Less Pressure, Happier Minds: The Mental Health Impact of Relaxation-Oriented Education

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Mental health of school-age children is crucial

Mental health issues can have significant adverse effects on individual and organizational development.

- They can notably impact test scores and overall educational attainment in both the short run and long run (Eisenberg et al., 2009; Mojtabai et al., 2015).
- Bad mental health conditions can lead to considerable economic costs from additional care and support (Breivik and Costa-Ramón, 2024) and reduced economic productivity in children's later life (Egan et al., 2015).
- Elevated levels of stress associated with mental health challenges harm physical well-being and may push individuals to engage in addictive behaviors, such as smoking (Friedman, 2020).

Education and Mental Health

Of all the factors that influence mental health and the strategies for improvement, education is an aspect that is most frequently discussed because it serves as a foundational element for personal development and well-being.

- Most research focuses the extensive margin of education's effect on health
- Higher educational attainment can significantly benefit children's mental health (Cornaglia et al., 2015; Halpern-Manners et al., 2016), as educated individuals are more likely to access healthcare resources, including mental health services, and engage in preventive measures that promote overall wellness.
- Upward spillover effects from children to parents, indicating that increased educational attainment among children leads to enhanced cognitive functions, higher survival expectations, and improved lung function for their older parents in China (Ma, 2019).

Education and Mental Health- cont'

Our paper closely aligns with the literature examining the impact of instruction time (i.e., intensive margins), a crucial area for many governments striving to improve student learning outcomes.

- Lavy (2015) examines the impact of school time variations on international achievement gaps, finding that while instructional time improves test scores, its effect is weaker in developing countries.
- More instruction improves early reading (Harn et al., 2008) and math scores for disadvantaged students (Battistin & Meroni, 2016); the degree of improvement depends on the duration and the classroom environment (Rivkin and Schiman, 2015).
- Few focus on mental health, with the exception of Marcus et al. (2020), which examines a German schooling reform and finds that increased weekly instruction time slightly heightened stress-related health problems among schoolchildren.

Contribution

- Longer-run Effects & Mechanism: We examine the emergence of these effects (immediate impact), their duration over time, and potential reasons for their diminishing impact.
- While many studies focus on the impact of increased instruction time, comparatively less is understood about the effects of reducing it. The Yutori educational reform offers a noteworthy case for analysis:
  - Niki (2024) indicates that the reform negatively impacted students' cognitive and non-cognitive abilities.
  - Kikuchi (2014) finds that the revision decreases years of schooling and the probability to enroll in high school.
  - Bai and Tanaka (2024) assess how such reductions influence long-term labor market outcomes.

The Early 2000s Reforms

The 2002 reforms built upon the 1990s preparations (i.e., viewing children's academic performance from a new perspective), with a focus on:

- Independent thinking, problem-solving, and decision-making
- Project-based and cross-curricular learning
- Moving away from rote memorization and exam preparation

A key feature was the reduction in instructional hours for core subjects like mathematics, science, and Japanese, to ease the academic burden and allow more time for other activities. Other features include:

- Introduction of the "Period of Integrated Study" for interdisciplinary topics
- A five-day school week to reduce student stress and promote well-being
- Flexibility for schools to tailor content to student interests, fostering self-directed learning

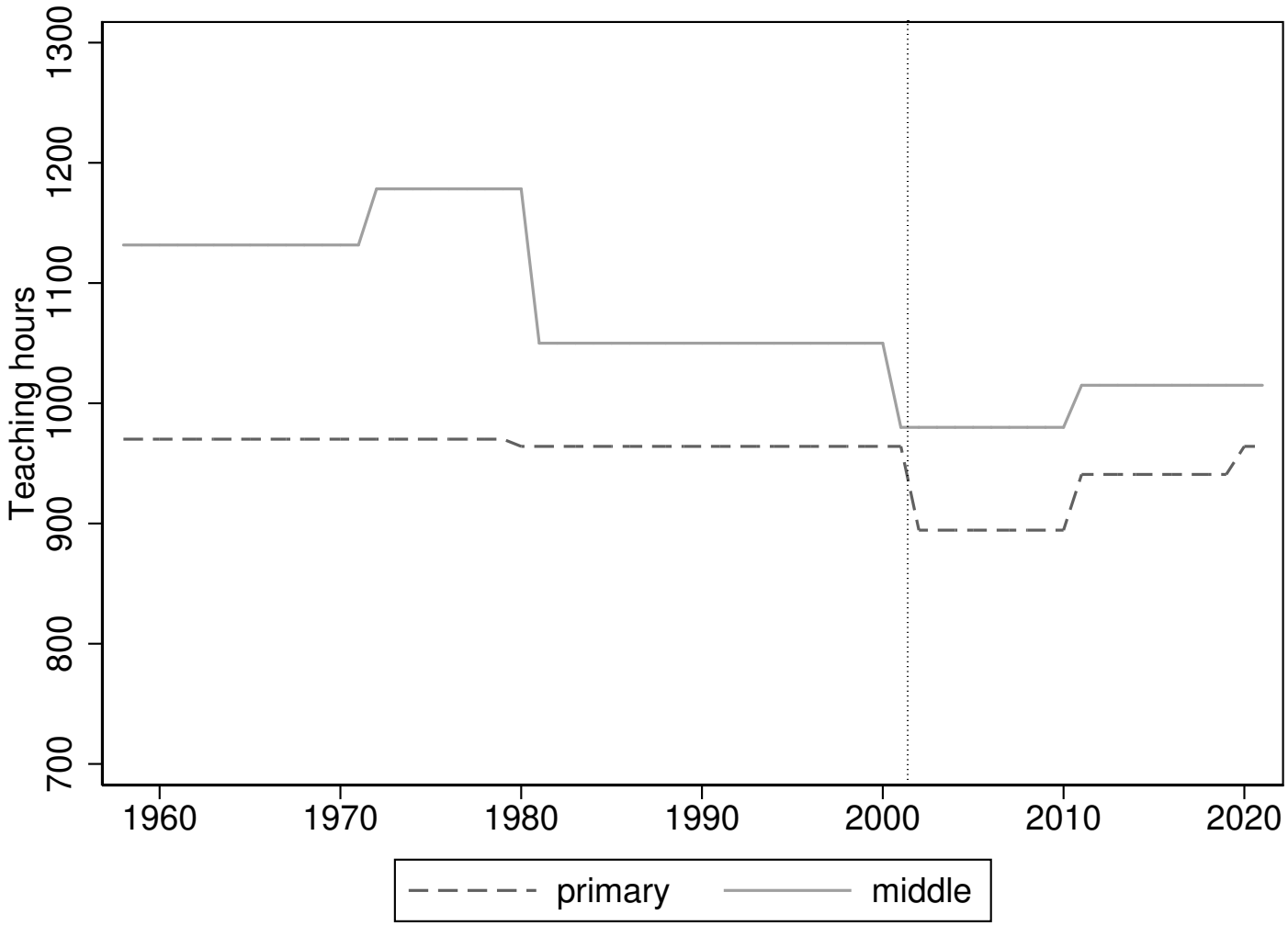

Figure: Time variations of teaching hours in primary and junior high schools

Post-Yutori Education Reforms

Yutori Education faced criticism for contributing to perceived drops in academic performance (Nozaki and Matsuura, 2017; Tasaki, 2017). By the mid-2000s, Japan's declining scores in international assessments like PISA, particularly in reading and mathematics, triggered a phenomenon known as the "PISA shock." In response, the 2010s saw the introduction of "post-Yutori (de-relaxed) education":

- Focused on fostering a "zest for living" rather than being classified as either Yutori or cram-style education.
- Aimed to address previous shortcomings by reinstating some of the reduced instructional hours.

This approach was fully implemented in 2011 (elementary) and 2012 (junior high).

Data and Key Variables

Data: Comprehensive Survey of Living Conditions
Conducted annually by Japan's Ministry of Health, Labour, and Welfare since 1986, covering:

- Household demographics (annually)
- Health, Income (every 3 years)
- Caregiving, Saving

Mental health variables included since 2004. We use pooled cross-sectional data from 2004–2022 (waves: 2004, 2007, 2010, 2013, 2016, 2019, 2022).

Key Variable: Post

- Post = 1 if born in/after April (later school entry)
- Post = 0 if born before April (earlier school entry)

However, entry age itself may influence academic, cognitive, and social development (Cascio & Schanzenbach, 2016; Dhuey et al., 2019; Datar, 2006; Dee & Sievertsen, 2018). Older entrants may initially outperform younger peers (Fredriksson & Öckert, 2014), so using Post alone could introduce confounding.

Explanatory Variables and Cohort Definitions

Sample Limitation: Individuals born between 1978 and 1995; aged 12–35

- Treatment Group: Individuals born from 1987 to 1995 (affected by 2002 educational policy relaxation)
- Control Group: Individuals who completed middle school by 2002 (unaffected by the policy change)

The key variable is the interaction term between the treatment and post variables:

- Difference within treatment group is driven by exposure to the relaxed education system + enrollment age effects
- Difference within control group is solely driven by enrollment age effects

By applying the DID approach, we isolate the effect of an additional year of exposure to the relaxed education system.

Outcome Variables: Mental Health Indicators

- **Stress** Binary variable based on the question: "Do you experience worries or stress in daily life?" 0 = No, 1 = Yes.
- **Mental Point** Composite score based on six items (depression, anxiety, hopelessness, etc.) rated on a 5-point scale (0 = Never, 4 = Always). Range: 0 to 24, higher values = poorer mental health.
- **Mental Health Disorders** Includes doctor-diagnosed psychosis, neurosis, and autonomic nervous system disorders. Captures the presence of these conditions over time.
- **Sleep Quality (Sleepwell)** Measures sleep adequacy on a 4-point scale (1 = Completely Adequate, 4 = Not Adequate at All). Higher values = poorer sleep, which is linked to worsened mental health outcomes.

Difference-in-Differences Regression Model

We use the following difference-in-difference regression models to evaluate the effect of the relaxation educational policy on children's mental health outcomes:

$$\text{Health}_{icmw} = \alpha_0 + \alpha_1 I(1987 \leq c \leq 1995) \times \text{Post}_i + \alpha_2 \text{Post}_i + \delta X_i + \sigma_c + \lambda_m + \epsilon_w + \epsilon_{icmw}$$

The key assumption of the cohort DID approach is the parallel trends assumption: in the absence of the educational policy, the treatment and control groups should exhibit the same cohort trend in mental health. To test this, we estimate a fully flexible cohort-by-cohort specification

$$\text{Health}_{icmw} = \alpha_0 + \sum_{\gamma=1978}^{1996} \alpha_{1\gamma} \text{Post}_i \times I(c = \gamma) + \delta X_i + \sigma_c + \lambda_m + \epsilon_w + \epsilon_{icmw}$$

Table: Impact of Relaxation of Education Reform on Mental Health

Dependent variable	Stress (1)	Mentalpoint (2)	Mentaladd (3)	Sleepwell (4)
$I(1987 \leq t \leq 1995) \times Post$	-0.009***	-0.168***	-0.001	-0.012
	(0.003)	(0.036)	(0.001)	(0.011)
$Post$	-0.015***	-0.083**	-0.000	0.019*
	(0.002)	(0.032)	(0.000)	(0.011)
Age FE	Y	Y	Y	Y
Cohort FE	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y
Wave FE	Y	Y	Y	Y
Covariates	Y	Y	Y	Y
N	672,572	377,939	758,283	206,410

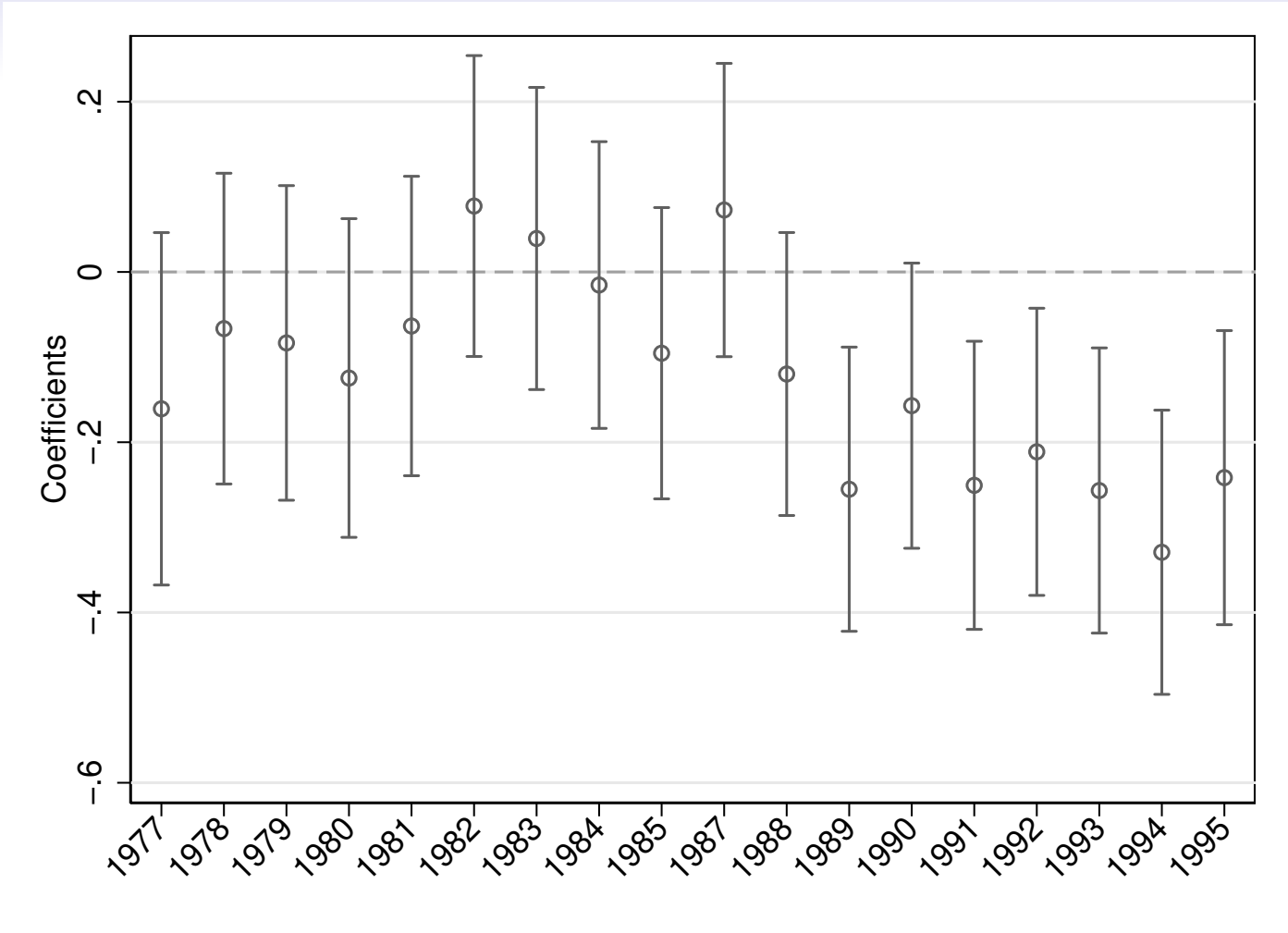

Figure: Event study figure

Note: The fixed effects and outcome variable are the same as column (2) of the table above. We plot the coefficients of interactions with the Post variable along the y-axis, using the birth cohort of 1986 as the reference and the x-axis denoting birth years.

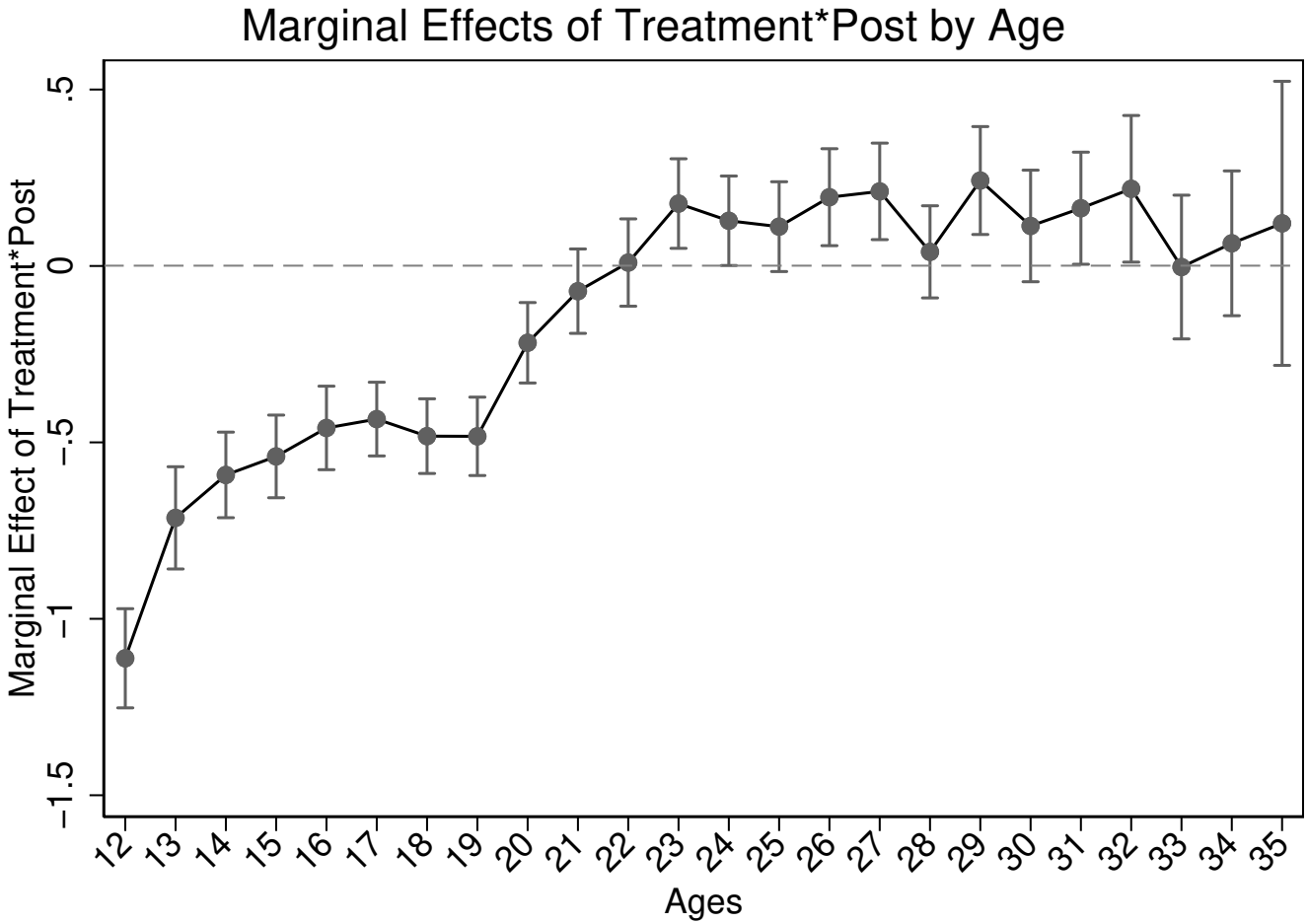

Figure: Diminishing effects

Note: The fixed effects and outcome variable are the same as column (2) of the table above. We plot the marginal effects of treatment*post over ages along the y-axis, and the x-axis denoting ages.

"Health-wealth tradeoff"

Table: Impact of Relaxation of Education Reform on Academic and Labor Market Performance

Dependent variable	Educational level	Employed	High-skilled job	Income (log)
	(1)	(2)	(3)	
$I(1987 \leq t \leq 1995) \times Post$	-0.0711***	-0.0224***	-0.0147***	-0.0138***
	(0.0100)	(0.0022)	(0.0033)	(0.0069)
$Post$	0.0906***	-0.0084***	-0.0013	0.0073
	(0.0086)	(0.0018)	(0.0029)	(0.0047)
Cohort FE	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y
Wave FE	Y	Y	Y	Y
Covariates	Y	Y	Y	Y
N	408,306	408,306	398,141	179,771

De-relaxed reform in 2010s

Table: Impact of Post-Yutori Education on Mental Health

Dependent variable	Stress (1)	Mentalpoint (2)	Mentaladd (3)	Sleepwell (4)
$I(1987 \leq t \leq 1995)) \times Post$	-0.008***	-0.186***	-0.001	-0.014
	(0.003)	(0.036)	(0.001)	(0.011)
$I(1997 \leq t \leq 2005)) \times Post$	-0.005	-0.167***	-0.000	0.132***
	(0.004)	(0.036)	(0.001)	(0.014)
$Post$	-0.015***	-0.053**	-0.000	0.018*
	(0.002)	(0.026)	(0.000)	(0.010)
Age FE	Y	Y	Y	Y
Cohort FE	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y
Wave FE	Y	Y	Y	Y
Covariates	Y	Y	Y	Y
N	753,560	486,769	829,259	324,703

Mechanisms

- We propose that reduced study burden may be a key mechanism.
- We investigate this by utilizing the Japanese Time Use Survey (JTUS), which has been conducted every five years by the Bureau of Statistics since 1991, with data collected in the years 1991, 1996, 2001, 2006, and 2011.
- Each wave contains time diaries for all household members including children, recording their activities in 15-minute intervals across 20 pre-defined categories.

Empirical Strategy

- We cannot apply the previous DID model, as this analysis focuses on the short-term effects; Since the children have not yet completed their education, there is no within birth-cohort variation.
- We modify the outcome variable to reflect the change in study hours or leisure time for each cohort
  - For control cohorts, study hours increase from 4.35 hours per day in grade 4 to 4.82 hours per day in grade 6, a difference of 0.47 hours, reflecting the greater study load as grade level increases.
  - In contrast, for treatment cohorts (1987-1995), the average study time is 5.94 hours per day in grade 4, only increasing to 5.98 hours per day in grade 6, a mere 0.04-hour increase.
  - This suggests that the relaxation of educational pressure has effectively reduced the study burden for treatment cohorts.

$$\Delta \text{Study} \backslash \text{Leisure}_{c,m} = \beta_0 + \beta_1 \, \mathit{Treatment}_c + \lambda_m + \varepsilon_{c,m}$$

Table: Illustration of Treatment and Control Groups for Time Use Survey

Group	Birth Year	Survey Year	Age in the 1st wave	Age in the 2nd wave
		Primary School		
Treatment	1993–1995	2001, 2006	5–7	10–12
Control	1988–1990	1996, 2001	5–7	10–12
		Middle School		
Treatment	1990–1992	2001, 2006	8–10	13–15
Control	1985–1987	1996, 2001	8–10	13–15

Table: Impact of Relaxation of Education Reform on Study Hour and Leisure Activity

Dependent Variable	Study Hour and Leisure Time			
	Total Study Hour (1)	Study At School (2)	Study Out School (3)	Leisure Time (4)
Panel A: Primary School				
Treatment Group $(1987 \leq t \leq 1995)$	-1.038***	-0.839***	-0.199***	0.577***
	(0.125)	(0.115)	(0.059)	(0.116)
Municipality FE	Y	Y	Y	Y
N	5382	5382	5382	5382
Panel B: Middle School				
Treatment Group $(1987 \leq t \leq 1995)$	-0.489***	-0.429***	-0.061	0.542***
	(0.117)	(0.105)	(0.068)	(0.083)
Municipality FE	Y	Y	Y	Y
N	6498	6498	6498	6498

Conclusion

- Exposure to Japan's 2002 relaxation-oriented curriculum reform led to improved mental health after the completion of compulsory education.
- Reduced study hours and increased leisure time contributed to these improvements.
- However, the findings do not suggest lifelong mental health benefits. The trade-off between academic rigor and well-being must be carefully managed.
- These findings offer insights for policymakers, emphasizing the need for curriculum reforms that foster both academic achievement and psychological well-being.