of their parents. Recent evidence emphasises the importance of early years development in general, and social and emotional development in particular, for human capital development (Heckman, Stixrud et al. 2006), and therefore an examination of disparities in early childhood can contribute significantly to understanding how social mobility operates and how this changes over time. This is the first Australian study we are aware of that compares the relationship between indicators of parent socio-economic status and indicators of child outcomes in the early years – up to about 12 years of age – across generations. It is important to emphasise that parents' socio-economic status in general, and their education in particular, are not the only influences on children's developmental outcomes. Nonetheless, our data suggest that there has been little significant change in the relationship between parental education and children's outcomes since the 1980s, and this adds to evidence that since the 1980s policy may not have succeeded in fostering greater intergenerational mobility or equity between children, at least as far as mobility and equity are related to children's circumstances in the early years.

Data and method

The broad intergenerational mobility literature argues that income, occupation, and education are 'transmitted' across generations. The child development literature suggests that children's social and emotional development is associated with their parents' socio-economic status. Actual mechanisms of transmission, however, are somewhat unclear, with considerable debate in the literature regarding how health, welfare and education policies, parents' characteristics (including their education, incomes and behaviour towards their children) and children's characteristics (such as their temperament, gender, and relationships) interact with each other to influence children's cognitive, social and emotional outcomes. The literature is also uncertain with respect to changes in children's developmental outcomes across generations – that is, we do not know if children's behaviour is getting better or worse, or if they are more intelligent than their predecessors. Moreover, while societies, including Australia, have changed greatly over the past decades, there is little evidence about whether, or how, societal changes have impacted on the relationship between parents' socio-economic status and children's outcomes.

Data

In order to address our main research question, we examine data from the Australian Temperament Project (ATP) and the Longitudinal Study of Australian Children (LSAC). The ATP commenced in 1983 with a representative sample of 2,443 infants and families from rural and urban areas of Victoria (Prior et al. 2000). The families were recruited from a sub-set of Victorian local government areas, selected upon advice from the Australian Bureau of Statistics to provide a representative sample of the State's population. All parents with an infant aged between four and eight months who visited their local Infant Welfare Centre in the selected local government areas during the first two weeks of May 1983 were invited to participate in the study. Comparison of the recruited sample to census data confirmed that the sample was representative of the State's population. Indeed, Smart & Sanson (2005), in their comparison of the ATP and LSAC, state that the former survey is broadly representative of the Australian population, as well as the Victorian population.

To date fourteen waves of data have been collected from ATP respondents (both parents and children) via mail questionnaires. The first four waves of data were collected at annual intervals from infancy to 3–4 years of age. From the commencement of primary school up to 19–20 years, the data collections were conducted at two-yearly intervals, with an additional assessment completed during the first year of secondary school in order to track each participant's adjustment and wellbeing over this important developmental transition. Approximately two-thirds of the original cohort is still participating in the study after 27 years. In this analysis, data from the third, fifth and seventh waves (age 3–4, 7–8 and 11–12 years respectively) are analysed. Fieldwork for these

waves was carried out in 1986, 1988 and 1990. The sample size of children participating in these three waves with sufficient information to be included in this analysis is 1,606.

Analysis of the ATP is compared with examination of the first four waves of the LSAC, in which children's progress at ages 6–7, 8–9 and 10–11 years is examined in relation to their starting points at age 4–5 years. The LSAC is part of a growing body of large-scale nationally representative longitudinal studies that track children's development. It was launched in 2004, and is ongoing, with detailed information collected from responding families every two years. Data from two separate samples of children and their families are being collected, the first aged 3 to 17 months in 2003–04 (the 'B' Cohort), and the second aged 4–5 years in 2003–04 (the 'K' cohort). Only 'K' cohort data (comprising 4,983 observations at Wave 1) are used in the present analysis. As with all longitudinal studies, attrition and item non-response has reduced the number of responding families in each wave. The sample size of children participating in all four waves with sufficient information to be included in this analysis is 3,182.

Bias resulting from attrition is always a concern in analyses of longitudinal data. Analysis samples for both surveys are considerably smaller than the original Wave 1 samples, mainly because of attrition. In both studies too, attrition is non-random. In the ATP, between age 3–4 and age 7–8 years, 7 per cent of children whose parents had a postgraduate qualification exited from the study, compared with 11 per cent among children whose parents had a year 10 or lower education. There is no weighting variable to compensate for this differential attrition in the ATP. In the LSAC, of parents with a postgraduate qualification who responded to key questions about the study child's development at Wave 1, 22 per cent were non-respondents at Wave 4; among parents with a Year 10 or less education, the non-response rate was 54 per cent. Unlike the ATP, potential bias resulting from attrition in the LSAC is partially reduced with longitudinal and cross-sectional weights. We argue that results presented the current analysis are not biased as a result of attrition for three reasons. First, previous analysis of both ATP and LSAC shows how non-random attrition does not necessarily influence results of the sort presented here (Letcher, Smart et al. 2009; Daraganova and Sipthorp 2011). Second, even though the LSAC uses weights to compensate for attrition and the ATP does not, the Appendix table (Table A1) shows that a comparison of unweighted results from both surveys would not change the main conclusions of this analysis. Third, comparison by the authors of the full Wave 1 ATP and LSAC samples and the (much smaller) Wave 1 samples used in this analysis shows that the proportions exhibiting high behavioural difficulties in the full and reduced samples are very similar (results available from the authors on request).

Methodological approach

The methodological approach that we adopt in the analysis is driven in large part by the properties and limitations of the two datasets that we use. Our main dependent variables are summary scores of behavioural difficulties, social skills and reading and vocabulary skills. All of these variables – except those relating

to vocabulary – capture parents' perceptions of their children's development, but none are measured identically in the ATP and LSAC. For example, behavioural difficulties are measured using the Behar Preschool Behaviour Scale and the Rutter, Tizard and Whitmore Child Behaviour Questionnaire in the ATP, and the Strengths and Difficulties Questionnaire (SDQ) in the LSAC (Goodman 1997). It is worth emphasising that these are clinical screening tests used to detect risk of behavioural difficulties. They have not therefore been designed to examine distributions of social and emotional development in the population. Nonetheless, they have been extensively used to examine and compare behavioural characteristics in populations of children. Literacy development is assessed with the ACER Word Knowledge Test Form BB in the ATP, but with the Peabody Picture Vocabulary Test in the LSAC. Both of these tests are carried out directly on the child, rather than being reported by the parent. Social skills are measured by the Gresham and Elliott Social Skills Rating System (again, a clinical test; see Elliott and Busse 1991) in the ATP and the SDQ Prosocial scale in the LSAC.

Because the tests in ATP and LSAC are not directly comparable in absolute terms, we focus on comparisons of rankings rather than on comparisons of absolute scores. In other words, we assume that a child who scored highly on an ATP test would, *ceteris paribus*, score highly on the corresponding LSAC test. The comparison of child behaviour using the Rutter test and the SDQ is probably the most robust, in that the latter test was in part developed from the former; the two have been compared before (see Goodman 1997; Smart and Sanson 2005). Our main explanatory variable of interest is parents' education, as measured by the highest education of the mother or the father if both live with the child, or alternatively the education of the lone parent who is living with the child. This was recorded when children were aged 3–4 years in the ATP, and aged 4–5 years in the LSAC. Parental education achievement is divided into five categories: postgraduate qualification; undergraduate degree; post-school diploma or certificate; secondary school to Year 11 or 12; and education to Year 10 or less.

In this study we descriptively explore the relationship between parents' education and a number of outcome measures:

(1) High and low behaviour difficulties at ages 3–4, 7–8 and 11–12 years in the ATP, and at ages 4–5, 6–7, 8–9 and 10–11 years in the LSAC;

(2) High and low social skills at ages 11–12 years in the ATP, and 8–9 and 10–11 years in the LSAC (comparable data on social skills were only collected at age 11–12 years in the ATP);

(3) High and low reading skills at ages 7–8 years in the ATP and at 6–7 and 8–9 years in the LSAC (comparable data on reading skills were only collected at age 7–8 years in the ATP).

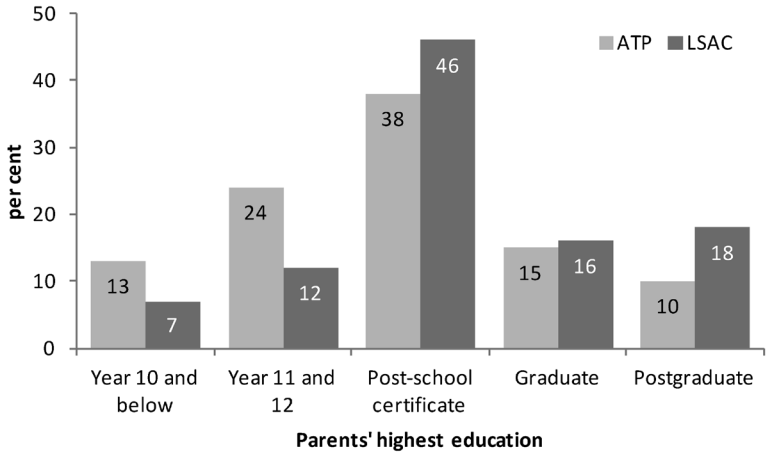
It is worth noting that the definition of 'high' and 'low' varies depending on whether behavioural difficulties, social skills or reading skills are being measured. These are outlined in more detail in the notes to tables 1, 2 and 3.

This is due to 'clumping' in both ATP and LSAC data, where high proportions of children are given the same absolute score, reducing the possibilities for differentiating among them. For example, 38 per cent of 10–11 year-olds in the LSAC have an absolute score of 10 – the highest possible – on the SDQ pro-sociability scale, the indicator for social skills in that study. Therefore, the highest category of social skills in the LSAC has to include at least 38 per cent of children.

Results

Figure 1 shows how the ATP and LSAC cohorts vary in their composition according to the highest education of parents living with the child. Since the ATP and LSAC cohorts are two decades apart, the differences observed to a large extent reflect changes in Australian society over this period. The table provides evidence of a substantial increase in the number of Australians obtaining tertiary qualifications over this period, and the substantial decrease in the proportion who fail to finish school or go on to further training or education. The proportion of parents completing a postgraduate qualification in the LSAC cohort (18 per cent) is almost twice that in the ATP cohort (10 per cent). The percentage of parents in the LSAC who have completed only Years 11 or 12 is half that in the ATP cohort. Also, only 7 per cent of children in the LSAC have a parent with less than Year 10 education compared to 13 per cent in the ATP.

Figure 1: Parents' highest education in the ATP and LSAC child cohort samples, 3-4 years (ATP) and 4-5 years (LSAC)



Source: ATP and LSAC
Notes: ATP results are unweighted. LSAC results are weighted using cross-sectional sample weights.

Educational achievement is not the only difference in parent characteristics that might have a bearing on child outcomes between the surveys. Other differences include the share of children living in lone parent households – there are more in the LSAC, as might be expected, given the generational difference between the two surveys; the proportion of mothers born in a non-English speaking country – again, more in LSAC; and the average age of the mother – older in the LSAC. In this analysis however, we focus on the relationship between parent education as an indicator of socio-economic status, and children's early developmental outcomes.

Table 1: Children with low and high behaviour difficulties scores at ages 3–12 years by highest parental education (per cent)

	High behaviour difficulties						
	ATP			LSAC			
	3-4 years	7-8 years	11-12 years	4-5 years	6-7 years	8-9 years	10-11 years
Postgraduate	15.7	17.1	20.0	12.3	14.9	19.3	18.6
Graduate	18.4	15.5	19.2	12.3	13.8	17.5	15.1
Post-school certificate	22.2	20.8	19.0	20.3	23.2	27.4	25.5
Year 11 and 12	26.4	19.6	20.5	26.2	28.1	30.2	26.7
Year 10 and below	31.2	28.5	26.9	34.1	33.4	38.8	33.1
Ratio – Year 10/Postgraduate	1.99	1.67	1.35	2.78	2.24	2.01	1.78
	Low behaviour difficulties						
	ATP			LSAC			
	3-4 years	7-8 years	11-12 years	4-5 years	6-7 years	8-9 years	10-11 years
Postgraduate	35.7	25.7	22.9	24.4	23.2	28.2	28.3
Graduate	30.1	23.0	26.4	27.7	27.4	32.4	31.5
Post-school certificate	22.8	19.1	18.6	16.2	17.1	19.6	18.4
Year 11 and 12	21.0	19.6	18.2	16.3	12.9	20.3	18.5
Year 10 and below	16.2	13.5	11.2	10.7	11.5	9.5	15.9
Ratio – Year 10/Postgraduate	0.45	0.53	0.49	0.44	0.50	0.34	0.56

Source: ATP and LSAC

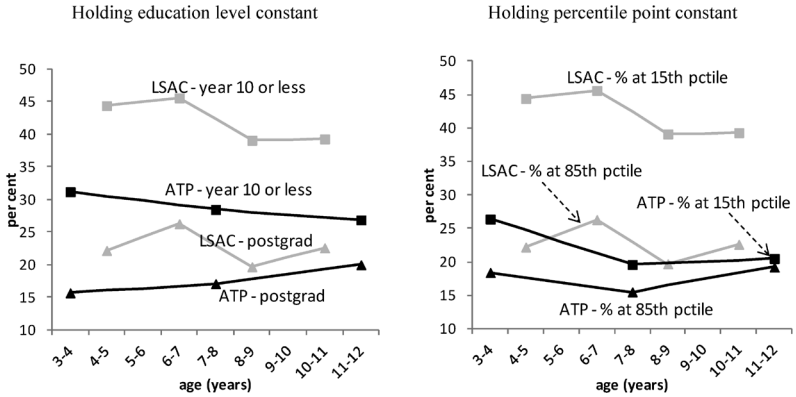
Notes: Children with high behaviour difficulties are those in roughly the top fifth of the behaviour problem distributions. Children with low behaviour difficulties are those in the bottom fifth of the same distribution. Proportions vary slightly in different waves of both datasets because of 'clumping' in results. ATP results are unweighted. LSAC results are weighted using cross-sectional sample weights. The Appendix Table compares unweighted results from both surveys.

Table 1 shows the percentage of children with high and low behaviour difficulties (defined as those in the top and bottom quintiles of the distribution of behaviour difficulties) in three waves of the ATP and four waves of the LSAC, by parents' education. Percentages in the table refer to the proportion of children within each parental education category who exhibited high or low behavioural difficulties. For example, among children at age 3–4 years in the

ATP whose parents had undertaken postgraduate education, 15.7 per cent had high behavioural difficulties, 35.7 per cent had low behavioural difficulties, with 48.6 per cent falling between these two categories. Inequalities in high behaviour difficulties scores are greater in the LSAC than in the ATP for children of all ages except the youngest. This is seen in the ratio of percentages of children with high difficulties scores among those whose parents have completed Year 10 or less, compared with those whose parents with postgraduate education. The bottom row of the table shows that in most years the ratio is substantially higher in the LSAC than in the ATP. There is little difference between the two surveys in terms of the ratios associated with low behaviour difficulties. However, since the tests used to derive these scores are mainly used to screen for difficulties – as opposed to high levels of social and emotional functioning – they may be less sensitive at the other end of the spectrum. Both the ATP and the LSAC data suggest some convergence over time between children of parents with lower and higher levels of education. However, this is more pronounced in the ATP data. Overall, there is little evidence from this table suggesting that the parental education gradient of children's behaviour difficulties narrowed between the 1980s and the 2000s.

Figure 2 presents information from Table 1 in an alternative format that shows differences in both absolute and relative inequalities between children whose parents have low and high levels of education, and takes account of changes in parents' educational attainment since the 1980s. The vertical axes show the percentage of children with high behavioural difficulties, and the horizontal axes show the ages at which measures are made in the two surveys (lines between the points are interpolated). Data are presented with respect to children of parents with Year 10 attainment or less and postgraduate education levels (left picture); and with respect to children whose parents' education levels are at the 15th percentiles from the bottom and the top of parent educational achievement (right picture). As Figure 1 shows, the 15th percentile from the bottom in both the ATP and the LSAC falls within the 'Year 11 and 12' education level for parents. However, the 15th percentile from the top falls within the 'Graduate' education level in the ATP, but the 'Postgraduate' level in the LSAC; the corresponding percentage data from Table 1 are used in the right picture. The Figure therefore presents both 'absolute' and 'relative' perspectives on changes in children's outcomes according to parents' education. In both pictures and at most ages, the proportion of children of highly educated parents with behaviour difficulties is slightly higher in the LSAC than in the ATP. However, the proportion of children of parents with low education who have behavioural difficulties is significantly greater in the LSAC than in the ATP. In both pictures, inequalities between children of low and higher-educated parents are also greater in the LSAC than in the ATP. Analogous graphs to those in Figure 2 showing the percentage of children with low behaviour difficulty scores by parent education paint a similar picture (available from the authors on request).

Figure 2: Proportion of children with high behaviour difficulties among parents with low and high levels of education, denominated by level, and by percentile (per cent)



Source: ATP and LSAC.
Notes: Data between points are interpolated. Percentages at 15th and 85th percentiles are 'best guess' estimations – that is, the percentage associated with the parent education level into which the 15th and 85th percentiles fall. See also notes to Table 2.

Table 2 shows the distribution of high and low social skills at age 11–12 in the ATP, and at age 10–11 in the LSAC. Table 3 shows the distribution of children's low and high reading skills by highest parental education at age 7–8 in the ATP and at ages 6–7 and 8–9 in the LSAC. In these cases, similar conclusions can be drawn from 'absolute' and 'relative' differences; therefore, only absolute differences are discussed here. With respect to low and high social skills, the gradient is quite strong in the ATP: a child whose parents have Year 10 or less education is twice as likely as a child whose parents have postgraduate education to show low social skills. However, the gradient is almost non-existent in the LSAC. With respect to reading skills, results for the two LSAC waves that straddle the age of the ATP cohort are fairly consistent. Moreover, the parental education gradient in reading skills is fairly consistent across the two surveys. Children of postgraduates are about twice as likely to have high as low reading skills in both the ATP and the LSAC. Children whose parents have Year 10 or below education are about 70 per cent as likely to have high reading skills as they are to have low reading skills in the ATP, but between 30 and 50 per cent as likely in the LSAC. High reading skills are also unequally distributed between children according to the educational achievements of their parents; but again, the difference between the two surveys is small. The ratios of the proportion of children with low and high reading skills whose parents have low levels of education to the proportion whose parents have high levels of education are similar across the surveys.

Table 2: Children with low and high social skills at age 10–12 years, by highest parental education (per cent)

	Low social skills		High social skills		Ratio of high/low social skills	
	ATP 11-12 years	LSAC 10-11 years	ATP 11-12 years	LSAC 11-12 years	ATP 11-12 years	LSAC 11-12 years
Highest parental education						
Postgraduate	12.4	13.2	28.9	35.0	2.3	2.7
Graduate	9.7	11.8	28.6	42.3	2.9	3.6
Post-school certificate	14.3	13.5	24.1	39.3	1.7	2.9
Year 11 and 12	19.3	15.8	24.2	42.3	1.3	2.7
Year 10 and below	26.6	9.1	17.5	35.0	0.7	3.8
Ratio – Year 10/Postgraduate	2.1	0.7	0.6	1.0		
Ratio - 15th to 85th percentile	2.0	1.1	0.8	0.9		

Source: ATP and LSAC.

Note: Children with low social skills are those who are in the bottom 15 per cent in the ATP and the LSAC. Children with high social skills are those in the top quartile in both ATP and the top 38 per cent in the LSAC. This is due to clumping of data in the top category of social skills in the LSAC. Therefore, data for high social skills should be compared with caution. ATP results are unweighted. LSAC results are weighted using cross-sectional sample weights.

Table 3: Children with low and high reading skills at ages 7–9 years by highest parental education (per cent)

	Low reading skills			High reading skills			Ratio of high/low social skills		
	ATP	LSAC		ATP	LSAC		ATP	LSAC	
	7-8 years	6-7 years	8-9 years	7-8 years	6-7 years	8-9 years	7-8 years	6-7 years	8-9 years
Highest parental education									
Postgraduate	12.4	18.4	18.3	28.9	40.2	35.0	2.3	2.2	1.9
Graduate	9.7	17.3	19.4	28.6	40.4	34.0	2.9	2.3	1.7
Post-school certificate	14.3	31.3	32.7	24.1	22.4	20.4	1.7	0.7	0.6
Year 11 and 12	19.3	31.9	32.7	24.2	24.3	21.5	1.3	0.8	0.7
Year 10 and below	26.6	39.9	45.8	17.5	19.4	12.0	0.7	0.5	0.3
Ratio – Year 10/ Postgraduate	2.1	2.2	2.5	0.6	0.5	0.3			
Ratio – 15th to 85th percentile	2.0	1.1	1.1	0.8	0.9	1.1			

Source: ATP and LSAC.

Note: Children with low reading skills are those who score in the bottom quartile and children with high reading skills are those who score in the top thirty per cent (ATP) and quartile (LSAC). Percentages in each category of reading skills are not exactly equal because of clumping. ATP results are unweighted. LSAC results are weighted using cross-sectional sample weights.

In summary, it appears that disparities in outcomes for children from high and low parental education backgrounds have not changed greatly for behavioural difficulties and reading, but have declined for social skills.

Persistence in behaviour difficulties

It is difficult to measure accurately children's development in the early years, and many studies find considerable variation in children's early developmental outcome scores. This is because normal infants develop very differently from each other and have spurts of development at different ages. The analysis of persistence focuses on those children who remain in the top or the bottom of the distribution of developmental scores over a period of time – in other words, those children who are progressing well or poorly for several years. These children are much less likely to be classified as 'high' or 'low' by chance. We can only compare persistence in children's social and emotional outcomes across the two surveys, as the ATP does not have repeated measures of other aspects of children's development.

Table 4: Percent distribution of persistence of behaviour difficulties at ages 3–12 years by highest parental education

	Persistently high behaviour difficulties		Persistently low behaviour difficulties		Ratio of low/high behaviour difficulties	
	ATP 3-12 years	LSAC 4-11 years	ATP 3-12 years	LSAC 4-11 years	ATP 3-12 years	LSAC 4-11 years
All	8.8	7.2	8.1	5.0	0.92	1.14
Highest parental education						
Postgraduate	6.9	4.6	7.8	7.4	1.13	1.63
Graduate	4.0	4.6	14.1	8.4	3.53	1.85
Post-school certificate	8.0	7.8	7.4	3.6	0.93	0.46
Year 11 and 12	8.3	9.7	6.9	3.2	0.83	0.33
Year 10 and below	18.8	13.2	5.4	1.7	0.29	0.13
Ratio of Year 10 and below to Postgraduate	2.7	2.9	0.7	0.2		
Ratio of 15th to 85th percentile	2.1	2.1	0.4	0.4		

Source: ATP and LSAC.
LSAC results are weighted using longtudinal sample weights. Note: see notes to Table 2 for definition of low and high behaviour difficulties.

It was noted in Table 1 that percentages of children with relatively low and high levels of behavioural difficulties in all waves of both the ATP and the LSAC varied according to the educational achievements of the parents. It was also noted how, in the case of behaviour difficulties, inequality in outcomes has increased since the 1980s. Table 4 shows how children showing persistent patterns of high or low difficulties – that is, they are consistently in the top or bottom fifth of behaviour difficulties in all three waves (ATP) or four waves (LSAC) for which data are collected – are distributed according to the education of their parents. The Table shows that overall, the percentage of children with

consistently high behavioural difficulties is higher in the ATP than in the LSAC. In the ATP, a child whose parents have attained Year 10 or below is 2.7 times as likely to have consistently high behavioural difficulties in comparison with a child whose parents have received postgraduate education; in the LSAC the ratio is similar (2.9). In terms of low behavioural difficulties, the advantage experienced by children of high-educated parents over children of low-educated parents is greater in the LSAC than in the ATP. These data would tend to confirm those in the other tables – that parental education gradients with respect to children's developmental outcomes for the most part have not decreased since the 1980s.

Discussion

The period between the 1980s and the present has been one of considerable social, demographic and policy change in Australia. One of the most notable changes has been the great increase in average educational achievement in this period. The proportion of parents with Year 10 or less education has declined significantly, while the proportion with graduate and postgraduate qualifications has increased greatly. One expected impact of this general increase in educational achievement among parents is that, on average, children's early developmental outcomes might have improved. As we report above, Sanson & Smart (2005) found little difference in temperament between children from these two cohorts, with a slight advantage for the current cohort. In this paper we focus on relativities – whether the relationship between parents' education – an indicator of socio-economic status – and children's early developmental outcomes has strengthened or weakened since the 1980s.

Our key findings relate to children's development between the ages of 3–4 and 11–12 years in the 1980s, and between ages 4–5 and 10–11 years in the 2000s. The two surveys that we use are at their most comparable with respect to social and emotional behavioural difficulties. Moreover, unlike the other child development measures that we use in this analysis, they can be averaged over several years, allowing for the calculation of both point-in-time and persistence scores. Our analysis shows that in both surveys, at any given age, there is evidence of a fairly steep parental education gradient with respect to behaviour difficulties. That is, children of low-educated parents have worse outcomes in terms of behavioural difficulties than children of high-educated parents. The data also suggest that this gradient has not diminished since the 1980s. Disparities in reading skills are also strong in both surveys, and similarly do not appear to have decreased since the 1980s. On the other hand, disparities in social skills appear to have reduced. Taken together, these results would suggest no across-the-board advance in reducing the parental education gradient in the early development of Australian children over the two decades between the mid-1980s and the mid-2000s.

There are a number of possible explanations for stable levels of inequality in children's early developmental outcomes. First, it is possible that the results are driven by differences in the ATP and LSAC, as discussed in the third section above. The surveys are not identical; they were not designed to be comparable; any differences or similarities between them must be viewed with this fact in mind.

Second, both surveys ask parents – mostly mothers – about their children's characteristics and development. It is possible that even if questions asked in the two surveys are broadly comparable, the frameworks that parents refer to in responding to these questions have changed. In other words, parents may view their children's behaviour and development in a different way now than they did two decades previously. Greater acceptance and tolerance of a wide range of behaviours among parents may influence both highly educated and less well educated parents to report behavioural difficulties now, where they did not see behavioural difficulties in previous decades.

Third, the generally increasing diversity of Australian society cannot be discounted as a factor in the changing relationship between parents' education and children's outcomes. Factors as diverse as changing fertility patterns, the ethnic make-up of Australia, and in household formation and dissolution may all play a part – positive or negative – in attenuating the effect of parent education on children's early developmental outcomes.

Fourth, it is possible that divergent influences have had a cancelling-out effect: greater diversity in society, leading to more diversity in child outcomes, may have been counterbalanced by greater knowledge among parents about child development, and greater use of professional child care and development services. Exposure of greatly increased proportions of children to early childhood care and education in the early 2000s in comparison with two decades previously might have resulted in more effective teacher and parent understanding and management of children, including those with behavioural difficulties. It may also be associated with improvement in the social skills gradient observed in this analysis. Unfortunately, the data available to us do not allow testing of the changing impact of early education and child care on children's developmental outcomes.

To summarise, it seems plausible that continued educational diversity among Australian parents may be associated with more diverse developmental outcomes among children. It also seems plausible that increased exposure of the current generation of children to early child care and education may have resulted in greater recognition by parents and teachers of issues in children's development, and in triggering the provision of support for children. However, it is difficult to separate parents' and teachers' greater knowledge about child development from their changing perceptions of the children in their care. Changing knowledge or changing perceptions, or both, could be associated with parents and teachers interpreting what might objectively be the same issues in their children differently from how their predecessors had done.

In the broader context, the findings suggest that the component of intergenerational mobility accounted for by differences in early developmental outcomes between children from different backgrounds have persisted over the decades. Attempts to promote intergenerational mobility in Australia through provision of child care, income support and other services aimed at vulnerable children and families do not appear to have had a dramatic impact in terms of improving the outcomes of children from low parental education backgrounds relative to those from more privileged families.

Comparisons across studies and across generations are challenging and there are a number of limitations to this study. As noted above, the two samples differ to some extent, the specific measures used in the ATP and the LSAC are not identical, and the ages at which measures are taken vary as well. Nevertheless, other research has shown some of the different measures that we use to be broadly comparable (see for example Goodman 1997). We have endeavoured to minimise these measurement differences by restricting our analyses to within-study comparisons and using rankings rather than absolute scores. The timespan covered in the two studies also differs: six years for the LSAC and eight years for the ATP. Nevertheless, comparisons across generations are valuable and an important source of information for policy. More studies like this one are needed, in part to assess the validity of findings such as those presented here, but even more so because it is important for policymakers, and for society to know how inequalities in outcomes across generations are changing, and the impact of policy on these changes.

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References

Blanden, J., Katz, I., & Redmond, G. (2012) 'Persistent Inequality? A Comparison of the Impact of Family Background on Children's Outcomes in the U.K. and Australia'. In J. Ermisch, M. Jantti, & T. Smeeding (eds) *Inequality from Childhood toAdulthood: A Cross-National Perspective on the Transmission of Advantage*, New York, Russell Sage Foundation.

Bornstein, M.H. & Bradley, R.H., (eds) (2003) *Socioeconomic Status, Parenting and Child Development*, Mahwah, NJ, Lawrence Erlbaum Associates.

Checchi, D., Fiorio, Carlo V., & Leonardi, Marco. (2013). 'Intergenerational persistence of educational attainment in Italy', *Economics Letters*, 118 (1), 229–32.

d'Addio, A.C. (2007) *Intergenerational Transmission of Disadvantage: Mobility or Immobility Across Generations?*, Paris, OECD, Directorate for Employment, Labour and Social Affairs.

Daraganova, G. & Sipthorp, M. (2011) *Wave 4 Weights*, Melbourne, Australian Institute of Family Studies.

Duncan, G.J., Yeung, W. J., Brooks-Gunn, J., Smith, J.R. (1998) 'How Much Does Childhood Poverty Affect the Life Chances of Children?', *American Sociological Review*, 63 (3), 406–23.

Elliott, S.N. & Busse, R.T. (1991) 'Social Skills Assessment and Intervention with Children and Adolescents: Guidelines for Assessment and Training Procedures', *School Psychology International*, 12 (1–2), 63–83.

Ermisch, J. (2008) 'Origins of Social Immobility and Inequality: Parenting and Early Child Development', *National Institute Economic Review*, 205 (1), 62–71.

Ermisch, J. and C. Pronzato (2010) *Causal Effects of Parents' Education on Children's Education*, Colchester, Institute for Social and Economic Research (ISER) University of Essex.

Feinstein, L. (2003) 'Inequality in the Early Cognitive Development of British Cohort Children in the 1970 Cohort', *Economica*, 70 (1), 73–77.

Flynn, J.R. (1984) 'The mean IQ of Americans: Massive gains 1932 to 1978' , *Psychological Bulletin,* 95 (1), 29–51.

—— (1987) 'Massive IQ Gains in 14 Nations: What IQ Tests Really Measure', *Psychological Bulletin*, 10 (2), 171–91.

Goodman, R. (1997) 'The Strengths and Difficulties Questionnaire: A Research Note', *Journal of Child Psychology and Psychiatry*, 38 (5), 581–86.

Heckman, J.J., Stixrud, J., Urzana, S. (2006) 'The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior', *Journal of Labor Economics*, 24 (3), 411–82.

Herrnstein, R.J. & Murray, C.A. (1994) *The Bell Curve: Intelligence and Class Structure in American Life*, New York, Free Press.

Johnson, P. & Reed H. (1996) 'Intergenerational Mobility Among the Rich and Poor: Results From the National Child Development Survey', *Oxford Review of Economic Policy*, 12 (1), 127–28.

Leigh, A. (2007) 'Intergenerational Mobility in Australia', *The B.E. Journal of Economic Analysis & Policy*, 7.

Letcher, P., Smart, D., Sanson, A., & Toumbourou, J.W. (2009) 'Psychosocial Precursors and Correlates of Differing Internalizing Trajectories from 3 to 15 Years', *Social Development*, 18 (3), 618–46.

Marks, G.N. (2009) 'Modernization Theory and Changes Over Time in the Reproduction of Socioeconomic Inequalities in Australia', *Social Forces*, 88 (2), 917–44.

MUSP (Mater–University of Queensland Study of Pregnancy) (1981–), University of Queensland, Brisbane, http://www.socialscience.uq.edu.au/musp

Najman, J.M., Aird, R., Bor, W., O'Callaghan, M,, Williams, G.M., & Shuttlewood, G.J. (2004) 'The generational transmission of socioeconomic inequalities in child cognitive development and emotional health', *Social Science & Medicine*, 58 (6), 1147–58.

OECD (2008) *Growing Unequal?: Income Distribution and Poverty in OECD Countries*, Paris, Organisation of Economic Co-operation and Development.

Prior, M., Sanson, A., Smart, D., & Oberklaid, F. (2000) *Pathways from Infancy to Adolescence: The Australian Temperament Project 1983–2000*, Melbourne, Australian Institute of Family Studies.

Rothman, S. (2003) 'The changing influence of socioeconomic status on student achievement: Recent evidence from Australia', Australian Council for Educational Research, http://research.acer.edu.au/lsay_conference/3

Smart, D. and Sanson, A. (2005) 'A Comparison of Children's Temperament and Adjustment Across 20 Years', *Family Matters*, (72), 50–57.

Tick, N.T., Ende, J.v.d., Koot, H.M., & Verhulst, F.C. (2007a) '14-year Changes in Emotional and Behavioural Problems of Very Young Dutch Children', *Journal of the American Academy of Child and Adolescent Psychiatry*, 46 (10), 1333–40.

Tick, N. T., Ende, J.v.d., & Verhulst, F.C. (2007b) 'Twenty-year trends in emotional and behavioral problems in Dutch children in a changing society', *Acta Psychiatrica Scandinavica*, 116 (6), 473–82.

Verhulst, F.C., Ende, J.v.d., & Rietbergen A. (1997) 'Ten-year time trends of psychopathology in Dutch children and adolescents: no evidence for strong trends', *Acta Psychiatrica Scandinavica*, 96 (1), 7–13.

Wångby, M., Magnusson, D., & Stattin, H. (2005) 'Time trends in the adjustment of Swedish teenage girls: A 26-year comparison of 15-year-olds', *Scandinavian Journal of Psychology*, 46 (2), 145–56.

Welshman, J. (2007) *From transmitted deprivation to social exclusion: Policy, poverty, and parenting*, Bristol, Policy Press.

Appendix: Table A1 – Children with low and high behaviour difficulties scores at ages 3–12 years by highest parental education – unweighted data for ATP and LSAC compared (per cent)

	High behaviour difficulties						
	ATP			LSAC			
	3-4 years	7-8 years	11-12 years	4-5 years	6-7 years	8-9 years	10-11 years
Postgraduate	15.7	17.1	20.0	11.4	14.0	18.2	16.8
Graduate	18.4	15.5	19.2	11.9	13.3	16.7	14.6
Post-school certificate	22.2	20.8	19.0	19.8	22.2	25.3	23.6
Year 11 and 12	26.4	19.6	20.5	25.1	26.3	29.3	25.4
Year 10 and below	31.2	28.5	26.9	35.3	35.3	38.1	31.7
Ratio – Year 10/Postgraduate	1.99	1.67	1.35	3.09	2.51	2.10	1.88

	Low behaviour difficulties						
	ATP			LSAC			
	3-4 years	7-8 years	11-12 years	4-5 years	6-7 years	8-9 years	10-11 years
Postgraduate	35.7	25.7	22.9	25.6	24.4	29.6	24.4
Graduate	30.1	23.0	26.4	28.3	27.7	33.6	31.9
Post-school certificate	22.8	19.1	18.6	16.3	17.9	20.7	20.0
Year 11 and 12	21.0	19.6	18.2	15.7	14.2	21.5	20.2
Year 10 and below	16.2	13.5	11.2	10.1	10.8	9.4	16.6
Ratio – Year 10/Postgraduate	0.45	0.53	0.49	0.39	0.44	0.32	0.68

Source: ATP and LSAC

Notes: Children with high behaviour difficulties are those in the top fifth of the behaviour problem distributions. Children with low behaviour difficulties are those in the bottom fifth of the same distribution.

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