

# Impact of parental education on children's development outcome by cultural inheritance and ethnic background

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- Childhood is an important time for healthy development and for establishing the foundations for future well-being. Parental education is crucial for child development and human capital formation.
- There are well documented evidence on the impact of parental (maternal) education on children's cognitive abilities and academic performance, and further adolescence development stage.
  - Swinnerton (2016), Hancock et al. (2016), Berthelsen and Walker (2008), Hanushek et al. (2020), Hartinger et al. (2021), Nguyen et al. (2020)

# Motivation

- What are the differential impacts of parental education on children's development outcomes by cultural inheritance and ethnic background?
- Literature in the U.S. suggests that there are diminished returns to parental education among Black families which they attribute to structural barriers and racism.
- However, these studies tend to use cross-sectional datasets and do not control for important factors such as school characteristics and cognitive ability.
- Our main contribution is the longitudinal setting and a rich dataset that allows us to define cultural inheritance in multiple ways, and includes a comprehensive set of individual, family and school characteristics, proxies for ability and time use diaries.

- We use 8 waves of data from the Longitudinal Study of Australian Children (LSAC) data.
- LSAC started in 2004 and is bi-annual, nationally representative survey data following two cohorts of children, one is from the age of 4/5 and the other is from their birth.
- We define parental education as two binary variables equal to 1 if the mother (father) has completed a Bachelor degree or higher.
- We measure cultural inheritance and ethnic background as first or second generation immigrants, and children that speak a language other than English at home.
  - 34% of children are born to parents at least one of them born overseas.
  - 11% speak in language other than English at home.

# Measures of Children Development

- Children's development outcomes can be measured by their cognitive ability, academic performance, and executive functioning.
- Peabody Picture Vocabulary Test (PPVT) - measures a child's knowledge of the meaning of spoken words for standard English.
- Matrix Reasoning Test (MR) - measures a child's non-verbal visiospatial ability.
- National Assessment Program - Literacy and Numeracy (NAPLAN) - is nationally administered test to students in grades 3, 5, 7, and 9 in the five domains of reading, writing, spelling, grammar, and numeracy.

Table: 1. Development outcomes

	All	Overseas	LOTE
PPVT	65.2	64.4***	65.6***
MR	10.5	10.6***	10.4***
Grammar	523.1	525.5***	521.6***
Numeracy	517.6	520.1***	532.8***
Reading	522.8	523.5***	522.2***
Spelling	511.9	516.5***	508.5***
Writing	499.1	500.8***	497.2***

$$\begin{aligned}\Delta y_{it} = & \alpha_0 + \alpha_1 y_{it-1} + \alpha_2 \text{moth.edu}_{it} + \alpha_3 \text{fath.edu}_{it} \\ & + \sum_{k=1}^4 \beta_k \text{Ethnicity}_i + \sum_{k=1}^4 \gamma_k (\text{Ethnicity}_i \times \text{moth.edu}_{it}) \\ & + \sum_{k=1}^4 \delta_k (\text{Ethnicity}_i \times \text{fath.edu}_{it}) + X_i' \gamma + \varepsilon_{it}\end{aligned}$$

- $\Delta y_{it}$ : change in children's development outcome (NAPLAN scores by subject, cognitive development)
- $\text{Ethnicity}_i$ : first or second generation immigrants, Indigenous and/or Torres Strait Islander, speaking a language other than English.
- $X_i'$ : a set of control variables including child, family, and school characteristics, ability and time use diaries.

Table 2. Returns to parental education: Numeracy

	(1) Basic	(2) Student	(3) Family	(4) School
Mother at least Bachelor	8.885*** (1.101)	9.437*** (1.135)	8.072*** (1.196)	7.262*** (1.577)
Father at least Bachelor	9.688*** (1.175)	9.973*** (1.201)	8.280*** (1.269)	5.899*** (1.668)
First generation	4.859 (4.083)	5.198 (4.153)	9.322** (4.739)	0.076 (6.276)
Second generation	-1.260 (0.987)	-1.358 (1.039)	2.200 (1.377)	0.794 (1.838)
Indigenous	-13.555*** (2.702)	-14.843*** (2.760)	-9.415*** (3.461)	-7.309 (4.464)
Child speaks other language	9.291*** (2.029)	9.081*** (2.057)	7.212*** (2.321)	7.097** (3.259)
Mother at least Bachelor=1 × First generation=1	0.057 (5.522)	0.091 (5.596)	-3.068 (6.209)	-0.397 (8.467)
Mother at least Bachelor=1 × Second generation=1	2.381 (1.705)	2.277 (1.737)	0.624 (2.069)	-0.432 (2.784)
Mother at least Bachelor=1 × Indigenous=1	2.258 (7.636)	3.430 (7.713)	4.296 (8.573)	-1.223 (10.787)
Mother at least Bachelor=1 × Child speaks other language=1	-1.876 (3.325)	-1.663 (3.361)	-0.582 (3.704)	-3.499 (5.080)

Table: 2. continues. Returns to parental education: Numeracy

	(1) Basic	(2) Student	(3) Family	(4) School
Father at least Bachelor=1 × First generation=1	10.389* (5.480)	11.018** (5.551)	9.109 (6.285)	9.996 (8.548)
Father at least Bachelor=1 × Second generation=1	4.645** (1.886)	4.989*** (1.916)	1.907 (2.145)	1.630 (2.882)
Father at least Bachelor=1 × Indigenous=1	6.855 (9.252)	8.125 (9.364)	5.215 (9.907)	-2.829 (14.071)
Father at least Bachelor=1 × Child speaks other language=1	0.911 (3.371)	1.377 (3.408)	4.162 (3.683)	12.266** (5.103)
Observations	18458	17492	14784	8225
Time/wave effect	Yes	Yes	Yes	Yes
Cohort effect	Yes	Yes	Yes	Yes

Table: 3. Returns to parental education: Spelling

	(1) Basic	(2) Student	(3) Family	(4) School
Mother at least Bachelor	3.583*** (0.951)	3.880*** (0.984)	3.217*** (1.015)	1.938 (1.317)
Father at least Bachelor	6.019*** (1.017)	6.299*** (1.043)	5.421*** (1.078)	4.712*** (1.394)
First generation	6.389* (3.471)	6.940* (3.545)	10.759*** (3.934)	11.252** (5.113)
Second generation	0.740 (0.853)	0.803 (0.901)	3.051*** (1.170)	0.648 (1.537)
Indigenous	-5.774** (2.329)	-6.346*** (2.386)	-5.332* (2.910)	-1.941 (3.705)
Child speaks other language	7.286*** (1.766)	7.942*** (1.795)	7.013*** (1.987)	9.383*** (2.738)
Mother at least Bachelor=1 × First generation=1	1.597 (4.774)	1.246 (4.856)	-1.427 (5.270)	-0.737 (7.070)
Mother at least Bachelor=1 × Second generation=1	1.956 (1.477)	1.964 (1.509)	1.347 (1.761)	2.668 (2.332)
Mother at least Bachelor=1 × Indigenous=1	5.674 (6.587)	5.328 (6.674)	6.805 (7.255)	-4.702 (8.947)
Mother at least Bachelor=1 × Child speaks other language=1	-5.151* (2.883)	-5.639* (2.920)	-4.538 (3.166)	-4.975 (4.276)

Table: 3. continues. Returns to parental education: Spelling

	(1)	(2)	(3)	(4)
	Basic	Student	Family	School
Father at least Bachelor=1 × First generation=1	4.408 (4.723)	4.228 (4.800)	2.333 (5.296)	-1.515 (7.073)
Father at least Bachelor=1 × Second generation=1	1.779 (1.633)	1.906 (1.664)	-0.682 (1.824)	0.264 (2.413)
Father at least Bachelor=1 × Indigenous=1	-3.365 (8.023)	-2.928 (8.146)	-3.075 (8.417)	-5.037 (11.753)
Father at least Bachelor=1 × Child speaks other language=1	-1.327 (2.927)	-1.655 (2.966)	-0.640 (3.150)	-4.399 (4.295)
Observations	18668	17685	14924	8298
Time/wave effect	Yes	Yes	Yes	Yes
Cohort effect	Yes	Yes	Yes	Yes

Table: 4. Returns to parental education: Writing

	(1) Basic	(2) Student	(3) Family	(4) School
Mother at least Bachelor	12.504*** (1.445)	13.374*** (1.453)	11.209*** (1.496)	7.679*** (1.942)
Father at least Bachelor	12.557*** (1.531)	13.685*** (1.529)	10.833*** (1.578)	9.975*** (2.048)
First generation	10.004* (5.234)	10.668** (5.195)	15.321*** (5.750)	12.004 (7.419)
Second generation	-0.529 (1.318)	-0.337 (1.348)	5.131*** (1.721)	2.624 (2.265)
Indigenous	-26.602*** (3.554)	-28.512*** (3.530)	-24.630*** (4.315)	-23.074*** (5.488)
Child speaks other language	6.465** (2.732)	7.820*** (2.706)	6.515** (2.992)	4.474 (4.121)
Mother at least Bachelor=1 × First generation=1	3.483 (7.189)	1.753 (7.122)	2.678 (7.731)	13.539 (10.356)
Mother at least Bachelor=1 × Second generation=1	-0.743 (2.261)	-0.875 (2.251)	-3.436 (2.601)	-3.181 (3.455)
Mother at least Bachelor=1 × Indigenous=1	18.661* (10.107)	17.019* (10.003)	20.817* (10.775)	32.617** (13.277)
Mother at least Bachelor=1 × Child speaks other language=1	-4.537 (3.899)	-3.899 (3.899)	-2.356 (2.356)	-4.649 (4.649)

Table: 4. continues. Returns to parental education: Writing

	(1)	(2)	(3)	(4)
	Basic	Student	Family	School
Father at least Bachelor=1 × First generation=1	1.442 (7.135)	1.428 (7.066)	-3.821 (7.739)	-14.843 (10.336)
Father at least Bachelor=1 × Second generation=1	3.632 (2.482)	3.490 (2.464)	-1.208 (2.680)	-2.749 (3.566)
Father at least Bachelor=1 × Indigenous=1	12.168 (12.122)	12.119 (12.002)	10.079 (12.339)	-6.661 (17.234)
Father at least Bachelor=1 × Child speaks other language=1	1.392 (4.547)	-1.044 (4.500)	2.106 (4.756)	4.105 (6.426)
Observations	18586	17606	14851	8255
Time/wave effect	Yes	Yes	Yes	Yes
Cohort effect	Yes	Yes	Yes	Yes

# Discussion of Differential Returns to Parental Education

- For numeracy, there are stronger returns to father's education among second generation immigrants (explained by family and school characteristics).
- For writing, there are stronger returns to mother's education among Aboriginal and/or Torres Strait Islanders.
- For spelling, grammar and reading, we do not find evidence of differential returns to parental education by ethnicity and cultural background.

# Conclusion

- We find strong effects of parental education on children's academic performance (father's and mother's education).
- There are some differences in children's outcomes by cultural inheritance and ethnic background, although this is often explained by socio-demographic and school characteristics and cognitive ability.
- We find little evidence of differential returns to parental education for immigrants, Indigenous populations and those speaking a language other than English at home (after controlling for individual, family and school characteristics and for ability).
- This may suggest a different context in Australia relative to the U.S. or differences due to longitudinal data and rich controls that reduce potential omitted variables bias.

Thank you.

Questions?