

Parental Responses to Children's Achievement Test Results

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Motivation

- Parents' perceptions about their children's school performance matter 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 report release date

- Outcomes:

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

- Information about their child and school corrects parents' beliefs (Andrabi et al. 2017, Dizon-Ross 2019, Greaves et al. 2019, Ainsworth et al. 2020)
- Information changes parental investments (often substitution effects); net effect on child learning can still be positive (Andrabi et al. 2017, Greaves et al. 2019, Bergman 2021)

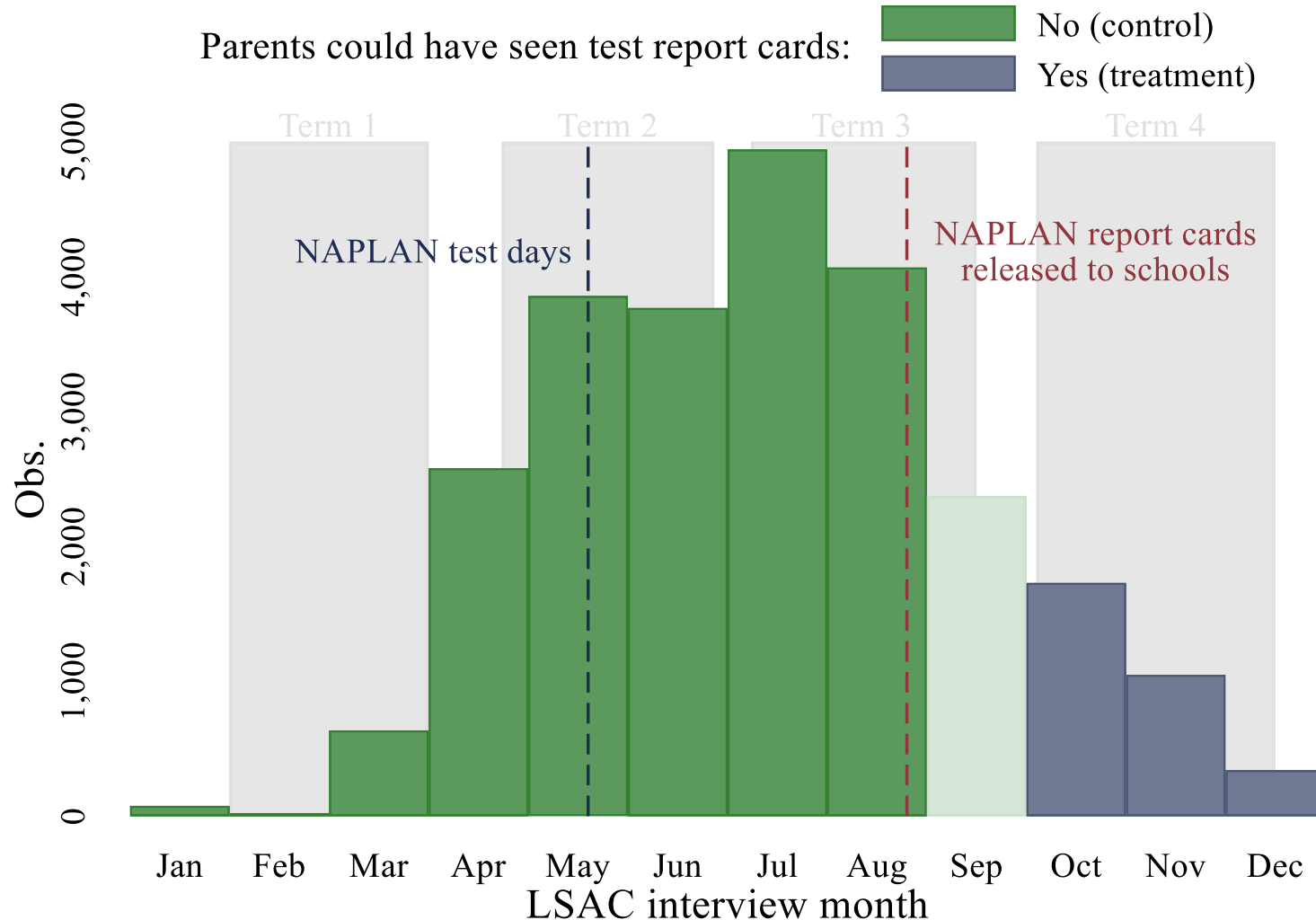
Data & Setting

Data: Longitudinal Study of Australian Children (LSAC)

- Cohort design, representative of Australian resident cohort
- $\approx 5,000$ children from age 5, interviews every 2 years; we use 6 waves
- 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



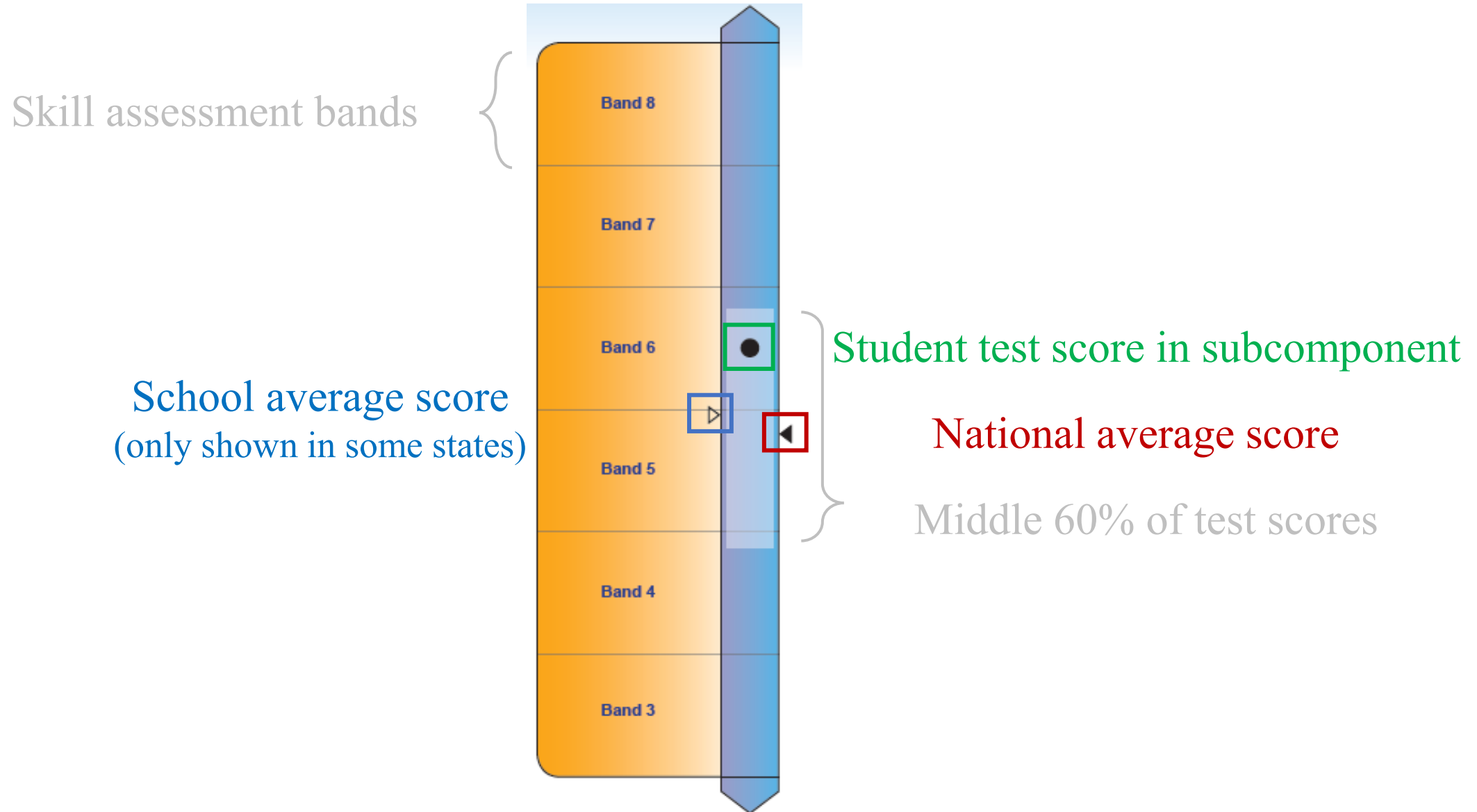
Both groups are:

- Not different on observables
- Not different on pre-test outcomes (waves 1 and 2)

Summary of skills assessed



NAPLAN Report Cards (Year 5 example)



Empirical strategy

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

Y_{iw} = Perceptions of child school achievement, school satisfaction,
parental investments, child time use

\mathbf{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

	<u>Test report release</u>	<u>Mean</u>
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 $\approx 2\%$
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

	<u>Test report release</u>	<u>Mean</u>
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

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 (0.180)	3.25
At-home activities per week	-0.445 (0.354)	9.20
Out-of-home activities per month	0.040 (0.062)	1.64
Money investments:		
30+ books at home	-0.016 (0.032)	0.74
43% of mean Has private tutor	0.064*** (0.023)	0.15
Has allowance	-0.037 (0.032)	0.37
22% of mean # extracurr. activities per week	-0.321*** (0.099)	1.43

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

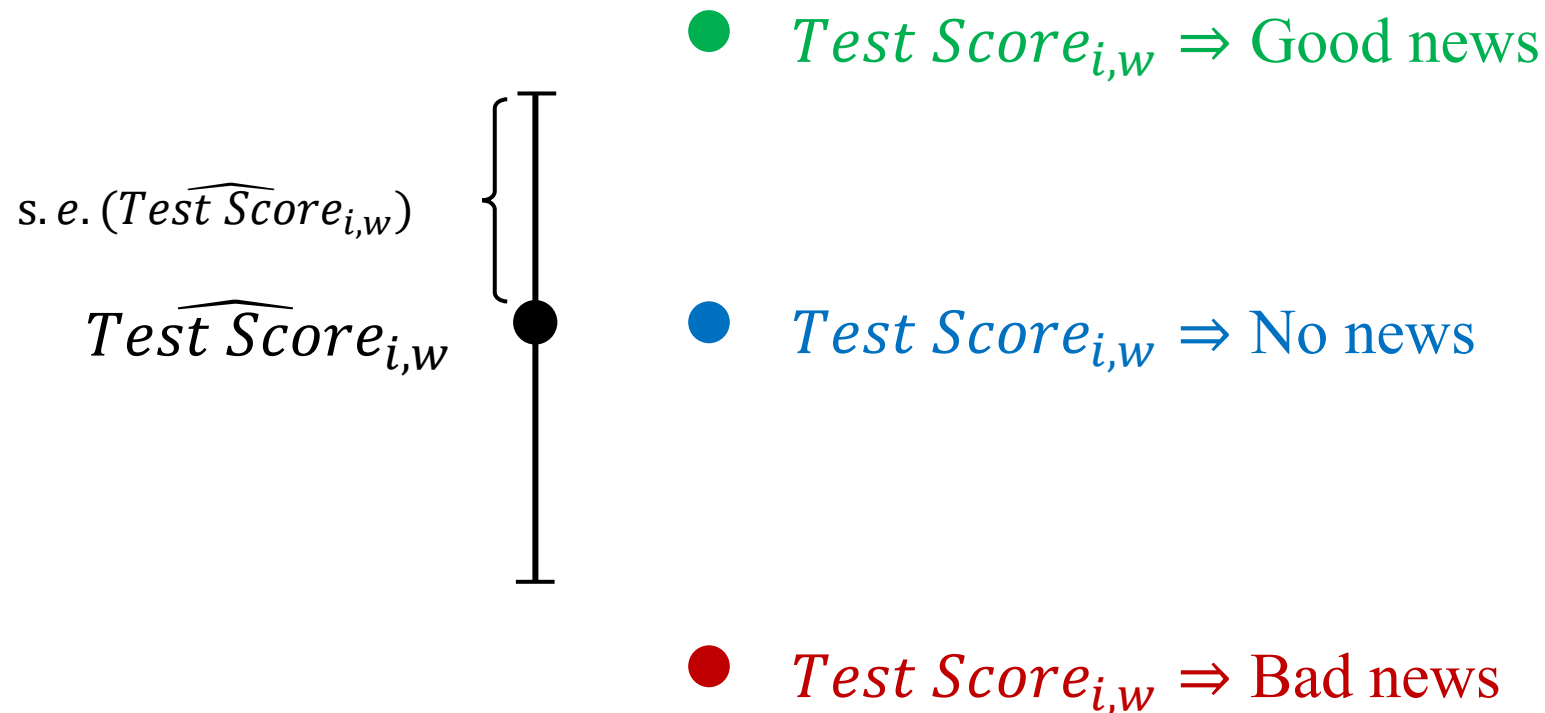
	Test report release	Mean
Parenting style:		
High warmth	0.012 (0.028)	0.72
Strict monitoring	-0.012 (0.025)	0.75
Minutes per day of child time in:		
Educational activities	13.328 (12.669)	283
Leisure	-21.114* (12.558)	304
Sleeping & personal care	6.415 (5.885)	638
Other activities	2.797 (7.479)	216

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

$$\widehat{Test\ Score}_{i,w} = f(\widehat{Test\ Score}_{i,w-1}, \widehat{Perceived\ Assessment}_{i,w-1}, \theta_{Region}, \theta_w)$$



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 (0.083)	-0.122** (0.057)	-0.168* (0.089)
Parent's satisfaction with child school [1-5]	-0.119 (0.074)	-0.054 (0.051)	-0.117 (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 (0.279)	-0.174 (0.192)	-0.365 (0.261)
At-home activities per week	-0.470 (0.512)	-0.426 (0.380)	-0.518 (0.579)
Out-of-home activities per month	-0.128 (0.100)	0.031 (0.071)	0.044 (0.111)
Money investments:			
30+ books at home	-0.022 (0.049)	-0.006 (0.035)	-0.051 (0.052)
Has private tutor	0.080** (0.037)	0.055** (0.025)	0.093** (0.038)
Has allowance	-0.068 (0.047)	-0.023 (0.034)	-0.058 (0.048)
# extracurr. activities per week	-0.259* (0.145)	-0.357*** (0.101)	-0.297** (0.144)

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

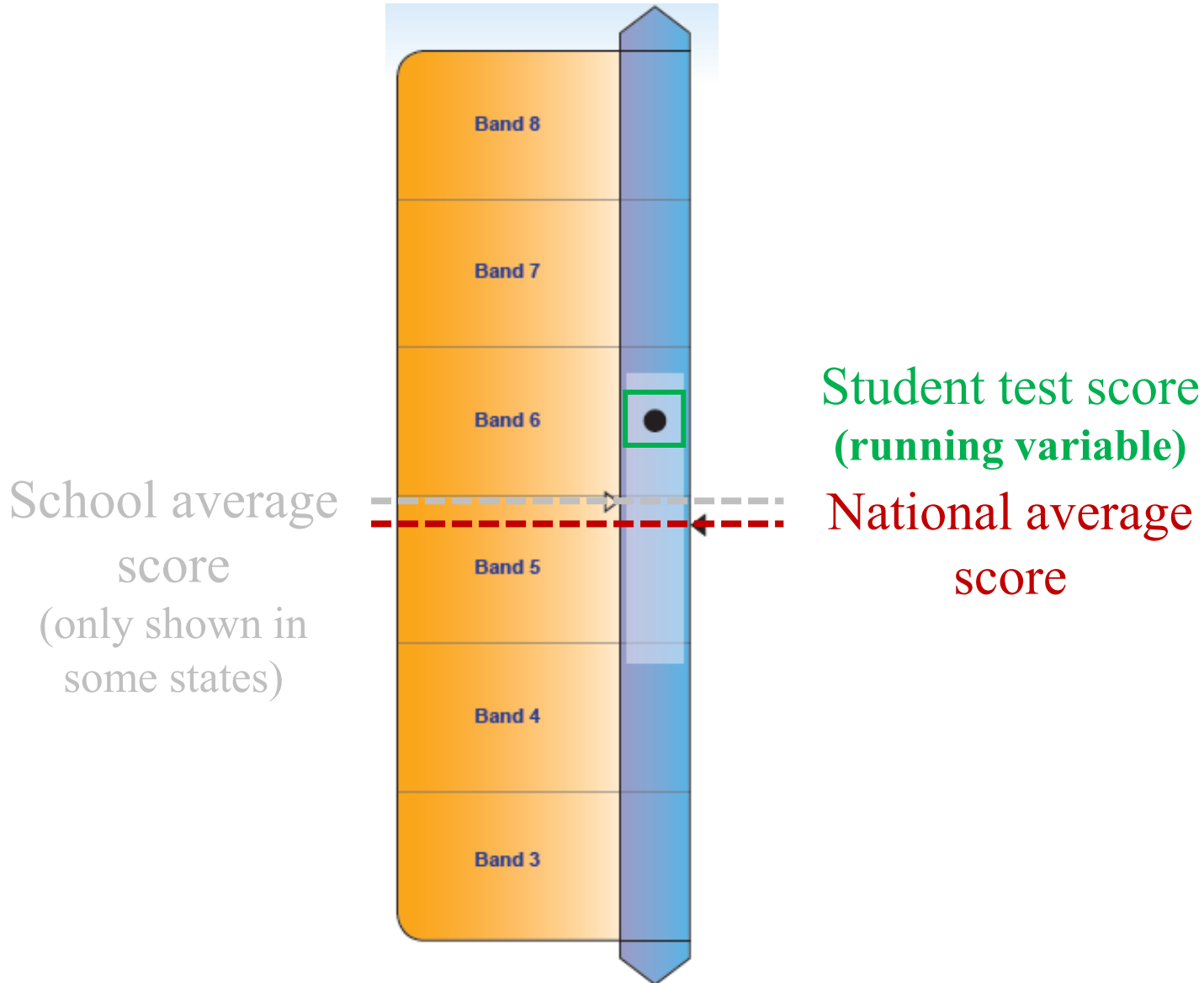
Heterogeneous effects on parenting style and child's time use

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



RD validity:

- Density test
- Balanced on pre-determined characteristics
- Falsification on pre-September interview sample

RD effects on perceptions of achievement and school satisfaction

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

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	above
Parenting style:				
High warmth	-0.098 (0.087)	1,396	21	35
Strict monitoring	0.149* (0.090)	1,437	26	21
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

Discussion

Discussion

- Standardized test reports contain valuable information for parents
- Parent update their perceptions about child achievement and school satisfaction, and increase their educational investments
- This is likely to be welfare-enhancing, if parents are making better informed decisions

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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**

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'.

Parental investments – Time

Variable	Definition
<i>Time spent with child (days/week of activity)</i>	
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.

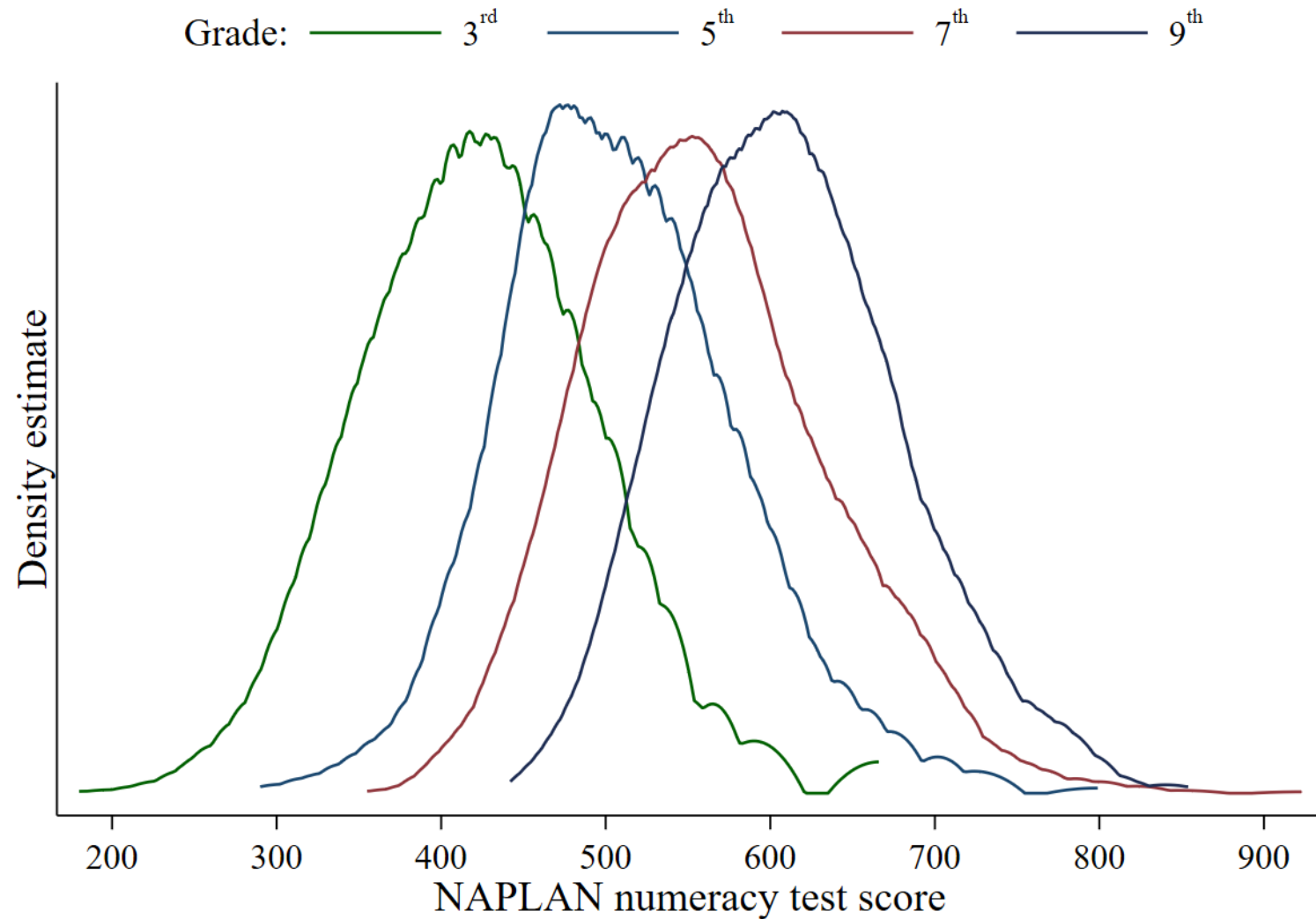
Child **goes out without telling**

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.

NAPLAN Numeracy Distribution over Grades



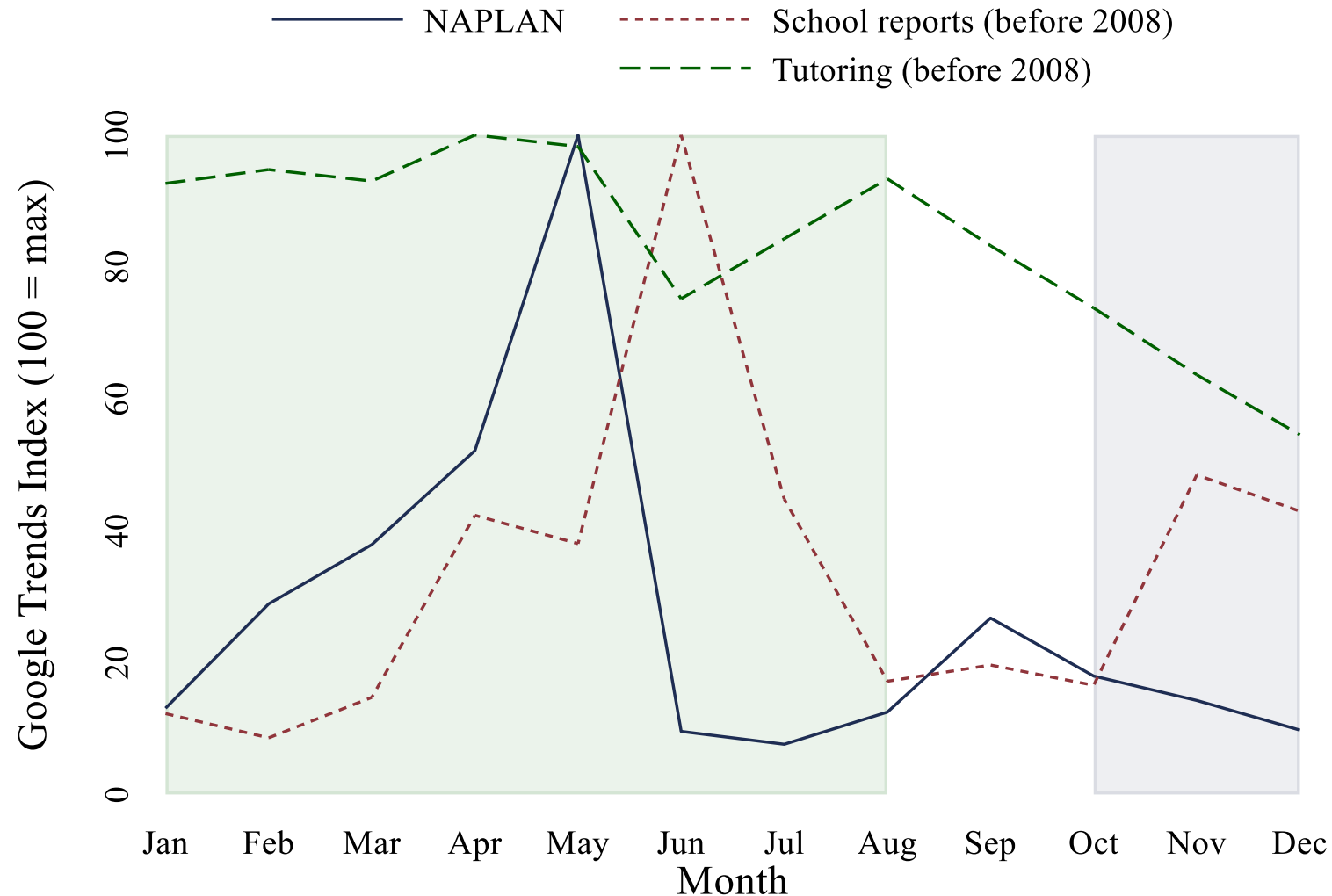
Groups comparable on observable characteristics [\(back\)](#)

	<u>Mean</u>	<u>Test report release</u>
Pre-determined characteristics:		
<i>Waves 3-6</i>		
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:		
<i>Waves 1-2</i>		
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)

Timing of school report and tutoring searches [\(back\)](#)



Heterogeneity by school NAPLAN average shown

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

Heterogeneity by public vs private school

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

Heterogeneity by household income

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

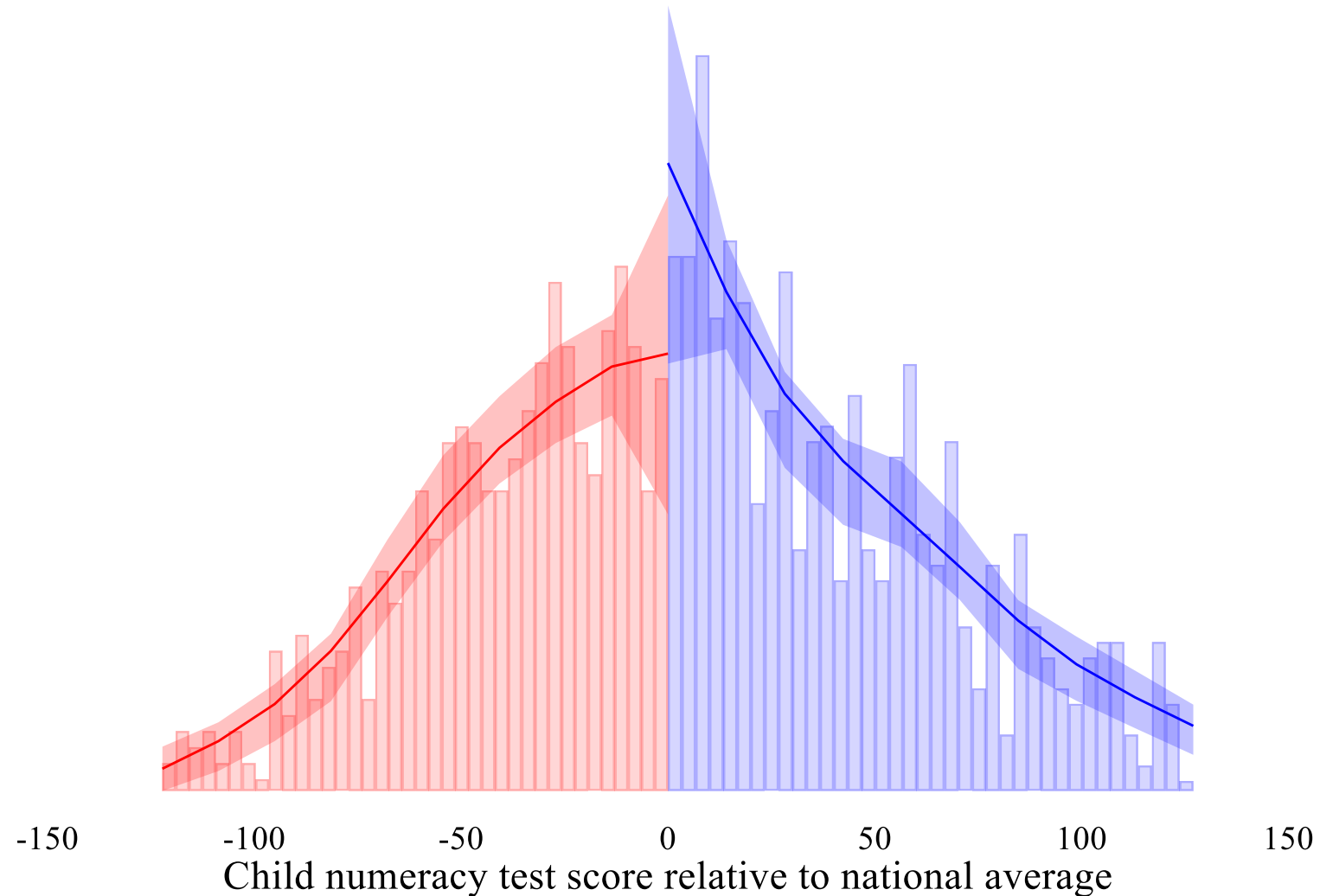
Alternative model of NAPAN news

	Bad news	[30%]
	No news	[60%]
	Good news	[10%]

Child's numeracy scores
in wave w is ...

		< 20 th percentile	20 th - 80 th percentile	> 80 th percentile	Total
Parental beliefs of child achievement relative to school average in wave $w-1$ is...	well below average	42 81%	10 19%	0 0%	52 100%
	below average	209 59%	141 39%	7 2%	357 100%
	at average	794 27%	1,937 67%	177 6%	2,908 100%
	above average	272 9%	2,242 71%	634 20%	3,148 100%
	well above average	139 7%	1,164 59%	682 34%	1,985 100%
Total		1,456 17%	5,494 65%	1,500 18%	8,450 100%

RD density plot of child score vs national avg. [\(back\)](#)



Balancing RD of child score vs national avg. [\(back\)](#)

	BCR RD effect using numeracy scores Child score > Nat. avg	Obs.	CER bandwidth	
			below	above
Child age (in months)	-4.672 (3.731)	1498	39	45
Female child	-0.079 (0.095)	1,498	30	45
Child birth weight (kilograms)	-0.028 (0.105)	1,480	41	50
2 biological parents in household	-0.641 (0.549)	1,498	68	42
Household gross income (AUD/week)	-318.548 (380.294)	1,498	35	37
University-educated parent(s)	-0.077 (0.095)	1,498	30	39
Migrant parent(s)	-0.033 (0.252)	1,498	29	26

Falsification RD of child score vs national avg. [\(back\)](#)

	RD estimates			Bandwidth	
	using numeracy			below	above
	effect	s.e.	Obs.		
Parent's perceptions:					
Child's school achievement	0.008	(0.066)	6808	31	47
Satisfaction with school	0.016	(0.062)	6817	35	40
Time investments:					
Hours per day with parents	-0.140	(0.285)	4,245	30	36
At-home activities per week	0.577	(0.520)	3,332	38	42
Out-of-home activities per month	0.207**	(0.095)	6,819	38	28
Monetary investments:					
30+ books at home	0.001	(0.051)	3,334	31	52
Has private tutor	0.016	(0.040)	4,461	27	39
Has allowance	-0.075	(0.055)	4,539	30	31
Extracurr. activities per week	-0.052	(0.141)	2,613	27	47
Parenting style:					
High warmth	-0.022	(0.041)	6,495	33	36
Strict monitoring	0.010	(0.036)	6,717	34	40
Minutes per day of child time in:					
Educational activities	7.413	(20.002)	4,245	32	52
Leisure	20.741	(22.636)	4,245	22	48
Sleeping & personal care	1.480	(9.809)	4,245	28	45
Other activities	-21.924	(13.978)	4,245	22	48