



# Leveraging parental engagement towards educational improvement in the Philippines

## The Quality of Basic Education in Southeast Asia

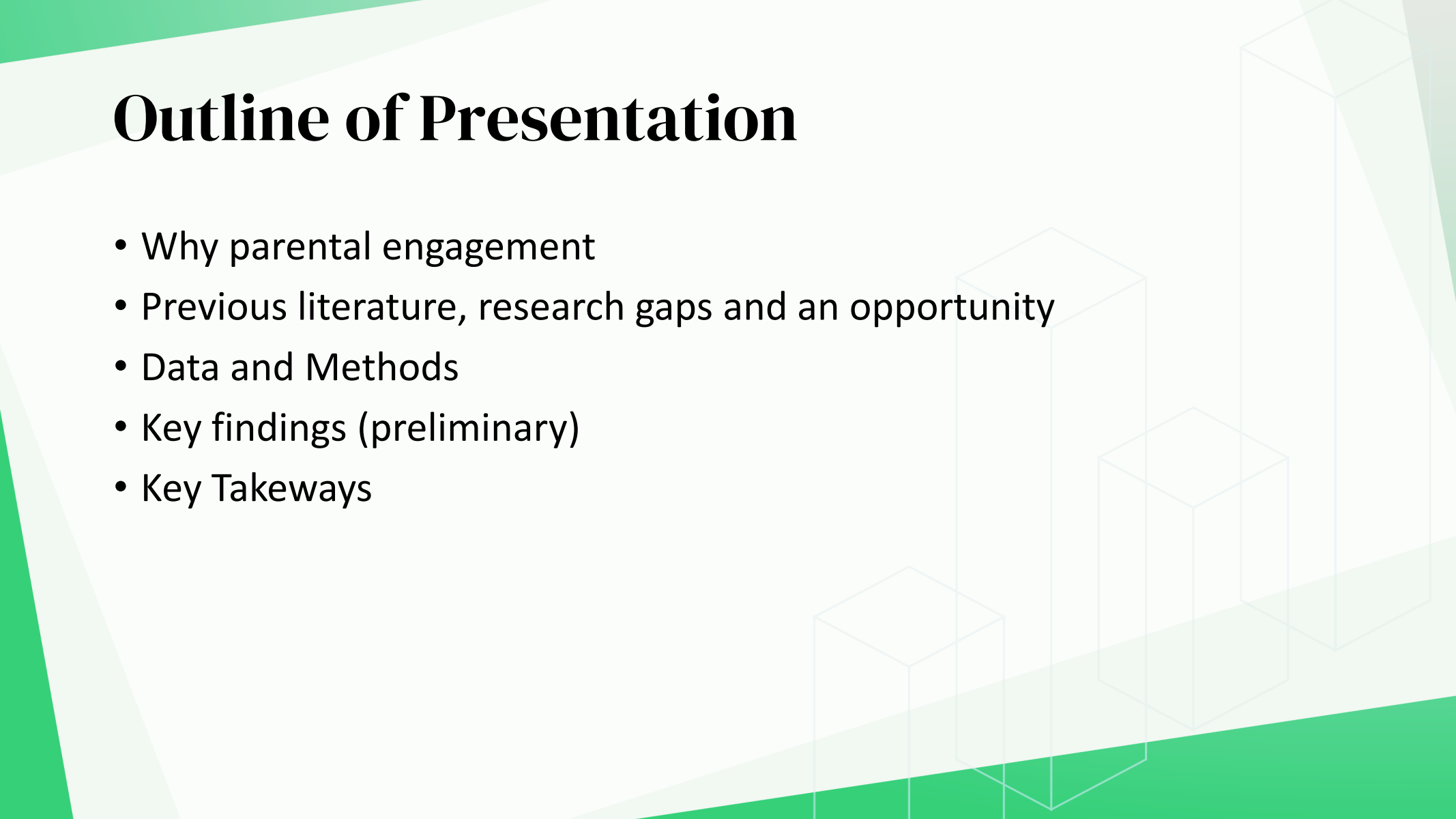
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# Outline of Presentation

- Why parental engagement
  - Previous literature, research gaps and an opportunity
  - Data and Methods
  - Key findings (preliminary)
  - Key Takeaways
- 
- The background features a green and white geometric design. On the left, there are green triangular shapes. On the right, there are several wireframe cubes of varying heights and orientations, some appearing to be stacked or arranged in a sequence. The overall aesthetic is clean and modern.

# Research Questions (1)

- First, what is the relationship between the type of parental engagement and the academic performance of Grade 5 students? How do parental background characteristics influence academic performance?
- Second, what factors account for the variation in parental engagement, and to what extent does it explain outcomes, such as test scores, nutritional status, and well-being?

# Research Questions (2)

- Third, what are the barriers in schools which deter a practical engagement with stakeholders such as parents? What are the foreseeable tensions in operationalizing and deepening parental engagement?

# Why parental engagement?

- Relational levers of the learning improvement process
- Conceptually there are no clear distinctions on terminologies used in practice: involvement, engagement and participation
- There is strong research tradition coming from education and family psychology, educational management, BUT largely understudied in economics (not surprising) until recently.
- We distinguish between **home-based** and **school-based** PE
- For purposes of education policy, let's look at PE as a **co-productive process**, where parents (as citizens) share roles and responsibilities in delivering improving the quality services

# Previous Literature: Academic Achievement and Outcomes

- The literature looks extensive at the drivers, motivations and outcomes of engagement
  - **Level of engagement decreases over time** (Paulson & Sputa, 1996); **mothers more involved than fathers** (Rogers, Wiener, et al., 2009).
  - **Mothers' involvement matter in reading scores** (Banerjee et al., 2011)
  - **Role of Par Inv Social adaptation** (Georgiou, 2008)
  - **High participation costs** (Garcia-Dominic et al. , 2010), **immigrant challenges** (Ceballo et al., 2012, 2014), **racial issues in US** (McKay et al., 2003)
- Sources of inequalities in cognitive/academic achievement as outcomes
  - **Gender:** gender gap between boys and girls (Ababneh & Abdel Samad, 2018); gender inequity in science education is a significant problem across a broad set of countries (Buccheri et al., 2011).
  - **Immigration status:** gap between performance of children natives and immigrants (Zinovyeva et al., 2014), as well as inter-generational differences across immigrants (Schleicher, 2006).
  - **Income/socioeconomic income group:** Economically disadvantaged students perform lower, for example, in Mathematics (Alivernini et al., 2017), as well as in reading (Azzolini et al., 2012).
  - **Language at home:** studies have found that language at home is relevant in explaining reading test scores (Verwiebe & Riederer, 2013).

# Research Gap and Potential Contributions

- The international large-scale assessment (ILSAs) framework provides opportunities to explore the research questions
  - Expansion of developing country participants such as Philippines in PISA 2018
  - Introduction of SEA-PLM for Southeast Asia can focus on indicators and outcomes which are specific and contextualized to the region
- Policy-wise, there is a strong call to explore robust mechanisms of educational improvement process, shifting from **input-based/school management principles** towards **community-based accountability mechanisms and learner-centered policies**

# Data and Methods

- For this study, I used the PHL module of the **SEA-PLM** (Southeast Asia Primary Learning Metrics)
  - Full Sample of 31,200 students in SEA; 6083 students from the Philippines, of which 4.75% did not have parental profiles
  - Main achievement indicator: Math, Reading and Writing Scores
  - We merged Student + Parent+ School Data Modules
- Unique opportunity to investigate PE variables and identifying how parental characteristics explain academic achievement



# Quantifying Parental Engagement in the SEA-PLM Dataset

Six items on PE, largely home-based

- Q1: **do** homework for school
- Q2: parent **ask** what we learned
- Q3: schoolwork **discussed** with parents
- Q4: parent **check** homework
- Q5: parent **help** homework
- Q6: parent **motivate** to succeed

*For the FULL SEA example, reducing the PE measure is reasonable!*

- *Average Inter-item correlation of 0.39 and Cronbach's Alpha of 0.7945*
- *KMO of 0.85; RMSEA of 0.057-0.063*
- *Tested using Anderson and Gerbing's (1988) approach to testing the compositeness of the measure*
- *Can be reduced into a single item via principal components*

# Main Model (1)

The RepEst model (Avvisati & Keslair, 2014, 2020) follows the basic form

$$S_{ij} = \beta_0 + \beta_{ij} * MS_{ij} + \sum_{n=2}^N \beta_{nj} * W_{nj} + \varepsilon_i$$

where  $S_{ij}$  is the achievement score of student  $i$  nested within school  $j$ .  $MS_{ij}$  are the various composite indicators of learning beliefs measured at the student level.  $W_{nj}$  contain the other student-level and school-level controls, as well as other predictors.

Each subject-specific achievement score is reported in five plausible values (pv1\_m, pv2\_m...pv3\_m) etc, with corresponding 80 replicate weights (rwgt1, rwgt2, ...rwgt95).

# Bands are used to delineate the learning thresholds

## Reading

	<i>Lower Limit</i>	<i>Upper Limit</i>	<i>Interpretation</i>
Band 2 and below	<i>below</i>	273.99	Identify relationships between words and their meanings
Band 3	274	288.99	Read a range of everyday texts fluently and begin to engage with their meaning
Band 4	289	303.99	Understand simple texts
<b>Band 5</b>	<b>304</b>	<b>316.99</b>	<b>Make connections to understand key ideas</b>
Band 6	317	<i>and up</i>	Understand texts with familiar structures and manage competing information

## Writing

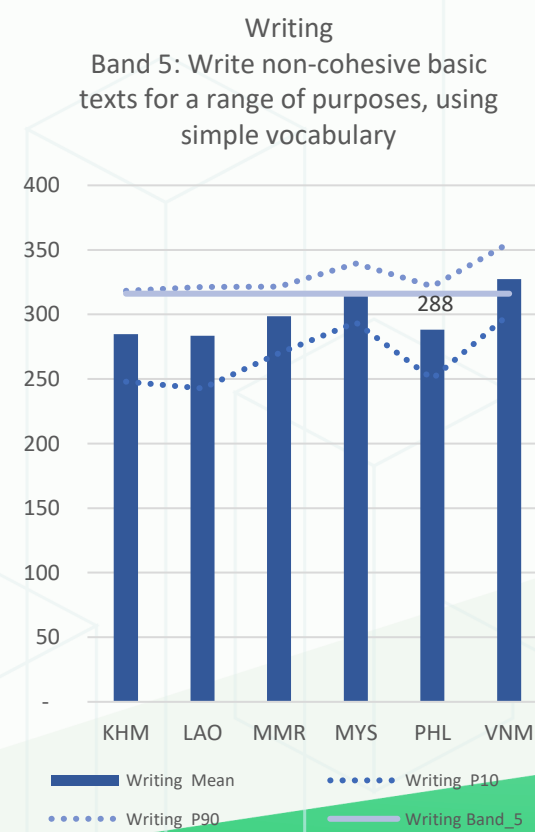
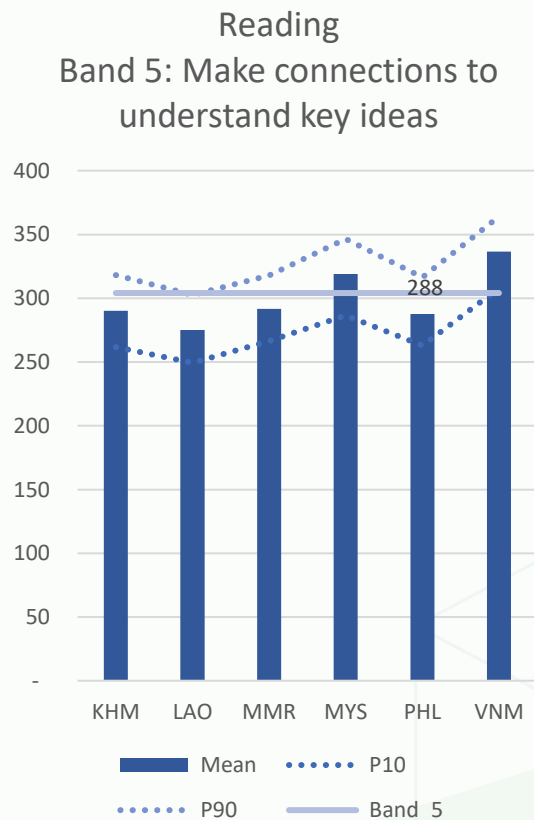
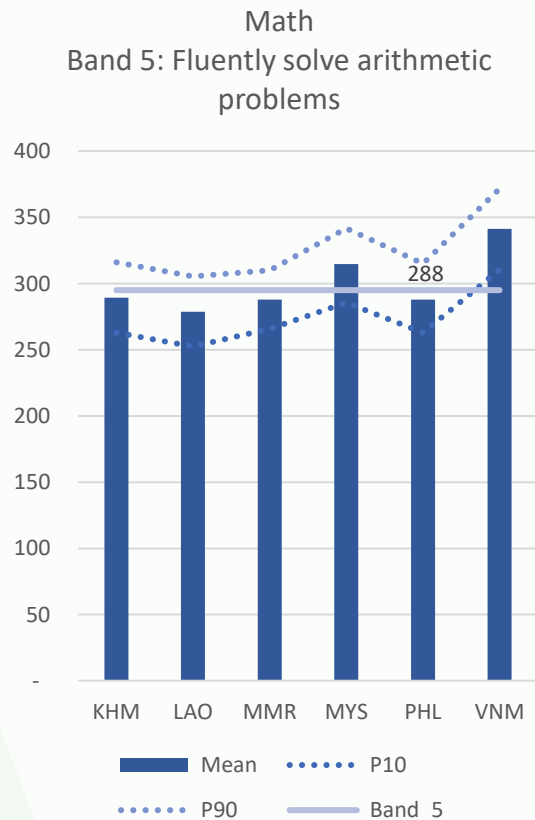
Band 1 and below	<i>below</i>	286.99	Limited ability to present ideas in writing
Band 2	287	295.99	Produce very limited writing, with fragmented ideas and inadequate vocabulary
Band 3	296	305.99	Produce very limited writing, with simple, insufficient ideas and limited vocabulary
Band 4	306	315.99	Produce limited writing, conveying simple ideas with basic vocabulary
<b>Band 5</b>	<b>316</b>	<b>326.99</b>	<b>Write non-cohesive basic texts for a range of purposes, using simple vocabulary</b>
Band 6	327	337.99	Write simple texts for a range of purposes with above basic vocabulary
Band 7	338	345.99	Write clear, detailed texts in various contexts with adequate vocabulary
Band 8	346	<i>and up</i>	Write cohesive texts with detailed ideas and a good range of appropriate vocabulary

## Mathematics

Band 2 and below	<i>below</i>	268.99	Few items to describe; simple counting and adding single digits
Band 3	269	281.99	Understand place value and scales of measurement
Band 4	282	294.99	Apply number properties and units of measurement
<b>Band 5</b>	<b>295</b>	<b>307.99</b>	<b>Fluently solve arithmetic problems</b>
Band 6	308	320.99	Perform mathematical operations, including with fractions, and interpret tables and graphs
Band 7	321	333.99	Apply fractions and percentages, and analyze data representations
Band 8	334	346.99	Think multiplicatively, convert between units
Band 9	347	<i>and up</i>	Few items to describe; reason about triangles and find unknown side length; solve using frequency distributions

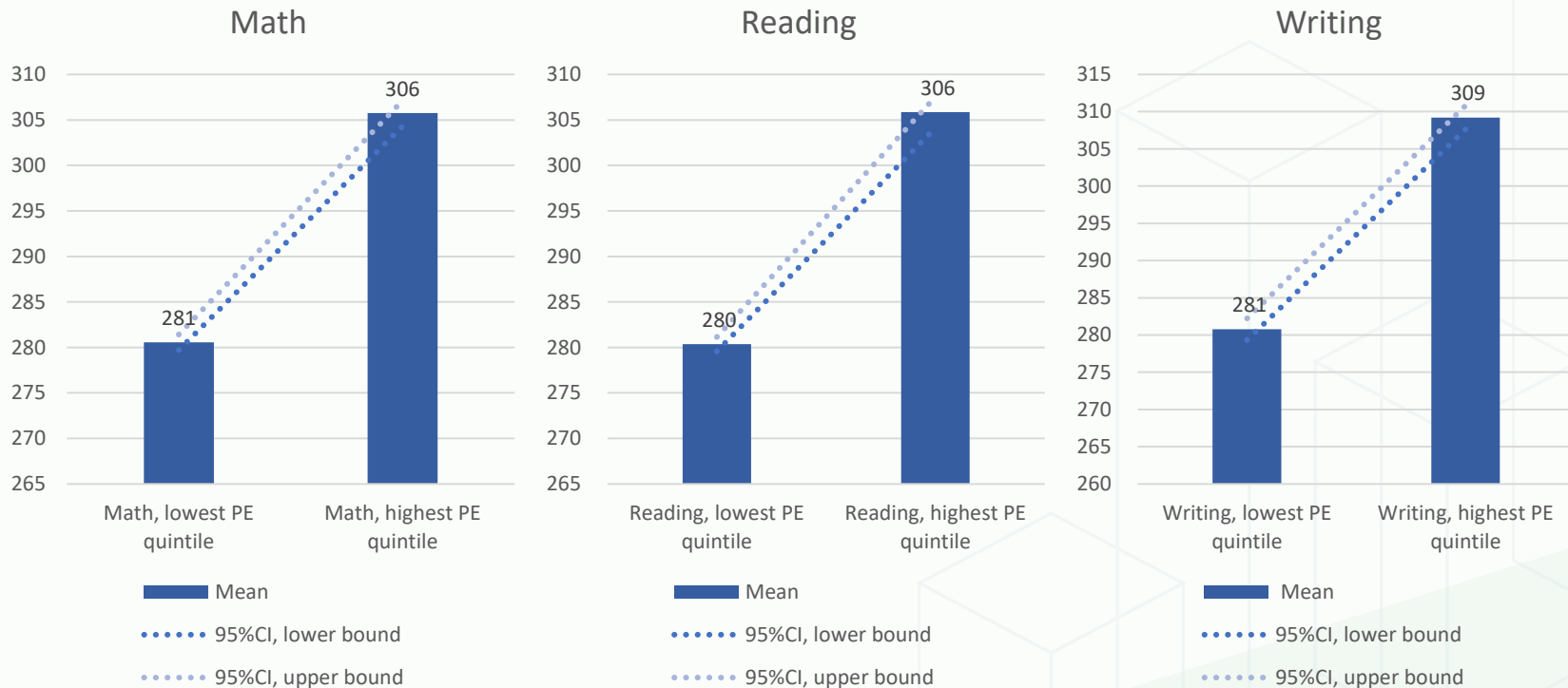
# Regional Averages

Regional performance varies extensively; Philippine national average consistently below Band 5



# Average Scores in the Philippines

How do scores vary across levels of parental engagement?



# The Intensity of Parental Engagement Matters

How do scores vary across levels of parental engagement in the Philippines?

		Q1: Do homework	Q2: Parent ask what learned	Q3: Schoolwork discussed with parents	Q4: Parent check homework	Q5: Parent help homework	Q6: Parent motivate to succeed
<b>Math</b>	Hardly/Never	277.7	283.0	283.5	283.3	284.5	280.0
	Monthly	282.2	281.5	284.4	284.8	284.4	282.7
	Weekly	294.1	290.9	290.3	288.4	291.1	288.4
	Daily	300.3	299.5	297.7	297.3	295.8	299.2
<b>Reading</b>	Hardly/Never	277.1	283.1	283.8	282.7	284.6	280.7
	Monthly	281.5	280.7	284.2	284.6	284.0	282.0
	Weekly	295.1	291.0	290.4	288.7	291.3	287.4
	Daily	300.4	299.4	297.2	297.1	295.5	299.5
<b>Writing</b>	Hardly/Never	275.3	284.7	284.5	283.3	285.7	281.5
	Monthly	283.3	278.6	285.1	285.6	285.4	283.1
	Weekly	296.9	293.3	290.8	289.1	292.1	289.3
	Daily	303.3	302.7	300.4	299.5	297.9	301.1

# **Do test scores in the Philippines vary significantly across schools and regions?**

Academic achievement variation is not high within schools.

- Methodologically difficult to compute test scores by school, in fact, it is not recommended.
- But it is possible to test whether variations in test scores of students are in fact explained by clustering
- Two level HLM model: Intraclass correlation coefficients are about  $\sim 0.06$  for Math and Reading, and  $\sim 0.04$  for Writing.
- Three-level HLM model: regional clustering is weakly correlated; however, scores are more “highly” correlated for schools within the same region,  $\sim 0.3-0.4$  across.

pooled	M1	M2	M3	M4
2_student_repeat_b	13.01***	11.52***	7.18***	7.2***
2_student_repeat_se	(0.62)	(0.78)	(0.74)	(0.74)
2_student_entry_b	-0.680	-0.550	0.350	0.340
2_student_entry_se	(0.63)	(0.73)	(0.67)	(0.65)
3_student_entry_b	-1.63*	0.070	1.010	0.960
3_student_entry_se	(0.97)	(1.21)	(1.06)	(1.04)
4_student_entry_b	-9.54***	-8.32***	-3.740	-3.410
4_student_entry_se	(1.46)	(2.7)	(2.67)	(2.58)
1_preschool_att_b	7.44***	6.26***	3.93***	3.83***
1_preschool_att_se	(0.98)	(1.09)	(0.98)	(1.01)
2_preschool_att_b	5.94***	5.32***	3.59***	3.51***
2_preschool_att_se	(0.86)	(1.04)	(0.98)	(1.01)
1_gender_b	1.24**	1.89***	0.90	0.910
1_gender_se	(0.57)	(0.63)	(0.57)	(0.59)
1_urban_b	-1.010	-1.460	-0.320	-0.330
1_urban_se	(1.51)	(1.55)	(1.17)	(1.13)
2_male_guardian_b		6.35***	3***	2.83***
2_male_guardian_se		(0.67)	(0.65)	(0.66)
3_male_guardian_b		11.26***	3.64***	3.67***
3_male_guardian_se		(1.22)	(1.25)	(1.25)
2_female_guardian_b		3.47***	-0.730	-0.70
2_female_guardian_se		(0.68)	(0.71)	(0.71)
3_female_guardian_b		11.49***	2.27*	2.23*
3_female_guardian_se		(1.05)	(1.24)	(1.22)
1_father_educ_b		4.1***	1.51**	1.64**
1_father_educ_se		(0.78)	(0.75)	(0.72)
cons_b	273.76***	269.73***	266.29***	268.07***
cons_se	(1.94)	(2.24)	(2.58)	(2.95)
R Squared	<b>0.22</b>	<b>0.36</b>	<b>0.53</b>	<b>0.53</b>
Region Controls	Yes	Yes	Yes	Yes

## Preliminary Results: Math Scores and Parental Engagement

The “Unsurprising” results

- **Non-repeaters** clearly have an advantage over **repeaters**
- **Late entrants** are also disadvantaged
- **Students who received ECCD** (either one year or two years) have better scores
- **Slight advantage of girls over boys** in M1 and M2, but considering PE the effect goes away

• No urban/rural advantage

BUT

- The work and educational background of parent and guardians matter!



# Preliminary Results: Math Scores and Parental Engagement

Intensity of parental engagement matters,  
but interaction with SES reinforces effects!

PE alone does not boost scores without  
resources available at home?

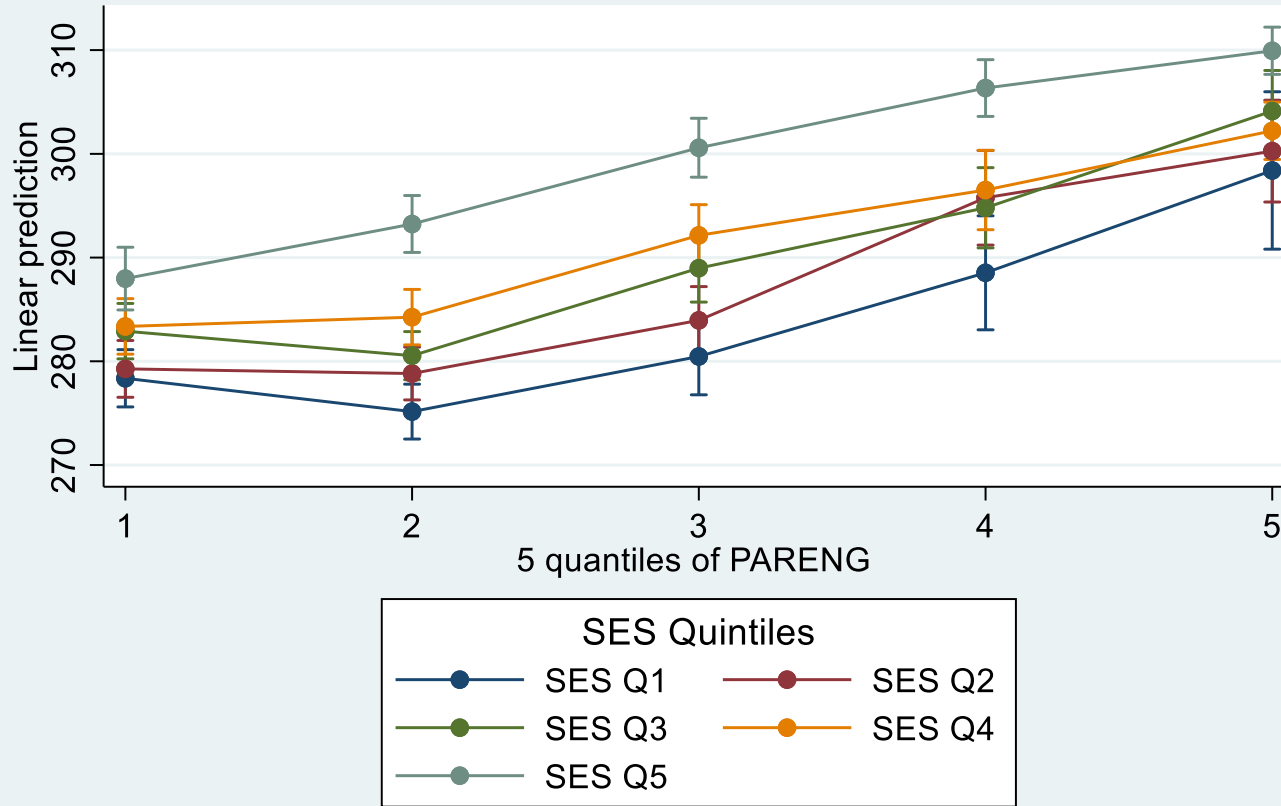
	M3	P-Values	95% CI-LL	95% CI UL
PE Quintile 2	0.410344	0.624	(1.23)	2.05
PE Quintile 3	6.967529	0.000	5.41	8.53
PE Quintile 4	14.73545	0.000	13.09	16.38
PE Quintile 5	19.30369	0.000	17.79	20.82
SES Quintile 2	3.578475	0.003	1.25	5.91
SES Quintile 3	5.822686	0.000	3.73	7.92
SES Quintile 4	7.819203	0.000	5.51	10.13
SES Quintile 5	15.23478	0.000	12.43	18.04

M3 specifications include PE and SES  
separately, but student, parent, region  
covariates are still included

	M4	P-Values	95% CI-LL	95% CI UL
PEQ1 x SESQ2	1.042	0.525	(2.172)	4.256
PEQ1 x SESQ3	4.856	0.001	1.870	7.842
PEQ1 x SESQ4	6.767	0.000	3.102	10.432
PEQ1 x SESQ5	10.483	0.000	6.872	14.094
PEQ2 x SESQ1	(2.667)	0.072	(5.569)	0.236
PEQ2 x SESQ2	2.175	0.233	(1.403)	5.753
PEQ2 x SESQ3	3.927	0.046	0.068	7.786
PEQ2 x SESQ4	6.515	0.000	3.053	9.977
PEQ2 x SESQ5	16.426	0.000	12.793	20.058
PE3Q3 x SESQ1	3.593	0.092	(0.589)	7.774
PE3Q3 x SESQ2	7.050	0.000	3.195	10.904
PE3Q3 x SESQ3	10.404	0.000	7.049	13.760
PE3Q3 x SESQ4	14.654	0.000	10.972	18.336
PE3Q3 x SESQ5	21.919	0.000	17.776	26.062
PEQ4 x SESQ1	12.514	0.000	6.059	18.968
PEQ4 x SESQ2	20.249	0.000	15.254	25.245
PEQ4 x SESQ3	17.630	0.000	12.909	22.351
PEQ4 x SESQ4	19.944	0.000	14.539	25.349
PEQ4 x SESQ5	28.170	0.000	24.722	31.618
PEQ1 x SESQ1	23.745	0.000	18.175	29.315
PEQ1 x SESQ2	24.693	0.000	19.050	30.336
PEQ1 x SESQ3	25.770	0.000	21.281	30.259
PEQ1 x SESQ4	23.876	0.000	20.502	27.250
PEQ1 x SESQ5	31.856	0.000	28.439	35.272

M4 Specifications interact PE and SES; student,  
parent, region covariates included

Predictive margins of PE Quintile & SES Quintiles with 95% CIs  
SEA-PLM Mathematics Computations



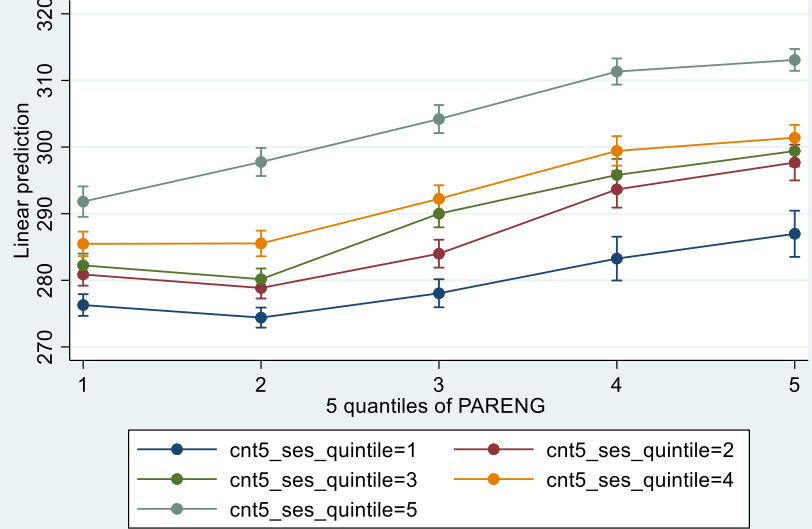
# The interaction between PE and SES, in relation to gains in academic achievement

PE alone is not sufficient; replicating the material and social support for higher SES towards the disadvantaged HHS

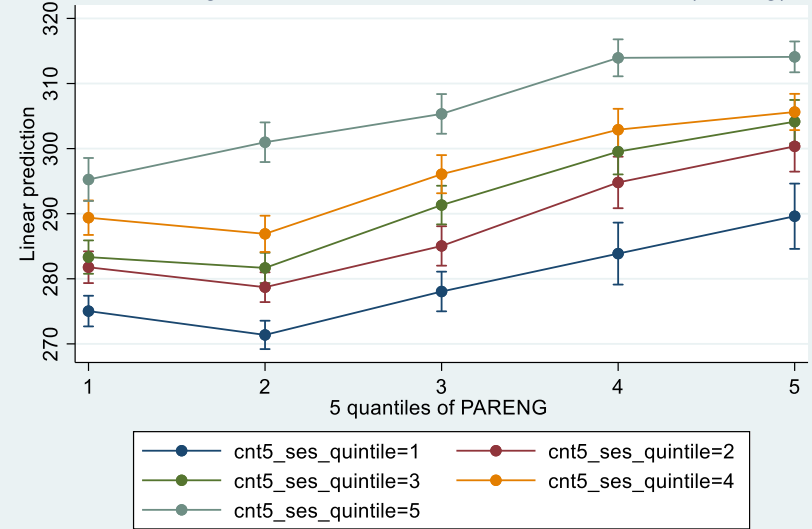
# Key insights: Replicating the M4 specification (with PE x SES interaction) to reading and writing, similar patterns emerge

- On Reading scores: students on PE Quintile 5 have **16** (SES Quintile 1) to **38** points (SES Quintile 5) higher points than those belonging to the lowest PE quintile.
- On Writing scores : students on students on PE Quintile 5 have **18** (SES Quintile 1) to **41** points (SES Quintile 5) higher points than those belonging to the lowest PE quintile.
- Even correcting for sample size reduction due to parental education backgrounds, the magnitude of PExSES interaction to be quite huge and statistically significant

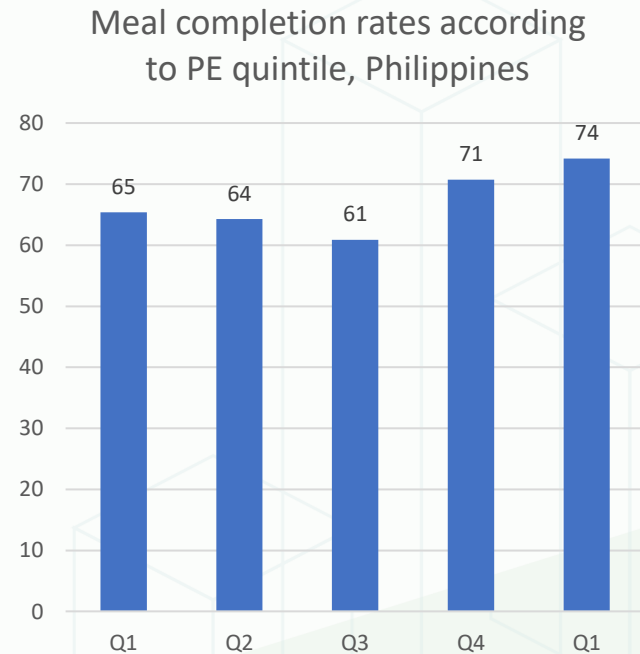
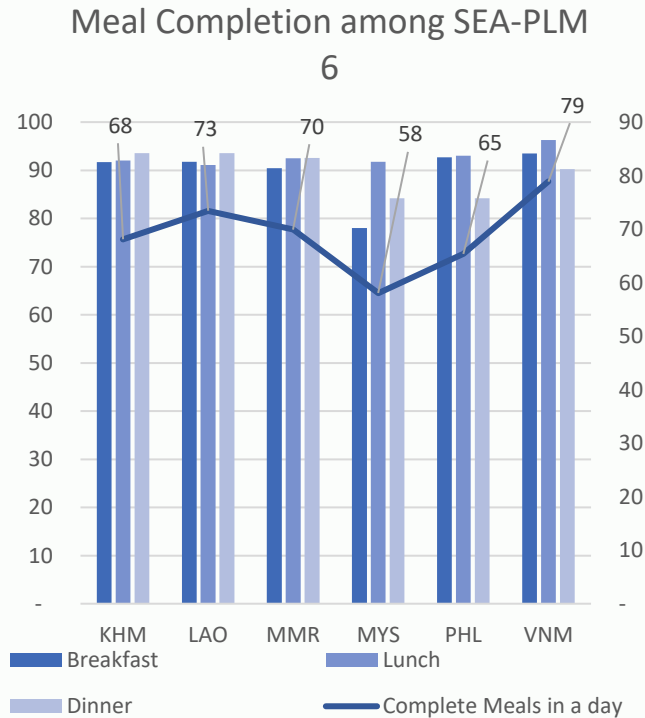
Predictive margins of PE x SES quintiles with 95% CIs (Reading)



Predictive margins of PE x SES Quintiles with 95% CIs (Writing)



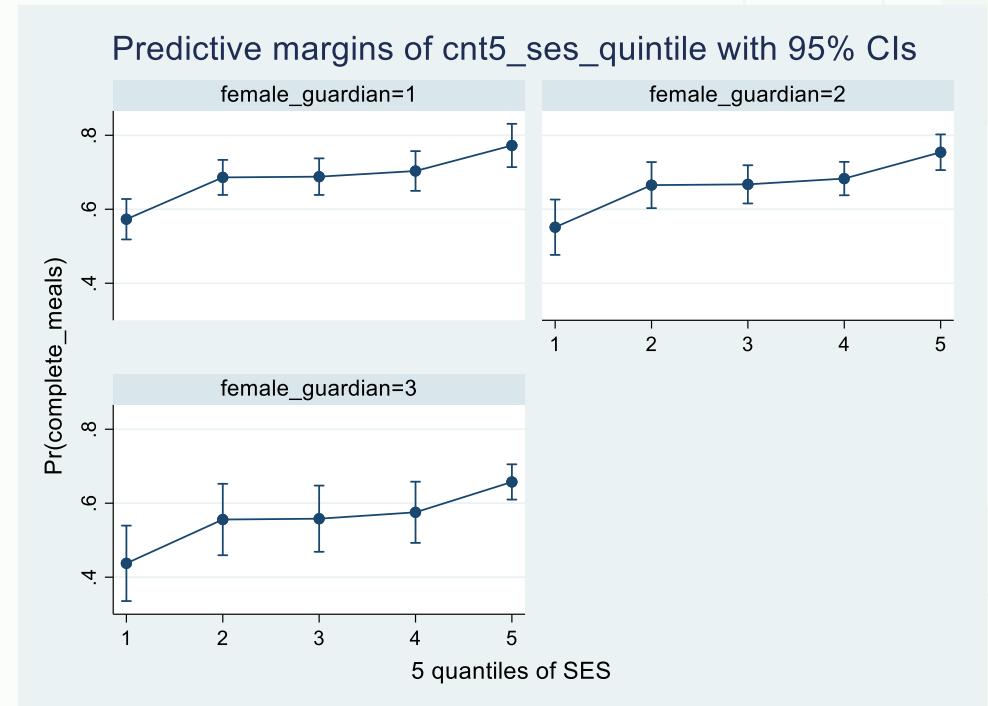
# Analysis 2: Does parental engagement matter in meal completion?



# Logistic Regression Results

Can parental engagement explain meal completion among students?

- We conducted a logistic regression analysis for meal completion among students (DV), with the usual student/parental covariates. Results:
- Parental engagement levels are NOT statistically significant; PE is separable from nutrition support?
- However, students from SES Quintile 1 are severely disadvantaged: they are 63% less likely than students from Quintile 5 to complete meals
- Students with a history of repetition are 48% more likely unable to complete meals
- Female students are 33% more likely to complete meals than boys
- Differences persist among job categories of the female guardians, students whose mother/female guardian belong to the professional category are 38% less likely to complete meals



# Key Takeaways (some next steps) from this PE research

1. There is a strong need to identify the drivers of academic achievement beyond classroom and school inputs; relational levers such as parental engagement matters, and should be nurtured with a feedback mechanism.
2. The transition (or instability) of learning modality during the pandemic did not clarify parental roles; learning losses are exacerbated by the fact that most parents cannot swap roles with teachers. While parents cannot fully acquire skills related to teaching, they have roles in shaping socioemotional skills, learning habits and attitudes.
3. While overall performance matters, equity matters more. The Philippines has a large share of drop-outs, non-readers, and those without ECCD experiences → they account significantly in differences in achievement. Closing the gap happens early during the early years.

# Key Takeaways (some next steps) from this PE research

3. Parental Involvement is important, but it does not happen in isolation with other learner and parental characteristics. It interacts with SES and other background characteristics. Therefore, tools must be available to disadvantaged parents empower them to support their child's learning journey.
4. Definitely more research is needed, particularly broadening the data available needed to look for levers of educational improvement, particularly on other non-cognitive education outcomes. Parental co-production is not about shifting roles and costs of teaching burden, but sharing responsibilities.



# Thank you for listening!

## **The Quality of Basic Education in Southeast Asia**

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**Extra Slide(s) Follow**

# Does Parental Engagement Matter?

Plots of 95% Confidence Intervals (CIs) across parental engagement quintiles in the Philippines

