

# (MIS)PERCEPTIONS ABOUT CHILDREN

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# Key challenge: identifying developmental delays in children

- Family and school investments critical for early child development (ages 0–6)  
(Cunha, Heckman, Lochner, Masterov, 2006, Cunha, Heckman, Schennach, 2010)
- Misperceptions about cognitive delays → suboptimal family investment choices  
(Dizon-Ross, 2019, Kinsler and Pavan, 2021)
  - Inequality in child development | Persistent delays | Resource misallocation
- Teachers' and mothers' perceptions about cognitive skills affected by *reference group bias* (Kinsler and Pavan, 2021, Elder and Zhou, 2021)
  - Overestimation of cognitive skills in schools with low average cognitive skills

# This paper: Teachers' perceptions about non-cognitive delays

- 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 inform families, schools, and governments about non-cognitive delays
  - No standardized tests for population of children
  - Potential bias in perceptions of non-cognitive skills (Elder and Zhou, 2021)

## This paper:

Use objective measures of non-cognitive skills and rich information about child home and school environments from the Longitudinal Study of Australian Children.

## Research questions:

1. Are teachers' perceptions of non-cognitive delays influenced by average neighbourhood child development?
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  
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(Kinsler and Pavan, 2021, Elder and Zhou, 2021)
- 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

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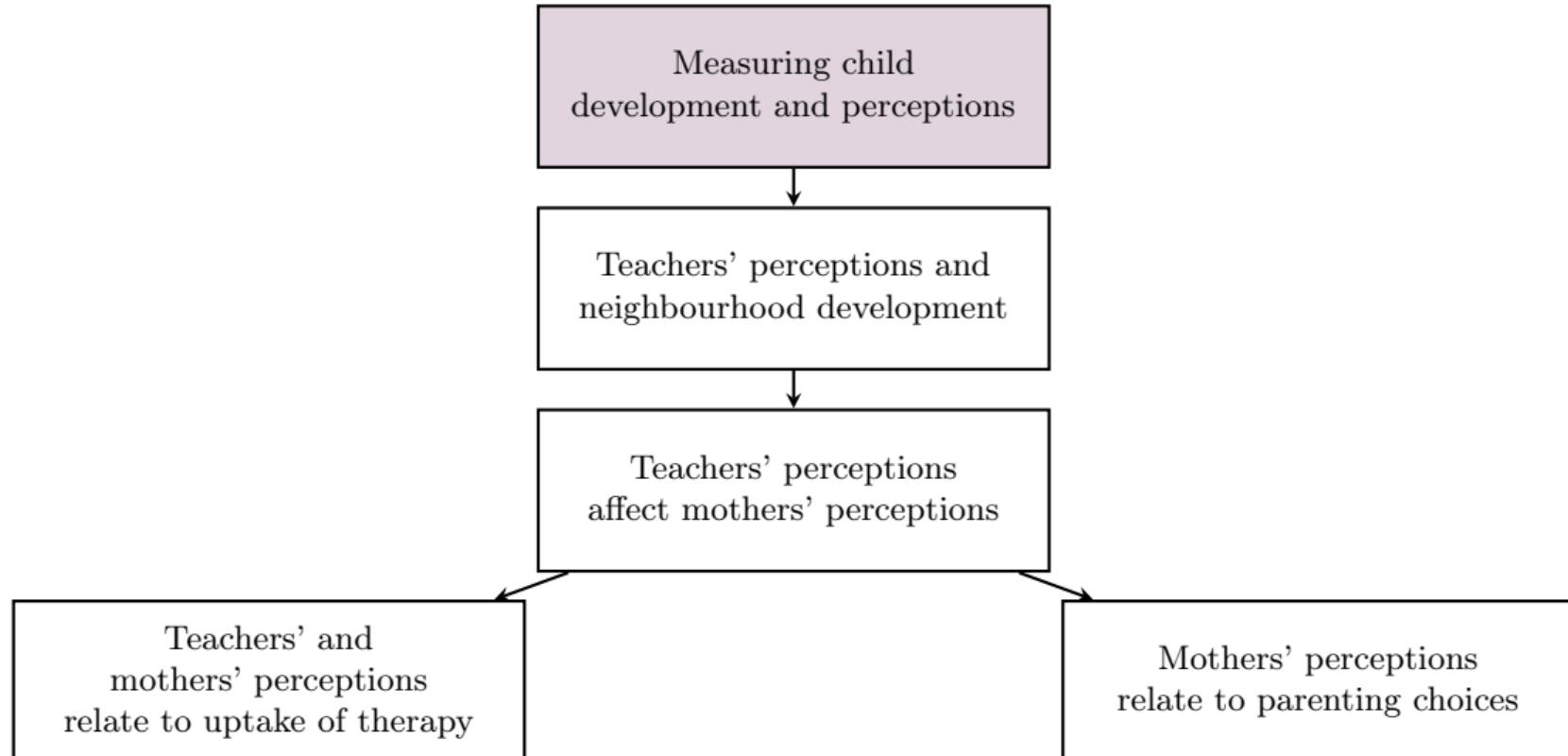
3. Consequences of misperceptions for *child environment*

- Underestimation of non-cognitive and cognitive delays by teachers/mothers → underinvestment in therapy
- Overestimation of non-cognitive delays 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 reference group role for perceptions of 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, Cattan , Meghir, 2021, Kautz, Heckman, Diris, Weel, Borghans, 2014, Falk, Kosse, Pinger, Schildberg-Hörisch, Deckers, 2023)
  - Focus on the role of neighbourhood-related information frictions

# Roadmap



## Data: LSAC - B(aby) and K(indergarten) 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)
  - **Sample** = random draw of 409 postcodes (~ 37 children per postcode)
  - Example: two postcodes in Sydney
    - 2006 Merrylands ~ 5,319 families | median weekly household income \$873
    - 2006 Putney ~ 886 families | median weekly household income \$1,715

[map](#)

[detailed map](#)

# Interviewer-evaluated objective measures of child development

- Psychologists trained interviewers to conduct
  - direct observations of non-cognitive skills + cognitive tests
- 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.” “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

- **Non-cognitive score** (ages 4-5 and 8-9): first principal component of 3 interview direct observation 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](#)

# Interviewer-evaluated development: non-cognitive | cognitive scores

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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

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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:

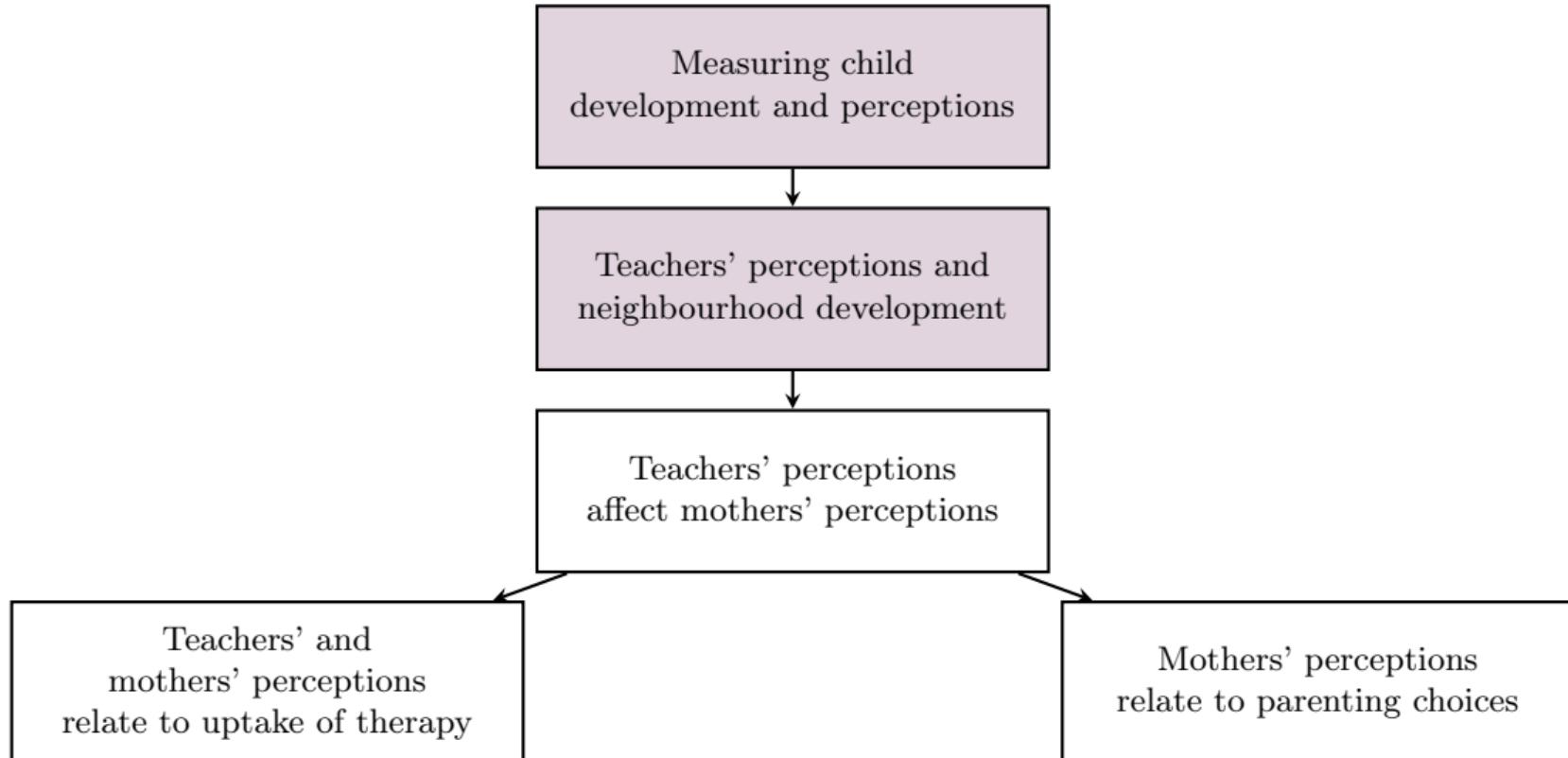
*Overall, compared to other children of the same age, do you think your child is?*

*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-meansed 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

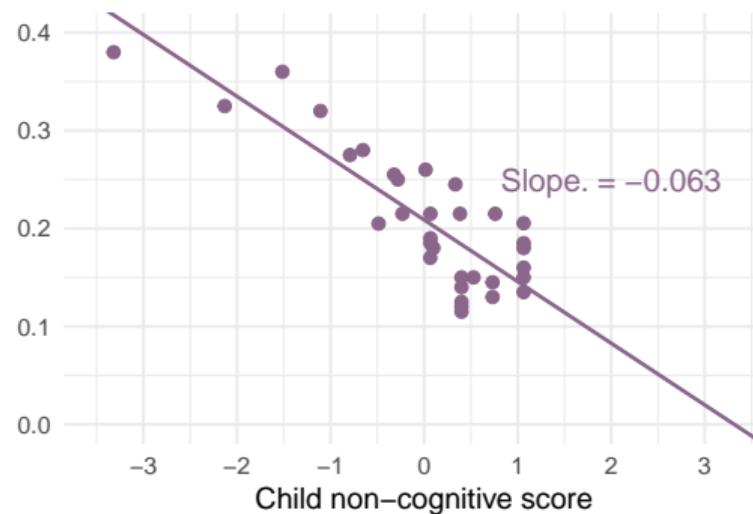
# Roadmap: Teachers' perceptions



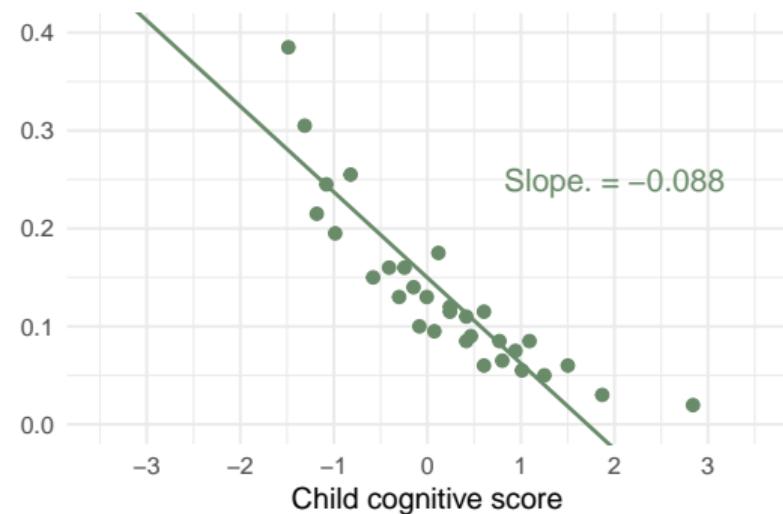
# Teachers' perceptions informed by child development

- ↑ measured development = ↓ likelihood teachers report delay

(a) Share teachers: non-cognitive delays



(b) Share teachers: cognitive delays

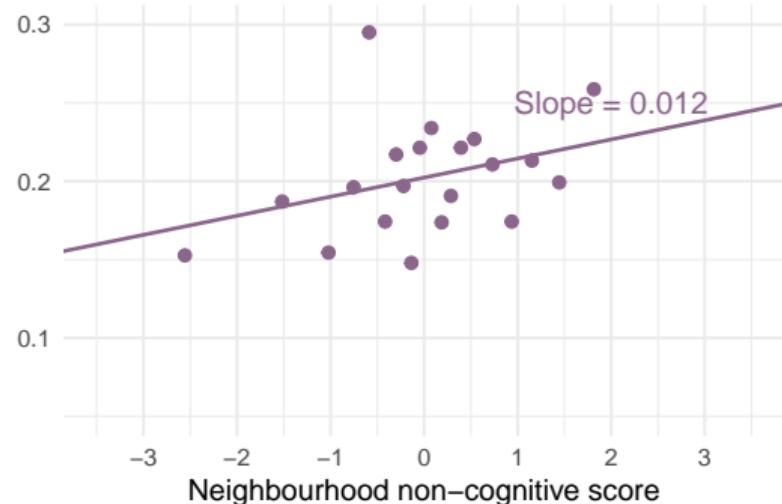


mother

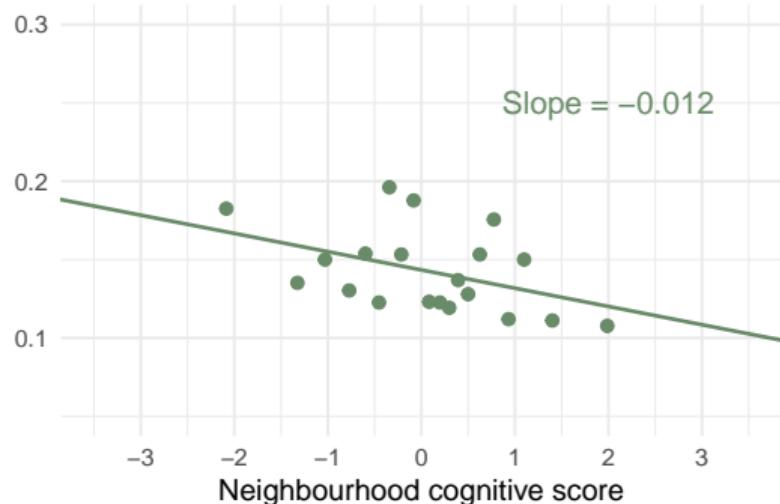
# Teachers' perceptions influenced by local environment

- ↑ neighbourhood non-cognitive development = ↑ likelihood teachers report non-cognitive delays

(a) Share teachers: non-cognitive delays



(b) Share teachers: cognitive delays



child    mother

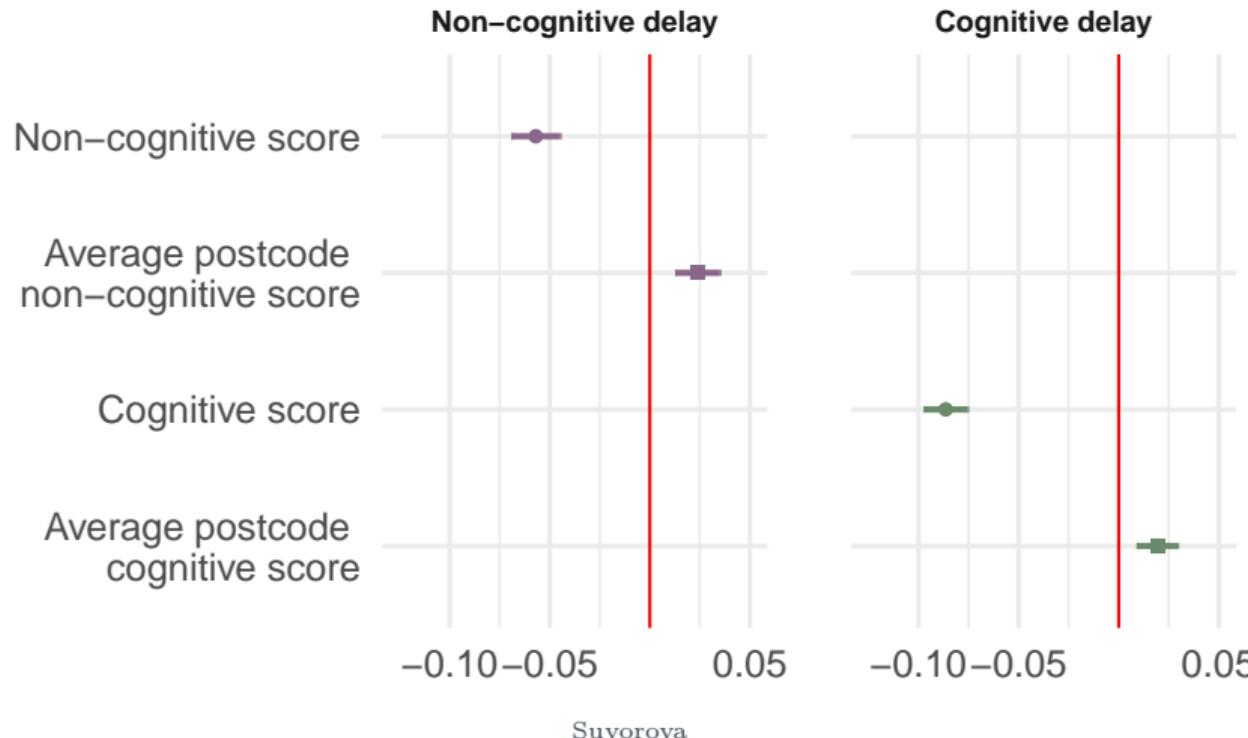
## Estimation: Teacher perceptions and local environment

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

- $T_{it}$  - 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

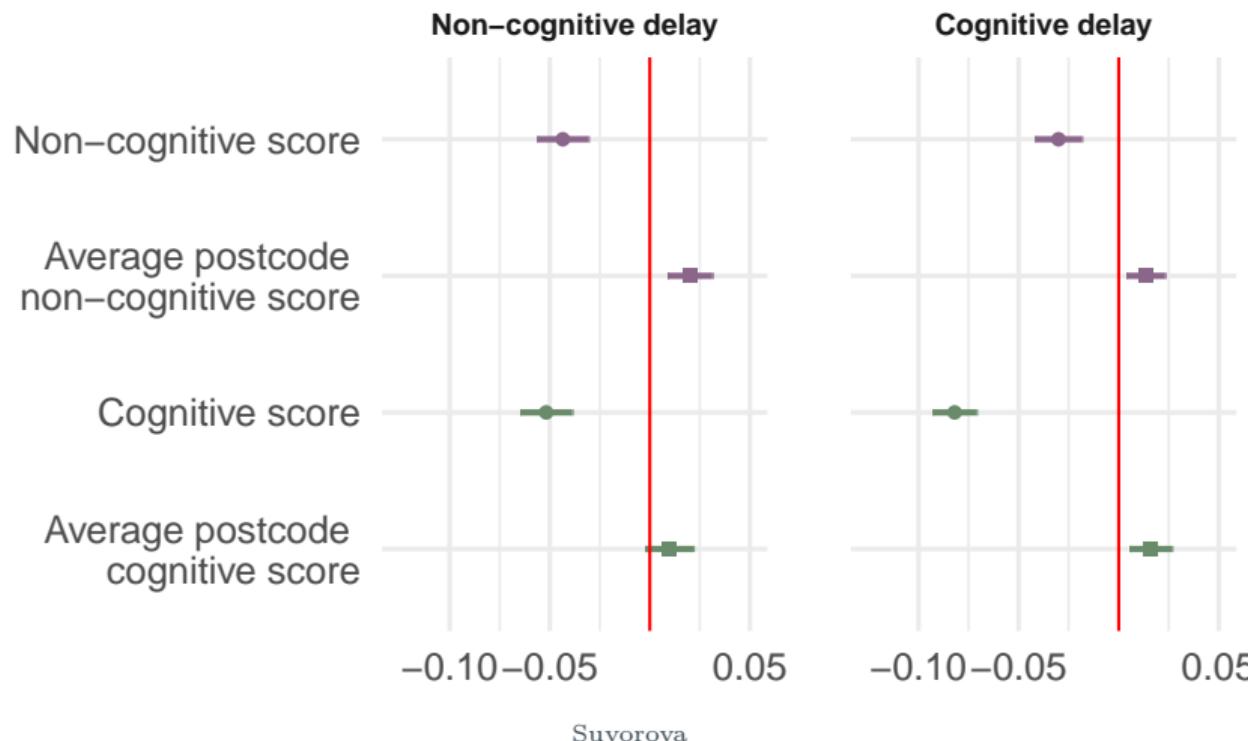
# Role of reference group: Perceptions about delays

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



# Role of reference group: Cross-influence of developmental dimensions

Estimated regression coefficients  $\beta^{T,D}$  and  $\beta^{\mathbf{T},\mathbf{N}}$  [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 → 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

[Robust table](#)

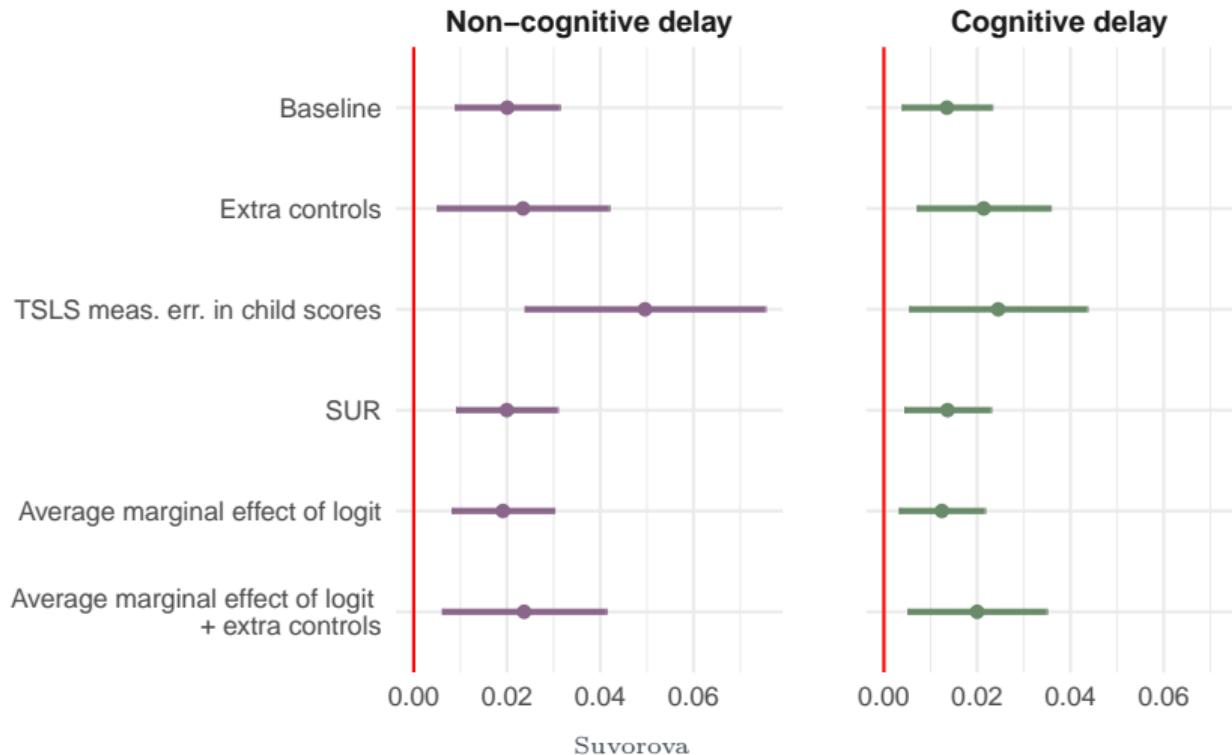
[more about ME](#)

[interview score](#)

[other measure](#)

# Robustness checks: Average neighbourhood non-cognitive score

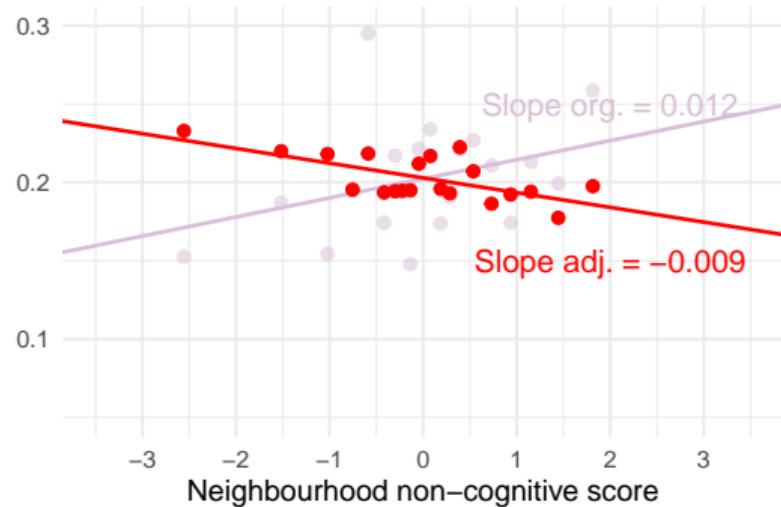
95% CI estimated  $\beta^{T,N}$  for average neighbourhood non-cognitive development cognitive



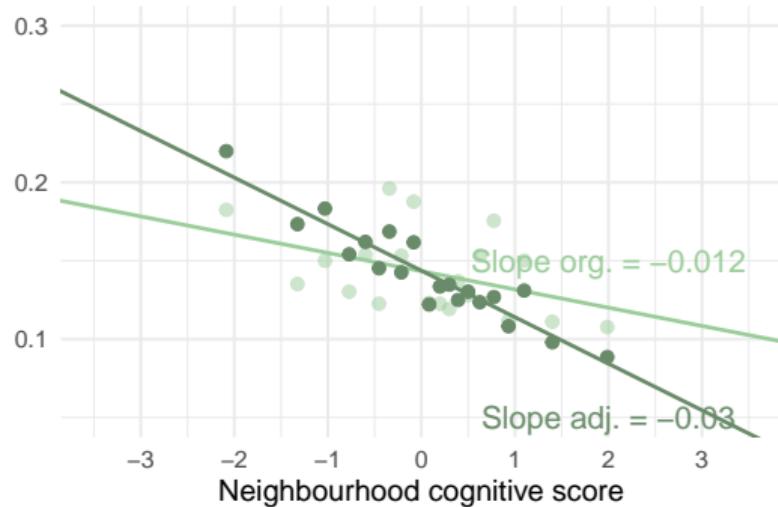
# Teachers' perceptions adjusted for role of reference group

- I adjust for the role of the neighbourhood child development in perceptions
  - Predict probability of reporting delay at mean neighbourhood development

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



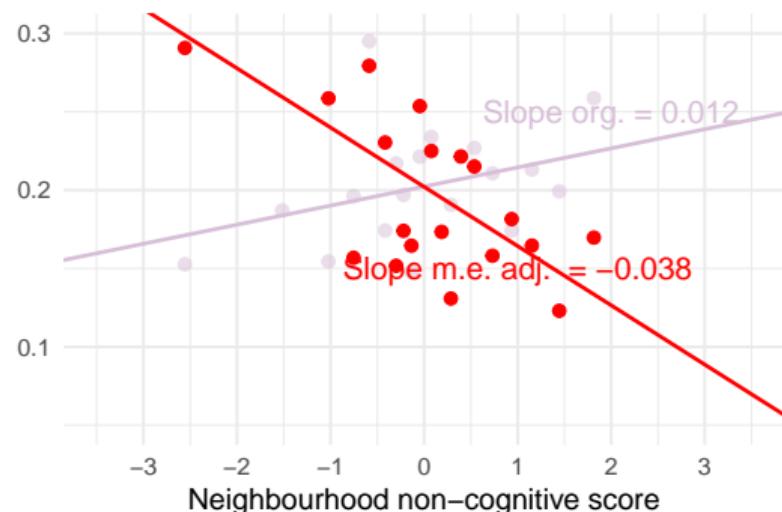
(b) Adj. share teachers: cognitive delays



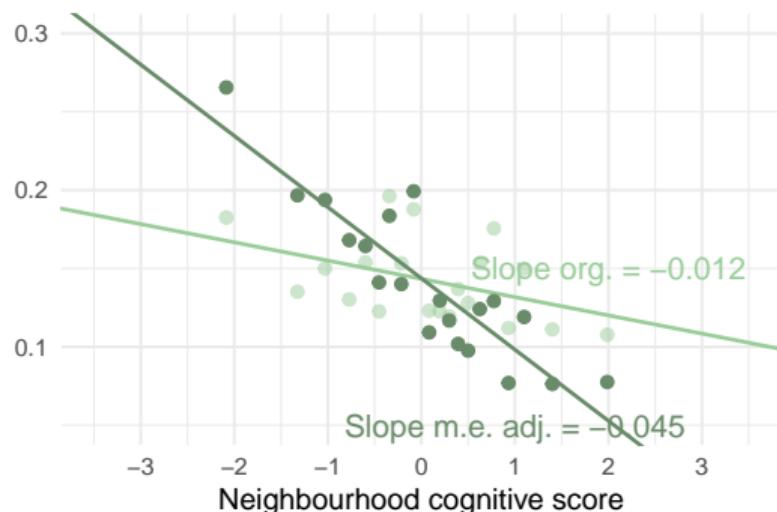
# Teachers' perceptions adjusted for the role of reference group

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

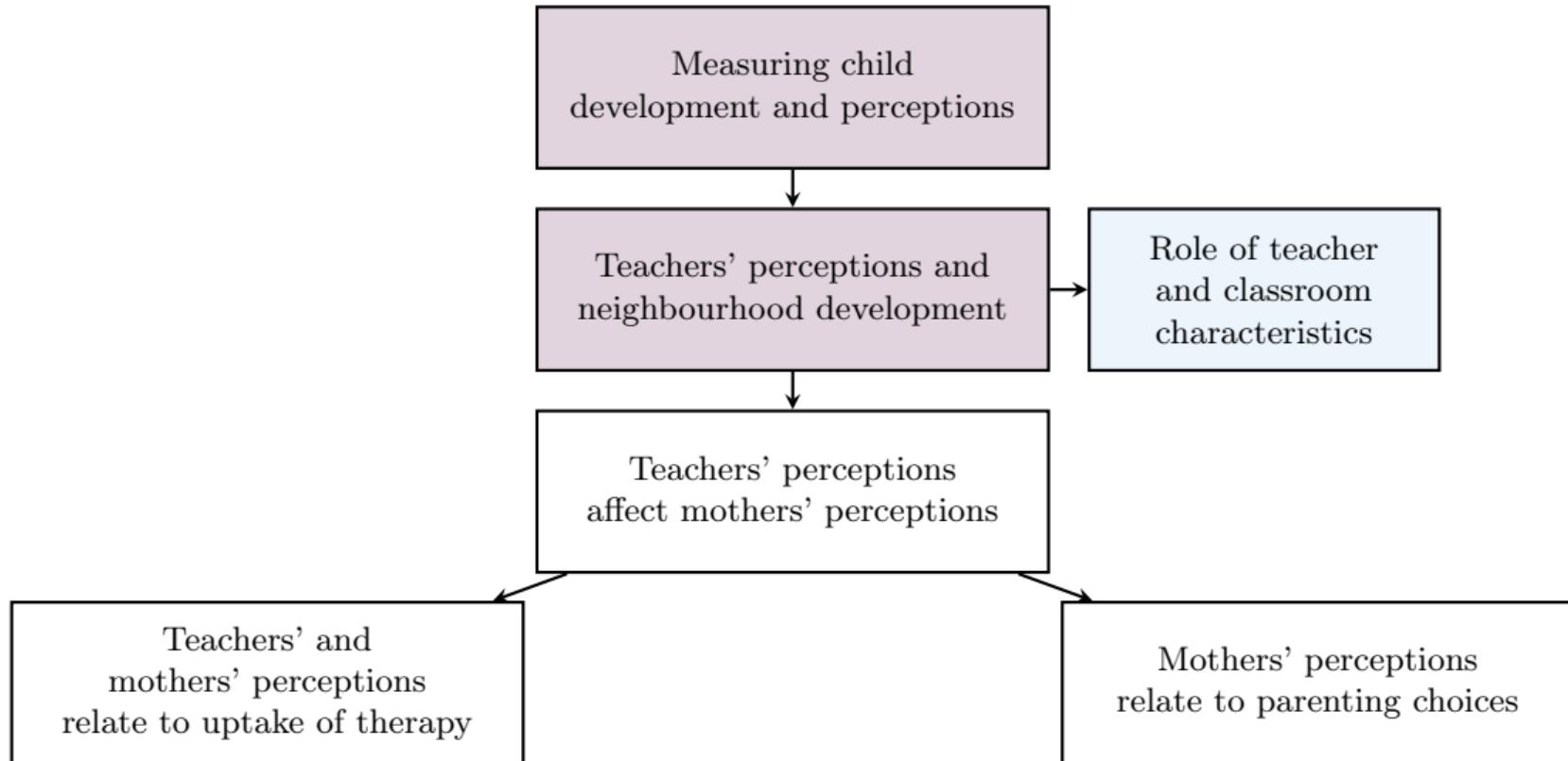
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# Roadmap: Teacher and classroom characteristics and perceptions

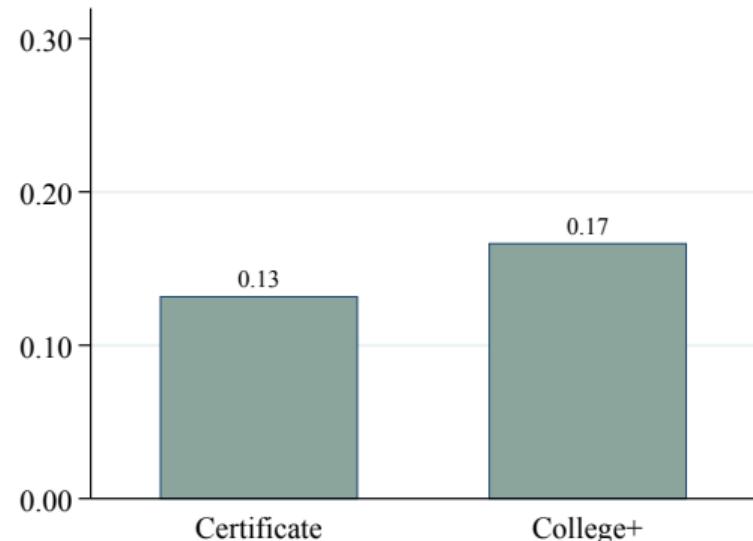
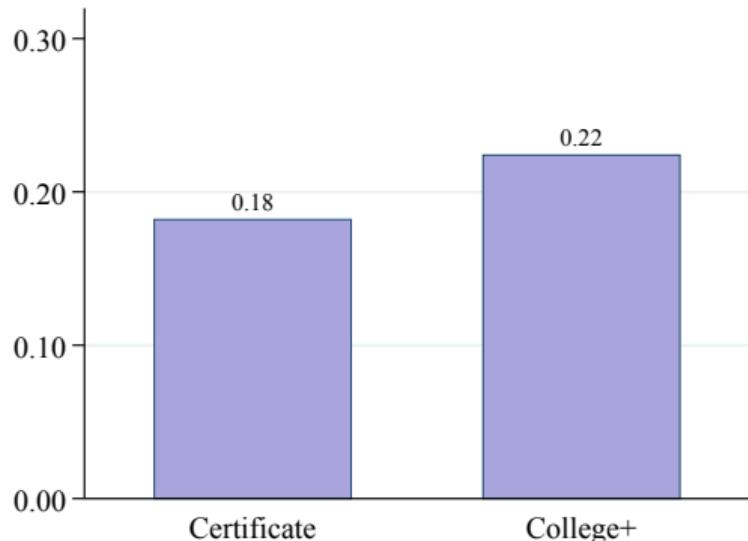


# College-educated teachers more likely to report delays

Probability to report delays by teacher's education

(a) Share teachers: non-cognitive delays

(b) Share teachers: cognitive delays



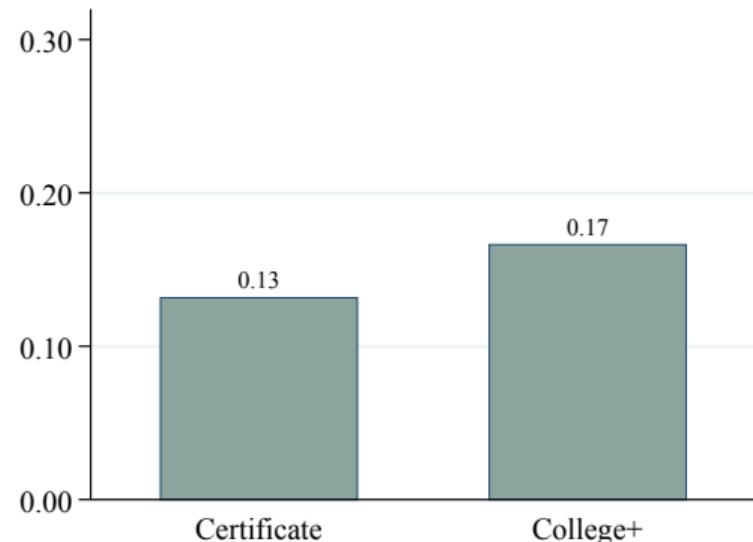
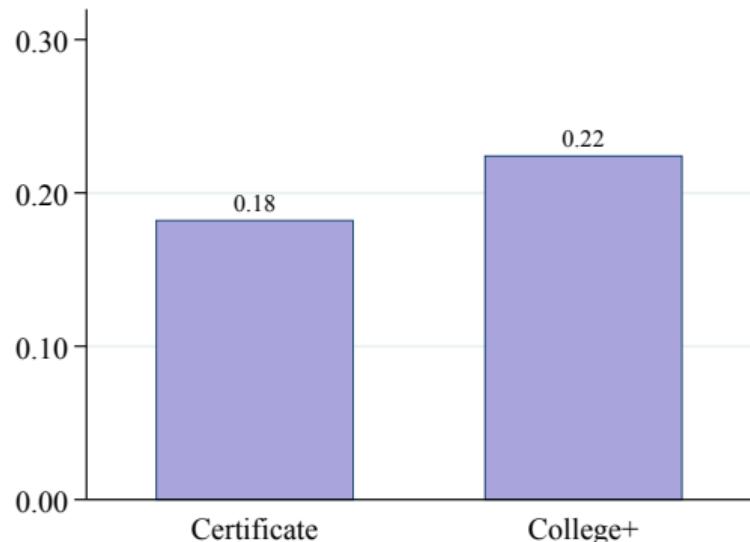
- College-educated teachers report more delays

# College-educated teachers more likely to report delays

Probability to report delays by teacher's education

(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  $j = \{H, L\}$

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

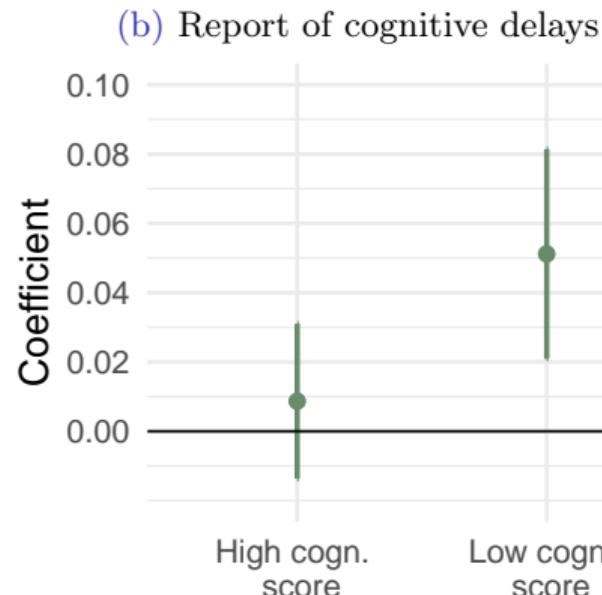
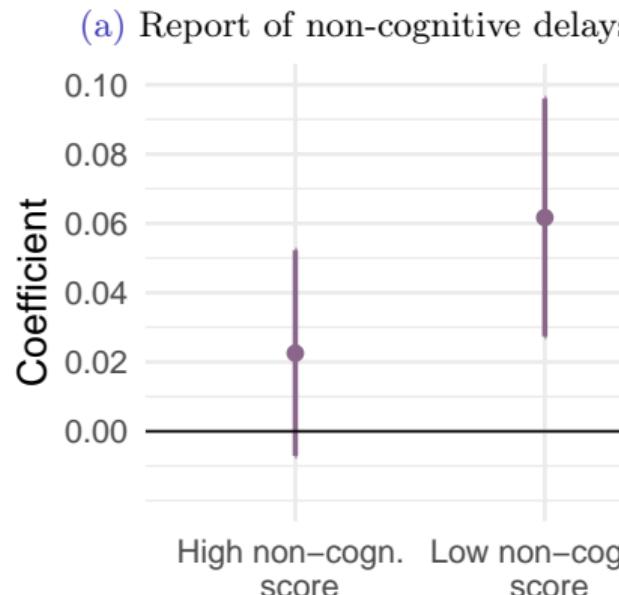
- $V_{i,t}^T$  are observed teachers' quality characteristics:
  - ▶ level of education (bachelors or postgraduate vs certificate or diploma)
  - ▶ experience in the childcare setting (0-5 and 6-10 years vs 11+ years)
  - ▶ childcare arrangement (daycare vs pre-school or kindergarten)
  - ▶ class size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

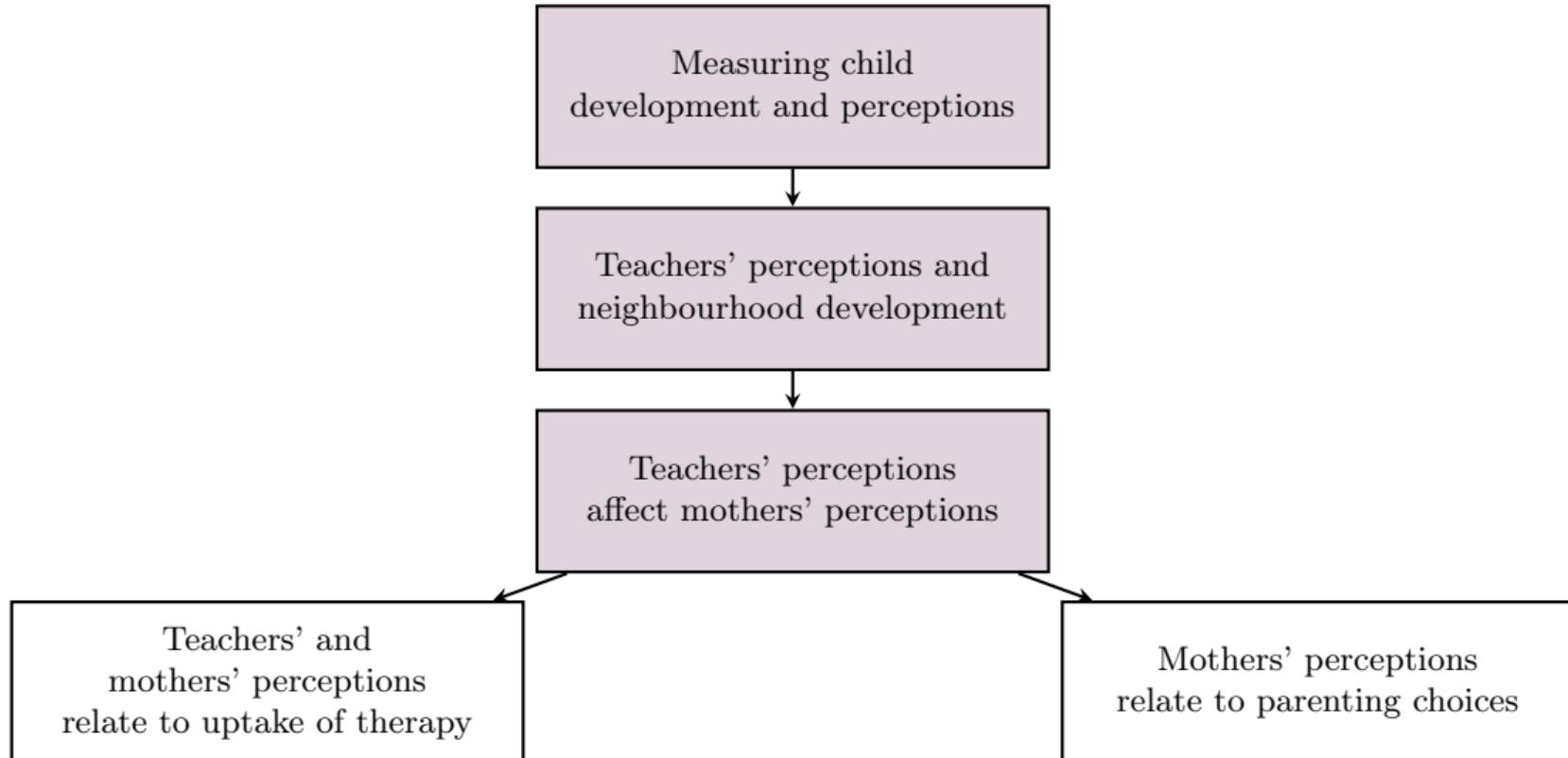
- ↑ education → ↑ reports of delays for children with low measured development
  - both for cognitive and non-cognitive skill

[full table](#)[bias by teacher educ](#)

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



# Roadmap: Mothers' perceptions



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

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

- $T_{i,t}$  - measures of teachers' perceptions about delays
  - Ages 4-5: 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

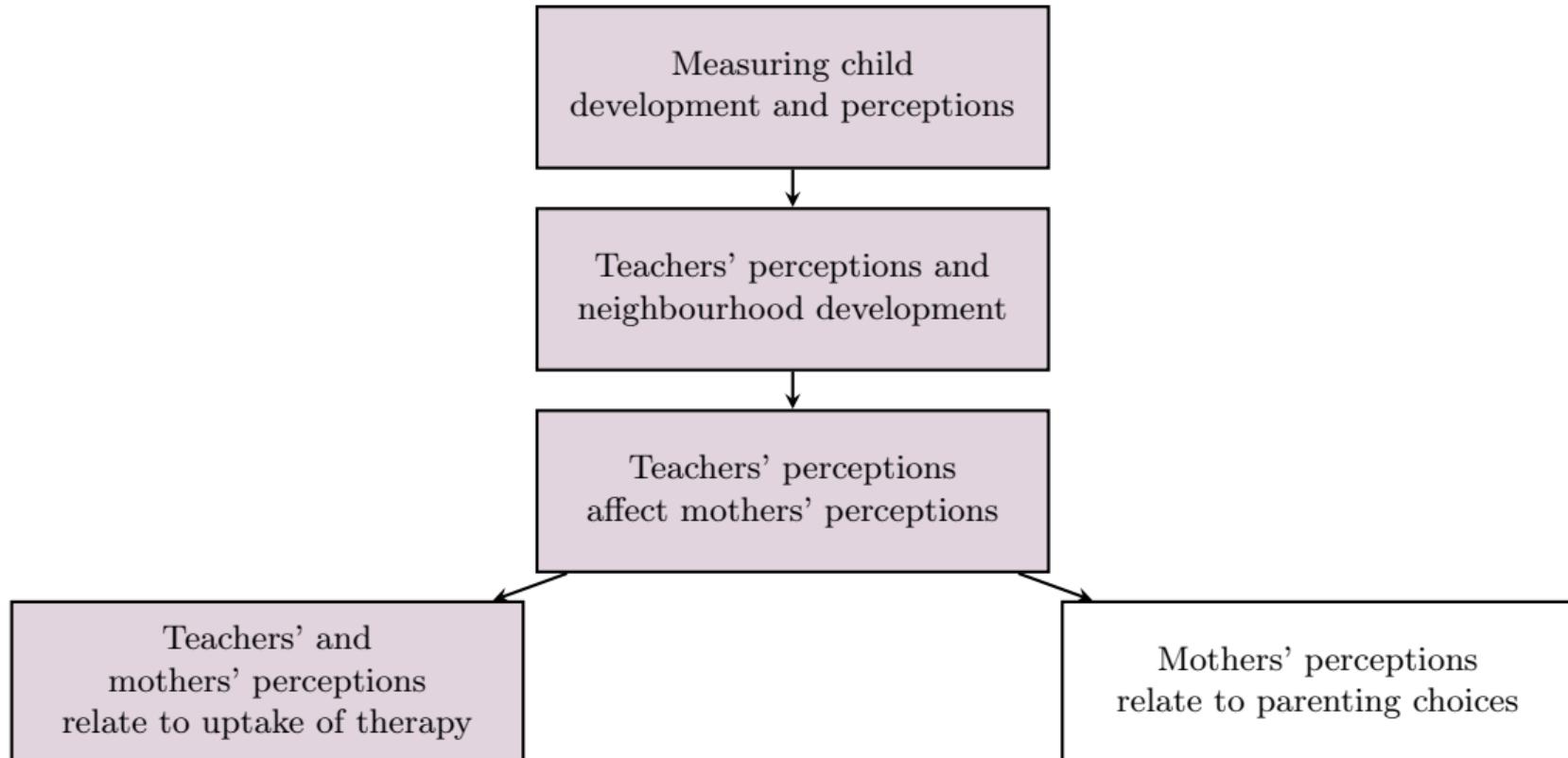
	Non-cognitive delay perceived by mother	
	Ages 4-5	Ages 8-9
<b>Teacher: Non-cognitive delay</b>	<b>0.08*</b> (0.02)	
Teacher: Cognitive delay	0.02 (0.02)	
<b>School contacted about behavior</b>		<b>0.11*</b> (0.01)
Non-cognitive score	-0.02* (0.01)	-0.01* (0.00)
Cognitive score	0.00 (0.01)	-0.01 (0.00)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

\* 5% significance level.

ME adj

ME adj and pcode

# 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	<i>neighbourhood characteristics</i>	

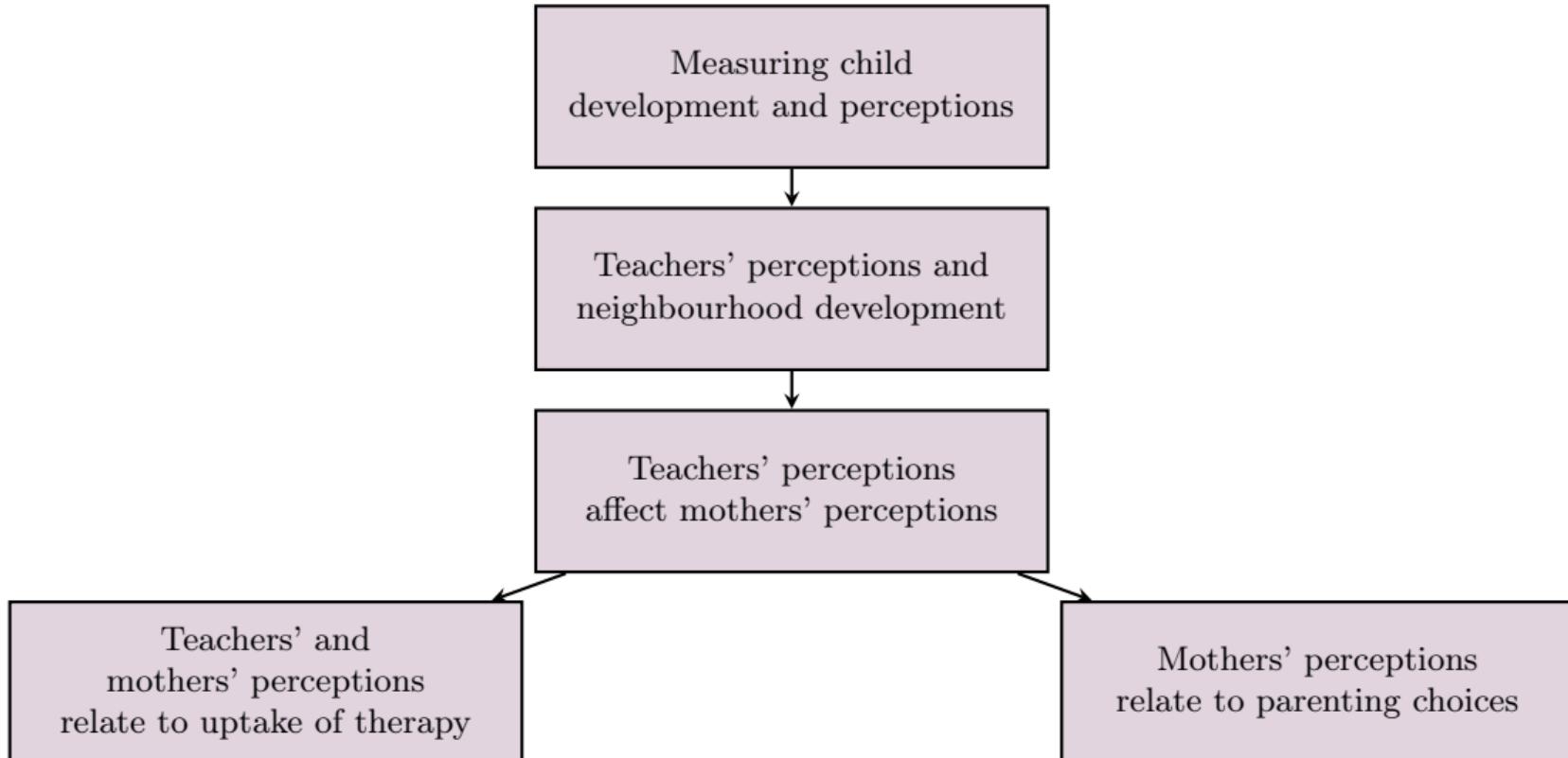
# Children with perceived delays more likely to use therapy

- Perceived non-cognitive delays → ↑ use of both therapy types
- Perceptions of cognitive delays by teachers → ↑ 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 ↑ 0.1 times per week
  - are more likely to [use community educational resources](#):
    - ▶ use parenting education courses ↑ 3 p.p.
    - ▶ report needing parenting education courses ↑ 5 p.p.
    - ▶ use parent support groups|helplines ↑ 4 p.p.
    - ▶ use child health|wellbeing information from phone|internet ↑ 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 ↑ 9 p.p.
    - ▶ more likely to raise voice or shout at the child ↑ 0.57 SD
    - ▶ more likely to lose temper with the child ↑ 0.57 SD
  - engage in **less warm interactions:**
    - ▶ less likely to often display physical affection with their child ↓ 5 p.p.
    - ▶ less likely to often tell their child how happy he/she makes them ↓ 7 p.p.
  - have **lower educational aspirations** for their children:
    - ▶ less likely to expect that the child will receive a university degree ↓ 9.4 p.p.

[table](#) [by mom educ](#)

## Discussion

- Teachers' perceptions about children's non-cognitive & cognitive delays depend on the 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.

main

# 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
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*	-0.03*
	(0.01)	(0.01)
Neighbourhood cognitive score	0.01	0.02*
	(0.01)	(0.01)
Cognitive score	-0.05*	-0.08*
	(0.01)	(0.01)
N	5258	5254

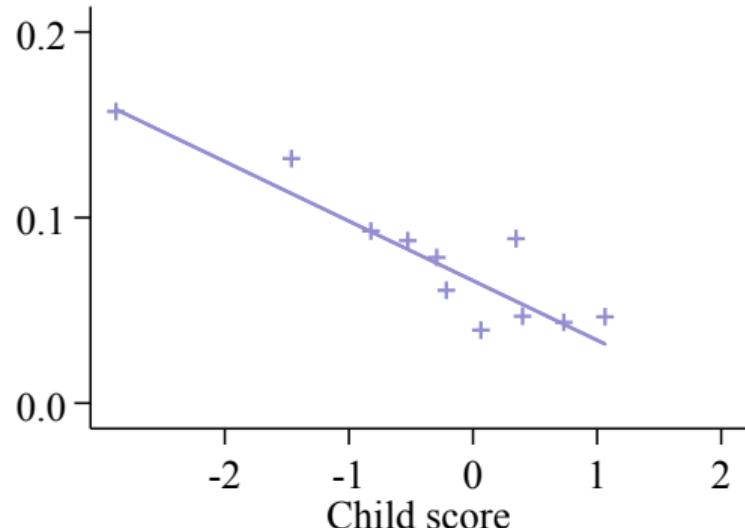
\* 5% significance level.

graph

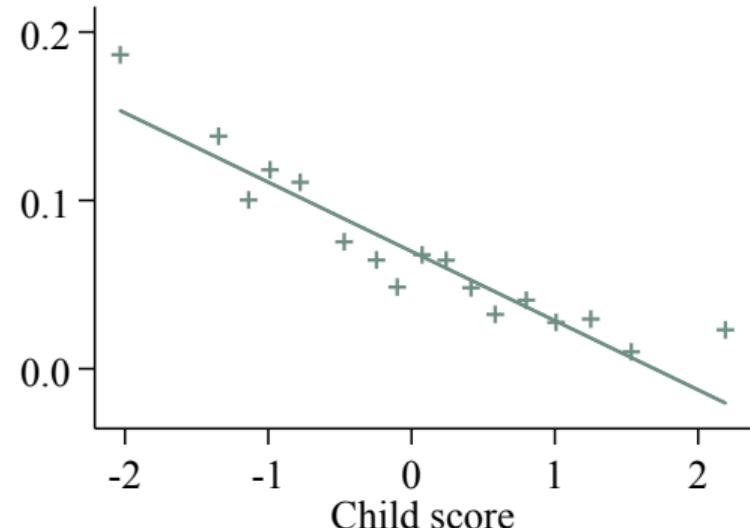
# Mothers perceptions are informed by child development

- ↑ measured development = ↓ lower likelihood that mothers indicates delay  
(main)

(a) Share mothers: socio-emotional delays



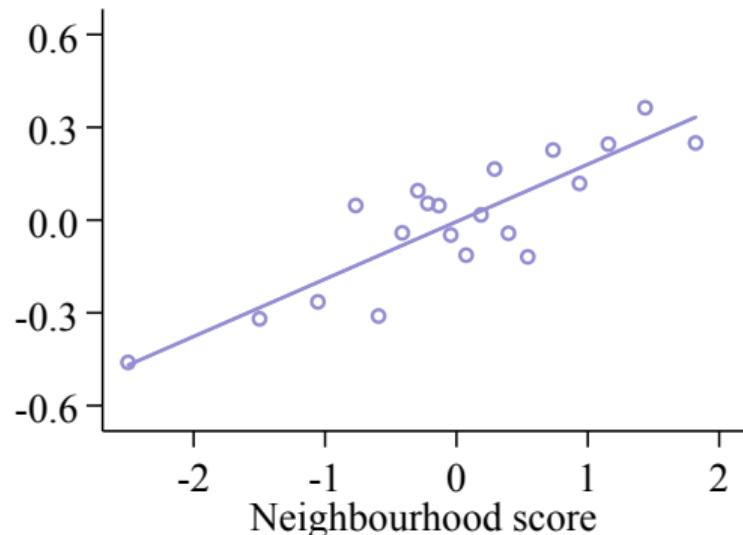
(b) Share mothers: receptive language concerns



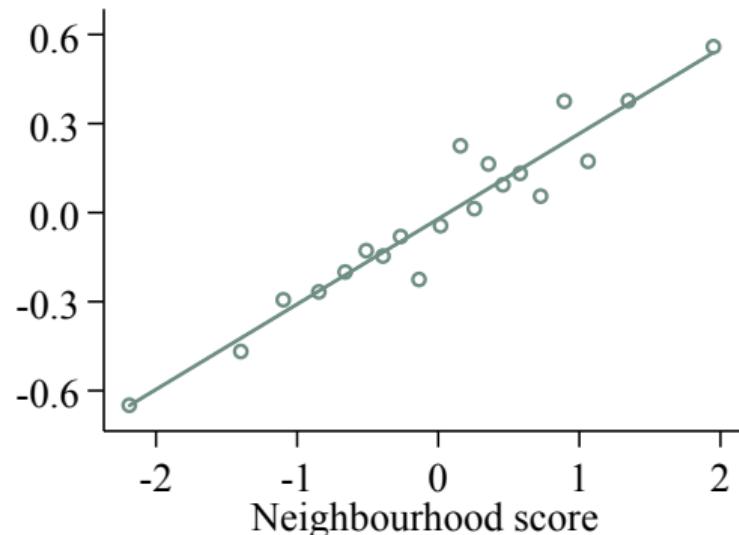
# Children in less developed neighbourhoods have lower own development

- ↑ average development of other children in the neighbourhood = ↑ higher average development score (main)

(a) Socio-emotional score



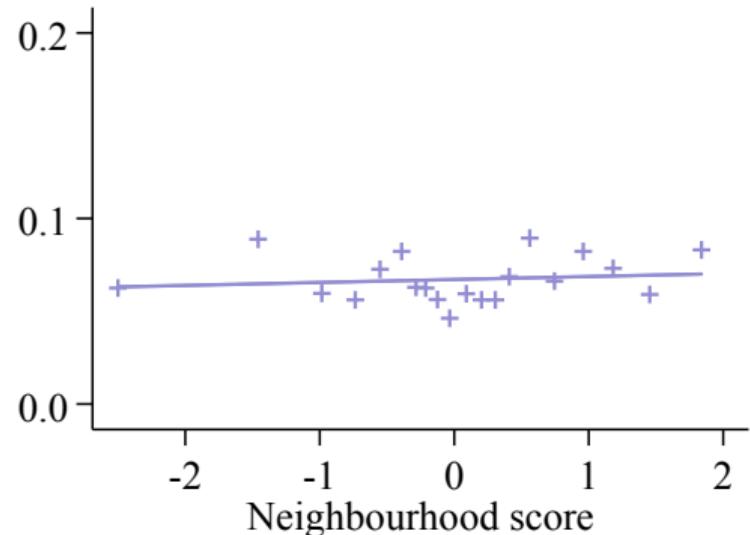
(b) Receptive language score



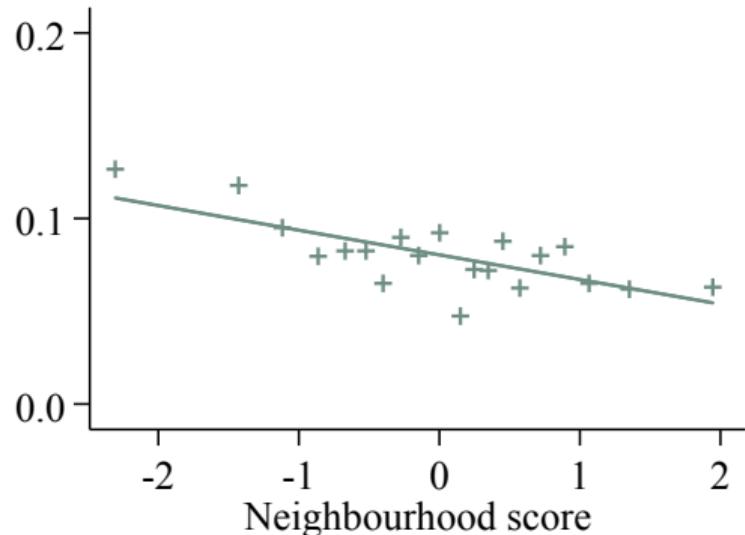
# Mothers' perceptions and local environment

main

(a) Share mothers: socio-emotional delays



(b) Share mothers: receptive language concern



# Robustness checks

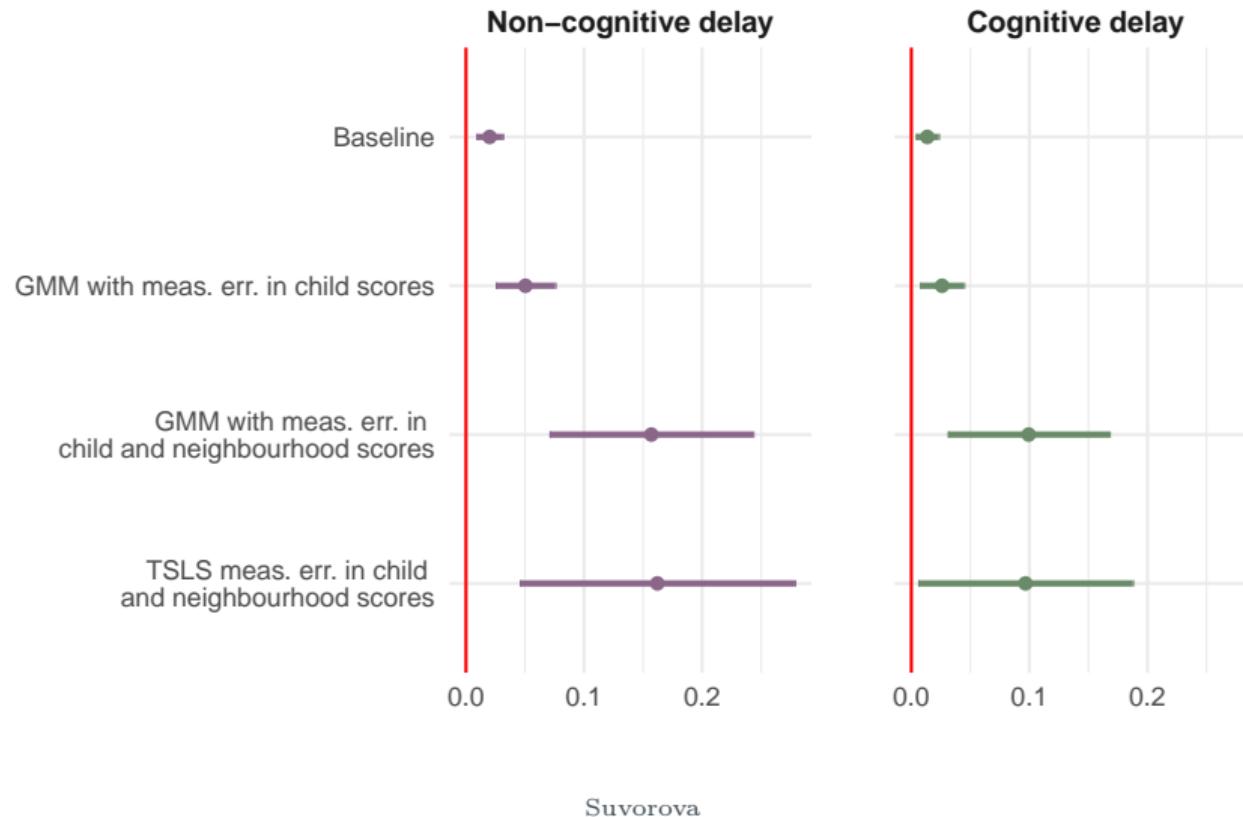
	Non-cognitive delay				Cognitive delay							
	Logit	Avg.	Marg.	Effect	Extra control	Meas. error adj.	Logit	Avg.	Marg.	Effect	Extra control	Meas. error adj.
Neighbourhood non-cognitive score	0.019*			0.023*		0.050*			0.012*		0.021*	0.025*
	(0.006)			(0.009)		(0.013)			(0.005)		(0.007)	(0.010)
Non-cognitive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

\* 5% significance level.

main

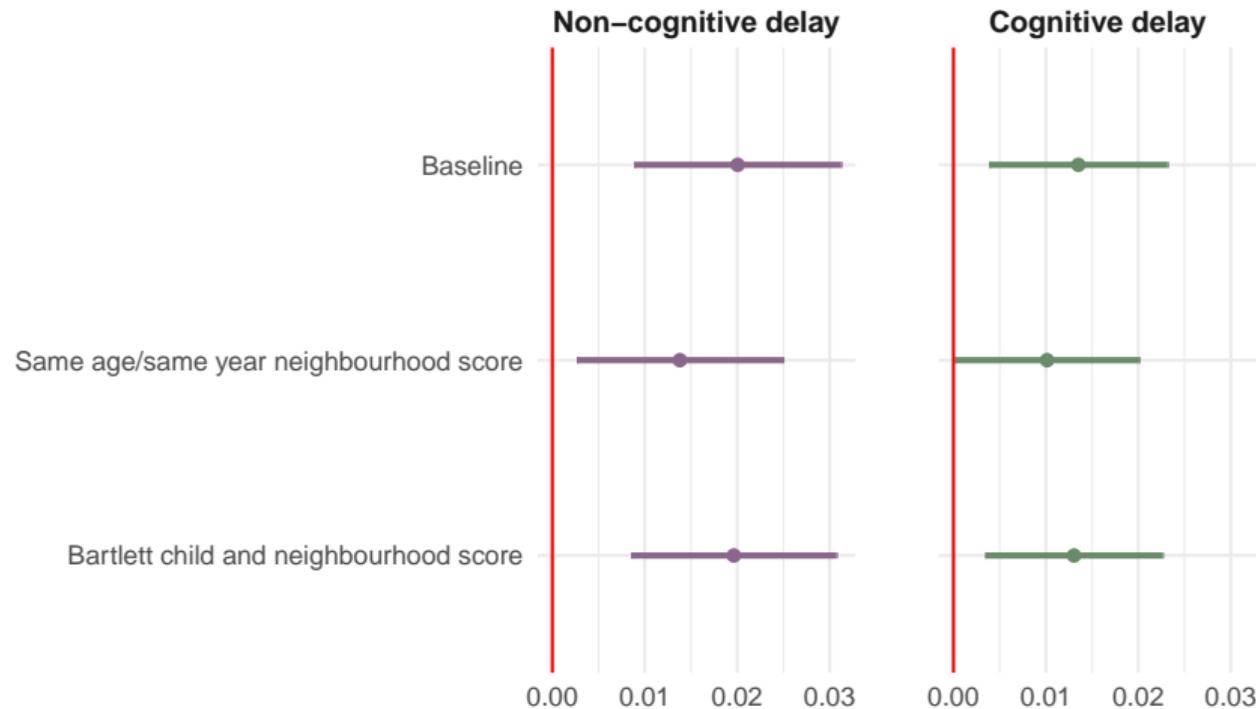
# Measurement error in child | neighbourhood development

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



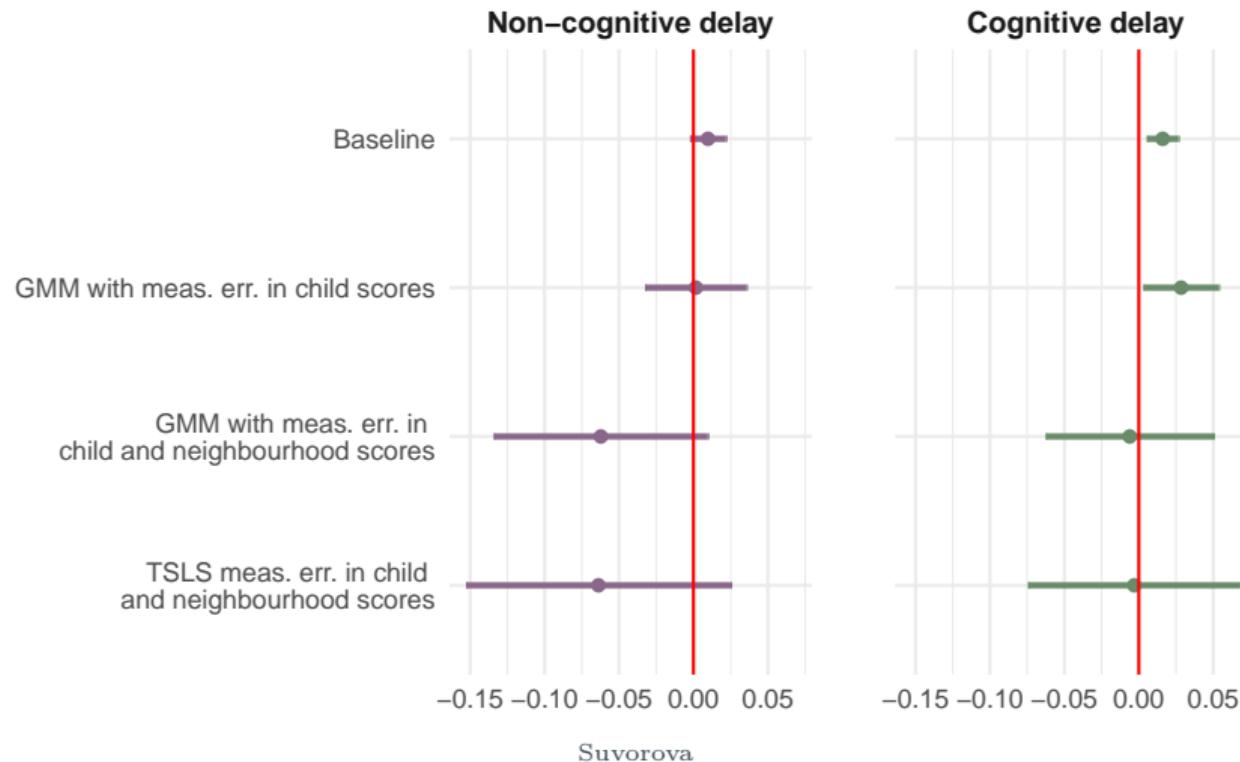
# Other child and neighbourhood non-cognitive score

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



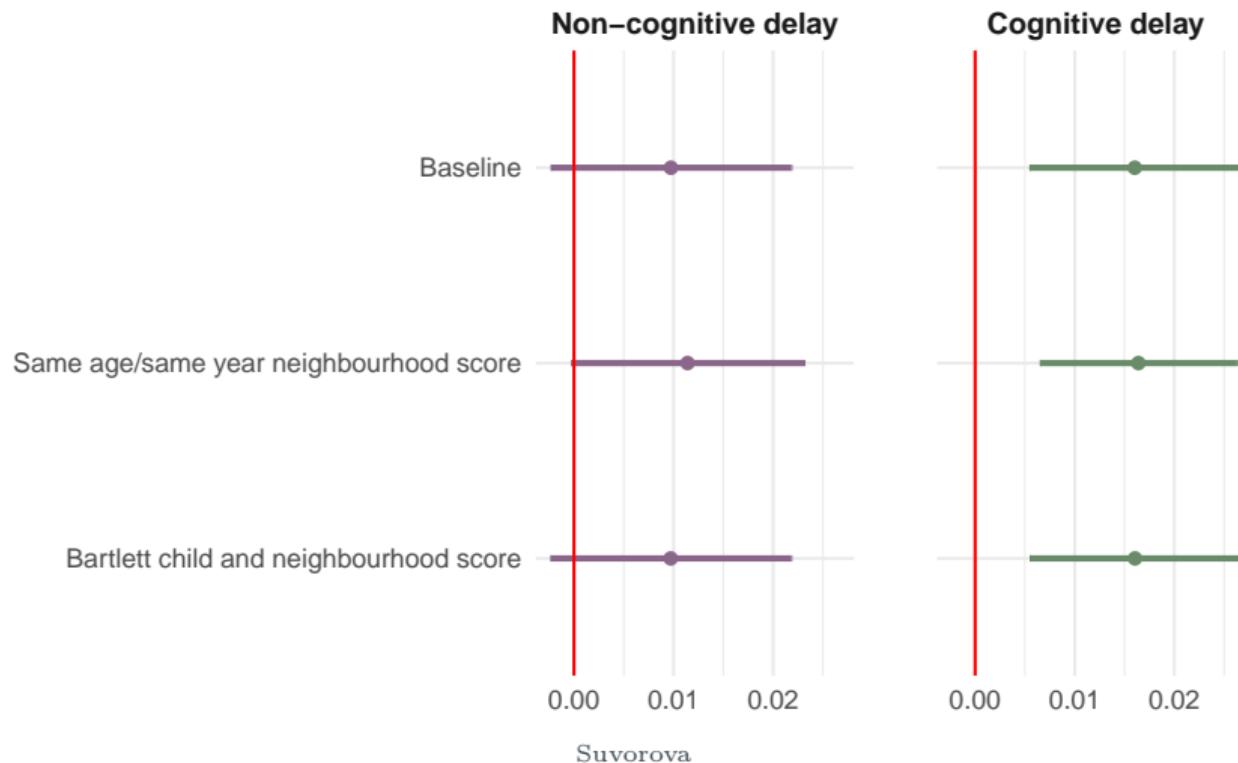
# Measurement error in child | neighbourhood development

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



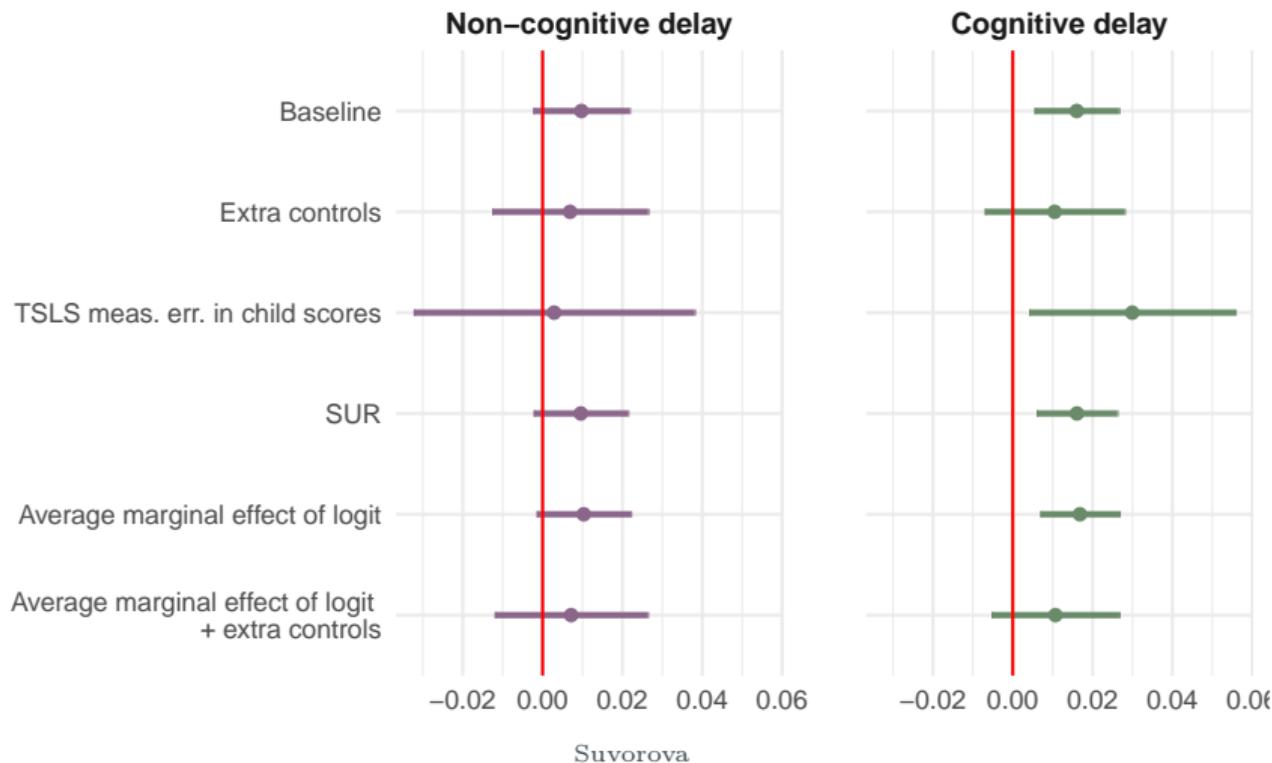
# Other child and neighbourhood non-cognitive score

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



# Robustness checks: Average neighbourhood cognitive score

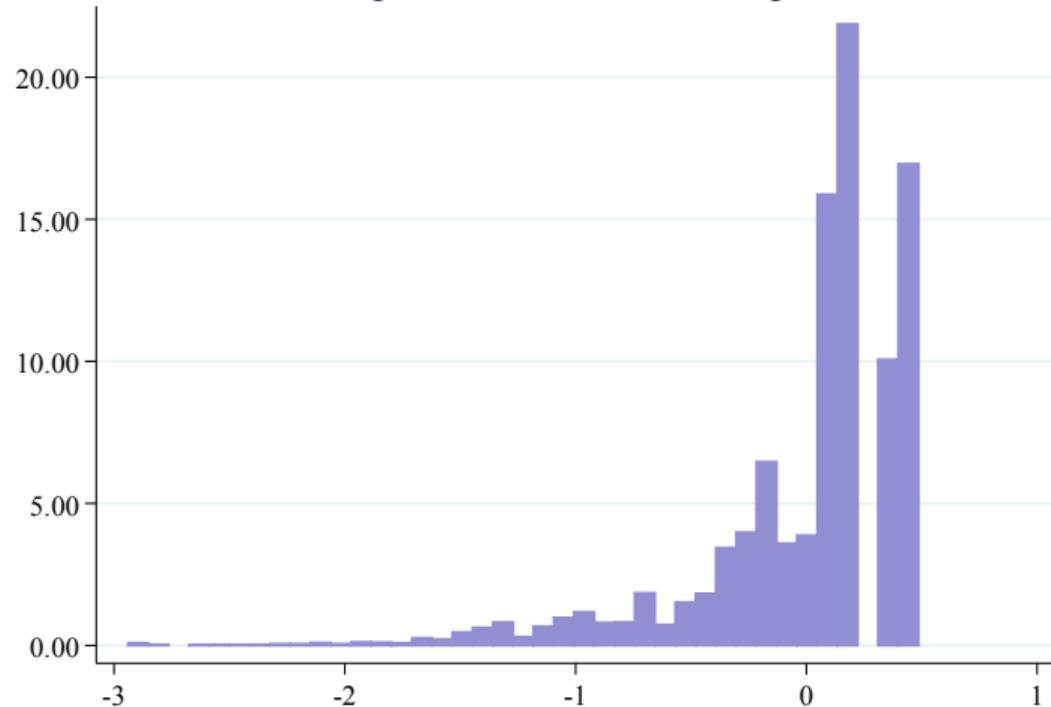
95% CI estimated  $\beta^{T,N}$  for average neighbourhood cognitive development (main)



# 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](#)

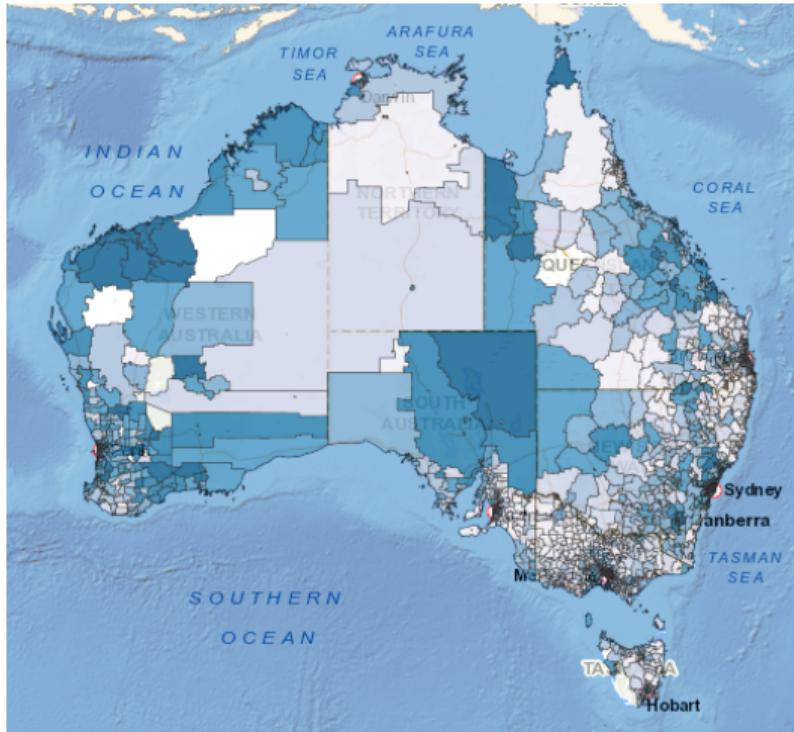
# Educated teachers are more likely to report delays in low-skill children

- ↑ education → ↑ 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

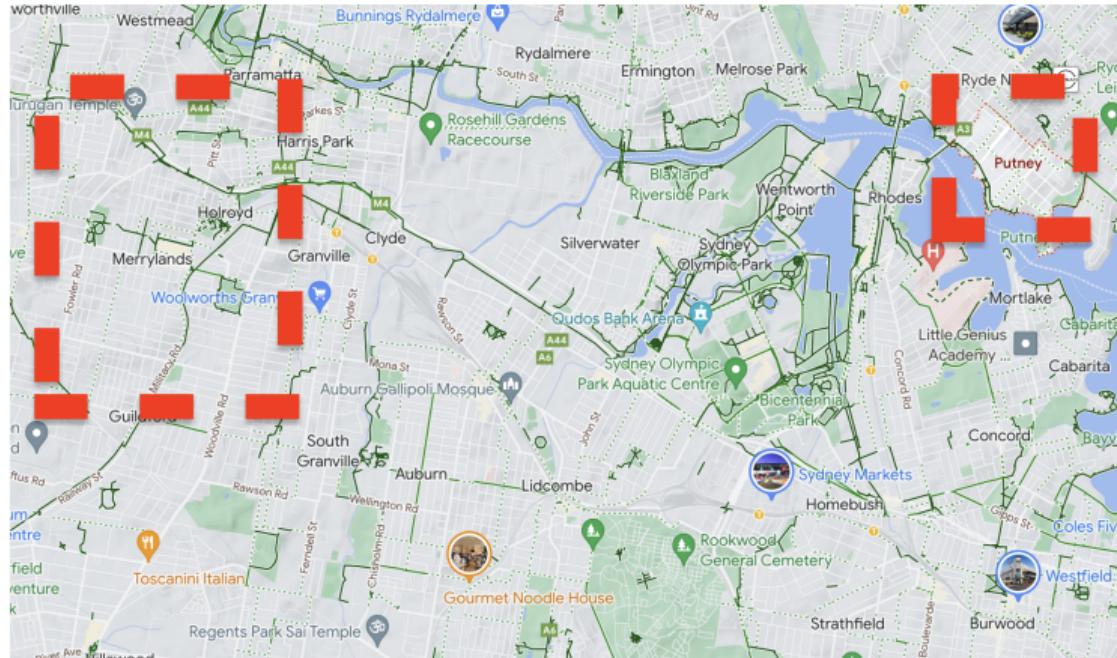
\* 5% significance level.

# Postal areas map of Australia



main

# Merrylands and Putney postcodes in Sydney



main

# 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)	
<b>School contacted about behavior</b>		<b>0.09*</b> (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

main

\* 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	-0.03
	(0.06)	(0.02)
Neighbourhood cognitive score	0.01	-0.00
	(0.01)	(0.01)
Neighbourhood non-cognitive score	0.01	0.02*
	(0.01)	(0.01)
N	1619	4623

main

\* 5% significance level.

Suvorova

# Perceptions and school-based investment: ME in development

	Behavioral or psych therapy			Learning or speech therapy		
	(1) b/se	(2) b/se	(3) b/se	(4) b/se	(5) b/se	(6) 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

- ↑ education → ↑ 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. [main](#)

	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.