Helping Parents Combat Middle-School Blues

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SEA Annual Meeting 2022

Motivation

- Middle-School Blues is widespread yet often overlooked
  - Parental mental health reaches its nadir during their children's middle school period
  - Common phenomenon in the US (Luthar and Ciciolla, 2015, 2016)
  - However, **lack of** empirical evidence in other societies

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- Why Middle school period is tough for parents?
  - Conflict between parental skills and adolescents in transition (Montemayor, 1983;Baumrind, 1991)
  - Adolescence period features lower parental involvement (Nomaguchi, 2012).
  - Adolescents often feel stressful (Eccles et al., 1993)

Research Questions

- Is the Middle-School Blues phenomenon also prevalent in China?
- Can a parental involvement program on parental skills and empathy improve parental mental health?

This Paper

- We document the same phenomenon in China using nationally representative data
  - Detect a “V-shaped” pattern between parental mental health and the stages of child development

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- We document the same phenomenon in China using nationally representative data
  - Detect a "V-shaped" pattern between parental mental health and the stages of child development

- We design and evaluate a low-cost, highly-scalable, and parent-directed intervention on empathy education in two middle schools in China
  - The program ↑ parental mental health (GHQ-12) by 0.17 SD
  - Three mechanisms: improvement in parental skills, time inputs, and children's non-cognitive ability
    - Can explain 62% of the total program impact
    - Improvement in parental skills is the **key driver**

Contribution to Literature

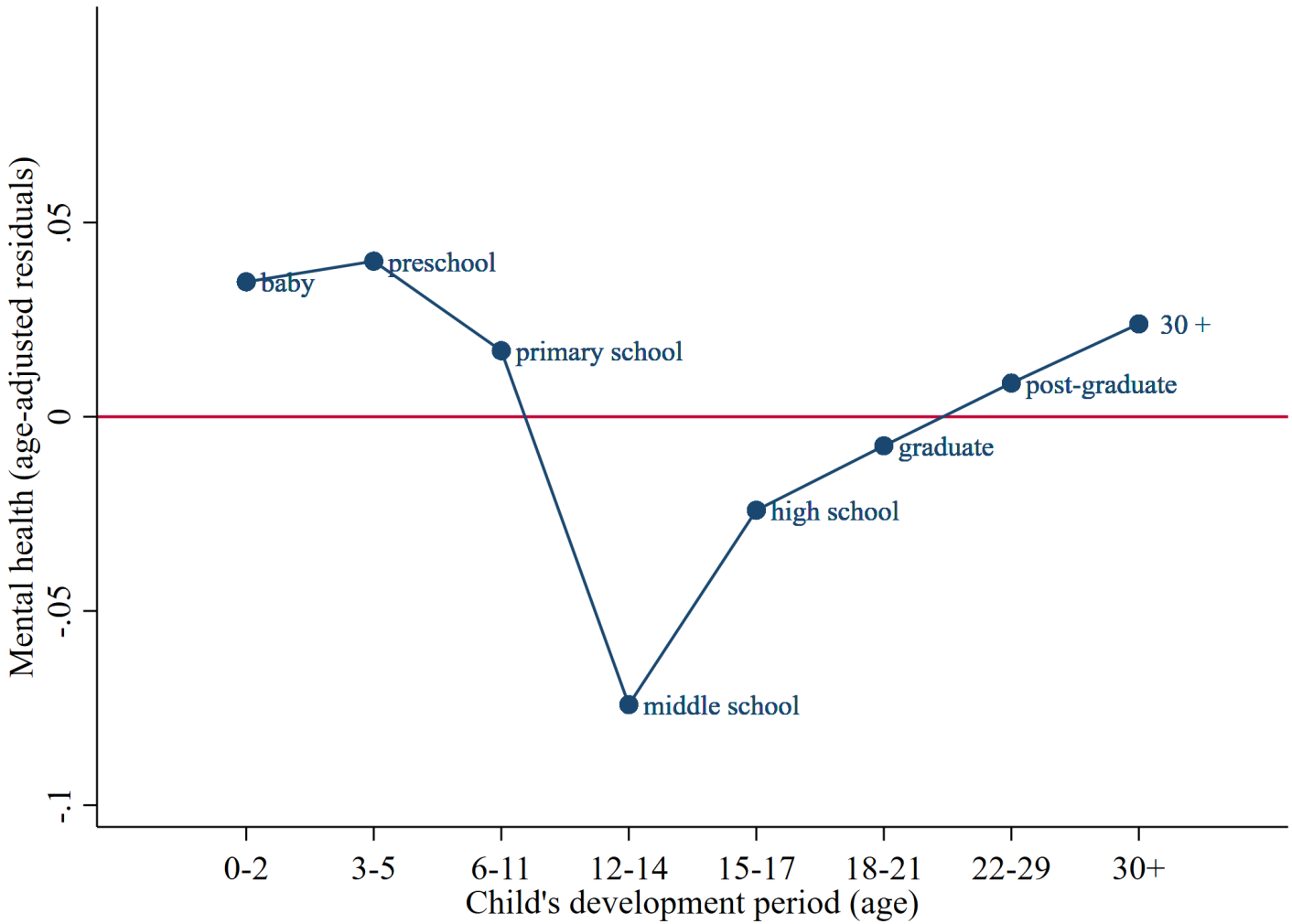
- **Happiness literature:** e.g., (Blanchflower-Oswald, 2008; Blanchflower, 2021; Graham-Ruiz Pozuelo, 2017; Cheng-Powdthavee-Oswald, 2017)
  $\longrightarrow$ Document the V-shape parental mental health throughout children's development period

- **Parental involvement program literature focuses on its impact mostly on children's outcomes and parental skills:** e.g., (Cunha-Heckman, 2008; Cunha-Heckman-Schennach, 2010; Bono-Francesconi-Kelly-Sacker, 2016; Del Boca-Monfardini-Nicoletti, 2017; Attanasio-Meghir-Nix, 2020; Barrera-Osorio-Gertler-Nakajima-Patrinos, 2020)
  $\longrightarrow$ Examine the return to parental involvement on parental mental health

- **Determinants of parental mental health - narrowly explored:** (Lund et al., 2018)
  $\longrightarrow$ Mediation analysis shows the importance of parental skills
  $\longrightarrow$ Parental time inputs and child ability also matter

Outline

Middle School Blues in China



Source: CFPS 2010. Parents' mental health is measured by K-6 score.

by gender | evidence from U.S.

Outline

Background

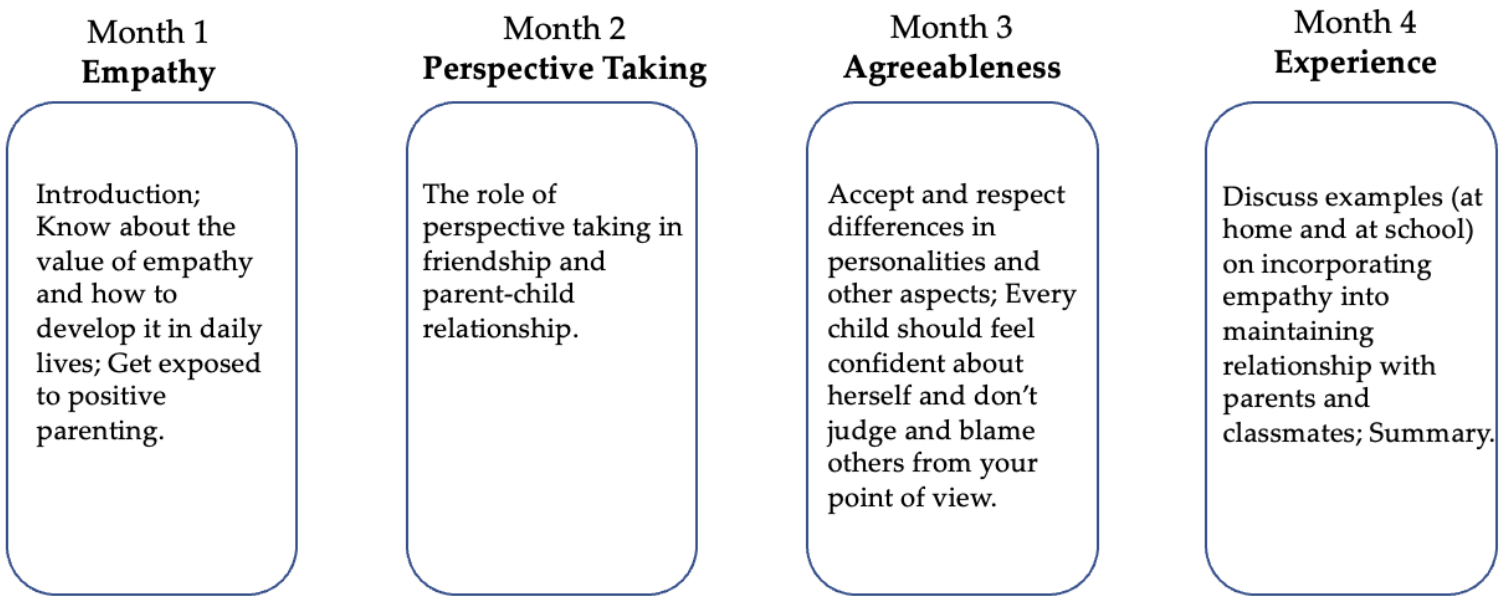
- Targeted population: middle school adolescents / 7th and 8th graders
- Targeted schools: one public & one private
- One suburban county in southern region of China - Yongkang, Zhejiang Province
  - 0.9 million residents and relatively rich: reached 103,163 RMB (about 15,000 USD) GDP per capita in 2020
  - lack of parental involvement: 0 hours a week on checking homework (40% of parents) or on outdoor activities (42% of parents)

The Intervention

- Parent-directed intervention
- Highly scalable and low cost
  - deliverable in a mobile App
  - verifiable with check-in feature
- The content includes education + coaching on non-cognitive skill formation

The Curriculum

- Embed a curriculum developed by psychologists inspired by Ciaramicoli (2000) *The Power of Empathy* and Ciaramicoli (2016) *The Stress Solution*
- The detailed content consists of 8 biweekly parent-child reading tasks and 4 empathy-oriented movies on 4 monthly themes detailed topics



Outline

Experimental Design

- **Baseline survey** for students collected in January 2021 timeline
- **Randomization**: stratified cluster randomization design (4 strata, 48 clusters) randomization
  - Treatment: 26 classes (1,217 students)
  - Control: 22 classes (1,029 students)
- **Treatment** classes received biweekly tasks information (March - June)
- **Control** classes received NO information during the intervention
- **Follow-up survey** for students and parents collected in late June 2021

Data and Measures

- Primary Outcome:
  - General Health Question 12-item (GHQ-12)
    - anxiety, social dysfunction, and loss of confidence
- Intermediate Outcomes: detail
  - Parental skills
    - parenting style, parental responsiveness, and empathy
  - Time investment
    - weekday and weekend
  - Child non-cognitive ability
    - stress, positive personality, empathy, CES-D10

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- 1,852 parents response - 17% attrition rate
  - No selection in attrition (Hausman and Wise, 1979; Dumville et al., 2006) detail
  - Balance in characteristics detail

- **Intent to Treat (ITT)**:

$$Y_{ic1} = \alpha + \beta_1 T_c + \phi_s + \epsilon_{ic},$$

  - Y_{ic1}, outcome variable measured at the followup;
  - T_c, treatment assignment indicator;
  - ϕ_s, strata fixed effects;
  - cluster SE at the classroom level
    - report Cameron et al. (2008)'s wild cluster bootstrap (WCB) p-values

Mediation Analysis

- Apply a mediation analysis following Heckman et al. (2013) and Heckman and Pinto (2015)
- Assume a linear production function of parental GHQ:

$$G_{i,d}^{C} = \kappa_d + \alpha_d^{T} T_{i,d}^{A} + \alpha_d^{P} ¶_{i,d}^{A} + \alpha_d^{S} \theta_{i,d}^{A} + \alpha_d^{U} U_{i,d} + \beta_d X_i + \epsilon_{i,d}, \quad d \in \{0,1\},$$

- With additional assumptions, the overall mental health effect can be decomposed:

$$\underbrace{\mathbb{E}\left[G_{i,1}^{C} - G_{i,0}^{C}\right]}_{\text{GHQ effect}} = \underbrace{\tau_1 - \tau_0}_{\text{unmeasured}} + \underbrace{\alpha^{T}\mathbb{E}\left[T_{i,1}^{A} - T_{i,0}^{A}\right]}_{\text{time investment}} + \underbrace{\alpha^{P}\mathbb{E}\left[¶_{i,1}^{A} - ¶_{i,0}^{A}\right]}_{\text{parental skill}} + \underbrace{\alpha^{S}\mathbb{E}\left[\theta_{i,1}^{A} - \theta_{i,0}^{A}\right]}_{\text{child ability}},$$

where $\boldsymbol{\tau} = \boldsymbol{\kappa}_d + \sum_{j \in J_U} \alpha_d^{j} \mathbb{E}\left[U_d^{j}\right]$.

Outline

Distribution of GHQ-12 Across Treatment and Control Groups

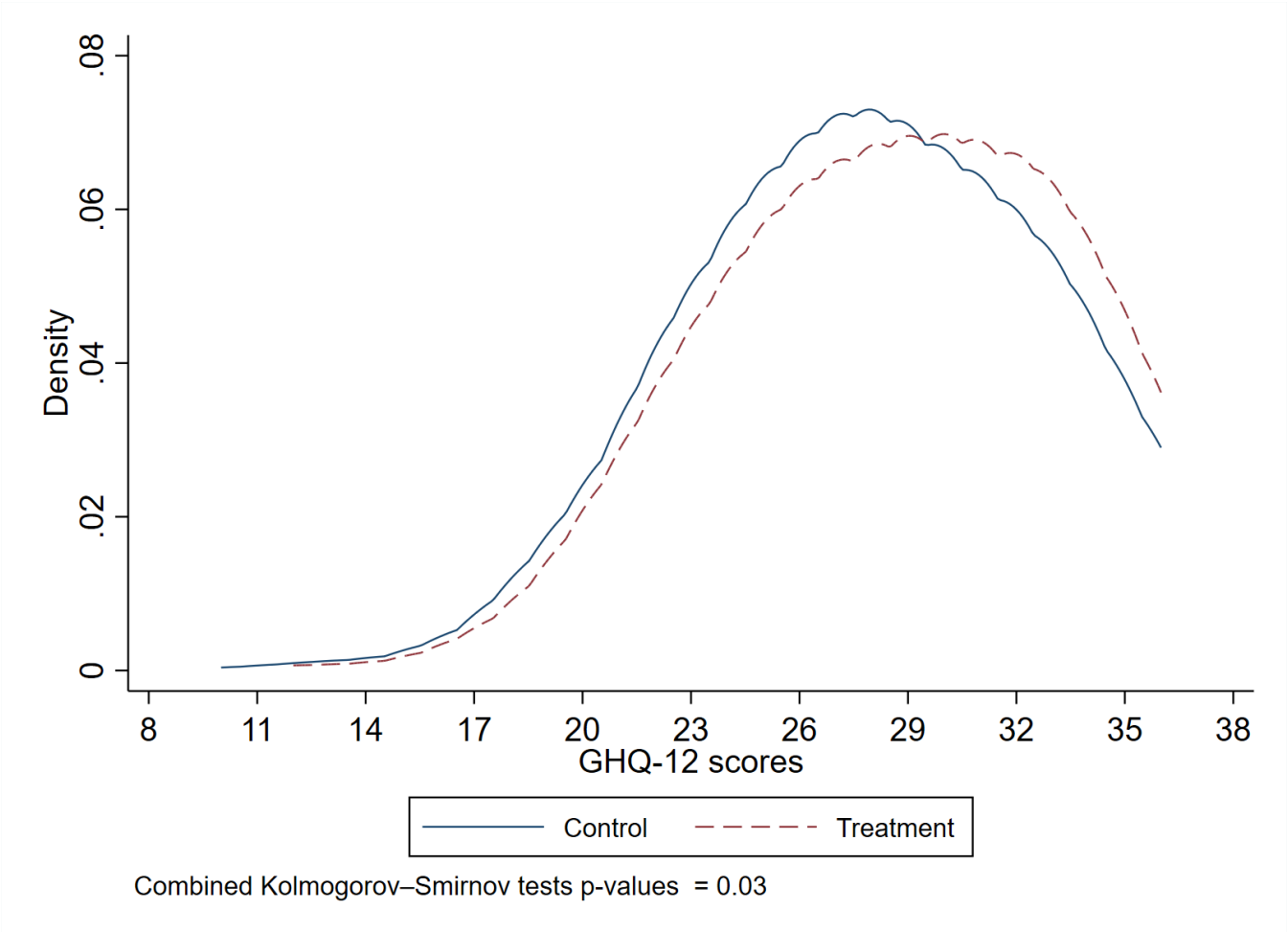


Table: Program Impacts (ITT) on parental mental health

	(1) Control mean	(2) ITT	(3) Permutation test	(4) WCB
		Panel A. Mental Health		
GHQ (Likert)	-0.077	0.169***	0.009	0.011
	(1.000)	(0.062)		
Feel very happy last week	0.423	0.060**	0.043	0.038
	(0.494)	(0.027)		
N	848	1,852		
		Panel B. Three dimensions		
Social dysfunction	-0.060	0.153**	0.012	0.018
	(1.006)	(0.059)		
Anxiety	-0.059	0.149**	0.019	0.028
	(0.955)	(0.061)		
Loss of confidence	-0.047	0.115**	0.037	0.047
	(0.973)	(0.051)		
N	848	1,852		

Robust to alternative scoring methods

other scoring methods

Robust to attrition

attrition analysis

Improves mental health for majority of the parents in a similar way

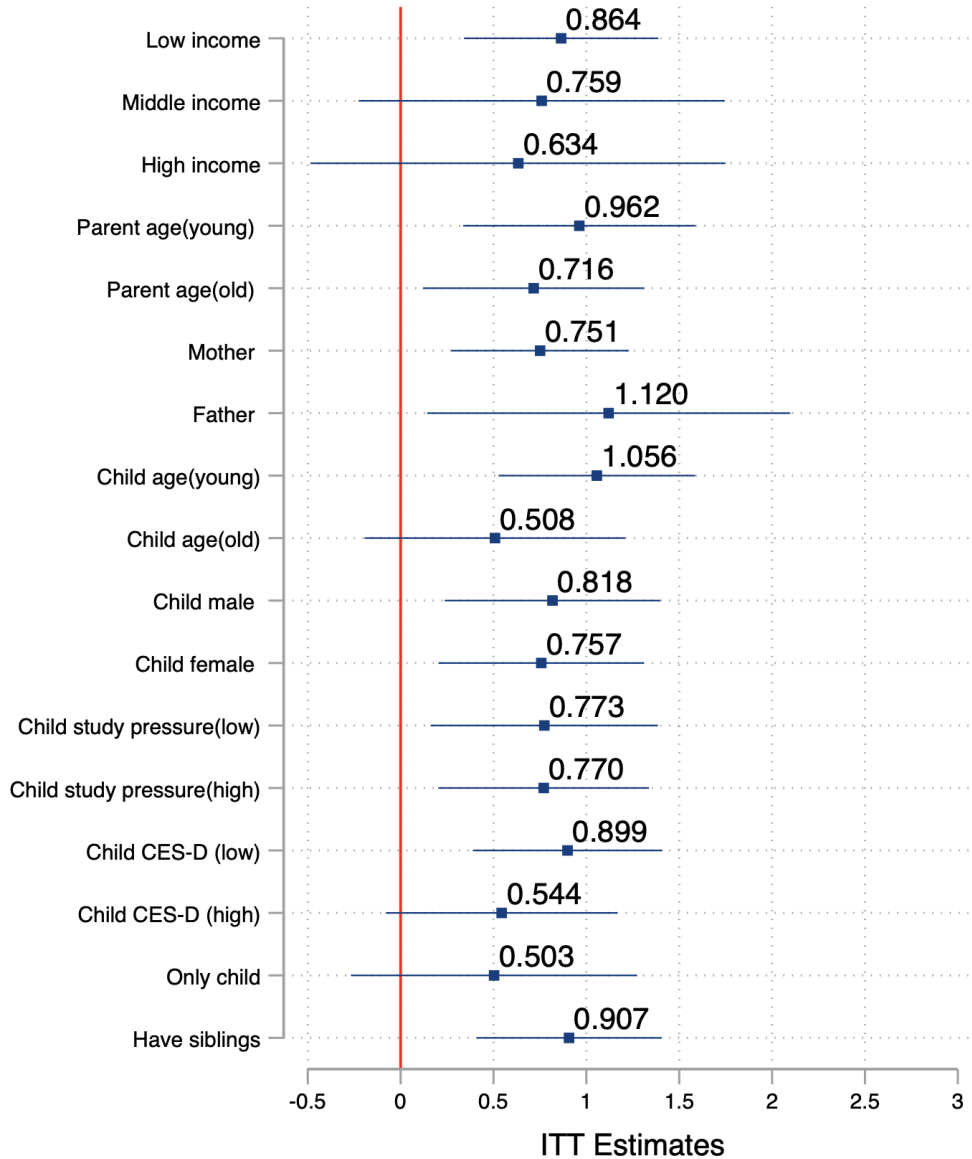
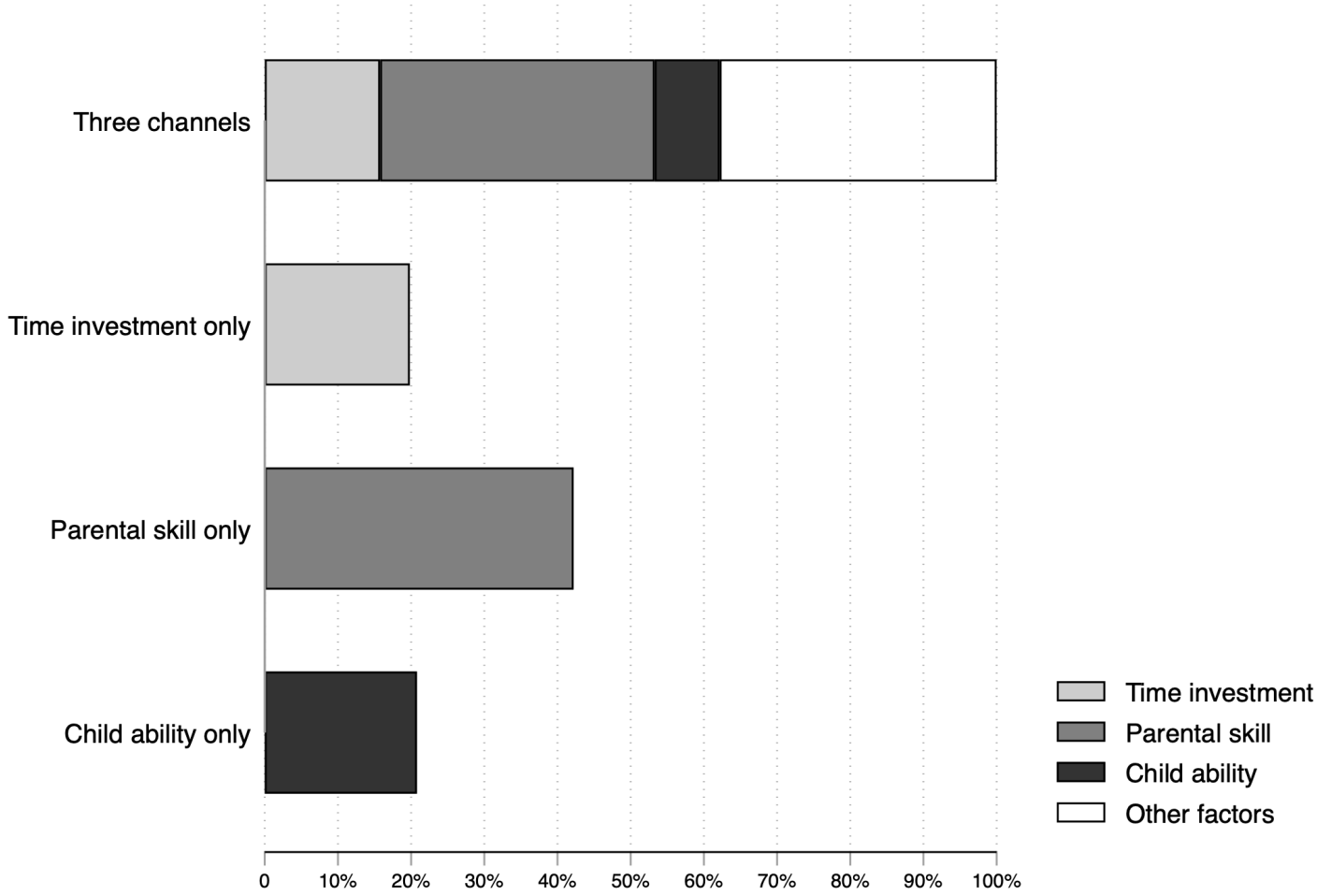


Table: Program Impacts (ITT) on mediators

	(1) Control mean	(2) ITT	(3) Permutation test	(4) WCB	(5) Romano Wolf
Overall Index	0.001	0.126***	0.000	0.000	
	(0.403)	(0.039)			
A. Parental skill index	0.000	0.119***	0.000	0.002	0.013
	(0.604)	(0.035)			
B. Parental time inputs index	0.000	0.106**	0.020	0.029	0.058
	(0.686)	(0.046)			
C. Child non-cognitive ability index	0.000	0.163***	0.004	0.016	0.058
	(0.646)	(0.067)			
A1. Empathy	-0.036	0.103**	0.052	0.042	0.050
	(1.024)	(0.048)			
A2. Democratic parenting	0.789	0.039**	0.029	0.030	0.050
	(0.408)	(0.017)			
A3. Understand child's feeling	2.380	0.135**	0.026	0.031	0.050
	(0.951)	(0.060)			
A4. Encourage child's hard work	2.264	0.172***	0.003	0.003	0.020
	(0.994)	(0.057)			
B1. Time investment weekday	3.725	0.513**	0.010	0.020	0.027
	(3.288)	(0.204)			
B2. Time investment weekend	5.413	0.408*	0.078	0.097	0.061
	(3.649)	(0.224)			
C1. Feel happy	4.890	0.256**	0.024	0.035	0.073
	(5.771)	(0.114)			
C2. Depressed (CES-D)	0.364	-0.048*	0.087	0.093	0.073
	(0.482)	(0.026)			
C3. Stress	0.092	-0.198**	0.016	0.034	0.073
	(0.962)	(0.088)			
C4. Empathy	-0.046	0.121*	0.105	0.115	0.073
	(1.010)	(0.071)			
C5. Positive personality	0.000	0.148**	0.008	0.012	0.059
	(0.875)	(0.058)			
N	848	1,852			

The three factors can explain about 62% of the total program impact



Test assumptions

assumptions Test score

Conclusion

- *Middle-School Blues* needs to be studied further

- Our parental involvement program on empathy education and positive parenting works for parental mental health
- Improvement in parental skills is the key driver

- Our program is also generalizable following the SANS conditions (List, 2020)
  - Sample represents parents with middle-school blues
  - Attrition is balanced
  - Program is natural to parents and happens in real setting
  - Low cost

Thank You!

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Appendix

Middle-School Blues by Gender

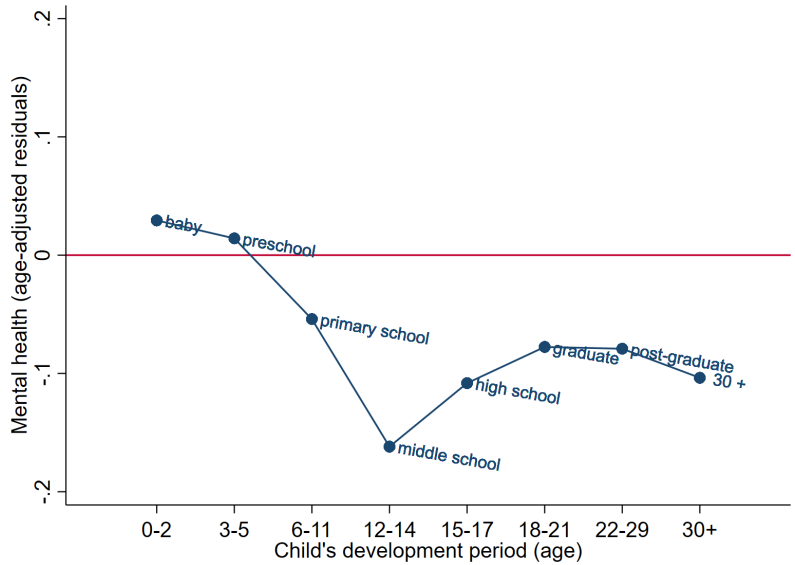

Figure: Female (K-6)

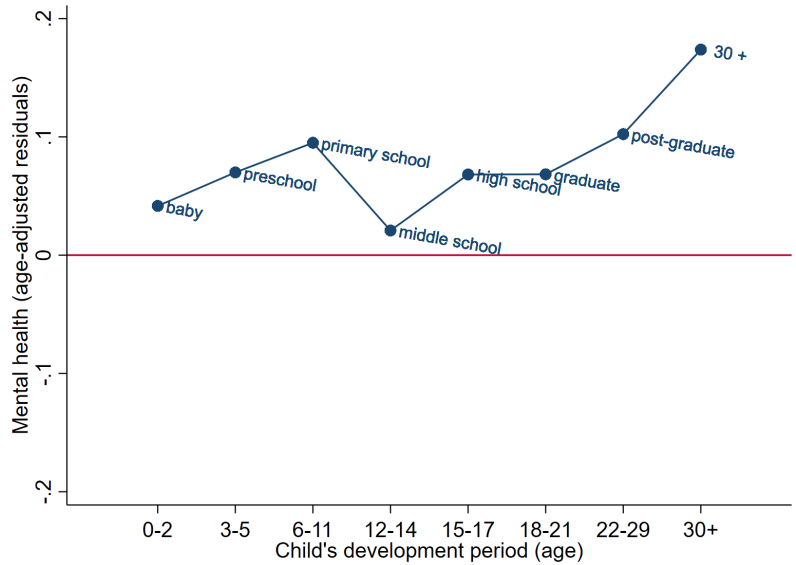

Figure: Male (K-6)

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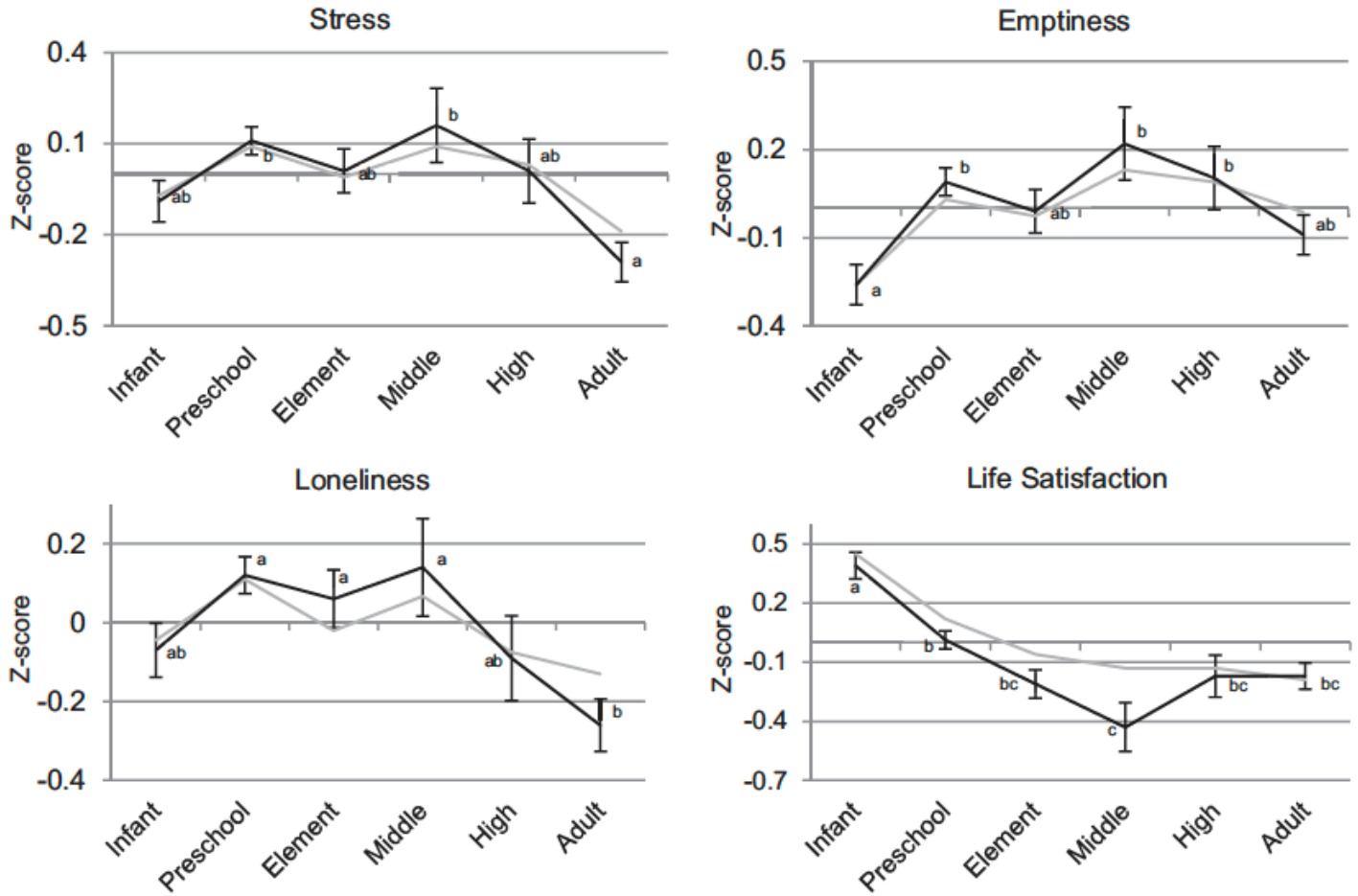
Middle-School Blues Among American Mothers



Source: Figure 1 from Luthar and Ciciolla (2016). back

Intervention Contents

- Week 1 Empathy and its value
- Week 2 Incorporating empathy into parenting styles
- Week 3 Perspective taking and its value
- Week 4 Self-centeredness and its drawback
- Week 5 Multiple intelligence and uniqueness
- Week 6 Value uniqueness and how to embrace others' uniqueness
- Week 7 Empathy and relationship with others: causes
- Week 8 Empathy and relationship with others: how to maintain good relationships with peers and parents
- Movies: "Looking Up?" "Wonder" "Taare Zameen Par" "Better Days"

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Table: Summary statistics and balance

	(1) Control	(2) Mean difference T-C
Age	42.597	-0.228
	(4.812)	(0.218)
Mother/not	0.791	0.006
	(0.407)	(0.024)
Rural Hukou/not	0.791	-0.013
	(0.407)	(0.031)
Migrant	0.041	-0.003
	(0.198)	(0.013)
Married	0.931	0.017
	(0.253)	(0.013)
Income ($<$ \$16K)	0.246	-0.013
	(0.431)	(0.025)
Income (\$16k-32k)	0.395	0.014
	(0.489)	(0.026)
Income (\$32k-64k)	0.196	0.005
	(0.397)	(0.017)
Income ($>$ \$64k)	0.163	-0.007
	(0.369)	(0.029)

Also balance in children's characteristics.

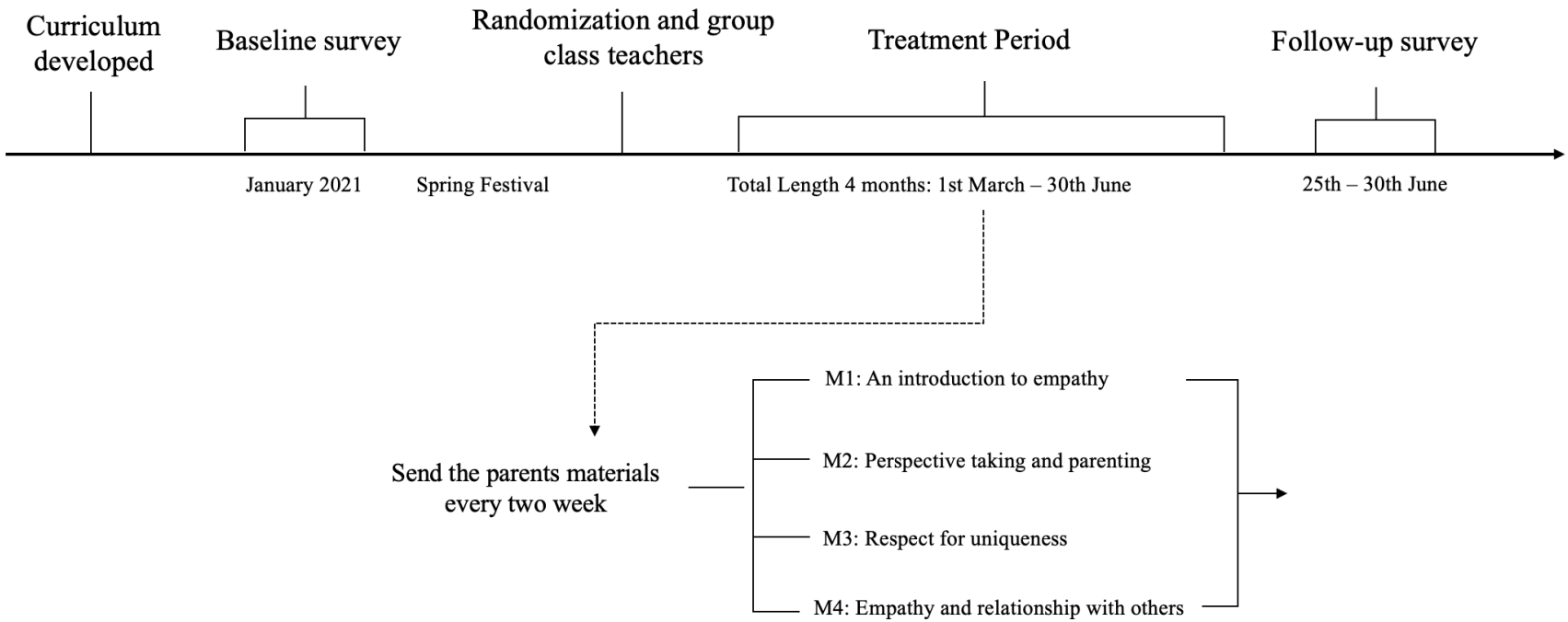
return

Table: Balance of attrition

Panel A. Attrition rate		
	(1)	(2)
Fraction of nonresponding parents	Control	T-C
	0.174	-0.001
	(0.379)	(0.023)
Panel B. Testing Selective Attrition		
	Attrition	Attrition * Treat
Age	0.016	0.010
	(0.043)	(0.061)
Male	0.037	-0.089*
	(0.034)	(0.052)
Urban hukou	0.004	-0.052
	(0.046)	(0.054)
Only child	0.055	-0.061
	(0.046)	(0.056)
Height in cm	0.178	0.362
	(0.684)	(0.862)
Weight in half kilo	0.887	1.424
	(1.810)	(2.403)
Bullying perpetrator	0.013	0.012
	(0.035)	(0.055)
Bullying victim	-0.009	0.054
	(0.034)	(0.050)
Number of friends	-0.317***	0.088
	(0.103)	(0.140)
Member of exclusive group	0.001	-0.055
	(0.037)	(0.054)
Empathy score	-1.242	0.391
	(0.784)	(1.005)
Consistent with goals	-0.236	-0.074
	(0.158)	(0.200)
Stress score score	0.292	-0.132
	(0.326)	(0.456)
CESD 10-item	1.133**	0.306
	(0.540)	(0.587)
Weekly interaction with parents	-0.773**	-0.857
	(0.381)	(0.593)

return

Detailed Timeline



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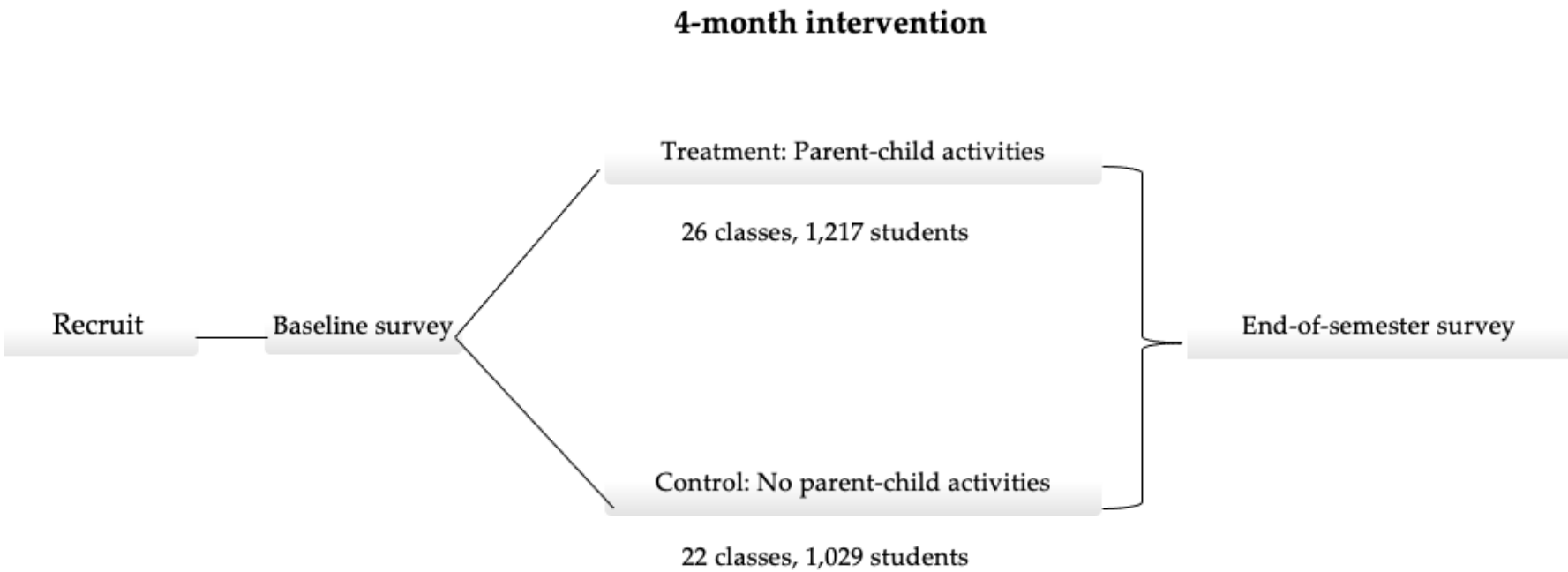
Randomization



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Students' Skills Measurements

	(1) Cognitive	(2) Noncognitive
Standardized Test Scores	Math Language	
Empathy Measure		Perspective taking Empathetic concern Prosocial fantasy
Mental Health and Stress		CES-D10 Study life at school Peer relationships Rank/test scores in the class Family background
Positive Personality (1-item)		Self-satisfied Self-worth Self-confident Self-esteem Consistency/grit

Parents' Inputs and Skills Measurements

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	(1) Investment	(2) Skills
Time Investment (total times per week)	Have dinner together Help homework Outdoor activities Caring and talk	
Monetary Investment (categorical variable)	5%- 5-10% 10-25% 25-50% 50%+	
Parenting Style (1-item)		Type of parenting style
Empathy Measure		Perspective taking Empathetic concern
Mental Health Measure		GHQ-12

Table: Robustness test

	(1) Control	(2) ITT
Panel A. GHQ scoring methods		
GHQ (Likert)	-0.077	0.169***
	(1.000)	(0.062)
GHQ (0011)	-0.043	0.092*
	(1.053)	(0.050)
C-GHQ	-0.043	0.090*
	(1.037)	(0.052)
Panel B: Mental illness using various cut-off values		
GHQ $\leq$ 21	0.091	-0.028**
	(0.287)	(0.012)
GHQ $\leq$ 22	0.131	-0.031*
	(0.337)	(0.016)
GHQ $\leq$ 23	0.175	-0.028
	(0.380)	(0.018)
GHQ $\leq$ 24	0.228	-0.029
	(0.420)	(0.020)
GHQ $\leq$ 25	0.318	-0.054**
	(0.466)	(0.026)
GHQ $\leq$ 26	0.387	-0.059**
	(0.487)	(0.025)
GHQ $\leq$ 27	0.448	-0.059**
	(0.498)	(0.028)
GHQ $\leq$ 28	0.538	-0.077***
	(0.499)	-0.069**
N	848	1,852

back

Table: Attrition and robustness of main ITT estimates

	(1)	(2)	(3)	(4)
			Lee bounds	
	ITT	IPW	Lower	Upper
Panel A. Mental Health				
GHQ score (standardized)	0.169***	0.181***	0.162**	0.168***
	(0.062)	(0.058)	(0.067)	(0.065)
Feel very happy last week	0.060**	0.067**	0.057**	0.060**
	(0.027)	(0.027)	(0.273)	(0.278)
N	1,852	1,852	2,246	2,246
Panel B. Three dimensions				
Social dysfunction	0.153**	0.157***	0.134*	0.142**
	(0.059)	(0.057)	(0.069)	(0.068)
Anxiety	0.149**	0.173***	0.081	0.154**
	(0.061)	(0.061)	(0.071)	(0.072)
Loss of confidence	0.115**	0.124**	0.112**	0.119**
	(0.051)	(0.048)	(0.057)	(0.059)
N	1,852	1,852	2,246	2,246

back

Table: Testing for the differing factor loadings

	(1) GHQ		(2) GHQ
Panel A. Test assumption 1 Between T and C		Panel B. Test assumption 2 Across baseline characteristics	
Treat * Time investment	0.002	Treat * Family income	-0.062
	(0.194)		(0.197)
Treat * Parental skill	0.050	Treat * Parent age	-0.513
	(0.185)		(0.474)
Treat * Child ability	-0.032	Treat * Mother	-0.585
	(0.222)		(0.568)
		Treat * Child male	0.158
			(0.392)
		Treat * Child study pressure	-0.252
			(0.438)
		Treat * Child CES-D	-0.123
			(0.370)
Treat	0.444*	Treat	2.833*
	(0.224)		(1.449)
Time investment	0.712***	Time investment	0.718***
	(0.152)		(0.095)
Parental skill	1.260***	Parental skill	1.290***
	(0.129)		(0.099)
Child ability	0.084	Child ability	0.061
	(0.186)		(0.113)
N	1,852	N	1,852

back

Insignificant Effects on Test Scores

	(1) Test score	(2) Grade rank
Panel A. Average effect		
Control Mean	0.024	-0.028
	(0.987)	(1.003)
N	1,029	
ITT	-0.009	0.011
	(0.015)	(0.016)
N	2,240	
Panel B. Quantile		
1st Decile	0.010	0.010
	(0.020)	(0.024)
3rd Decile	-0.017	0.008
	(0.016)	(0.015)
Median	-0.012	0.013
	(0.014)	(0.013)
7th Decile	-0.013	0.017
	(0.014)	(0.016)
9th Decile	-0.010	-0.012
	(0.017)	(0.019)
N	2,240	

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