

(MIS)PERCEPTIONS ABOUT CHILDREN

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Teachers' perceptions about children's cognitive delays

- Family and school investments in children are critical for child development
 - Highest returns in early childhood (ages 0–6)
(Cunha, Heckman, Lochner, Masterov, 2006, Cunha, Heckman, Schennach, 2010)

Key challenge: correctly identifying developmental delays in children

Delay = child less developed compared to **population** of similar-aged children

- Teachers' perceptions inform parents, school administrations, governments
 - Perceptions about children's cognitive skills suffer from **reference group bias**
(Kinsler and Pavan, 2021, Elder and Zhou, 2021)
- **Misperceptions about cognitive delays** → suboptimal family investment choices
(Dizon-Ross, 2019, Kinsler and Pavan, 2021)
 - inequality in child development | persistent delays | misallocation of resources

This paper: Perceptions about non-cognitive skills

- **Non-cognitive skills** are important for labour market outcomes (Deming, 2017), schooling and risky behaviours (Heckman, Stixrud, and Urzua, 2006), marriage stability (Lundberg, 2015), and health (Conti, Heckman, Pinto, 2015)
- Teachers critical for recognizing delays: no standardized tests
 - Potential bias in perceptions of non-cognitive skills (Elder and Zhou, 2021)

Research questions:

1. Do teachers perceive non-cognitive and cognitive delays relative to average non-cognitive development of other children in the neighbourhood?
2. Are teachers' perceptions about non-cognitive delays transmitted to mothers?
3. How do teachers/mothers perceptions relate to school/home environment?

3 key findings

1. Quantify the role of average neighbourhood child development in teachers' perceptions of *non-cognitive and cognitive* delays for children ages 4-5
 - Use *objective measures of non-cognitive* and cognitive skills in Longitudinal Study of Australian Children (LSAC)

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- Use *objective measures of non-cognitive* and cognitive skills in Longitudinal Study of Australian Children (LSAC)
- Conditional on children's objective development measures
 - ↓ neighbourhood non-cognitive development → ↓ reporting of all delays
 - ↓ neighbourhood cognitive development → ↓ reporting of cognitive delays (Kinsler and Pavan, 2021, Elder and Zhou, 2021)

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 - Early Childhood Education: Teachers with college degrees are more likely to report delays for children with low objective development measures.

This paper: 3 key findings

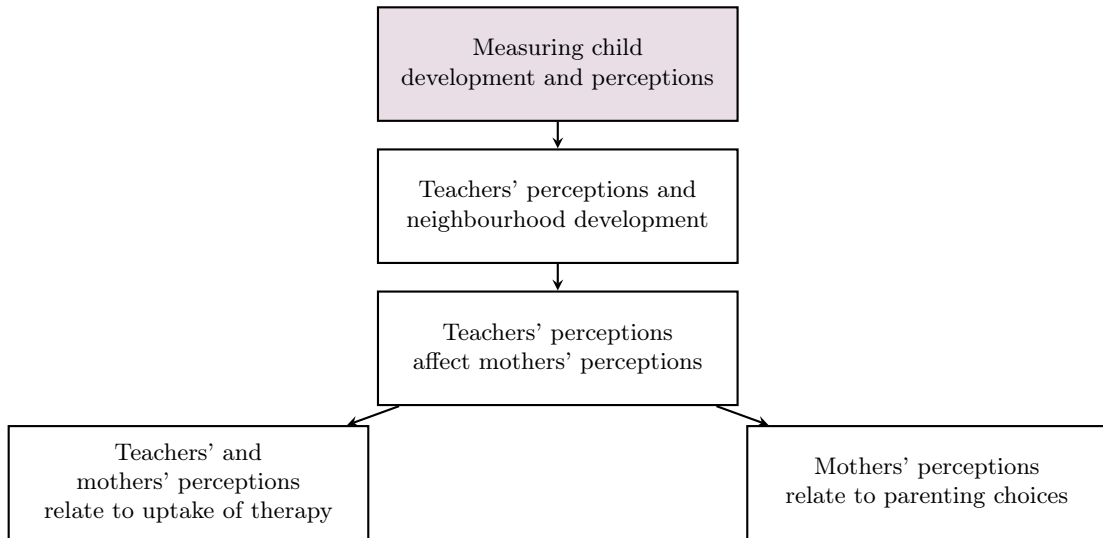
2. Document the relationship between teachers' and mothers' perceptions about children's *non-cognitive* skills for children ages 4-5 and 8-9
 - Mothers contacted by schools about their children's behaviour update their perceptions about children's non-cognitive delays

This paper: 3 key findings

2. Document the relationship between teachers' and mothers' perceptions about children's *non-cognitive* skills for children ages 4-5 and 8-9
 - Mothers contacted by schools about their children's behaviour update their perceptions about children's non-cognitive delays
3. Consequences of misperceptions for *child environment*
 - Underestimation of delays in child non-cognitive and cognitive development development by teachers and mothers → underinvestment in therapy
 - Overestimation of delays in child non-cognitive development by mothers → lower quality of parent-child interactions and lower educational aspirations

Literature and contribution

- Misperceptions about children's human capital
(Kinsler and Pavan, 2021, Elder and Zhou, 2021, Dizon-Ross, 2019, Boneva and Rauh , 2018, Attanasio, Cunha, and Jervis, 2019, Kiessling, 2021)
 - Quantify teachers' reference bias for both non-cognitive & cognitive delays
- Impact of early childhood teacher | program qualities on children's outcomes
(Chetty, Friedman, Hilger, Saez, Schanzenbach, and Yagan, 2011, Heckman, Pinto, and Savelyev, 2013, Manning, Wong, Fleming, and Garvis, 2019)
 - Explore the role of teacher and classroom characteristics in delay recognition
- The role of teachers' for parents' perceptions about children's cognition
(Dizon-Ross, 2019, Doss, Fahle, Loeb, and York, 2019, Bergman, 2021)
 - Focus on the transmission of information about non-cognitive skills
- Drivers of inequality in parenting across neighbourhoods/socioeconomic status
(Attanasio, Cattani , Meghir, 2021, Kautz, Heckman, Diris, Weel, Borghans, 2014, Falk, Kosse, Pinger, Schildberg-Hörisch, Deckers, 2023)
 - Focus on the role of neighbourhood-related information frictions



Data: LSAC - B(aby) and K(inderergarten) cohorts

Following 10000 children starting from ages 0-1 and 4-5 in 2004 biennially

- Pool children from both cohorts when they are ages 4-5 and 8-9
- Objective interview measures: children's non-cognitive | cognitive skills
- Teachers' & mothers' perceptions: children's non-cognitive | cognitive delays
- School and home environments of children

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- School and home environments of children
- **Neighbourhood = postcode** (over 3,000 in Australia) [map](#) [detailed map](#)
 - **Sample** = random draw of 409 postcodes (~ 37 children per postcode)
 - Example: two postcodes in Sydney
 - 2006 Merrylands $\sim 5,319$ families | median weekly household income \$873
 - 2006 Putney ~ 886 families | median weekly household income \$1,715

Interviewer-evaluated objective measures of child development

- Psychologists trained interviewers to
 - conduct cognitive tests
 - conduct direct observations of non-cognitive skills
- Assessments of cognitive and non-cognitive skills used objective scales.
 - Non-cognitive skills: count of the number of times and intensity of attitudes
(Review of Observational Methods in ADHD diagnosis - Platzman, et al., 1992)
- *“All interviewers received two weeks of intensive training across procedures.”*
(LSAC – Data User Guide)
“A large part of the training involved practice interviews, with one day devoted to interviews with parents and children.” (LSAC – Data User Guide)

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Advantages of interview measures of development:

- Training + objective scale → designed to limit bias in assessments
- Available for a large, nationally representative sample

Interviewer-evaluated development: non-cognitive | cognitive scores

- **Non-cognitive score** (ages 4-5 and 8-9): first principal component of 3 interview direct observations measures
(in-person interview lasted 1 - 2.5 hours with and without the parent present)
 1. *Positive*: smiling, laughing, or sounding excited, happy, or pleased
 2. *Negative*: fussing, pouting, whining, crying, vocal/physical expression of anger
 3. *Focus*: To what degree did the child remain focused on the PPVT tasks?
 - ▶ Detects children in the left tail of non-cognitive skill distribution density plot

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 - ▶ Detects children in the left tail of non-cognitive skill distribution density plot
- **Cognitive score** (ages 4-9): Peabody Picture Vocabulary Test (receptive language)
 - Who Am I test (ages 4-5) used to address measurement error (language and numeracy abilities)

Teachers' and mothers' perceptions: non-cognitive | cognitive delays

- Perceptions match developmental dimensions measured in interview
- **Teachers** evaluate children ages 4-5 *compared to children of similar age*
 - Non-cognitive delays - social/emotional development
 - Cognitive delays - receptive language development
- Teacher reports delay = child is much less | less competent than other children

Teachers' and mothers' perceptions: non-cognitive | cognitive delays

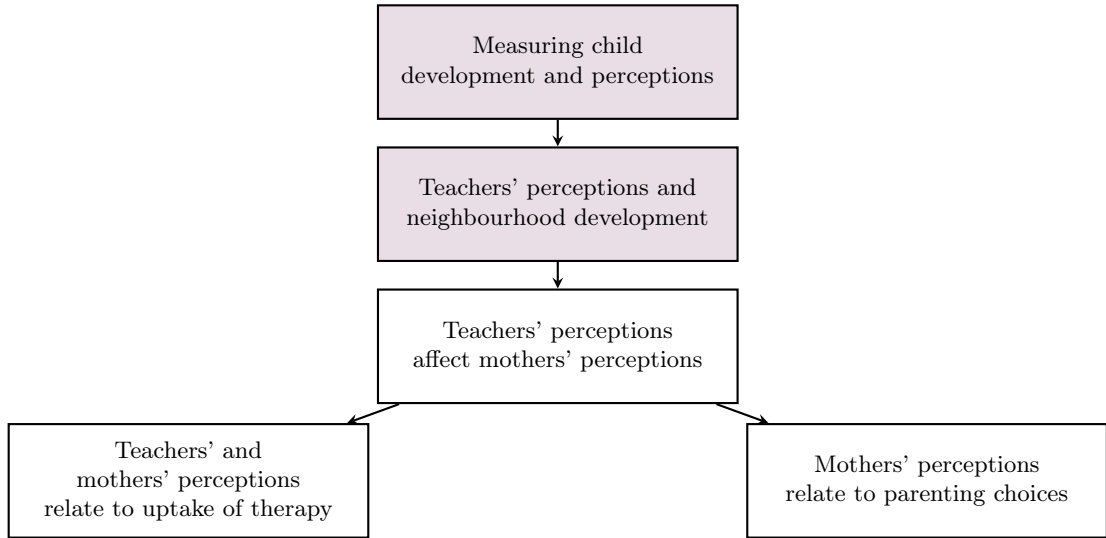
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 - **Non-cognitive delays** - social/emotional development
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- Teacher reports delay = child is much less | less competent than other children
- **Mothers** evaluate children ages 0-15 *compared to children of a similar age*
 - **Non-cognitive delays:**

Overall, compared to other children of the same age, do you think your child is?
1 Easier than average; 2 About average; 3 More difficult than average
- Mothers report non-cognitive delays: child is more difficult than average

Average neighbourhood development: Computation

- Construct leave-one-out measure of neighbourhood child development (same age, both cohorts):
 1. De-mean objective interview measures by year and age group
 2. Average neighbourhood child development = the average de-meaned measure for children from the same postcode as child i excluding child i
 3. Standardize within age groups to match the scale of child development scores

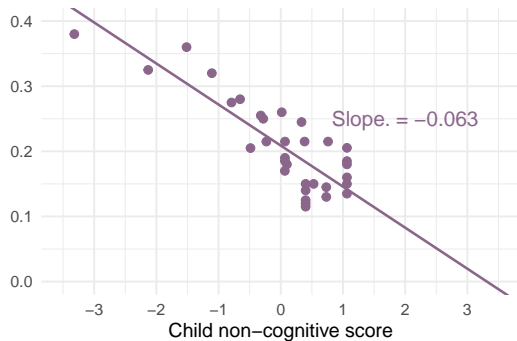
Roadmap: Teachers' perceptions



Teachers' and mothers' perceptions are informed by child development

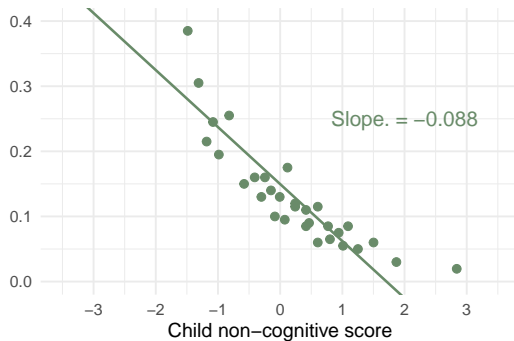
- \uparrow measured development = \Downarrow likelihood teachers or mothers indicate delay

(a) Share teachers: non-cognitive delays



mother

(b) Share teachers: cognitive delays



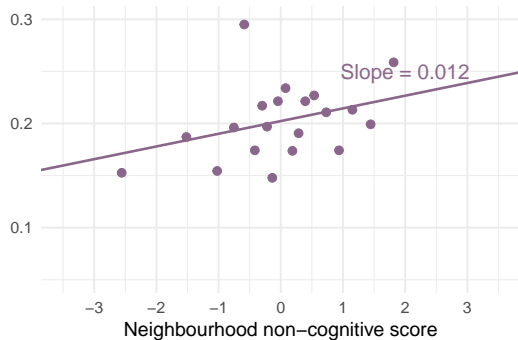
Teachers' and mothers' perceptions are biased by local environment

- \uparrow neighbourhood development score = \uparrow child own development score

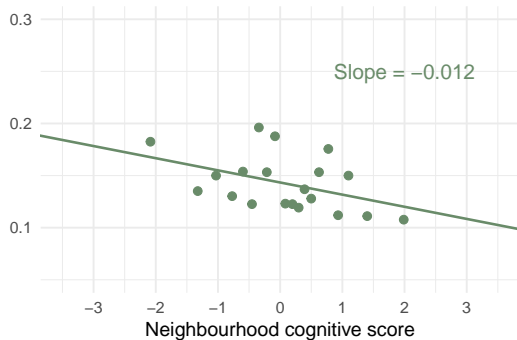
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child

mother

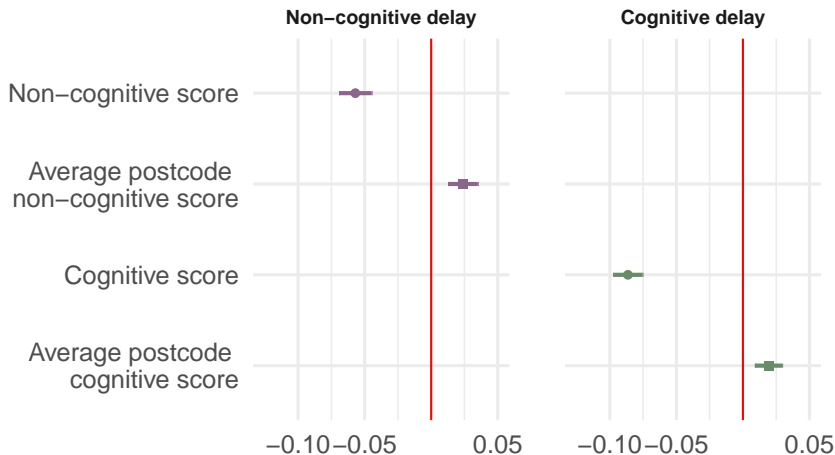
Estimation: Teacher perceptions and local environment

$$T_{it} = \beta^{T,N} \bar{D}_{it}^N + \beta^{T,D} D_{it}^I + \gamma_t^{T,X} X_{it}^T$$

- T_{it} - teacher reports delay for child i at age 4-5
- D_{it}^I - child interview development score
- \bar{D}_{it}^N -neighbourhood average development
- X_{it}^T - **Control variables:**
 - child's gender child's cohort child's age in months
 - family socioeconomic status (SES) index

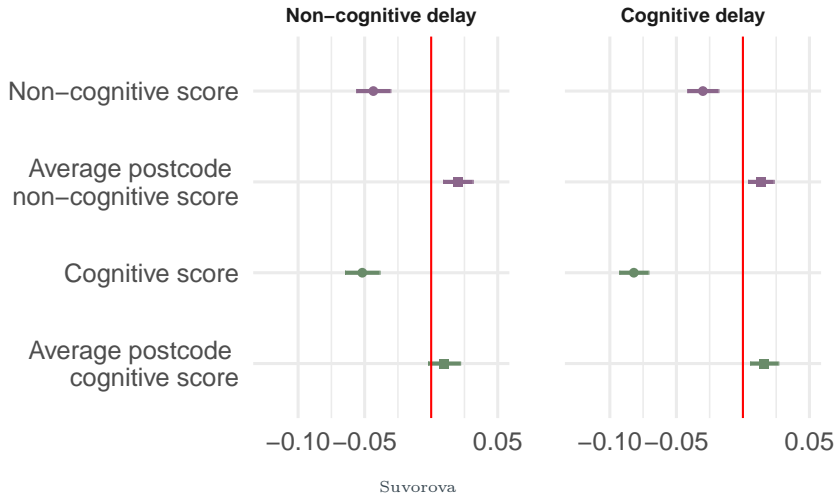
Reference bias: perceptions about non-cognitive and cognitive delays

Estimated regression coefficients $\beta^{T,D}$ and $\beta^{T,N}$ [table](#)



Reference bias: Cross-influence of developmental dimensions

Estimated regression coefficients [table](#)



Robustness checks

1. Confounding factors:

- Interview efforts
 - ▶ behaviour of parents and siblings during the interview
 - ▶ sleeping problems
 - ▶ interview months
- Selection of teachers
 - ▶ teacher and classroom characteristics

2. Measurement error in interview scores \rightarrow distorts coefficients towards zero

- TSLS adjustment for measurement error (Agostinelli and Wiswall, 2016)

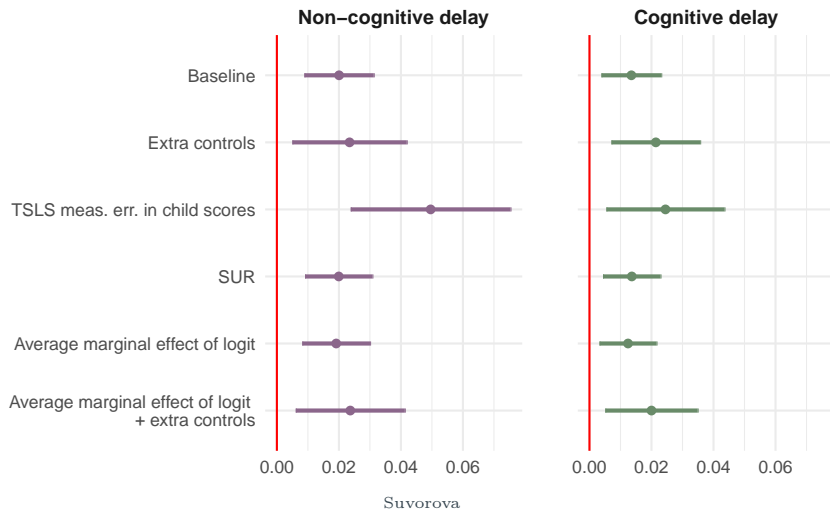
3. Correlated errors in perceptions: Seemingly unrelated regression specification

4. Sensitivity to functional form

- Linear probability model vs average marginal effects of the logistic model

Robustness checks: Average neighbourhood non-cognitive score

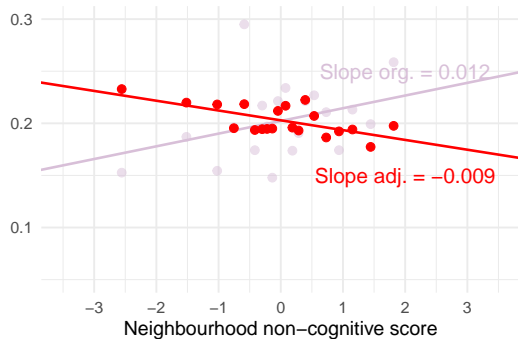
95% CI estimated $\beta^{T,N}$ for average neighbourhood non-cognitive development cognitive



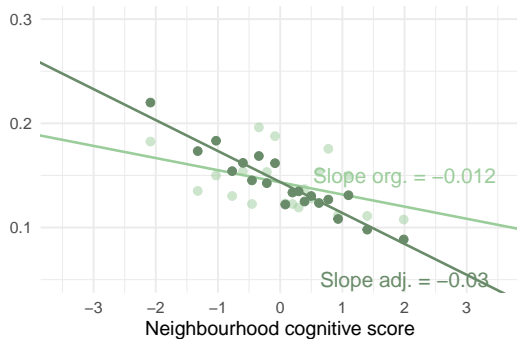
Teachers' perceptions adjusted for bias

- I adjust for reference bias component in perceptions
 - Predict probability of reporting delay at mean neighbourhood development

(a) Adj. share teachers: non-cognitive delays



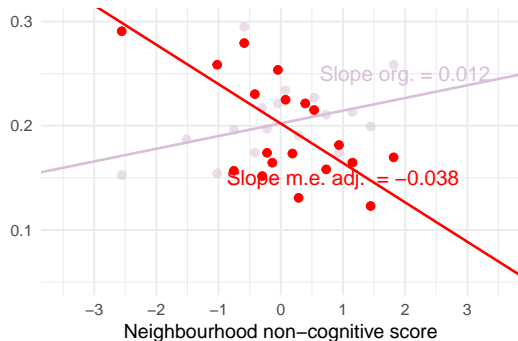
(b) Adj. share teachers: cognitive delays



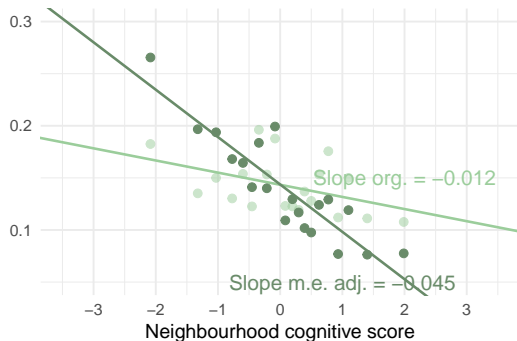
Teachers' and perceptions adjusted for bias

- I adjust for reference bias component in perceptions
 - Predict probability of reporting delay at mean neighbourhood development **using estimates adjusted for measurement error in child scores**

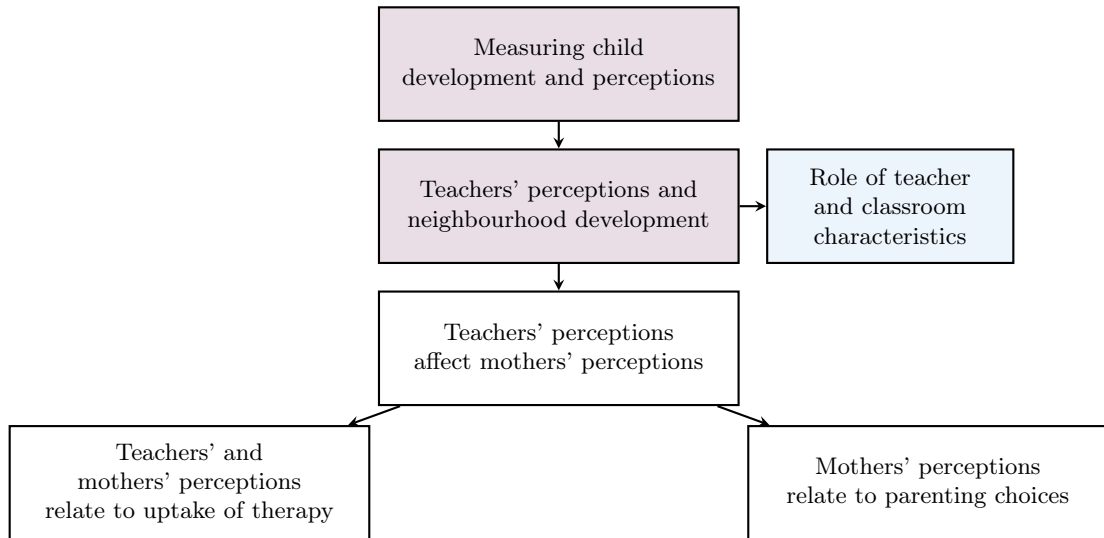
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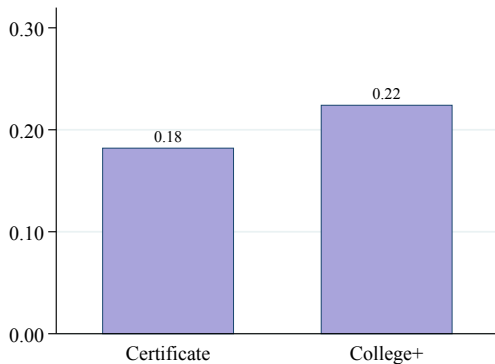
Roadmap: Teacher and classroom characteristics and perceptions



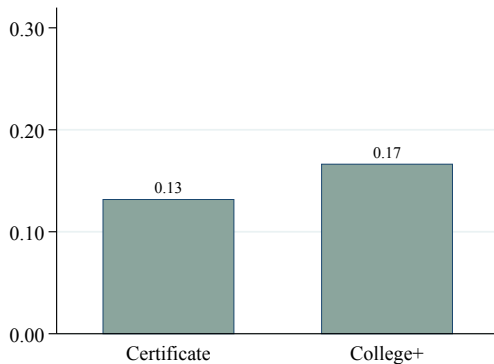
College-educated teachers more likely to report delays

Probability to report delays by teacher's education

(a) Share teachers: non-cognitive delays



(b) Share teachers: cognitive delays

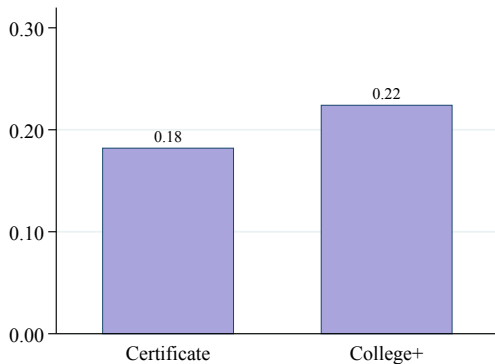


- College-educated teachers report more delays

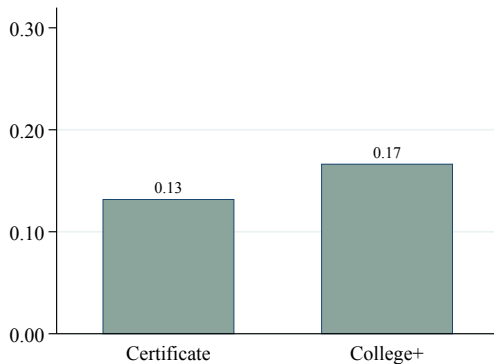
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(a) Share teachers: non-cognitive delays



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- College-educated teachers report more delays **for the right children?**

Estimation: Teachers' quality and deficit recognition

1. Split children into **high/low measured development** subsamples:
 - Low measured development = interview development measure below median
2. Estimate linear probability regression separately for subsamples $j = \{H, L\}$

$$T_{i,t} = \beta^{j,V} V_{i,t}^T + \gamma_t^{j,X} X_{i,t}^T$$

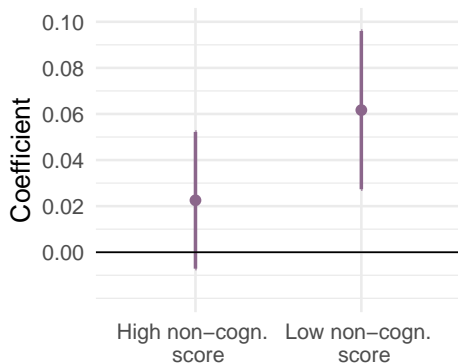
- $V_{i,t}^T$ are observed teachers' quality characteristics:
 - ▶ level of education (bachelors or postgraduate vs certificate or diploma)
 - ▶ experience in the childcare setting (0-5 and 6-10 years vs 11+ years)
 - ▶ childcare arrangement (daycare vs pre-school or kindergarten)
 - ▶ class size children to qualified staff ratio)
 - ▶ age range (age of oldest and youngest in class)

Educated teachers are more likely to report delays in low-skill children

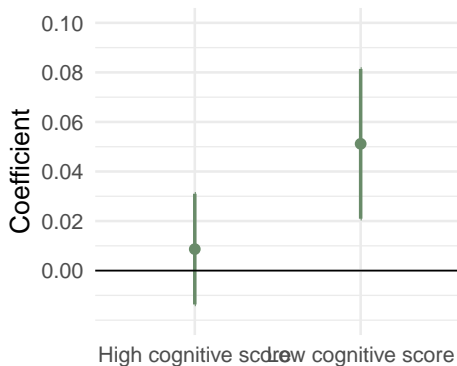
- \uparrow education \rightarrow \uparrow reports of delays for children with low measured development
 - both for cognitive and non-cognitive skill [full table](#) [bias by educ](#)
 - Reason: Stronger relationship between measured cognitive skills and perceptions

Estimated coefficient for teacher's level of education: College+

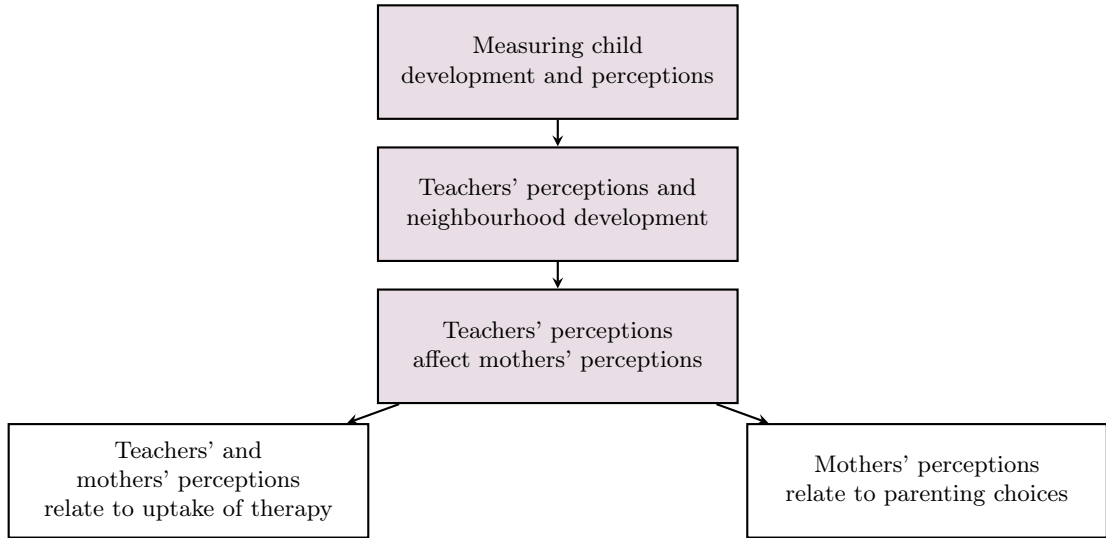
(a) Report of non-cognitive delays



(b) Report of cognitive delays



Roadmap: Mothers' perceptions



Estimation: Mothers' and teachers' perceptions (ages 4-5 and 8-9)

$$\underbrace{M_{it}}_{\substack{\text{mother reports} \\ \text{non-cognitive delay}}} = \alpha^{M,D} D_{it}^I + \underbrace{\alpha^{M,T} T_{i,t}}_{\substack{\text{teacher reports} \\ \text{delay}}} + \alpha^{M,X} X_{it}^M + \alpha^{M,M'} M_{it-1}$$

$T_{i,t}$ - measures of teachers' perceptions about delays

- - Ages 0-4: teacher's reports of non-cognitive and cognitive delays
 - **Ages 8-9: Measure of teacher-to-parent communication**
School has contacted parents about child's behavior within the last 12 months
- $X_{i,t}^M$ - **Control variables:**

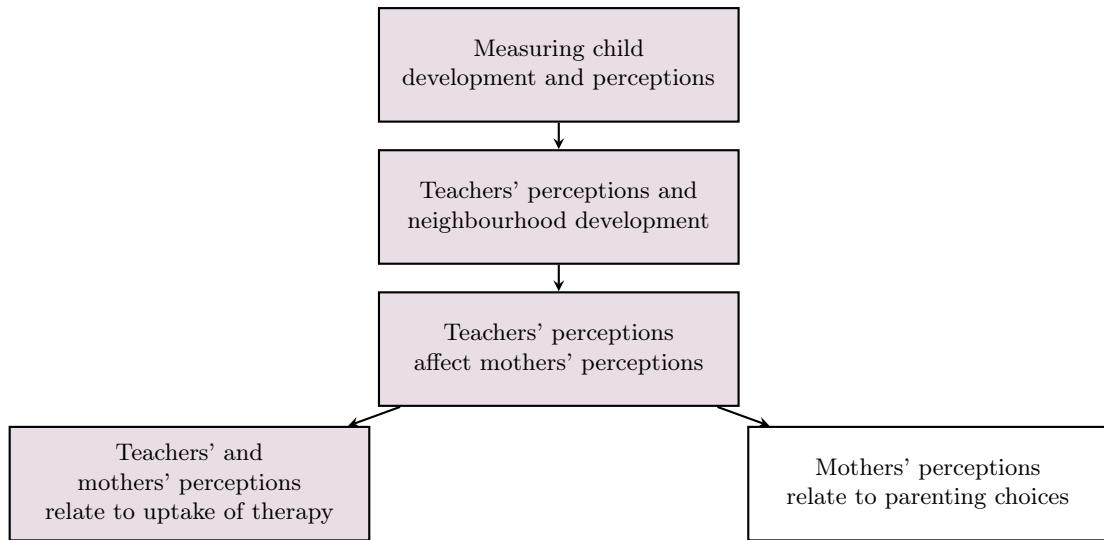
child's gender	child cohort	age in months
SES index	<i>mother's depression</i>	<i>mother's involvement at school (ages 8-9)</i>

Teacher's perceptions affect mother's perceptions

	Non-cognitive delay perceived by mother	
	Ages 4-5	Ages 8-9
Teacher: Non-cognitive delay	0.08* (0.02)	
Teacher: Cognitive delay	0.02 (0.02)	
School contacted about behavior		0.11* (0.01)
Non-cognitive score	-0.02* (0.01)	-0.01* (0.00)
Cognitive score	0.00 (0.01)	-0.01 (0.00)
N	2228	5561

* 5% significance level.

Roadmap: School environment



Estimation: Perceptions and school environment

- School-based investments - child received therapy $I_{i,t}^S$:
 - directed at *non-cognitive skills*:
 - ▶ behavioural therapy
 - ▶ psychological evaluation
 - ▶ guidance counsellor
 - ▶ other psychiatric and behavioural services
 - directed at *cognitive skills*:
 - ▶ learning support
 - ▶ speech therapy

$$I_{i,t}^S = \beta^{S,M} M_{it} + \beta^{S,T} T_{it} + \beta_t^{S,X} X_{it}^S$$

- X_{it}^S - **Control variables:**

child's gender

child's cohort

child's age in months

SES index

neighbourhood characteristics

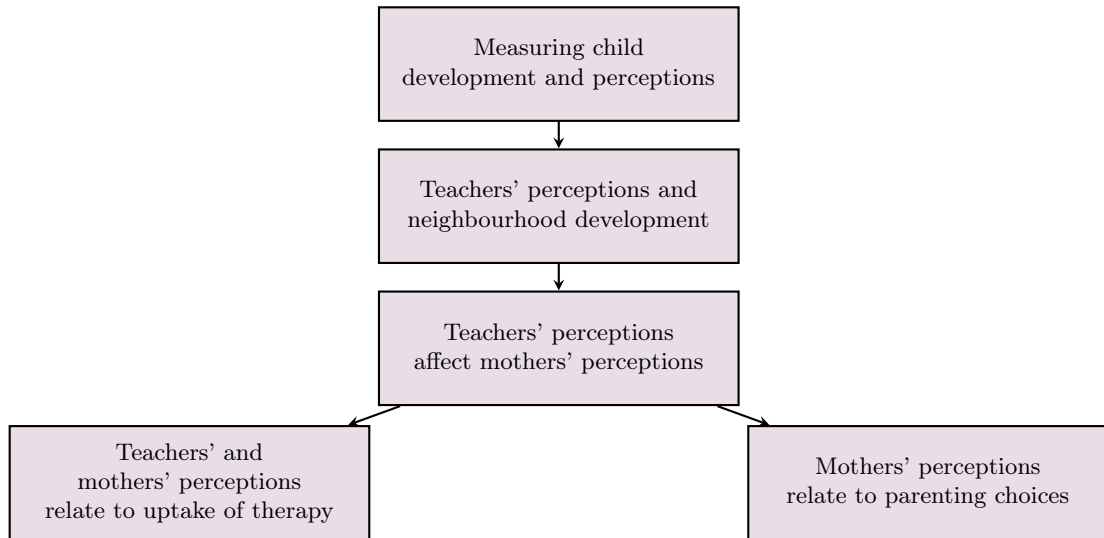
Children with perceived delays more likely to use therapy

- Perceived non-cognitive delays \rightarrow \uparrow use of both therapy types
- Perceptions of cognitive delays by teachers \rightarrow \uparrow use of cognition therapy

	Behavioral or psych therapy	Learning or speech therapy
Teach.: Non-cognitive delay	0.07* (0.01)	0.07* (0.02)
Teach.: Cognitive delay	0.01 (0.01)	0.15* (0.02)
Moth.: Non-cognitive delay	0.15* (0.02)	0.10* (0.03)
Moth.: Concern cognitive	0.06* (0.02)	0.21* (0.03)
N	4104	4104

* 5% significance level.

Roadmap: Home environment



Estimation: Perceptions and home environment

- Family-based investments ($I_{i,t}^F$):

$$I_{i,t}^F = \beta^{F,M} M_{it} + \beta_t^{F,X} X_{it}^F + \beta^{F,M'} M_{it-1} + \beta^{F,I} I_{i,t-1}^F$$

- X_{it}^F - **Control variables:**

child's gender	child's cohort	child's age in months
SES index	neighbourhood characteristics	mothers' depression

- Control for unobserved heterogeneity
 - ▶ Lag of perceptions $M_{it-1} \sim$ idiosyncratic perceptions
 - ▶ Lag of investment $I_{it-1} \sim$ idiosyncratic preferences

Mothers reporting delays reach out for professional help

- Mothers who perceive non-cognitive delays
 - hire more tutoring for children \uparrow 0.1 times per week
 - are more likely to use community educational resources:
 - ▶ use parenting education courses \uparrow 3 p.p.
 - ▶ need parenting education courses \uparrow 5 p.p.
 - ▶ use parent support groups|helplines \uparrow 4 p.p.
 - ▶ use child health|wellbeing information from phone|internet \uparrow 4 p.p.

table

by mom educ

Mothers reporting delays have lower quality of parent-child interactions

- Mothers who perceive non-cognitive delays:
 - engage in **more hostile interactions**:
 - ▶ more likely to tell their child that they are not as good as others \uparrow 9 p.p.
 - ▶ more likely to raise voice or shout at the child \uparrow 0.57 SD
 - ▶ more likely to lose temper with the child \uparrow 0.57 SD
 - engage in **less warm interactions**:
 - ▶ less likely to often display physical affection with their child \downarrow 5 p.p.
 - ▶ less likely to often tell their child how happy he/she makes them \downarrow 7 p.p.
 - have **lower educational aspirations** for their children:
 - ▶ less likely to expect that the child will receive a university degree \downarrow 9.4 p.p.

table

by mom educ

- Teachers' perceptions about children's non-cognitive & cognitive delays biased relative to average level of neighbourhood non-cognitive development.
 - Early Childhood Education:
More educated teachers are more likely to recognize deficits in children with low objective measures of development.
- Teachers' perceptions affect mothers' perceptions.
- Children with perceived delays are more likely to use therapy.
- Mothers who perceive child deficits have a lower quality of parenting but are more likely to reach out for professional help.
- **Policy implication:**
 - Training improves the recognition of children's developmental trajectories.

Mothers reporting delays have lower quality of parent-child interactions

	Phys. affection ind: often +	Tell happy ind: often +	Tell bad ind: > never	Exp. coll+ ind	Lose temper SD	Shout SD
Mother: Non-cognitive delay	-0.05* (0.02)	-0.07* (0.02)	0.09* (0.02)	-0.09* (0.02)	0.57* (0.10)	0.57* (0.09)
N	6561	6583	6574	6186	2891	2898

* 5% significance level.

TSLS

main

Mothers reporting delays have lower quality of parent-child interactions

Effect of perceived non-cognitive delay by mothers' education

	Mother Warmth		Mother Anger		Exp. coll+	
	Coll+	No coll	Coll+	No coll	Coll+	No coll
Mother: non-cognitive delay	-0.12 (0.07)	-0.21* (0.07)	0.56* (0.07)	0.61* (0.08)	-0.07 (0.04)	-0.09* (0.03)
N	2381	3117	2380	3116	2299	2929

Control: lag perceptions, lag investment, mother's depression, neighbourhood ch-s, family income, number of children, mother's age, mother's employment, two-parent household, household language - English, child's gender, child's age, child's cohort.

5% significance level.

Mothers reporting delays reach out for professional help

	Parent educ. ind: use	Parent educ. ind: need	Support groups helpline ind: use	Child health info ind: use	Tutor weekly times
Mother: Non-cognitive delay	0.03* (0.01)	0.05* (0.02)	0.04* (0.01)	0.05* (0.02)	0.10* (0.03)
N	6503	3690	6503	3690	3570

* 5% significance level.

main

Mothers reporting delays reach out for professional help

Effect of perceived non-cognitive delays, by mothers' education

	Tutoring		Use educ		Need educ		Use support		Use info	
	Coll+	No coll	Coll+	No coll	Coll+	No coll	Coll+	No coll	Coll+	No coll
Mother: non-cognitive delay	0.19*	0.04	0.07*	-0.03	0.07	-0.02	0.05*	0.04	0.05	0.04
	(0.06)	(0.06)	(0.03)	(0.01)	(0.04)	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)
N	1349	1624	2376	3108	1401	1666	2376	3108	1401	1666

Control: lag perceptions, lag investment, mother's depression, neighbourhood ch-s, family income, number of children, mother's age, mother's employment, two-parent household, household language - English, child's gender, child's age, child's cohort.

5% significance level.

main

Children with perceived delays more likely to use therapy

Effect of perceived delays, by mothers' education main

	Behavioral or psych therapy		Learning or speech therapy	
	Coll+	No coll	Coll+	No coll
Teach.: Non-cognitive delay	0.05* (0.02)	0.08* (0.01)	0.07* (0.03)	0.08* (0.02)
Teach.: Cognitive delay	0.05 (0.03)	0.01 (0.01)	0.19* (0.04)	0.17* (0.03)
Moth.: Non-cognitive delay	0.17* (0.04)	0.16* (0.03)	0.10* (0.04)	0.16* (0.04)
Moth.: concern Cognitive	0.10* (0.04)	0.03 (0.02)	0.23* (0.05)	0.22* (0.04)
N	1820	2438	1820	2438

Control: neighbourhood ch-s, family income, number of children, mother's age, mother's employment, two-parent household, household language - English, child's gender, child's age, child's cohort. * 5% significance level.

Reference bias: perceptions about non-cognitive and cognitive delays

	Non-cognitive delay	Cognitive delay
Neighbourhood non-cognitive score	0.02* (0.01)	
Non-cognitive score	-0.06* (0.01)	
Neighbourhood cognitive score		0.02* (0.01)
Cognitive score		-0.09* (0.01)
N	5520	5270

* 5% significance level.

graph

Reference bias: Cross-influence of developmental dimensions

	Non-cognitive delay	Cognitive delay
Neighbourhood non-cognitive score	0.02* (0.01)	0.01* (0.00)
Non-cognitive score	-0.04* (0.01)	-0.03* (0.01)
Neighbourhood cognitive score	0.01 (0.01)	0.02* (0.01)
Cognitive score	-0.05* (0.01)	-0.08* (0.01)
N	5258	5254

* 5% significance level.

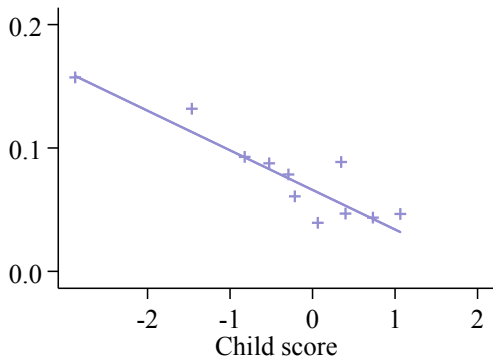
graph

Mothers perceptions are informed by child development

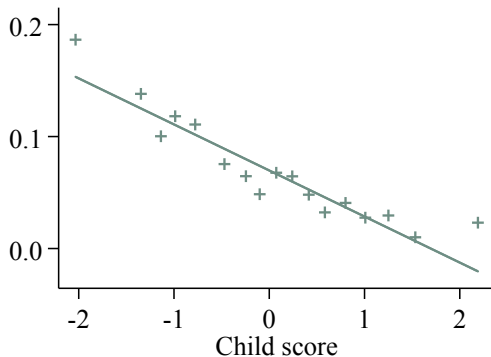
- \uparrow measured development = \downarrow lower likelihood that mothers indicates delay

main

(a) Share mothers: socio-emotional delays



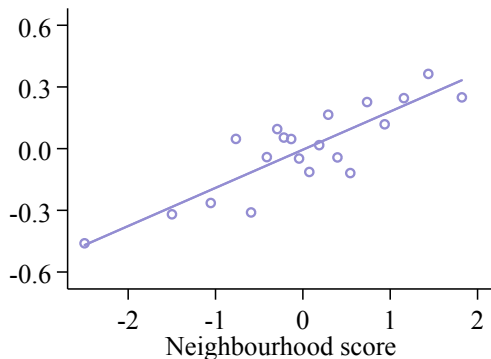
(b) Share mothers: receptive language concerns



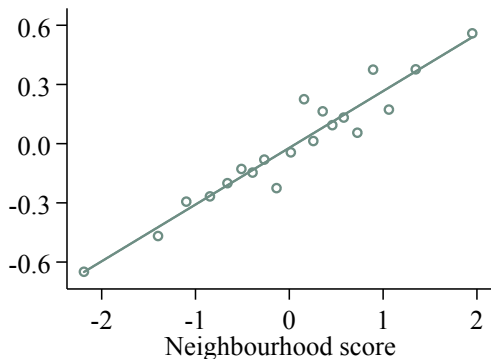
Children in less developed neighbourhoods have lower own development

- \uparrow average development of other children in the neighbourhood = \uparrow higher average development score main

(a) Socio-emotional score



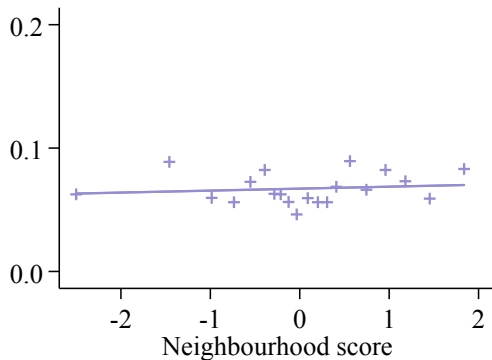
(b) Receptive language score



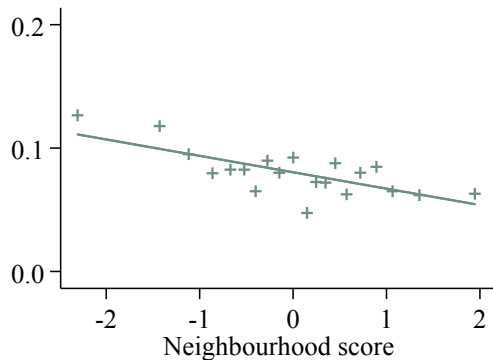
Mothers' perceptions and local environment

main

(a) Share mothers: socio-emotional delays



(b) Share mothers: receptive language concern



Robustness checks

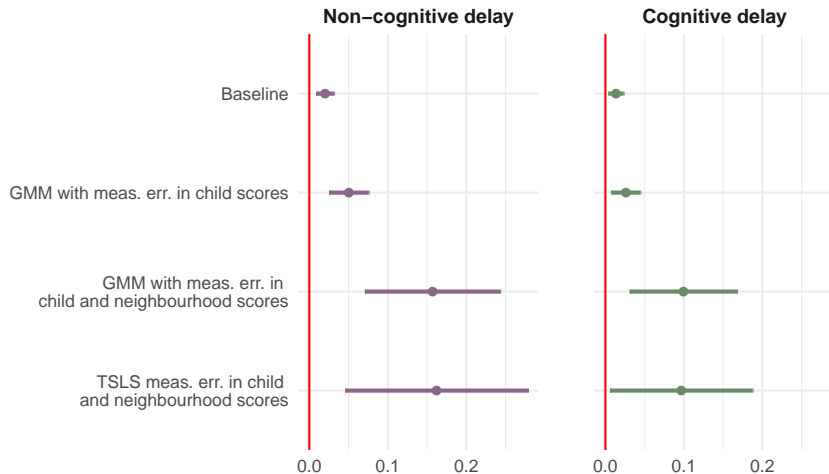
	Non-cognitive delay			Cognitive delay								
	Logit	Avg. Marg. Effect	Extra control	Meas. error adj.	Logit	Avg. Marg. Effect	Extra control	Meas. error adj.				
Neighbourhood non-cognitive score	0.019*	(0.006)	0.023*	(0.009)	0.050*	(0.013)	0.012*	(0.005)	0.021*	(0.007)	0.025*	(0.010)
Non-cognitive score	-0.037*	(0.006)	-0.033*	(0.011)	-0.386*	(0.112)	-0.023*	(0.005)	-0.030*	(0.010)	-0.161	(0.087)
Neighbourhood cognitive score	0.010	(0.006)	0.007	(0.010)	0.003	(0.018)	0.017*	(0.005)	0.011	(0.009)	0.030*	(0.013)
Cognitive score	-0.050*	(0.006)	-0.074*	(0.011)	-0.045	(0.067)	-0.077*	(0.005)	-0.089*	(0.011)	-0.155*	(0.052)
N	5258		1939		5215		5254		1939		5211	

* 5% significance level.

main

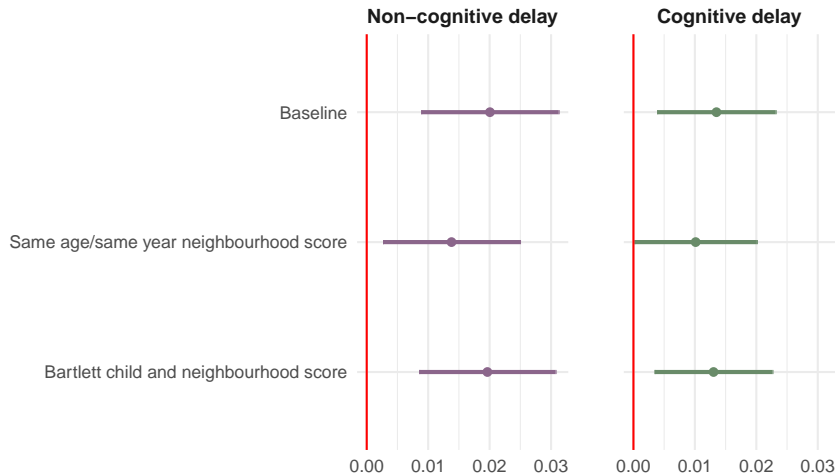
Measurement error in child | neighbourhood development

95% CI estimated $\beta^{T,N}$ for average neighbourhood non-cognitive development main



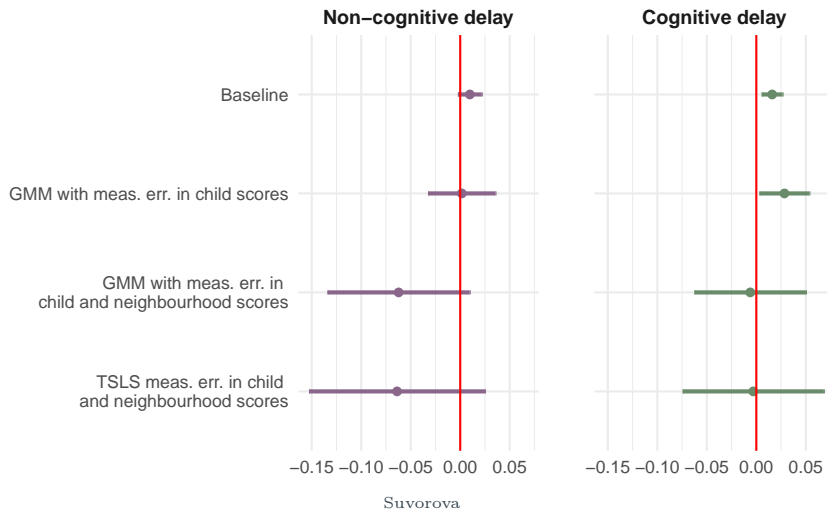
Other child and neighbourhood non-cognitive score

95% CI estimated $\beta^{T,N}$ for average neighbourhood non-cognitive development main



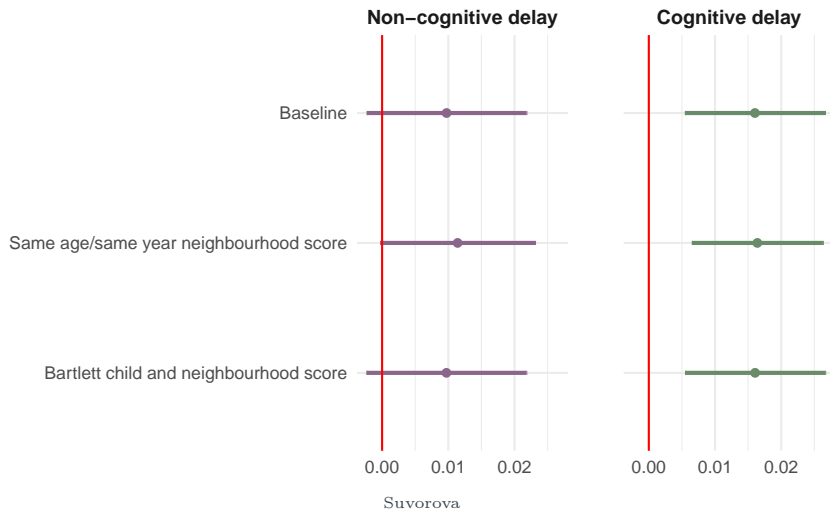
Measurement error in child | neighbourhood development

95% CI estimated $\beta^{T,N}$ for average neighbourhood cognitive development main



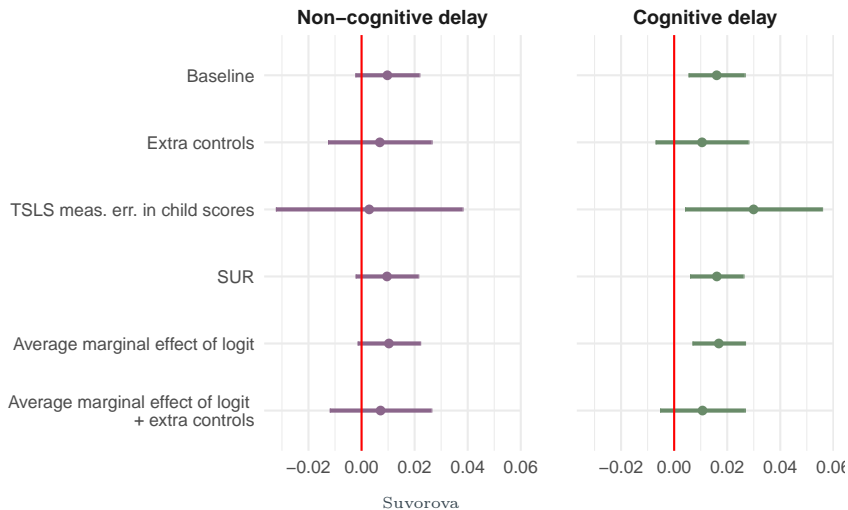
Other child and neighbourhood non-cognitive score

95% CI estimated $\beta^{T,N}$ for average neighbourhood cognitive development main



Robustness checks: Average neighbourhood cognitive score

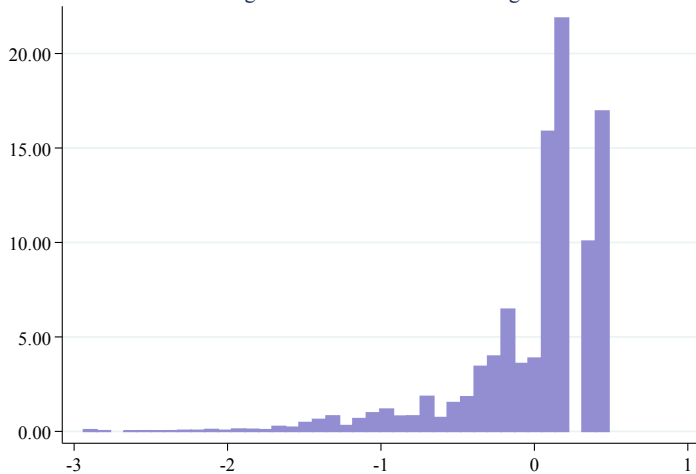
95% CI estimated $\beta^{T,N}$ for average neighbourhood cognitive development main



Behavior during the interview at age 4-5 is predictive of later outcomes

	Repeated grade by ages 12-13	Grade 9 Reading	Grade 9 Math
Socio-emotional score	-0.010*** (0.003)	4.199*** (0.873)	4.440*** (0.929)
PPVT score	-0.011*** (0.003)	17.490*** (0.869)	12.168*** (0.920)
N	6699	5739	5678

Histogram: interview behavior at age 4-5



[back](#)

Educated teachers are more likely to report delays in low-skill children

- \uparrow education \rightarrow \uparrow reports of delays for children with low measured development
 - both for cognitive and non-cognitive skill
 - Reason: Stronger relationship between measured cognitive skills and perceptions

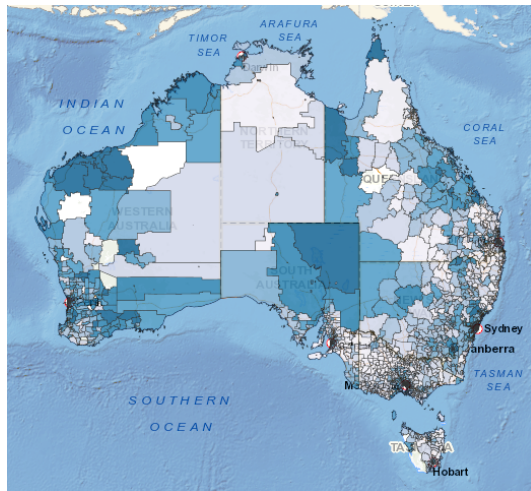
bias degree

main

	Non-cognitive delay		Cognitive delay	
	Non-cogn. score low	Non-cogn. score high	Cogn. score low	Cogn. score high
Teacher college+	0.06*	0.02	0.05*	0.01
	(0.02)	(0.02)	(0.02)	(0.01)
Child attends daycare	-0.04	-0.02	-0.02	0.00
	(0.02)	(0.02)	(0.02)	(0.01)
Teaching experience 0-5 years	-0.04	0.01	0.01	0.03
	(0.02)	(0.02)	(0.02)	(0.02)
Teaching experience 6-10 years	0.01	-0.02	-0.02	0.01
	(0.02)	(0.02)	(0.02)	(0.01)
Age of youngest in class	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Age of oldest in class	-0.00	0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Children to qualified staff ratio	-0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
N	2899	2847	2771	2749

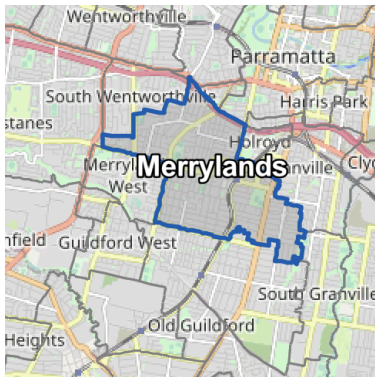
* 5% significance level.

Postal areas map of Australia



Merrylands and Putney postcodes in Sydney

(a) Merrylands: Median weekly income \$1,470



(b) Putney: Median weekly income \$3,053



Teacher's and mother's perceptions: ME in development

	Non-cognitive delay perceived by mother	
	Ages 4-5	Ages 8-9
Teacher: Non-cognitive delay	0.05 (0.03)	
Teacher: Cognitive delay	-0.02 (0.03)	
School contacted about behavior		0.09* (0.02)
Mother depression	0.02* (0.01)	0.01* (0.01)
Non-cognitive score	-0.25 (0.17)	-0.36* (0.15)
Cognitive score	-0.02 (0.06)	0.01 (0.03)
N	2202	5547

* 5% significance level.

Teacher's and mother's perceptions: ME & neighbourhood development

	Non-cognitive delay perceived by mother	
	Ages 4-5	Ages 8-9
Teacher: Non-cognitive delay	0.06* (0.03)	
Teacher: Cognitive delay	-0.01 (0.04)	
School contacted about behavior		0.09* (0.02)
Non-cognitive score	-0.30 (0.16)	-0.16* (0.06)
Cognitive score	0.02 (0.06)	-0.03 (0.02)
Neighbourhood cognitive score	0.01 (0.01)	-0.00 (0.01)
Neighbourhood non-cognitive score	0.01 (0.01)	0.02* (0.01)
N	1619	4623

Perceptions and school-based investment: ME in development

	Behavioral or psych therapy			Learning or speech therapy		
	(1)	(2)	(3)	(4)	(5)	(6)
	b/se	b/se	b/se	b/se	b/se	b/se
Teach.: Non-cognitive delay	0.069* (0.012)	0.062* (0.013)		0.070* (0.018)	0.061* (0.020)	
Teach.: Cognitive delay	0.013 (0.014)	-0.009 (0.017)		0.145* (0.022)	0.078* (0.028)	
Moth.: Non-cognitive delay	0.154* (0.025)	0.133* (0.028)		0.104* (0.028)	0.103* (0.032)	
Moth.: concern Cognitive	0.058* (0.019)	0.038 (0.021)		0.206* (0.031)	0.160* (0.033)	
Non-cognitive score		-0.112 (0.087)	-0.194* (0.094)		0.096 (0.109)	-0.014 (0.108)
Cognitive score		0.001 (0.043)	0.007 (0.048)		-0.184* (0.060)	-0.197* (0.059)
Neighbourhood non-cognitive score		0.014 (0.009)	0.023* (0.010)		-0.022 (0.012)	-0.010 (0.012)
Neighbourhood cognitive score		-0.005 (0.011)	-0.009 (0.013)		0.045* (0.017)	0.043* (0.017)
N	4104	4074	4074	4104	4074	4074

main

Family investment: endogenous perceptions

- Maternal perceptions and investment can suffer from reverse causality → instrument for mother deficit recognition with indicator for being contacted by school about child's behavior

	Warmth	Anger	Tutor	Exp coll+
Mother: Non-cognitive delay	0.113 (0.279)	2.152* (0.354)	0.065 (0.171)	-0.850* (0.185)
N	6556	6554	3570	6186
F stat.	77.24	66.49	50.14	65.21

main

* 5% significance level.

Stronger link between measured development and perceptions

- \uparrow education \rightarrow \uparrow stronger relationship between measures of cognitive development and perceptions

	Non-cognitive delay		Cognitive delay	
	Certificate	College+	Certificate	College+
Non-cognitive score	-0.031*	-0.055*	-0.030*	-0.036*
	(0.011)	(0.009)	(0.011)	(0.008)
Neighbourhood non-cognitive score	0.016	0.025*	0.021*	0.016*
	(0.010)	(0.008)	(0.008)	(0.007)
Cognitive score	-0.030*	-0.067*	-0.060*	-0.098*
	(0.012)	(0.009)	(0.009)	(0.008)
Neighbourhood cognitive score	0.004	0.008	0.012	0.018*
	(0.010)	(0.009)	(0.008)	(0.008)
N	1725	2912	1722	2912

* 5% significance level.

Alternative measure of teachers' perceptions of non-cognitive deficits

- Continuous score of teachers' perceptions about child's non-cognitive deficits
 - Subquestions from Strength and Difficulty Questionnaire related to behaviours measured during the interview.

	Ages 4-5	Ages 8-9
Neighbourhood non-cognitive score	0.04* (0.02)	0.04* (0.02)
Non-cognitive score	-0.07* (0.02)	-0.05* (0.02)
Neighbourhood cognitive score	-0.01 (0.02)	0.00 (0.02)
Cognitive score	-0.08* (0.01)	-0.05* (0.01)
N	5055	4679

* 5% significance level.