Parental Responses to Children's Achievement Test Results

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Motivation

- Parents' perceptions about their children's ability matters for their investments (Cunha 2015; 2021)
- Parents' perceptions are often wrong (Dizon-Ross 2019)
- We show that receiving report cards from standardized tests changes parents' perceptions and investments in their children
- Our results add a new dimension to the debate on the value of standardized testing

This paper

1. Do parents respond to the release of national standardized test report cards?
   - Identification: calendar time variation relative to test card release date
   - Outcomes:

     Parents' perceptions of child' school achievement and satisfaction with child school

     Time investments: hrs/day with parents, activities together

     Money investments: books at home, tutoring, extracurr. activities

     Parenting style: warmth, monitoring

     Child time use data: leisure, education activities, sleep
   - Results:

     Test reports → - perceptions of achievement, - school satisfaction

     → + tutoring, - extracurricular activities

This paper

2. How do parents assess the test score information in test report cards?

→ separate effects of good news, no news and bad news

- Identification:
  - compare *actual* scores and *forecasted* scores to create news types
  - Estimate heterogeneous effects by news type
- Results:
  - Receiving bad news and no news → - perception of achievement
  - No differential effects of news types on + tutoring and - extracurricular activities

This paper

3. Do parents also benchmark their child's test performance against other children?
   - Identification: RD of child score (running variable) vs national/school average (displayed in test score report cards)
   - Results:
     - Child score right above national average → + perceptions of achievement ; - activities at home ; + education time, - leisure time,
     - Child score right above school average → + school satisfaction

Information and parental investments

- Parents change their beliefs when they receive information about their child or their child's school
  - Academic performance → + targeted educational inputs (Dizon-Ross 2019)
  - School value-added → + belief accuracy about schools (Ainsworth et al. 2020)

- Information also changes parental investments and can affect learning
  - Missed assignments → - monitoring (Bergman 2021)
  - Good school quality → - time (Greaves et al. 2019)
  - School report cards → + test scores, + enrolment (Andrabi et al. 2017)

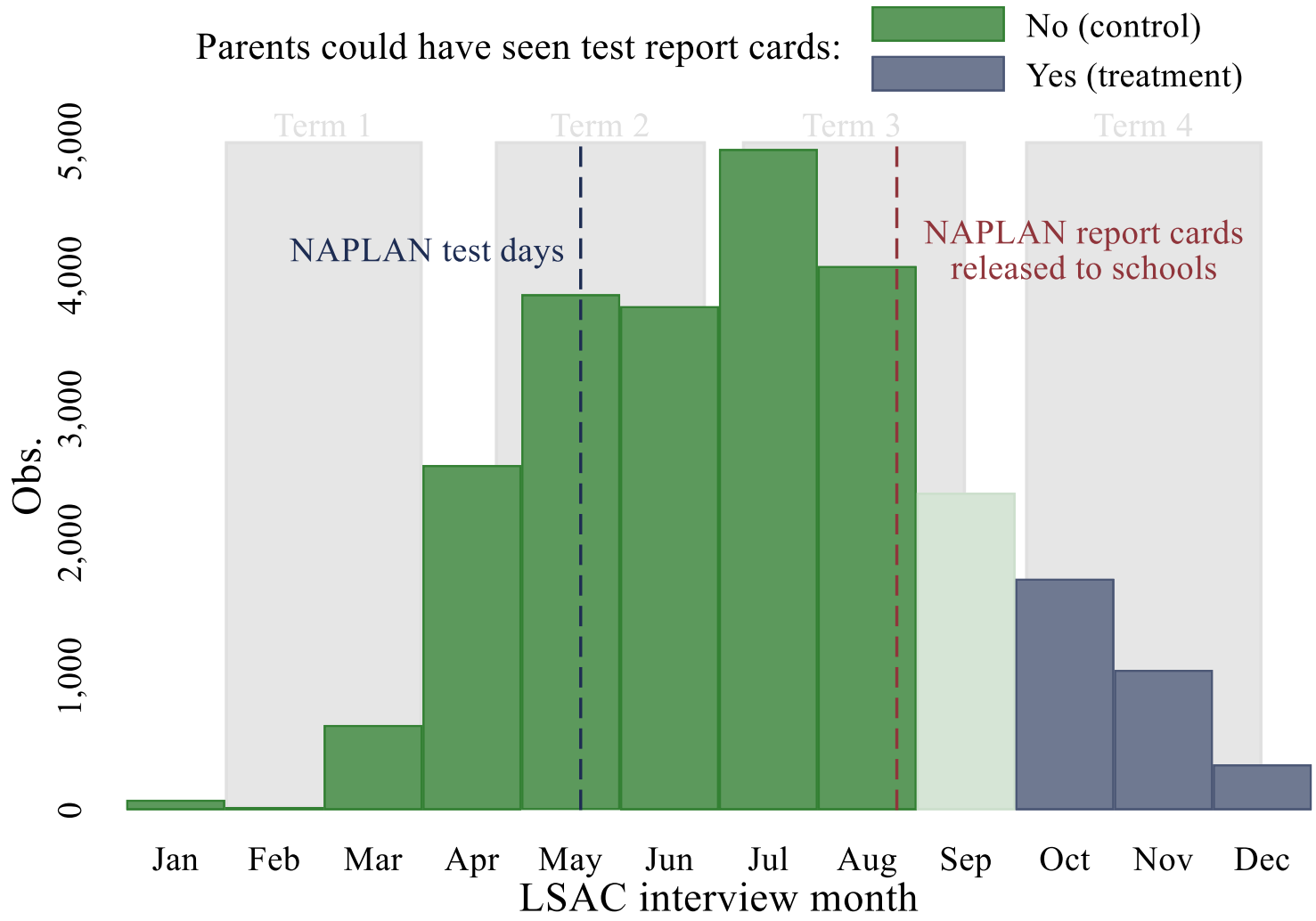
Data: Longitudinal Study of Australian Children (LSAC)

- Cohort design, representative of Australian resident cohort
- ≈5,000 children followd from age 5; 6 waves; interviews every 2 years
- Rich information on parents-child relationship

- From wave 3, LSAC years coincide with the National Assessment Program – Literacy and Numeracy (NAPLAN) standardized test years

LSAC wave	1	2	3	4	5	6
Age	5	7	9	11	13	15
Year of schooling	K	1	3	5	7	9
NAPLAN test			✓	✓	✓	✓

Calendar time identifying variation



Both groups are:

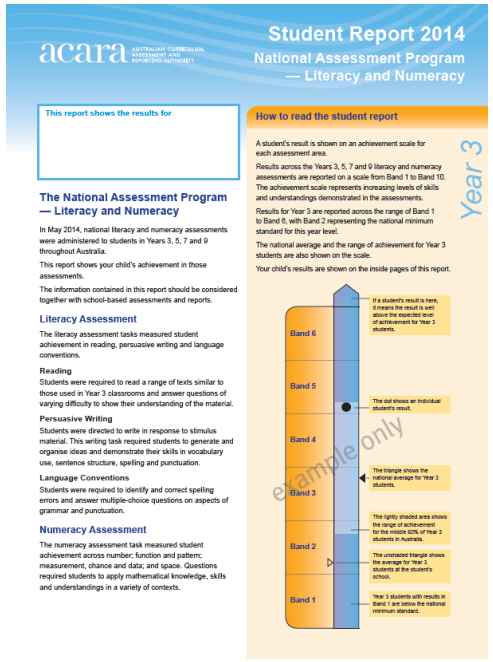
- Similar on observables
- Similar on pre-NAPLAN outcomes (waves 1 and 2)

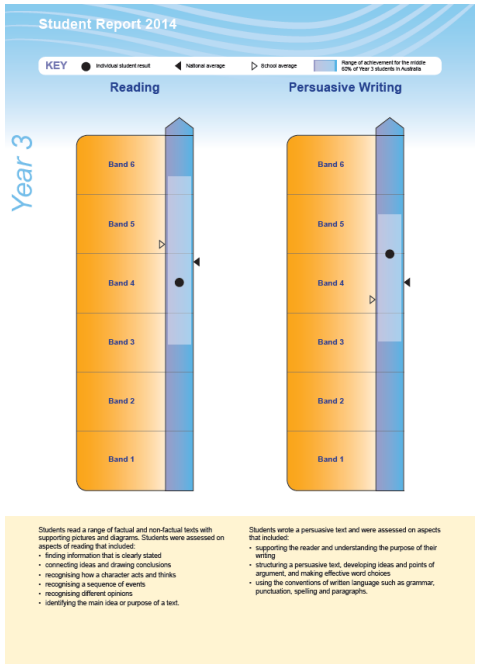
NAPLAN Report Cards (Year 5 example)

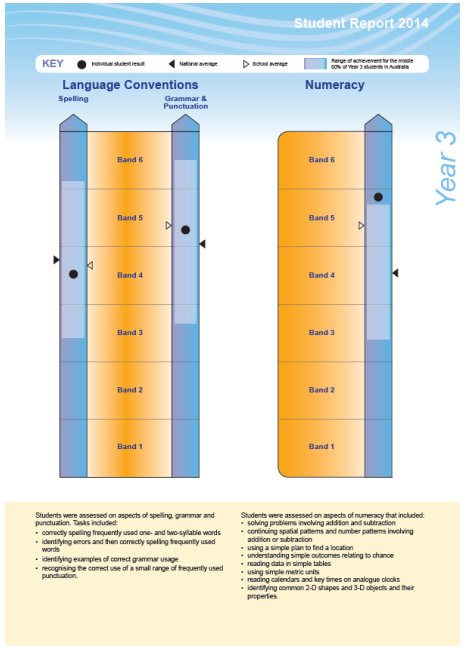
Child name and how-to-read figures

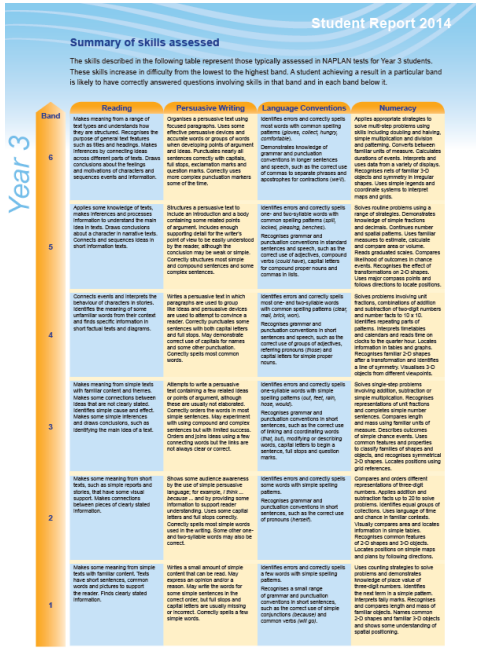
Student test scores
[Reading, Writing, Language, Numeracy]

Summary of skills assessed



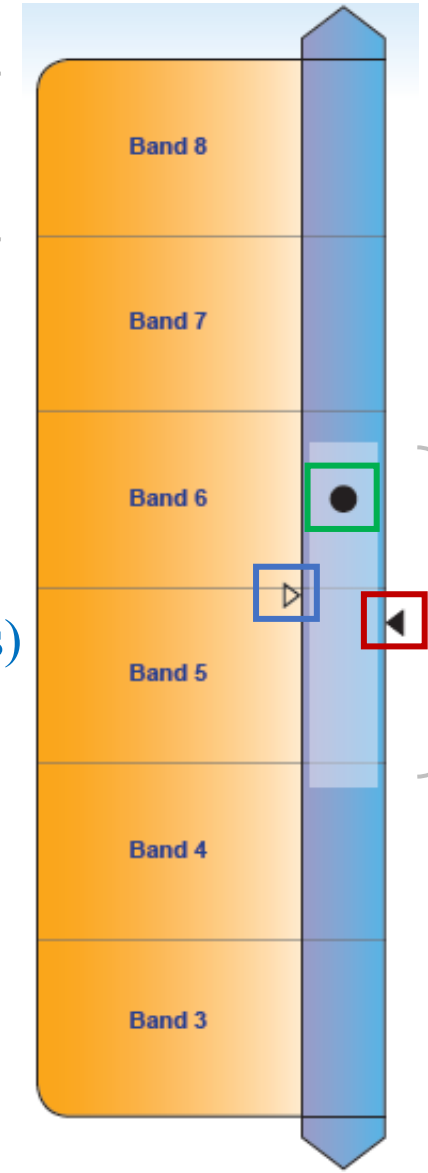






NAPLAN Report Cards (Year 5 example)

Skill assessment bands



School average score
(only shown in some states)

Student test score in subcomponent

National average score

Middle 60% of test scores

Empirical strategy

$$Y_{iw} = \theta Post_{iw} + \gamma' X_{iw} + \delta_w + \delta_{Region} + \delta_{Age} + \varepsilon_{iw}$$

Y_{iw} = Perceptions of child school performance, school satisfaction, parental investments (time, money, parenting style), child time use

$Post_{iw}$ = LSAC interview date in October—December

X_{iw} = weather, child and family characteristics (↑precision)

1. Do parents respond to the release of national standardized test report cards?

Test report effects on perceptions of achievement and school satisfaction

	Test report release	Mean
Parent's perceptions of child achievement [1-5]	-0.086* (0.051)	3.76
Parent's satisfaction with child school [1-5]	-0.109** (0.046)	4.44

Decrease of about ≈2% of unconditional mean in both measures

Test report effects on perceptions of achievement and school satisfaction

94% parents believe their child is achieving at or above school average

	Test report release	Mean
Parent's perceptions of child achievement [1-5]	-0.086*	3.76
	(0.051)	
Parent's satisfaction with child school [1-5]	-0.109**	4.44
	(0.046)	

90% parents are satisfied or very satisfied with child's school

Test report effects on time and money investments

	Test report release	Mean
Time investments:		
Hours per day with parents	-0.198	3.25
	(0.180)	
At-home activities per week	-0.445	9.20
	(0.354)	
Out-of-home activities per month	0.040	1.64
	(0.062)	
Money investments:		
30+ books at home	-0.016	0.74
	(0.032)	
Has private tutor	0.064***	0.15
	(0.023)	
Has allowance	-0.037	0.37
	(0.032)	
# extracurr. activities per week	-0.321***	1.43
	(0.099)	

43% of mean

22% of mean

Test report effects on parenting style and child's time use

	Test report release	Mean
Parenting style:		
High warmth	0.012	0.72
	(0.028)	
Strict monitoring	-0.012	0.75
	(0.025)	
Minutes per day of child time in:		
Educational activities	13.328	283
	(12.669)	
Leisure	-21.114*	304
	(12.558)	
Sleeping & personal care	6.415	638
	(5.885)	
Other activities	2.797	216
	(7.479)	

Some evidence of -7% of leisure time, mostly reallocated to education

2. How do parents assess the test score information in test report cards?

Heterogeneous effects: Good News, No News, Bad News

$$\widehat{Test\ Scores}_{i,\boldsymbol{w}} = f(Test\ Scores_{i,\boldsymbol{w-1}}, Perceived\ Assessment_{i,\boldsymbol{w-1}}, \theta_{Region}, \theta_w)$$

$$\boldsymbol{Test\ Scores_{i,w}} > \widehat{Test\ Scores}_{i,\boldsymbol{w}} + se\left(\widehat{Test\ Scores}_{i,\boldsymbol{w}}\right) \Rightarrow \text{Good news}$$

$$\boldsymbol{Test\ Scores_{i,w}} \in \widehat{Test\ Scores}_{i,\boldsymbol{w}} \pm se\left(\widehat{Test\ Scores}_{i,\boldsymbol{w}}\right) \Rightarrow \text{No news}$$

$$\boldsymbol{Test\ Scores_{i,w}} < \widehat{Test\ Scores}_{i,\boldsymbol{w}} - se\left(\widehat{Test\ Scores}_{i,\boldsymbol{w}}\right) \Rightarrow \text{Bad news}$$

Interact this with calendar time treatment to identify e.g, the difference between parents that receive Good News and parents who *will* receive Good News (but haven't)

Heterogeneous effects on perceptions of achievement and school satisfaction

	Test report release with		
	good news	**no news**	**bad news**
Parent's perceptions of child achievement [1-5]	-0.039	-0.122**	-0.168*
	(0.083)	(0.057)	(0.089)
Parent's satisfaction with child school [1-5]	-0.119	-0.054	-0.117
	(0.074)	(0.051)	(0.086)

no news and bad news drive change in perceptions of child achievement …

Heterogeneous effects on time and money investments

	Test report release with		
	good news	**no news**	**bad news**
Time investments:			
Hours per day with parents	-0.098	-0.174	-0.365
	(0.279)	(0.192)	(0.261)
At-home activities per week	-0.470	-0.426	-0.518
	(0.512)	(0.380)	(0.579)
Out-of-home activities per month	-0.128	0.031	0.044
	(0.100)	(0.071)	(0.111)
Money investments:			
30+ books at home	-0.022	-0.006	-0.051
	(0.049)	(0.035)	(0.052)
Has private tutor	0.080**	0.055**	0.093**
	(0.037)	(0.025)	(0.038)
Has allowance	-0.068	-0.023	-0.058
	(0.047)	(0.034)	(0.048)
# extracurr. activities per week	-0.259*	-0.357***	-0.297**
	(0.145)	(0.101)	(0.144)

… yet there is no heterogeneity across news types on monetary investments …

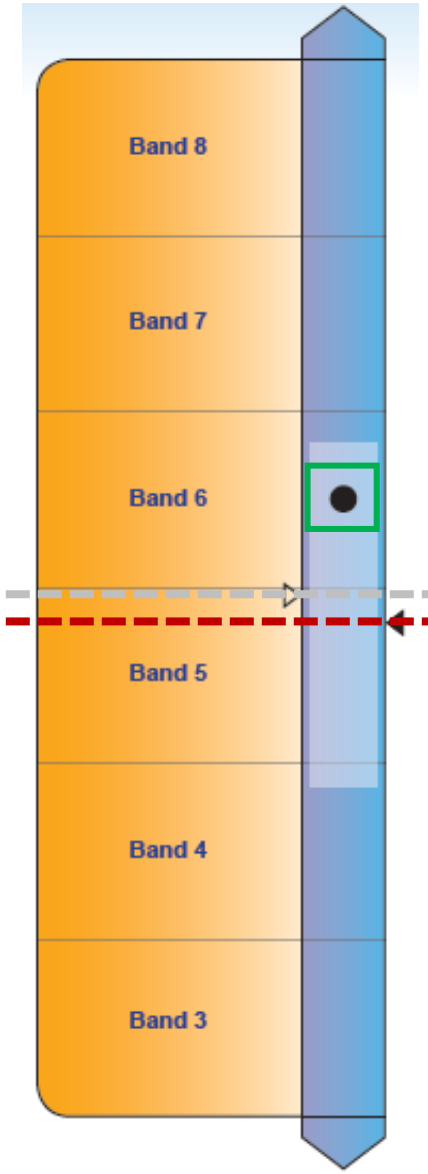
Heterogeneous effects on parenting style and child's time use

	Test report release with		
	good news	**no news**	**bad news**
Parenting style:			
High warmth	0.016	0.016	0.033
	(0.048)	(0.033)	(0.046)
Strict monitoring	-0.002	-0.022	-0.013
	(0.043)	(0.030)	(0.043)
Minutes per day of child time in:			
Educational activities	34.554*	-2.173	53.440***
	(19.514)	(13.509)	(19.317)
Leisure	-45.803**	-10.689	-37.952*
	(20.325)	(13.227)	(19.613)
Sleeping & personal care	0.483	9.690	-3.371
	(9.333)	(6.272)	(9.330)
Other activities	11.711	4.136	-8.652
	(11.211)	(8.064)	(11.345)

… and some heterogeneity for child time use responses

3. Do parents also benchmark their child's test performance against other children?

Comparisons with other children



Student test score in subcomponent
(running variable)

School average score
(only shown in some states)

National average score

RD effects on perceptions of achievement and school satisfaction

	BCR RD effect using numeracy scores Child score > Nat. avg	Obs.	CER bandwidth below	CER bandwidth above
Parent's perceptions of child achievement [1-5]	0.568*** (0.169)	1,474	23	26
Parent's satisfaction with child school [1-5]	-0.028 (0.169)	1,475	26	36

Children scoring right above nat. avg. are perceived to be higher-achieving by their parents

RD effects [child vs nat. avg.] time and money investments

	BCR RD effect using numeracy scores Child score > Nat. avg	Obs.	CER bandwidth below	CER bandwidth above
Time investments:				
Hours per day with parents	-0.016	1,160	33	52
	(0.447)			
At-home activities per week	-2.838**	855	23	38
	(1.404)			
Out-of-home activities per month	0.174	1,477	33	34
	(0.198)			
Money investments:				
30+ books at home	0.115	856	37	40
	(0.107)			
Has private tutor	0.094	1,365	26	41
	(0.067)			
Has allowance	0.172*	1,374	33	28
	(0.098)			
# extracurr. activities per week	0.113	1,116	33	28
	(0.275)			

They also do fewer at-home activities with their parents…

RD effects on parenting style and time use

	BCR RD effect using numeracy scores Child score > Nat. avg	Obs.	CER bandwidth below	CER bandwidth above
Parenting style:				
High warmth	-0.098	1,396	21	35
	(0.087)			
Strict monitoring	0.149*	1,437	26	21
	(0.090)			
Minutes per day of child time in:		1,160	34	30
Educational activities	86.357**			
	(39.395)			
Leisure	-84.704**			
	(36.402)			
Sleeping & personal care	-6.242			
	(19.460)			
Other activities	-3.088			
	(24.368)			

… likely because they refocus their time on educational activities and away from leisure

Conclusions

Conclusions

- Standardized test reports contain valuable information for parents
- Parent update their perceptions about child achievement and school satisfaction, and increase their educational investments
- Seems to be a good thing

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Support Slides

Heterogeneity in effects of test reports (summary)

- In some states, test reports also display school-level average test scores, in the rest only national average
  - Stronger effects of + school satisfaction
    → school info does matter to parents
  - Stronger - leisure time *when school average is not shown*
    → same-school children are relevant benchmarks (and more similar to child); a "local distortion"? (e.g., Kinsler & Pavan 2020)

- Stronger effects on - leisure and - perceptions of achievement in public schools
  - Consistent with less parent-school contact in public system (Goldring & Phillips 2008)

Additional results from RD models (summary)

- Only effect for RD of child vs. school avg. is + school satisfaction
  - Parents benchmark against school avg., but this doesn't affect investments
- No systematic evidence that parents react to School avg. vs National avg. comparisons
- No RD effects in the pre-September interview sample
  - This validates empirical design

Parental investments – Time

Variable	Definition
Time spent with child (days/week of activity)	
Read with child	The number of days in the past week where the parent or an adult in the family has read to the study child from a book.
Told child a **story**	The number of days in the past week where the parent or an adult in the family has told the study child a story, not from a book.
Drawn picture with child	The number of days in the past week where the parent or an adult in the family has drawn pictures or done other art or craft activities with the study child.
Music with child	The number of days in the past week where the parent or an adult in the family has played music, sung songs, danced or done other musical activities with the study child.
Toys or games with child	The number of days in the past week where the parent or an adult in the family has played with toys or games indoors, like board or card games and excluding electronic games, with the study child.
Everyday activities with child	The number of days in the past week where the parent or an adult in the family has involved the study child in everyday activities at home, such as cooking or caring for pets.
Played outdoors with child	The number of days in the past week where the parent or an adult in the family has played a game outdoors or exercised together (e.g., walking, swimming, cycling) with the study child.
Sum of activity days/week	Sum of days per week spent with the study child being engaged in activities inside the home.

Parental investments – Time

Parent-child activities (times last month)	
Gone to **playground or pool**	Equals 1 if study child has gone to a playground or a swimming pool with their parent or another adult in the family in the past month.
Gone to **concert, museum, etc.**	Equals 1 if study child has gone to a concert, play museum, art gallery or community or school event with their parent or another adult in the family in the past month.
Attended a **religious service**	Equals 1 if study child has attended a religious service, church temple, synagogue or mosque with their parent or another adult in the family in the past month.
Visited **library**	Equals 1 if study child has visited a library with their parent or another adult in the family in the past month.
Sum of activities last month	Sum of parent-child activities outside the home in the last month.

Parental investments – Warmth

Warm parenting	
Display **physical affection**	How often the parent has expressed affection by hugging, kissing, and holding the study child in the past six months. Answered on a scale of 1 to 5 where 1 is 'Never/Almost Never' and 5 is 'Always/Almost Always'.
Express happiness to child	How often the parent has told the study child how happy he/she makes them in the past six months. Answered on a scale of 1 to 5 where 1 is 'Never/Almost Never' and 5 is 'Always/Almost Always'.
Warm encounters with child	How often the parent has had warm, close times together with the study child in the past six months. Answered on a scale of 1 to 5 where 1 is 'Never/Almost Never' and 5 is 'Always/Almost Always'.
Enjoy doing things with child	How often the parent enjoyed listening to the study child and doing things with him/her in the past six months. Answered on a scale of 1 to 5 where 1 is 'Never/Almost Never' and 5 is 'Always/Almost Always'.
Close when happy or upset	How often the parent has felt close to the study child when he/she was happy and when he/she was upset in the past six months. Answered on a scale of 1 to 5 where 1 is 'Never/Almost Never' and 5 is 'Always/Almost Always'.
High warmth	We define a parent to have high warmth parenting style if they have rated themselves with a total of 20 or more points from the above 5 warmth parenting items.

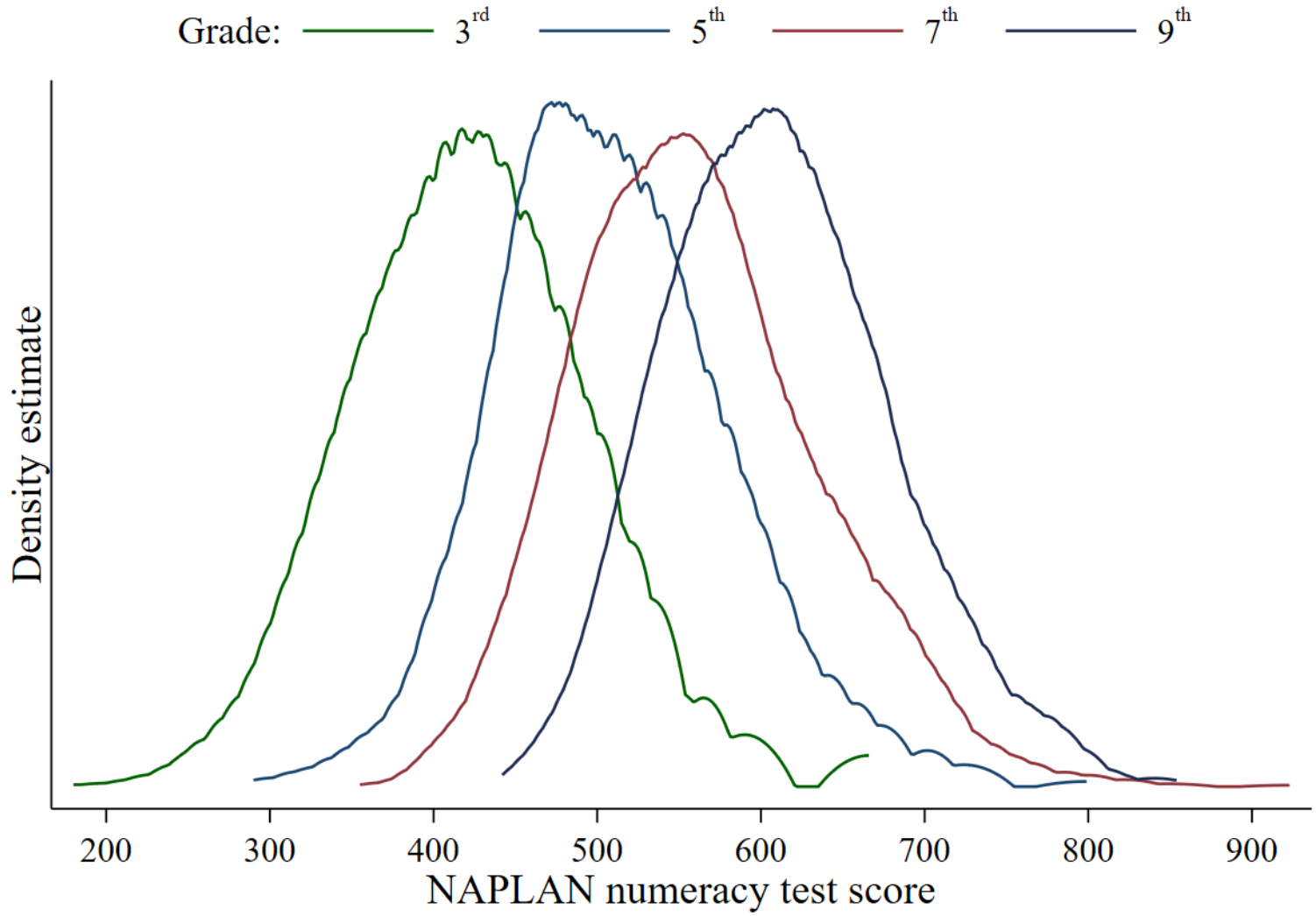
Parental investments – Monitoring

Parental Monitoring	
Know child's **friends' names and faces**	How many of study child's close friends the parent knows by sight and by their first and last names. Answered on a scale of 1 to 5 where 1 is 'None of them' and 5 is 'All of them'.
Know child's **friends' parents' names and faces**	How many of study child's close friends' parents the parent knows by sight and by their first and last names. Answered on a scale of 1 to 5 where 1 is 'None of them' and 5 is 'All of them'.
Know **where child is**	How often the parent knows where study child is in the course of a day. Answered on a scale of 1 to 5 where 1 is 'Always' and 5 is 'Never'. We reverse code the scale such that 1 is 'Never' and 5 is 'Always', so that the scale is increasing in monitoring.
Know **who child is with**	How often the parent knows who the study child is with in the course of a day, when the study child is away from home. Answered on a scale of 1 to 5 where 1 is 'Always' and 5 is 'Never'. We reverse code the scale such that 1 is 'Never' and 5 is 'Always', so that the scale is increasing in monitoring.
Talk with **child about** their **life**	How often the parent talks to the study child about what is going on in his/her life. Answered on a scale of 1 to 5 where 1 is 'Always' and 5 is 'Never'. We reverse code the scale such that 1 is 'Never' and 5 is 'Always', so that the scale is increasing in monitoring.
Child **goes out without telling**	How often the study child goes out without telling the parent where he/she will be. Answered on a scale of 1 to 5 where 1 is 'Always' and 5 is 'Never'.
High monitoring	We define a parent to have high monitoring parenting style if they have rated themselves with a total of 24 or more points from the above 6 monitoring parenting items.

Parent's assessments

Parent's assessments	
Child's performance in school	How the parent would describe the study child's **overall achievement at school**. Answered on a scale of 1 to 5 where 1 is 'Excellent' and 5 is 'Well below average'.
Satisfaction with school	How **satisfied the parent is with the school that the study child currently attends**. Answered on a scale of 1 to 5 where 1 is 'Very satisfied' and 5 is 'Very dissatisfied'.

NAPLAN Numeracy Distribution over Grades



Groups comparable on observable characteristics (back)

	Mean	Test report release
Pre-determined characteristics:		
Waves 3-6		
Female child	0.49	-0.011
		(0.027)
Child birth weight (kilograms)	3.42	0.011
		(0.030)
2 biological parents in household	0.84	-0.109
		(0.177)
Household gross income (AUD/week)	2,168	-79.123
		(88.443)
University-educated parent(s)	0.46	-0.030
		(0.025)
Migrant parent(s)	0.32	-0.024
		(0.180)

Falsification regressions (back)

	Mean	Test report release
Placebo outcomes:		
Waves 1-2		
At-home activity days per week	15.97	-0.154
		(0.361)
Out-of-home activity days per month	2.29	0.032
		(0.068)
30+ books at home	0.85	-0.019
		(0.024)
High warmth parent(s)	0.87	-0.026
		(0.024)
Parents' perceptions of achievement	3.86	-0.058
		(0.099)
Parent's satisfaction with school	4.54	0.005
		(0.052)

Heterogeneity by school NAPLAN average shown

State NAPLAN report cards:	**Effect of Post-September LSAC interview if:**	
	do not show school avg. [70%]	*show school avg. [30%]*
Outcomes:		
Has private tutor	0.062**	0.067**
	(0.024)	(0.029)
	0.17	*0.12*
Extracurr. activities per week	-0.306***	-0.350***
	(0.103)	(0.118)
	1.44	*1.41*
Minutes per day on leisure	-35.533***	1.014
	(12.860)	(15.854)
	316	*316*
Parental perceptions of school achievement	-0.091*	-0.076
	(0.054)	(0.062)
	3.77	*3.75*
Parental satisfaction with child school	-0.093*	-0.142**
	(0.048)	(0.061)
	4.46	*4.40*

Heterogeneity by public vs private school

	Effect of Post-September LSAC interview if:	
Child's attends a:	*public school [81%]*	*private school [19%]*
Outcomes:		
Hours per day with parents	-0.228	-0.016
	(0.185)	(0.247)
	3.42	*3.57*
Has private tutor	0.065***	0.064*
	(0.024)	(0.034)
	0.14	*0.20*
Extracurr. activities per week	-0.320***	-0.321***
	(0.100)	(0.123)
	1.33	*1.73*
Minutes per day on leisure	-27.482**	-12.318
	(12.552)	(17.150)
	321	*297*
Parental perceptions of school achievement	-0.104**	-0.000
	(0.052)	(0.069)
	3.74	*3.87*
Parental satisfaction with child school	-0.106**	-0.096
	(0.047)	(0.062)
	4.39	*4.64*

Heterogeneity by household income

	Effect of Post-September LSAC interview if:	
Household income is in the:	*bottom tertile [31%]*	*top tertile [36%]*
Outcomes:		
Hours per day with parents	-0.378	-0.510**
	(0.244)	(0.247)
	3.45	*3.44*
Has private tutor	0.074**	0.064**
	(0.032)	(0.033)
	0.15	*0.18*
Extracurr. activities per week	-0.293**	-0.303**
	(0.136)	(0.134)
	1.23	*1.62*
Minutes per day on leisure	-27.176	-10.055
	(16.826)	(17.077)
	332	*299*
Parental perceptions of school achievement	-0.096	-0.049
	(0.070)	(0.068)
	3.66	*3.84*
Parental satisfaction with child school	-0.127*	-0.064
	(0.066)	(0.061)
	4.35	*4.51*

Alternative model of NAPAN news

