How does Single Parent Family Affect Children's Human Capital Investment

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Quick Recap

What's out research focused on?

- Motivation
  - **Single parent (SP)** family might fail to provide children with stable environment for learning
  - Besides, single parent might not give enough mental support to children
- Therefore, we aim to estimate the negative impact on **children's education attainment**

Dataset

Taiwan Education Panel Survey and Beyond, SRDA

- A panel data tracking down two different groups of children across almost 20 years
  - Senior High group (**SH**): born in 1984-1985
  - Core/New Population group (**CP/NP**): born in 1988-1989
- A comprehensive dataset **surveying on the children, their parent and teachers**, even after they enter labor market
- Each group contains 20,000 samples

Concerned Variable

What's the outline of our analysis?

- Treatment variable:

$$SP_i = \begin{cases} 1, & \text{if individual } i \text{ once under SP family in senior high} \\ 0, & \text{o.w} \end{cases}$$

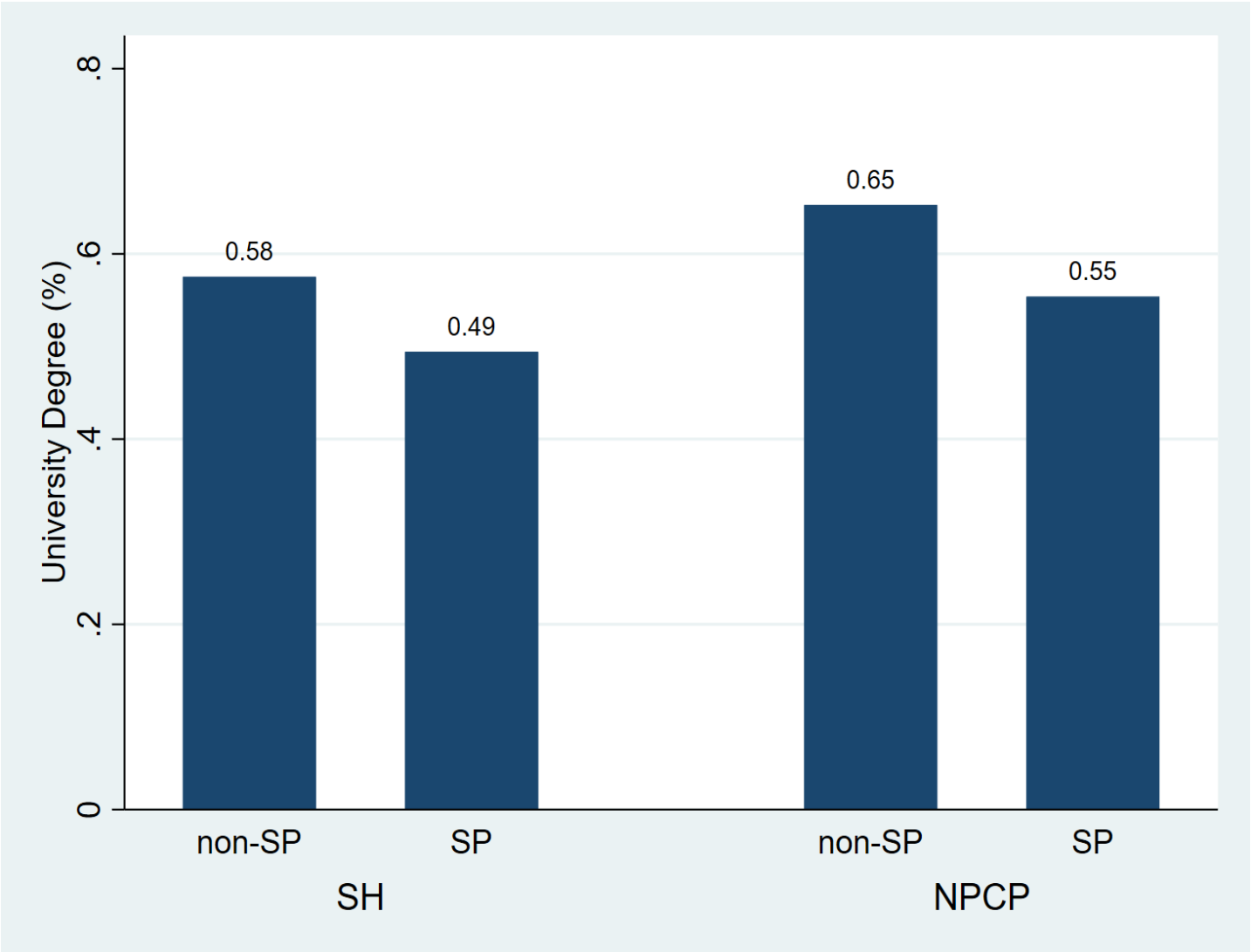
- Outcome variable:

$$Y_i = \{\text{University Degree, Master Degree, Public University}\}$$

- To begin an analysis, it's always good by looking at the graph

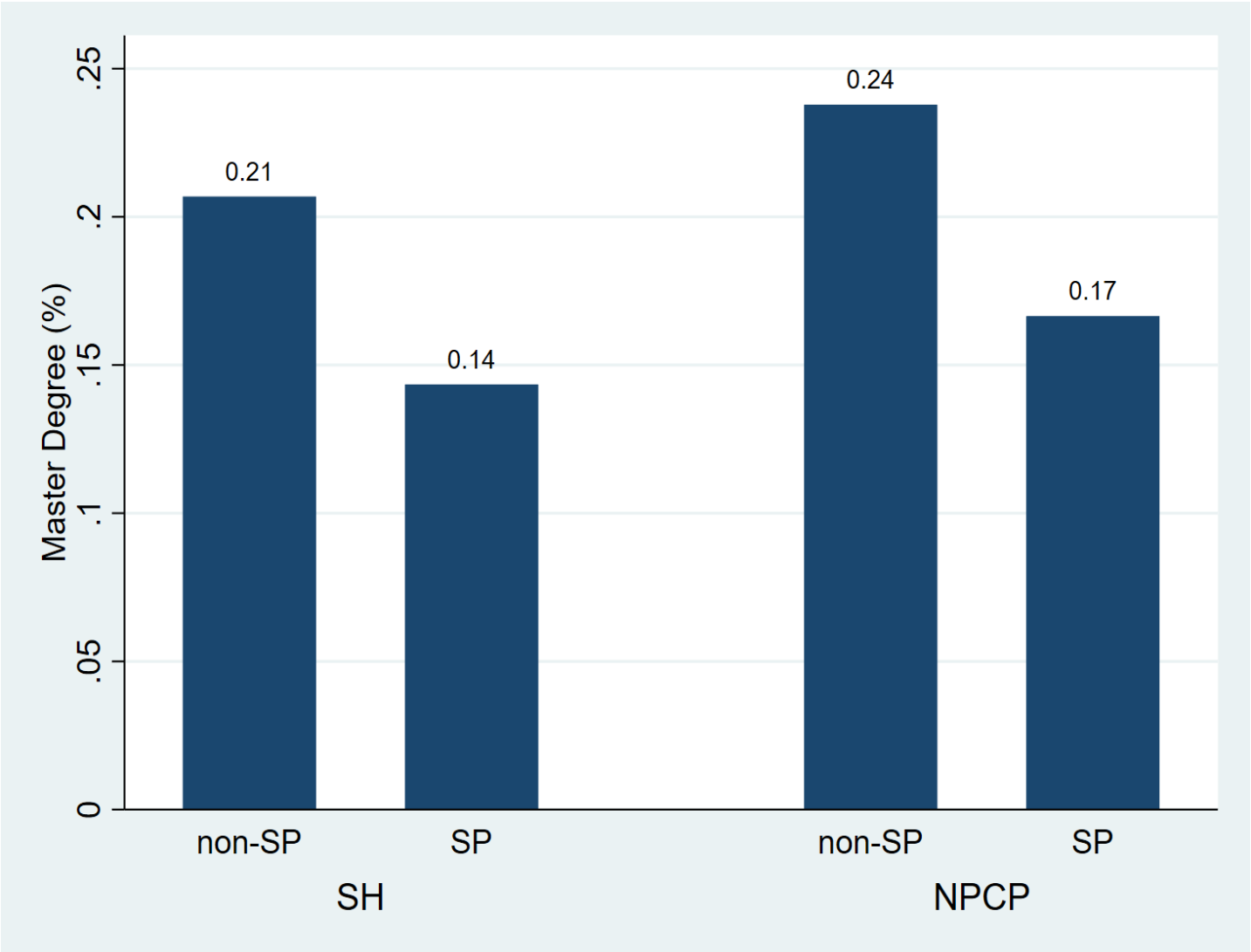
Concerned Variable

Outcome Variable (1): University Degree



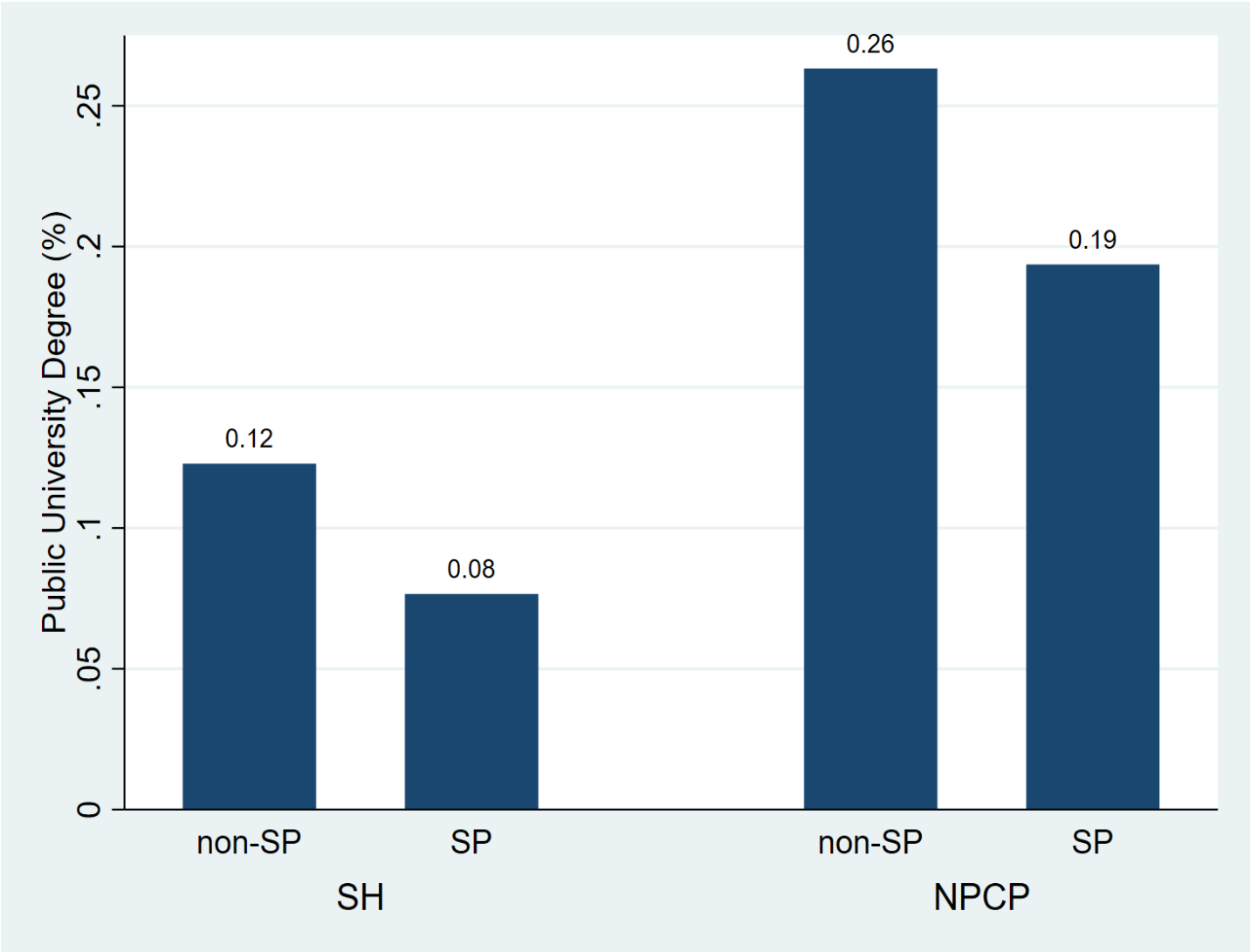
Concerned Variable

Outcome Variable (2): Master Degree



Concerned Variable

Outcome Variable (3): Public University



Concerned Variable

How to pick up potential confounders?

- To perform PDS analysis, We pick an abundance of covariates, including
  - student's background information
    - ★ gender, living area, private/public school, general/vocational school
  - parent's education
  - each teacher's evalutaion
  - etc.
- It's important to not include **bad control** in the model, hence we use very few covariates in parent's dataset

Empirical Specification

Post-Double Selection

- With PDS, we can detect the confounders in roughly **80 selected covariates** and identify the causal relationship

$$Y_i = \beta_0 + \beta_1 SP_i + \bigcup_{j \in A \cup B} \pi_j W_i^j + \epsilon_i$$

where A, B are the Lasso-selected covariates at step 1 & 2 in PDS.

Preliminary Result

Outcome Variable (1): University Degree

	SH			CP/NP		
	(1) University	(2) University	(3) University	(4) University	(5) University	(6) University
sp	-0.0799***	-0.0318***	-0.0136	-0.0989***	-0.0230**	-0.0264**
	(0.000)	(0.008)	(0.402)	(0.000)	(0.022)	(0.041)
female		0.00945			0.000753	
		(0.180)			(0.902)	
hs_private		-0.0762***	-0.0386***		-0.0896***	
		(0.000)	(0.000)		(0.000)	
hs_urban		0.0711***			0.0294***	0.0124
		(0.000)			(0.000)	(0.159)
general_high		0.556***	0.514***		0.635***	
		(0.000)	(0.000)		(0.000)	
paedu		0.101***	0.0739***		0.0829***	0.0330***
		(0.000)	(0.000)		(0.000)	(0.000)
PDS_control			Yes			Yes
N	11132	11050	5230	12576	12386	5766

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Preliminary Result

Outcome Variable (2): Master Degree

	SH			CP/NP		
	(1) University	(2) University	(3) University	(4) University	(5) University	(6) University
sp	-0.0753***	-0.0481***	-0.0405**	-0.0714***	-0.0404***	-0.0465**
	(0.000)	(0.000)	(0.024)	(0.000)	(0.000)	(0.015)
female		-0.0981***	-0.0597***		-0.101***	-0.0558***
		(0.000)	(0.000)		(0.000)	(0.000)
hs_private		-0.0763***			-0.0555***	
		(0.000)			(0.000)	
hs_urban		0.0536***			0.0497***	0.0570***
		(0.000)			(0.000)	(0.000)
general_high		0.204***	0.156***		0.167***	
		(0.000)	(0.000)		(0.000)	
paedu		0.156***	0.129***		0.105***	0.0813***
		(0.000)	(0.000)		(0.000)	(0.000)
PDS_control			Yes			Yes
N	10438	10362	4848	12173	11986	5600

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Preliminary Result

Outcome Variable (3): Public University

	SH			CP/NP		
	(1) University	(2) University	(3) University	(4) University	(5) University	(6) University
sp	-0.0331***	-0.00861	0.01000	-0.0696***	-0.0374***	-0.0443**
	(0.006)	(0.450)	(0.553)	(0.000)	(0.001)	(0.020)
female		-0.00220			-0.0278***	
		(0.757)			(0.000)	
hs_private		-0.103***	-0.0675***		-0.120***	-0.0860***
		(0.000)	(0.000)		(0.000)	(0.000)
hs_urban		0.0751***			0.0841***	0.0968***
		(0.000)			(0.000)	(0.000)
general_high		0.229***	0.184***		0.275***	
		(0.000)	(0.000)		(0.000)	
paedu		0.118***	0.0978***		0.108***	0.0641***
		(0.000)	(0.000)		(0.000)	(0.000)
PDS_control			Yes			Yes
N	10577	10503	5027	11518	11353	5576

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Concluding and Future Prospect

What do PDS tells us?

- There're many unexpected variables PDS selected, like
  - *"How many years had the teacher taught in school?"*
  - *"What's the score/performance for this class?"*
  - *"Does the teacher hold extra class in the weekend?"*
  - *"How many student's parents the teacher had met with in this semester?"*
- PDS surely help us reduce the OVB in a convenient way
  - however, missing data problem comes with dimension, leading to significantly decreasing number of samples

Concluding and Future Prospect

What and How can we dive deeper?

- Focus on the difference between SH and CPNP
  - high education reform in 2000s
- Explain the negative effect channel (Mediation Analysis)
  - accompanying time
  - economic condition