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

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Abstract

This paper examines the impact of a relaxation-oriented educational policy on the mental health outcomes of affected children. Leveraging a difference-in-differences estimation strategy, we utilize the exogenous shock introduced by Japan's 2002 relaxation-oriented curriculum reform to assess the effect of decreased instruction time on student mental health. Our results indicate that individuals exposed to more years of relaxed education tended to experience improved mental health outcomes. We also explore potential mechanisms behind these improvements, noting that reduced hours of study and increased time for leisure activities contribute to better mental health. However, the effect appears to be temporary, suggesting that while relaxed education policies can enhance students' mental health, these benefits may not endure long-term.

Keywords: Relaxation-oriented educational policy, Mental health, Time use, Japan

JEL classification: I10, I21, I28, I15

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1 Introduction

Ensuring the well-being of children is critical not only for individual development but also for long-term societal and economic growth (Learnlife, 2023; World Health Organization, 2023). Mental health, in particular, is as vital as physical health, shaping children's ability to form relationships, succeed academically, and thrive into adulthood (NSPCC, 2023). When neglected, mental health challenges in childhood can lead to substantial individual suffering and broader social costs—including greater educational support needs, reduced parental labor supply, and diminished future productivity (Breivik and Costa-Ramón, 2024; Egan et al., 2015). Thus, early interventions that support children's mental health can yield large private and public returns.

A growing body of research shows a strong link between education and mental health. Much of this literature focuses on the extensive margin—showing that more years of schooling are associated with improved mental health outcomes (Brunello et al., 2016; Conti et al., 2010a; Groot and Van Den Brink, 2007; Jiang et al., 2020; Kondirolli and Sunder, 2022). However, less is known about the intensive margin—how the intensity of education, such as instructional hours or academic pressure, influences mental health. One exception is Marcus et al. (2020), who found that increased instruction time in Germany slightly worsened stress-related health problems. Yet, the reverse relationship—whether reducing instructional time improves mental well-being—remains unexplored. Understanding the impact of educational intensity on health is crucial for shaping educational policy, as policymakers possess significant control over national curriculum standards and the intensity of compulsory education. In particular, from an economic perspective, modifications to instructional time are often regarded as practical and beneficial, as they can be carried out without the need for additional resources or funding at the school level.

This study addresses that gap by examining the mental health effects of Japan's 2002 "Yutori" (relaxed) education reform, which significantly reduced compulsory instructional hours, particularly in math, science, and Japanese. We leverage this nationwide policy as an exogenous shock to analyze how reductions in educational intensity affect children's mental health. Our empirical strategy exploits Japan's school entry cutoff: children born in April

or later (Post = 1) start school a year later than those born between January and March (Post = 0), resulting in an additional year of exposure to the relaxed curriculum. To address potential confounding from age-at-enrollment-related differences in mental health, we define the treatment group as children born between 1987 and 1995, who were affected by the reform, and incorporate older cohorts unaffected by the reform as an additional control group. Using a difference-in-differences (DID) framework, we control for cohort, region, and survey wave fixed effects to isolate the causal impact of reduced educational intensity on mental health outcomes.

Using repeated cross-sections of the Comprehensive Survey of Living Conditions on individuals aged 12 to 35, we find that a one-year difference in exposure to relaxed education has a positive impact on individuals within the treatment cohort overall. Specifically, those who benefited from the relaxed curriculum exhibit improved mental health compared to their peers. The treatment group reports lower stress levels, fewer symptoms of depression, and better sleep quality, with these effects being statistically significant across all mental health measures. These results are obtained after accounting for both individual-level characteristics and age fixed effects, which absorb systematic cohort differences as well as the potential attenuation of treatment effects due to time elapsed since schooling. However, it is important to note that these effects are primarily temporary rather than enduring. Age-specific marginal effects reveal that the mental health gains are most pronounced during early adolescence (ages 12–15), peaking at age 12. The benefits gradually fade by ages 18–19—likely due to increased pressure from university entrance exams—and converge to zero in early adulthood. This dynamic pattern underscores that the impact of education reform is not uniform across ages: early adolescence emerges as a critical period in which reduced academic pressure yields the greatest mental health returns, reflecting a clear "health-wealth tradeoff."

To explore the mechanisms underlying these findings, we analyze data from the Survey on Time Use and Leisure Activities (STULA) to assess how changes in study load may influence student well-being. Our analysis suggests that the reduction in study hours plays a vital role. With fewer instructional hours, students in the treatment cohort had increased time for leisure activities, which provided more opportunities for restorative and

relaxing pursuits. This additional free time appears to alleviate the negative impacts of academic stress by allowing students to engage in activities that promote mental relaxation and social interaction. These findings imply that educational policies aimed at reducing academic workloads and enhancing the balance between study and rest could be instrumental in improving students' mental health in the short term. Such changes allow students to recharge and recover from academic pressures, thereby boosting their psychological well-being. Consequently, these policies could serve as a model for other educational systems striving to enhance student well-being while upholding academic standards.

The rest of our paper is structured as follows. Section 2 reviews the relevant literature. In Section 3, we provide an overview of the 2002 educational reform in Japan. Section 4 presents the data utilized in our analysis, and outlines our empirical strategy. Section 5 discusses the findings, and Section 6 identifies the main mechanisms underlying these results. Finally, Section 7 summarizes the key takeaways of this paper.

2 Related Literature

Mental health issues can have significant adverse effects on individuals. For instance, 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). Students grappling with mental health conditions often face challenges such as difficulty concentrating, decreased motivation, and heightened anxiety, all of which can impede their academic progress and performance. Furthermore, mental health conditions are stronger determinants of human capital than physical health (Currie and Stabile, 2006; Fletcher and Wolfe, 2008). Elevated stress may also lead to addictive behaviors like smoking (Friedman, 2020), creating harmful cycles that worsen both mental and physical health.

Mental health is deeply shaped by socioeconomic, familial, and community factors. Poverty and financial instability—such as unemployment or sudden wealth loss—are consistently linked to worse mental health outcomes, while higher income acts as a protective factor (Brewer et al., 2024; Currie et al., 2024; Li et al., 2019; McInerney et al., 2013). Interventions targeting family-level determinants have shown evidence of effectiveness: since

mental health is intergenerational, improving parental well-being—particularly maternal mental health—can enhance children's educational and psychological outcomes. (Bencsik et al., 2023; Johnston et al., 2013). Moreover, positive financial shocks, such as housing wealth gains, are associated with better child health (Ang et al., 2024), while maternal education shows mixed effects depending on developmental stages (Arendt et al., 2021; Lindeboom et al., 2009).

At the community level, social capital and support systems are key mediators. Access to formal and informal care, including home visiting programs, alleviates psychological distress and promotes resilience (Barnay and Juin, 2016; Sandner et al., 2018). This is particularly crucial for individuals exposed to trauma or conflict, which has long-term adverse effects on mental and physical health (Cesur et al., 2013; Gong et al., 2020; Phadera, 2021). Policies that strengthen community and institutional support—such as affordable daycare (van den Berg and Siflinger, 2022), extended maternity leave (Fabel, 2021), and paid family leave (Bullinger, 2019)—have been linked to improved child development and mental health outcomes. Notably, full mental health parity laws reduce youth suicide by improving insurance coverage for psychological services (Solomon and Dasgupta, 2022).[1] These findings reinforce the importance of integrated approaches that combine family, community, and policy-level interventions to reduce mental health disparities across the life course.

2.1 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.

Acquiring more years of education 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. Furthermore, recent studies have identified upward

[1] Environmental and behavioral factors, including early television exposure, high temperatures, and body image concerns, also significantly influence mental health trajectories (Mullins and White, 2019; Nieto and Suhrcke, 2021; Sun et al., 2025; Willage, 2018).

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).

Our paper closely aligns with the literature examining the impact of instruction time, a crucial area for many governments striving to improve student learning outcomes. Studies based on observational data raise concerns about the effectiveness of increasing instruction time, pointing to possible negative effects on student behavior (Andersen et al., 2016). Lavy (2015) examines international differences in school time and finds that while more instruction generally improves test scores, the effect is significantly weaker in developing countries. Similarly, Rivkin and Schiman (2015) and Meroni and Abbiati (2016) shows that academic performance rises with more instructional time, though the gains depend heavily on both the length of time and the quality of the classroom environment. Evidence suggests that students from disadvantaged backgrounds benefit the most. For example, Battistin and Meroni (2016) finds improved math performance among low-SES students, and Lavy (2012) demonstrates that extending the school week and increasing core subject time in Israeli elementary schools enhances outcomes in math, English, and science, especially among students from low socio-economic backgrounds. However, not all studies find consistent benefits. Dahmann (2017) notes that neither the quantity nor the timing of instruction time significantly improves adolescents' cognitive skills, suggesting that other contextual and individual factors may also be important drivers of educational outcomes. Building on these findings, Wedel (2021) highlights that teacher qualifications play a critical role in shaping the effectiveness of added instructional time.

While many studies focus on the impact of increased instruction time, comparatively less is understood about the effects of reducing it. Most research has predominantly assessed how such reductions influence student performance, with a particular emphasis on short-term exam scores (Barrios-Fernández and Bovini, 2021) and long-term labor market outcomes (Bai and Tanaka, 2024). The 2002 Japanese educational reform offers a noteworthy case for analysis; although not thoroughly examined. For example, Niki (2024) indicates that the reform negatively impacted students' cognitive and non-cognitive abilities. Furthermore, Motegi and Oikawa (2019) highlights that the effectiveness of instructional time is enhanced

when combined with higher-quality teaching. In addition to academic performance, the mental health of those involved also warrants consideration. While some research has addressed the mental health implications for teachers (Pirzadeh and Abotalebi, 2023), the effects on students' mental health are still largely unexplored. Thus, understanding how reductions in instruction time might affect students' well-being, beyond just academic outcomes, is crucial for forming a comprehensive view of the broader impacts of educational policy changes.

Our research also contributes valuable insights to educational policy implications, particularly in the context of balancing academic rigor with students' well-being. By highlighting the short-term mental health benefits of reduced instructional hours and the associated decrease in academic pressure, our findings suggest that educational policies should not solely prioritize academic performance but also consider the psychological and emotional needs of students. The positive effects on mental health, including reduced stress, depression, and improved sleep quality, underscore the potential benefits of adopting policies that promote a healthier balance between study and rest. These insights are particularly relevant for policymakers aiming to improve student outcomes, as they demonstrate that promoting mental health through manageable academic workloads can enhance overall well-being, which may, in turn, support future academic success. Our study provides evidence that reducing study burdens, increasing opportunities for leisure and restorative activities, and emphasizing mental health in the educational experience can lead to more holistic and sustainable student development. These findings can inform future curriculum reforms, as well as guide policymakers in creating environments that foster both academic achievement and psychological health.

2.2 The health-wealth tradeoff in education

Despite education's generally positive effects on health, several studies have identified potential tradeoffs between educational achievement and well-being. Zajacova and Lawrence (2018) review evidence showing that while education typically improves health outcomes, the stress associated with intense academic environments can negatively impact mental health. Conti et al. (2010b) developed a model demonstrating how education affects both

economic and health outcomes, with potential tradeoffs depending on educational intensity and individual characteristics. In competitive educational systems, Bound and Solon (1999) note that the pursuit of higher earnings through additional education may come at the cost of psychological well-being, particularly when academic pressure is excessive.

This "health-wealth tradeoff" is especially relevant in high-pressure educational contexts. Oreopoulos and Salvanes (2011) examine both monetary and non-monetary returns to education, finding that while education generally increases lifetime earnings, certain educational experiences can diminish health benefits through stress-related pathways. Buckles et al. (2016) similarly find heterogeneous effects of college education on mortality, suggesting that the health benefits of education may be partially offset by academic stress in certain contexts.

However, the specific characterization of "stress associated with intense academic environments" somewhat extends beyond the main focus of the above papers. Our study contributes to this strand of literature by explicitly addressing this question, offering insights into the relationship between academic pressure, academic achievement, and psychological well-being—insights that can inform educational policy design. By quantifying the mental health effects of Japan's Yutori reform, we provide evidence on whether reducing instructional time can improve psychological outcomes with proportionate academic costs, helping policymakers better understand the tradeoffs involved in educational intensity decisions.

3 Institutional Background

As Japan's postwar economy rapidly expanded, education became essential for developing a skilled workforce to support industrial and technological advancement. Increased investment in elementary and secondary education emphasized academic performance, with competitive entrance exams driving intense competition and widespread reliance on cramming methods. Concerns over the impact on students' physical and mental health grew, highlighted by cases of student suicides and bullying in the 1970s, which sparked national debate and criticism of exam-oriented education (Bai and Tanaka, 2024; Nishimura, 2003). In response, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) released the 1977 report

Improving the Curriculum Standards for Elementary and Secondary Education, advocating for reduced academic content, the cultivation of independent thinking, and a more relaxed educational environment (Yamanaka and Suzuki, 2020).[2] These reforms were implemented gradually throughout the 1980s and 1990s, culminating in significant curriculum changes in 2002, which included a major reduction in teaching hours. The following section focuses on the reforms of the 1990s and the landmark changes introduced in 2002.[3]

The Japanese National Curriculum Standards in the 1990s emphasized the importance of "viewing children's academic performance from a new perspective." This approach sought to inspire students to learn independently while cultivating critical thinking, judgment, and self-expression. Reflecting the proposals of the Ad Hoc Council on Education, MEXT revised the Courses of Study to prepare Japan's school education for the 21st century. The revised standards were implemented between 1992 and 1994; however, the 1990s reforms did not involve a reduction in teaching hours.[4]

Building on efforts to promote a more relaxed approach to education, Japan's National Curriculum Standards in the early 2000s—implemented in junior high schools and primary schools in 2002—advanced the reforms initiated in the 1990s. These revisions aimed to move away from traditional, rigid education systems. The updated standards emphasized independent thinking, problem-solving, and decision-making abilities through project-based and cross-curricular learning, moving away from rote memorization and exam preparation toward fostering lifelong learning skills. Schools were encouraged to incorporate hands-on activities, problem-solving tasks, and collaborative exercises.

A core feature of the early 2000s reform was the reduction in instructional hours, particularly for core subjects such as mathematics, science, and Japanese (Kawaguchi, 2016; Motegi and Oikawa, 2019). This measure was designed to ease the intense academic burden and provide students with more time for other pursuits. For instance, in primary schools, total instructional hours over six years were reduced by 418 hours, from 5,785 to 5,367

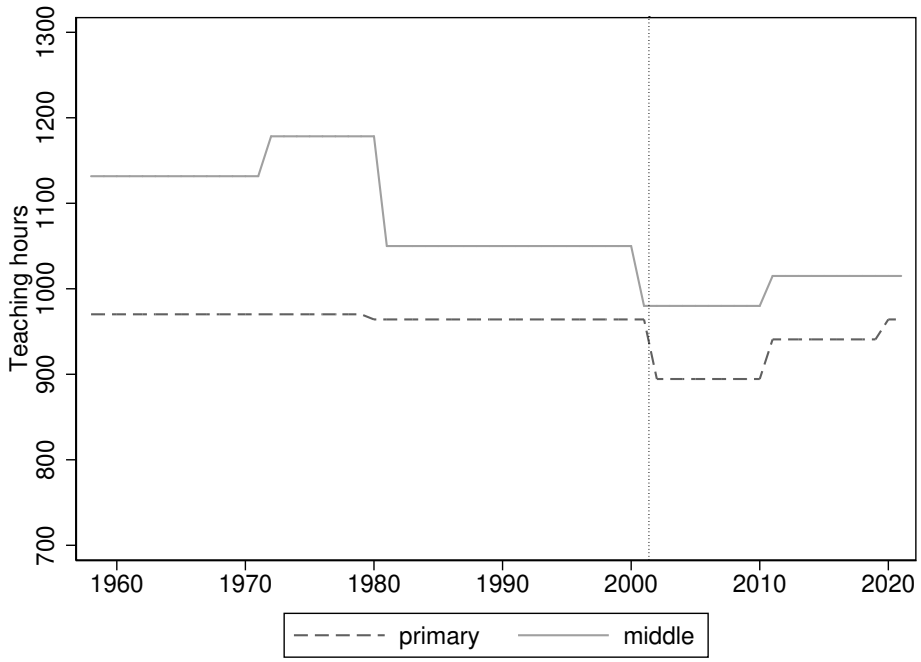
[2] Nozaki and Matsuura (2017) discusses the relative importance of public investment and the learning environment.

[3] Tasaki (2017) also explains the latest reform plan which will be implemented in 2020.

[4] As part of these changes, the "social studies" and "science" courses for first and second graders were replaced with a new "life" course, designed to align with younger students' developmental needs. Additionally, the second Saturday of each month was designated as a school holiday starting in September 1992, followed by the inclusion of the fourth Saturday in April 1995.

hours, with core subjects such as Japanese, arithmetic, science, and sociology reduced by 511 hours (from 3,659 to 3,148 hours). In junior high schools, instructional hours over three years were reduced by 210 hours, from 3,150 to 2,940 hours.[5] These reductions marked the most significant adjustment in instructional time to date. Figure 1 illustrates the dramatic decrease in teaching hours per year for junior high schools in 2001 and for primary schools in 2002. The relaxation-oriented education reforms of the 1980s led to the most significant reduction in junior high school teaching hours (Bai and Tanaka, 2024), while the reduction in primary school teaching hours in 2002 was even more substantial compared to earlier reforms, as shown in Figure 1. However, due to the lack of short-term data on students' mental health from that period, this study focuses solely on the 2002 curriculum reforms, despite their less substantial reduction in junior high school teaching hours compared to the 1980s.

Figure 1: Time variations of teaching hours in primary and junior high schools



Notes: The x-axis represents years from 1960 to 2020. The y-axis shows teaching hours per year. The solid line represents primary schools, the dashed line represents middle schools, and the vertical dotted line indicates the 2002 Yutori education reform.

Another notable component of the reform was the introduction of the "Period

[5]Data source for primary schools: https://www.mext.go.jp/a_menu/shotou/cs/1319941.htm; Data source for junior high schools: https://www.mext.go.jp/a_menu/shotou/cs/1320061.htm.

of Integrated Study", a dedicated time for exploring interdisciplinary topics such as international understanding, environmental awareness, and information literacy. This approach offered schools the flexibility to tailor content to students' interests, fostering self-directed learning. Additionally, the reform introduced a five-day school week, fully implemented in elementary and junior high schools in 2002 and in high schools in 2003. This change aimed to reduce student stress and provide more time for extracurricular activities, family interactions, and rest. By balancing academic learning with emotional and physical well-being, the reform sought to create a more holistic education experience. That approach was designed to reduce the academic pressure on students and shift the focus of schooling from rigid memorization and test preparation to more holistic learning. By reducing teaching hours and increasing flexibility in the curriculum, the reform sought to provide students with more time for personal development, creativity, and critical thinking.

Despite these reforms, challenges emerged. The significant reduction in instructional hours for core subjects such as mathematics, science, and Japanese raised concerns about declining academic standards. This approach, often referred to as "Yutori Education" or "relaxed education," faced criticism for contributing to a perceived drop in academic performance (Nozaki and Matsuura, 2017, Tasaki, 2017). By the mid-2000s, these concerns were further amplified by Japan's declining scores in international assessments such as PISA, particularly in reading and mathematics—a phenomenon termed the "PISA shock." These developments spurred public debate about Japan's global competitiveness, especially in the context of prolonged economic stagnation during the "lost two decades."

This backlash influenced subsequent curriculum revisions in the 2010s, often referred to as "post-Yutori education," along with the introduction of the National Assessment of Academic Ability. While continuing to focus on cultivating essential 21st-century skills, this educational reform aimed to address the perceived shortcomings of the previous system. It was fully implemented starting in 2011 for elementary schools and 2012 for junior high schools. According to the MEXT, this approach is described as fostering the "zest for living," rather than being categorized as either Yutori (relaxed) education or cram-style education. Notably, some of the previously reduced instructional hours were reinstated, as illustrated in Figure 1.

We hypothesize that individuals exposed to more years of relaxed education implemented in 2002 tend to report better mental health outcomes. Analysis of potential mechanisms suggests that reduced study hours and increased leisure time are likely contributors. Specifically, shorter study schedules and decreased pressure from intensive academic demands allow students to explore personal interests, reduce stress, and participate in activities that promote relaxation and recovery. These opportunities may enhance their sense of accomplishment and overall well-being. Conversely, we might observe that individuals exposed to more years of the education revisions introduced in 2012 report slightly worse mental health outcomes, reflecting a symmetric effect.

Meanwhile, we believe that the effects of relaxed education policies on students' mental health may be temporary, as these benefits often diminish over time. Several factors could explain this transience. As students advance to higher levels of education or enter the workforce, they frequently face increasing demands that reintroduce stressors similar to those in traditional academic settings. Additionally, the skills and coping mechanisms developed during periods of relaxed education may not sufficiently prepare them for the competitive environments they encounter later, potentially undermining earlier mental health gains. In highly competitive cultures, societal expectations to excel in subsequent educational or professional stages can further offset these initial benefits by reintroducing stress. Furthermore, the evolving nature of mental health itself—shaped by external factors such as economic shifts, life transitions, and interpersonal relationships—may contribute to the gradual attenuation of these positive effects over time.

4 Data and Methods

4.1 Dataset

The Comprehensive Survey of Living Conditions, conducted annually by Japan's Ministry of Health, Labour and Welfare, collects extensive data on various aspects of Japanese households' living conditions, including demographics, health status, income, social welfare needs, and caregiving. This data serves as a foundation for policy-making aimed at improving

public health and social welfare. However, the modules on health, caregiving, and income are collected every three years, and the main mental health variables have been included since 2004. Thus, the waves in our analysis are from 2004, 2007, 2010, 2013, 2016, 2019, and 2022. We combine these waves to create a pooled cross-sectional dataset for our study.

Explanatory variables. In the benchmark analysis, we limit the sample to individuals born between 1977 and 1995. The cohort born from 1987 to 1995 is defined as the treatment group, as they were affected by the relaxation of the educational policy in 2002. In contrast, the control cohort includes individuals who had already completed middle school by 2002 and were therefore unaffected by the policy change during their compulsory education. Despite the birth year differences between treatment and control groups, our lengthy sample period ensures we observe both treatment and control groups across ages 12–35 throughout the analysis.[6]

We define a *Post* variable based on birth month, assigning a value of 1 to individuals born in or after April and 0 otherwise. This distinction results in differences in school enrollment timing within the same birth cohort, with those born before April enrolling a year earlier. Such differences can directly influence mental health outcomes due to variations in individuals' ages during compulsory education.

The key variable of interest is the interaction term between the treatment and post variables, which captures the effect of an additional year of exposure to the non-relaxed education system. The control*post group serves as a benchmark, reflecting solely the schooling cohort difference, as they experienced no variation in the duration of Yutori education.

Outcome variables. We include several variables capturing individuals' mental health status. Our first outcome variable is *Stress*, which is measured as a binary variable derived from the question "Do you experience worries or stress in daily life?", with responses coded as 0 for "No" and 1 for "Yes."

[6]For example, individuals born in 1981 (control group) would be 23 years old in the 2004 survey wave, while those born in 1990 (treatment group) would be 23 years old in the 2013 survey wave, allowing us to compare mental health outcomes at similar ages across different educational policy exposures.

The regression analysis also incorporates a variable, *Mentalpoint*, which reflects respondents' self-reported mental health over the past month based on their experiences across six items: feeling depressed and unable to cheer up, feeling nervous, feeling agitated or upset and unable to remain calm, feeling hopeless about the future, feeling that everything is difficult, and thinking that life is meaningless. Each item is scored on a five-point scale, with responses of "Always" scoring 4 points, "Usually" scoring 3, "Sometimes" scoring 2, "Rarely" scoring 1, and "Never" scoring 0. This scale produces a composite mental point score ranging from 0 to 24, where higher values indicate poorer mental health. Our mental health composite measure follows the structure of the widely used Kessler Psychological Distress Scale (K6), consisting of six items scored 0 to 4. This scale has been extensively validated internationally and is commonly employed as a continuous variable in regression analyses to capture gradations of psychological distress (Kessler et al., 2003; Prochaska et al., 2012). It provides a nuanced view of mental health, allowing the regression model to capture varying levels of psychological distress beyond binary stress indicators, thereby offering insight into how the treatment may differentially impact those with varying degrees of mental health challenges.[7]

The third variable, *Mentaladd*, consists of three types of mental health conditions: psychosis, neurosis, and autonomic nervous system disorders. This variable provides insight into the presence of doctor-diagnosed mental health disorders across different time periods and allows for the identification of specific types of conditions.[8]

The fourth variable *Sleepwell* measures the adequacy of rest and recovery through sleep, using a four-point scale. The scale includes the following options: 1) completely adequate, 2) adequately adequate, 3) inadequate, and 4) not adequate at all. This variable is also considered a mental health indicator because sleep plays a critical role in mental and emotional well-being, with higher values indicating poorer mental health. Poor sleep quality and inadequate rest are closely linked to various mental health issues, including stress, anxiety, depression, and cognitive dysfunction. Inadequate sleep can exacerbate existing mental health conditions, and long-term sleep deprivation may contribute to the development

[7]This variable is available in the waves starting from 2007.

[8]This data distinguishes between the three disorder types only for survey waves before 2004. After 2004, it provides a single category representing all doctor-diagnosed mental illnesses.

of mental health disorders (Nguyen et al., 2024).

Other variables. First, we include birth month centered on April as a covariate to account for variation in school entry age due to the enrollment cutoff, capturing linear age-at-enrollment effects. Additional control variables include gender, municipality-level residence, marital status, household size, per capita household expenditure, number of income earners in the household, housing type, and social insurance coverage. We also consider potentially endogenous variables—such as years of schooling, employment status, and income level—for exploring the health-wealth trade-off.

4.2 Empirical strategy

We use the following DID regression model to evaluate the effect of the relaxation educational policy on children's mental health outcomes.

$$\text{Health}_{icmw} = \alpha_0 + \alpha_1 I(1987 \leq c \leq 1995) \times \text{Post}_i + \alpha_2 \text{Post}_i + \delta X_i + \delta_i + \sigma_c + \lambda_m + \epsilon_w + \epsilon_{icmw} \quad (1)$$

where $Health_{icmw}$ represents the mental health of individual i from cohort c in municipality m, and surveyed in year w. $I(1987 \leq t \leq 1995)$ equals to one if individual i was born between 1987 and 1995, meaning they were aged 6 to 15 during the relaxation of educational policy. The control group consists of individuals born between 1977 and 1986 who were not affected by the 2002 educational reform.[9] $Post_c$ is set to one for individuals born on or after April and zero otherwise; this variable captures grade differences within cohorts born in the same year but in different months. For example, individuals born before April may be in a higher grade than those born after April within the same birth year. Consequently, 1987–1995 cohorts born after April will have one additional year of exposure to the educational reform compared to their counterparts born earlier in the same year, conditional on the schooling cohort difference measured by *Post* itself.

[9]We exclude cohorts born before 1977 in the control group, as they may have been influenced by the educational reforms introduced in the 1980s.

$\mathbf{X}i$ denotes individual-level control variables, specifically gender. δ_i represents age fixed effects, which absorb systematic cohort differences as well as the potential attenuation of treatment effects due to time elapsed since schooling. σ_c captures birth-year fixed effects, accounting for cohort-specific characteristics—for example, the trend that later-born cohorts tend to experience longer study hours and poorer mental health than earlier cohorts. Region fixed effects λ_m control for time-invariant regional differences, including geographical or cultural factors at the municipality level. Wave fixed effects ϵ_w capture variation across survey years, accounting for national-level events or policy shifts that may influence mental health outcomes. Standard errors are clustered at the municipality level.

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 would have followed similar cohort trends in mental health. To test this, we estimate a fully flexible cohort-by-cohort specification, as shown in Eq. 2:

$$\text{Health}_{icmw} = \alpha_0 + \sum_{\gamma=1977}^{1996} \alpha_{1\gamma}\text{Post}_i \times I(c=\gamma) + \delta X_i + \delta_i + \sigma_c + \lambda_m + \epsilon_w + \epsilon_{icmw} \quad (2)$$

where all variables are the same as in Eq. 1, with the only difference being that we now interact *Post* with each birth cohort's fixed effect, rather than with a pooled treatment group (1987–1995). We use individuals born in 1986 as the reference group. The estimated coefficients $\alpha_{1\gamma}$ capture the differences between individuals born before and after April within each cohort. If the parallel trends assumption holds, we expect these coefficients to be close to zero for cohorts born before 1987, who were not exposed to the relaxation of the educational policy.

5 Empirical Results

5.1 Baseline results

The regression results in Table 1 assess the effects of the 2002 relaxation of Japan's educational policy on various dimensions of mental health. All specifications include a

comprehensive set of covariates and fixed effects for birth cohort, municipality, and survey wave to account for unobserved heterogeneity across individuals and regions.

The key variable of interest is the interaction between treatment status (birth cohort 1987–1995) and the *Post* indicator, which identifies individuals born in or after April (and thus exposed to one additional year of the relaxed Yutori curriculum due to later school enrollment). This interaction term captures the differential impact of the Yutori reform on individuals whose school entry was delayed due to their birth month.

In column (1), where *Stress* is the outcome variable, the interaction term is negative and statistically significant (coefficient = -0.009, p ¡ 0.01), indicating that individuals in the treatment cohort who entered school later—due to being born in or after April—experienced lower stress levels in adulthood. The *Post* variable is also negative and statistically significant, suggesting that delayed school entry is associated with reduced stress even outside the treatment cohort. These findings imply that both the Yutori curriculum and the timing of school entry independently and jointly contributed to lower stress levels overall.

In column (2), we examine the impact on *Mentalpoint*, a composite index that captures a broad range of depressive symptoms and serves as our primary mental health outcome. The results indicate a statistically significant and substantively meaningful reduction in depressive symptoms for those exposed to both the Yutori educational reforms and delayed school enrollment. Specifically, the interaction term between the treatment cohort (born between 1987 and 1995) and the *Post* variable yields a coefficient of -0.168 (p ¡ 0.01), indicating a sizable mental health gain. This finding underscores the psychological benefits of experiencing a less academically intense environment during formative years, particularly when the exposure is prolonged by an additional year of enrollment under the Yutori system. The *Post* variable alone is also negative and statistically significant, suggesting that later school entry is associated with improved mental health outcomes even outside the treatment group.

Taken together, these results reinforce the view that structural educational reforms designed to alleviate academic pressure can yield enduring benefits for mental well-being. In contrast to *Stress*, which may capture more immediate or situational emotional responses, the consistent and sizable decline in the *Mentalpoint* index reflects deeper, more sustained

psychological improvements. Since *Mentalpoint* aggregates a range of symptoms associated with depression and emotional distress, the observed reduction indicates a broad-based enhancement in psychological health rather than transient fluctuations in mood. For this reason, we treat *Mentalpoint* as our primary outcome and conduct more detailed analysis using this measure.

By contrast, column (3) shows no significant effects for either the interaction term or the *Post* variable on the more severe *Mentaladd* outcome. This null result may reflect the limited variation in the data, as the number of individuals diagnosed with mental health conditions is relatively small. The low incidence of clinically diagnosed cases reduces statistical power, making it difficult to detect meaningful associations with educational policy changes.

Finally, in column (4), the interaction term is negative but statistically insignificant, providing no strong evidence of improved sleep quality among individuals in the treatment cohort with delayed school entry. Interestingly, the coefficient on the *Post* variable is marginally positive and significant, suggesting that outside the treatment group, later school entry may be associated with slightly worse sleep outcomes. These results highlight the complexity of interpreting lifestyle-related outcomes and suggest that the interaction between policy exposure and school entry timing does not have a clear or robust effect on sleep behavior. Importantly, we emphasize that *Sleepwell* is not a direct measure of psychological well-being, as captured by outcomes like *Mentalpoint* or *Stress*. Rather, it reflects health-related habits and routines that may correlate with—but do not determine—mental health. Therefore, we treat it as a complementary reference point rather than a primary indicator. These mixed findings reinforce the view that the psychological effects of educational reforms are more reliably captured through direct mental health measures than through behavioral proxies like sleep. Nonetheless, the consistent negative sign of the interaction term, albeit insignificant, is directionally in line with the broader narrative that reduced academic pressure may contribute to improvements in both mental and behavioral health.

Parallel Trend——. The assumption of generalized parallel trends is critical for ensuring the unbiasedness of the DID estimates. However, it is a strong identifying assumption that warrants empirical validation rather than blind acceptance. To this end,

Table 1: Impact of relaxation of education reform on mental health

Dependent variable	Stress	Mentalpoint	Mentaladd	Sleepwell
	(1)	(2)	(3)	(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

Notes: This table presents the estimated impact of the relaxation of educational reform on various measures of mental health, as specified in Eq. 1. All specifications include age fixed effects, birth cohort fixed effects, municipality fixed effects, and survey wave fixed effects. Control variables include gender, residence type at the municipality level, marital status, household size, per capita household expenditure, number of income earners in the household, housing type, and social insurance coverage. Additionally, birth month centered on April is included as a covariate to account for variation in school entry age due to Japan's school enrollment cutoff. Standard errors are clustered at the municipality level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

we implement an event study framework incorporating birth cohort fixed effects and other controls aligned with the baseline specification. This allows us to examine the dynamics of mental health outcomes across birth cohorts and to test whether pre-treatment trends were indeed parallel. We focus on mentalpoint as the primary outcome variable, as it captures a broad spectrum of depressive and emotional symptoms.[10]

Figure 2 presents the estimated coefficients of the interaction terms between cohort dummies and the *Post* indicator, using individuals born in 1986 as the reference group. The x-axis represents birth years, while the y-axis plots the estimated differences in mental health outcomes relative to the 1986 cohort.

The findings offer strong support for the validity of the DID design. For cohorts born before the implementation of the policy (1977–1986), we observe no statistically significant

[10]Results using stress as the outcome are broadly similar and available upon request.

deviations, indicating that in the absence of treatment, mental health trends remained stable and comparable across cohorts. This lends credibility to the parallel trends assumption, which is essential for causal inference.

In contrast, for cohorts born between 1987 and 1995—those fully exposed to the Yutori education reform—we find a clear pattern of negative and statistically significant coefficients. These results suggest that the mental health of the treated cohorts improved in a systematic way following the policy change, relative to the pre-reform trend. The event study thus provides compelling evidence that the observed reductions in mentalpoint scores are not driven by pre-existing differences or spurious cohort-specific fluctuations, but rather reflect the causal effect of reduced academic pressure during key stages of educational development. Importantly, we find that this pattern does not hold for cohorts who were only partially exposed to the reform—for example, those who experienced Yutori-style curriculum only during junior high school. For these individuals, the effects are not statistically significant, likely due to the limited intensity and duration of exposure.

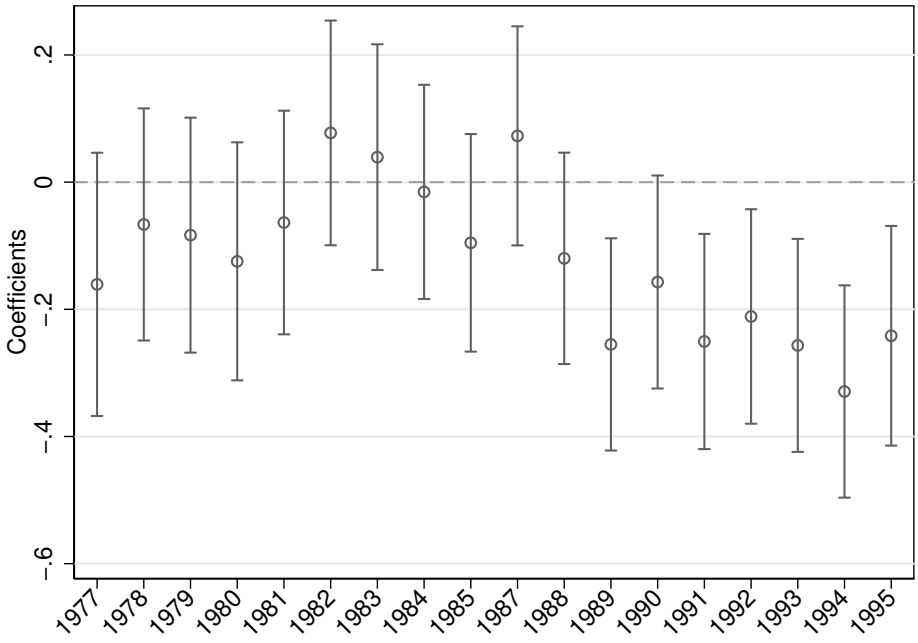
Moreover, the smooth trajectory of the event study coefficients and the absence of any anticipatory effects prior to treatment reinforce our interpretation that the mental health improvements were indeed driven by the policy intervention rather than by unobserved contemporaneous shocks. This dynamic analysis, together with the static DID results, highlights the robustness of our findings and points to a broader implication: educational policy, when timed appropriately within the developmental window of youth, can yield lasting psychological benefits.

5.2 Analysis of marginal effects by age

Figure 3 illustrates the marginal effects of the interaction between treatment status and post-April birth timing across different age groups. This visualization provides critical insights into how the impact of educational policy reform varies throughout the developmental trajectory of affected individuals.

The figure reveals a pronounced age-dependent pattern in the treatment effects. For younger individuals (ages 12-19), we observe substantial negative marginal effects, with the most pronounced impact occurring at age 12 (approximately -1.1). This suggests that

Figure 2: Event study figure



Notes: The fixed effects and outcome variable are the same as column (2) of Table 1. 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.

individuals in the treatment cohort who were born after April and thus experienced an additional year of the relaxed education system show significantly better mental health outcomes during their adolescent years compared to their counterparts born earlier in the year.

The sharp reduction in effect size observed around ages 18-19 likely corresponds with university entrance examination outcomes and subsequent higher education opportunities. This dramatic shift may directly reflect the consequences of the Yutori education on university admissions, as found in Bai and Tanaka (2024) and our Appendix Table A.1. Students who experienced more of the relaxed curriculum may have faced greater challenges in university entrance examinations, resulting in either failing to gain admission to preferred institutions or choosing not to pursue higher education altogether. This critical transition point appears to mark when the initial mental health benefits of reduced academic pressure during secondary education become substantially offset by the stress and disappointment associated with potentially limited higher education prospects. The timing of this effect

reduction aligns precisely with the age when Japanese students typically face university admission decisions, suggesting that educational attainment outcomes may be a key mechanism through which the policy's long-term mental health effects are moderated.

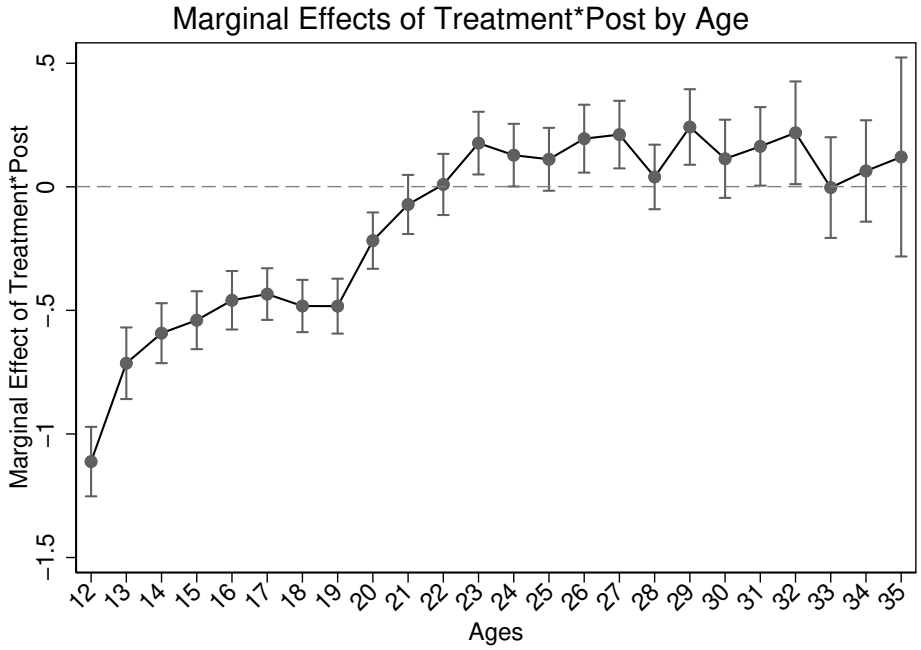
As age increases beyond this critical juncture, we observe a clear convergence toward zero effect, with the marginal effects crossing the zero threshold around age 21-22. For individuals aged 23 and above, the marginal effects fluctuate around zero, with most estimates being statistically indistinguishable from zero as indicated by the confidence intervals that cross the horizontal dashed line. This is supported by the facts that using this dataset, we also find that Yutori-treated cohorts are more likely to be employed and find a full-time, decent work, and usually have lower annual income (columns 2–4 of Appendix Table A.1). This pattern suggests that while the educational policy reform had substantial impacts on mental health during adolescence and early adulthood, these effects appear to diminish over time.

The convergence of mental health effects toward zero in adulthood reveals a compelling "health-wealth tradeoff" associated with the Yutori education reform. Our findings indicate that individuals who experienced more of the relaxed curriculum ultimately face a complex equilibrium between improved employment stability and reduced earning potential. While these individuals are more likely to secure full-time employment—potentially due to more realistic job expectations or greater flexibility in career choices—they typically command lower wages than their counterparts who received more traditional, intensive education. This tradeoff appears to create a balanced effect on mental health in adulthood: the psychological benefits of employment security and potentially reduced workplace stress may offset the negative psychological impacts of lower income and possibly less prestigious occupational status. The health-wealth tradeoff suggests that educational policies create complex ripple effects throughout individuals' lives, with initial reductions in academic stress potentially leading to different—but not necessarily worse—life trajectories characterized by different balances of financial and psychological well-being. This nuanced outcome challenges simplistic evaluations of educational reforms and highlights the multidimensional nature of policy impacts on life outcomes.

The labor market outcomes observed in our dataset provide important context for understanding the convergence of mental health effects in adulthood. This suggests a

complex interplay between educational policy, labor market outcomes, and mental health trajectories that evolves throughout the life course.

Figure 3: Time variations of teaching hours in primary and junior high schools



Notes: The x-axis represents ages from 12 to 35. The y-axis shows the marginal effect of *Treatment*Post* by age, ranging from -1.5 to 0.5. The solid points represent point estimates, and the vertical lines with horizontal caps indicate 95% confidence intervals.

Working hours have been widely recognized as an important factor influencing mental health, with longer hours often associated with increased stress, anxiety, and depression (Fujino et al., 2006; Sato et al., 2020). In our analysis, we directly control for individuals' reported working hours, which allows us to more precisely isolate the effect of educational exposure on mental health outcomes. Including this variable helps account for variation in work-related psychological burden that could otherwise confound our estimates. Results are reported in Appendix Table A.2. While longer working hours are associated with higher levels of stress and poorer sleep quality, they are paradoxically linked to lower scores on the continuous mental distress index, suggesting that the relationship between working time and mental health is complex and potentially non-linear. Nonetheless, our main results remain robust after controlling for working hours, indicating that the observed mental health benefits are not merely driven by differences in labor market intensity. By including working hours as

a control variable, we improve the precision of our estimates and provide a more conservative test of the education reform's effects on mental health.

5.3 Effect of post-Yutori education

The implementation of the post-Yutori education reform—which partially reversed the relaxed curriculum of the Yutori era by reinstating some of the previously reduced instructional hours—offers a unique opportunity to assess whether increasing academic demands after a period of educational leniency produces symmetrical or distinct effects on mental health outcomes. These outcomes include stress levels, general mental health points, and sleep quality, all of which are commonly used indicators of psychological well-being among students. To explore these effects, we expanded the analysis sample to include individuals born between 1997 and 2005, who were exposed to the post-Yutori reforms introduced around 2011/2012. This extended cohort was examined alongside the original benchmark sample to facilitate a comparative analysis across different educational regimes.

Methodologically, we augmented the DID specification by including an additional interaction term between the post-Yutori cohort and the post-reform indicator. This allows us to estimate the differential impact of both the Yutori and the post-Yutori reforms relative to the pre-Yutori cohorts. The identification strategy remains relative, with all effects interpreted against a baseline group born before 1987, who were unaffected by either reform. This triple-cohort framework enables us to disentangle the mental health consequences of both relaxing and subsequently re-tightening academic pressure within Japan's evolving education system.

The empirical results are presented in Table 2. The estimated effects vary by outcome. While stress levels (column 1) did not significantly change compared to those cohorts in the control group, mental health points (column 2)—a broader index capturing emotional well-being—remained negatively affected, but the magnitude of the effect is smaller to that observed under Yutori education, implying that some of the beneficial aspects of the Yutori-era reforms were not entirely negated. The *Mentaladd* variable (column 3), which may capture more acute or episodic mental distress, shows no significant effect. In contrast, sleep quality (column 4) deteriorated significantly, indicating that the return to a more demanding

academic environment may have adversely affected students' rest and recovery.

Overall, these findings highlight the complex and often asymmetric relationship between education policy and adolescent mental health. Although the post-Yutori reforms did not fully negate the psychological gains associated with Yutori-era education, they did impose specific burdens—particularly in terms of sleep—suggesting that reintensifying academic pressure may have undermined some aspects of student well-being.

Table 2: Impact of post-Yutori education reform on mental health

Dependent variable	Stress	Mentalpoint	Mentaladd	Sleepwell
	(1)	(2)	(3)	(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

Notes: This table reports the estimated impact of the post-Yutori education reform on various measures of mental health. The analysis includes a dummy variable indicating whether an individual was born between 1997 and 2005, as well as an interaction with the *Post* indicator. All regressions control for age fixed effects, birth cohort fixed effects, municipality fixed effects, and survey wave fixed effects. Additional covariates include gender, municipality-level residential status, marital status, household size, per capita household expenditure, the number of income earners in the household, housing type, and social insurance coverage. We also control for birth month (centered on April) to account for variation in school entry age due to Japan's enrollment cutoff system. Standard errors are clustered at the municipality level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

6 Mechanisms

To explore the potential mechanism behind the improvement in mental health following the relaxation of educational policies, we hypothesize that a reduction in students' study burden played a central role. To empirically assess this channel, we utilize data from the Survey on Time Use and Leisure Activities (STULA), a nationally representative survey conducted every five years by the Statistics Bureau of Japan since 1976. The available survey waves include the years 1991, 1996, 2001, 2006, and 2011.

The STULA is one of the most comprehensive time-use datasets available in Japan and is designed to capture detailed information on how individuals allocate their time across various daily activities. In each wave, all household members are asked to maintain a time diary that records their primary activities in 15-minute intervals over the course of a day, typically covering both weekdays and weekends to reflect variations in daily routines. Activities are classified into 20 pre-defined categories that encompass a wide range of behaviors, such as education, paid work, housework, personal care, socializing, and leisure.

The STULA has several strengths that make it particularly suitable for our study. First, its consistency over multiple waves allows us to track changes in time use over a long period, including before and after the implementation of educational policy reforms. Second, the granularity of the time diaries provides rich detail on not only the total time spent in various activities but also the precise distribution of time across different parts of the day.

For the purpose of our analysis, the original activity codes are reclassified into three broad categories: study time, leisure time, and other uses of time. This reclassification allows us to systematically assess changes in adolescents' time allocation patterns before and after the policy shift that aimed to reduce academic pressure. Appendix Table A.4 provides a detailed mapping between the STULA activity codes and our reclassified categories, specifying which original activities are counted as study-related or leisure-related. This enables a clear interpretation of how the policy reform may have altered daily schedules and contributed to improvements in mental health outcomes.

We further distinguish study time at school from study time outside school by utilizing information on companionship during activities—whether individuals are alone, with family,

or with school/company peers. We define study time at school as study activities conducted with school peers, while study time outside school includes study activities that take place without school peers.

To estimate the impact of relaxed education on study time and leisure time, we do not apply the DID model specified in Eq. 1, as this analysis focuses on the short-term effects. Since the children have not yet completed their education, there is no variation in their duration of exposure to the policy. For example, students born in *pre-April* 1995 were in Grade 2 when the policy was introduced in 2002, while those born in *post-April* 1995 were in Grade 1. By the time of the 2006 survey, both groups had undergone the same five years of policy exposure—either advancing from Grade 2 to Grade 6 or from Grade 1 to Grade 5—eliminating variation in treatment duration.

To address this concern and conduct a short-term analysis, we modify the outcome variable to reflect the change in study hours or leisure time for each cohort. Specifically, for earlier cohorts (born 1977–1986) unaffected by the reform, study hours increase with grade level—from 4.35 hours per day in grade 4 to 4.82 in grade 6, a rise of 0.47 hours—reflecting a growing academic burden. In contrast, later cohorts (born 1987–1995) show little change, with average study time rising only marginally from 5.94 to 5.98 hours per day between grades 4 and 6. This suggests that the relaxation of educational pressure effectively curbed the increase in study burden for these students.

The estimation equation to estimate is denoted as follows:

$$\Delta\text{Study}\backslash\text{Leisure}_{c,m} = \beta_0 + \beta_1 I(1987 \leq t \leq 1995) + \sigma_c + \lambda_m + \varepsilon_{c,m} \tag{3}$$

where $\Delta\text{Study}\backslash\text{Leisure}_{c,m}$ represents the change in study hours or leisure time for cohort c in municipality m. Specifically, it denotes the change in study hours or leisure time from 2001 to 2006 for the treatment group affected by the 2002 educational reform, and from 1996 to 2001 for the control group that was not affected by the reform. $I(1987 \leq t \leq 1995)$ equals one if the student was born between 1987 and 1995.

We further divide this range into three groups: the primary school group (born 1993–1995, aged 10–12 in 2006), the middle school group (born 1990–1992, aged 13–15 in 2006), and

the high school group (born 1987–1989, aged 16–18 in 2006). The control group consists of cohorts that are matched to the treatment group based on age range and educational level, but are not affected by the relaxed educational policy. In other words, we examine the change in study hours or leisure time for treatment cohorts, who are affected by the relaxed education policy, at ages 10-12, 13-15, and 16-18, compared to the change in study hours or leisure time for control cohorts, who are not affected by the policy, at the same age ranges. A detailed illustration of the treatment and control groups is provided in Appendix Table A.3. σ_c represents birth-year fixed effects, and λ_m is municipality fixed effect, and standard errors are clustered at the municipality level.

Results are presented in Table 3. Panel A, columns (1)–(3), reports outcomes for primary school students, indicating that the relaxation of the education policy led to a significant decrease in study hours, with a reduction of approximately 1.038 hours per day for children affected by the policy. This decrease is primarily driven by a reduction in study hours at school, which decreased by 0.839 hours, while the reduction in out-of-school study hours is smaller at 0.199 hours. These findings suggest that the relaxation policy primarily impacts the formal, school-related study hours for primary school students.

Similarly, Panel B, columns (1)–(3), shows a decrease of about 0.489 hours for middle school students. As in primary school, the reduction in study hours is mainly attributed to decreased in-school study time (a reduction of 0.429 hours), with the reduction in out-of-school study hours being smaller and insignificant. The pattern is consistent with that observed in primary school, suggesting that the policy is more effective at reducing formal, in-school study hours, rather than leisure or out-of-school study time.

At the high school level, however, as shown in Panel C, the effect of the policy on study hours is much less pronounced. The decrease in total study hours is negligible in Column (1). More importantly, there is no significant reduction in study hours at school or out of school, indicating that high school students may not have experienced the same level of reduction in study time, likely due to the more rigorous academic demands of high school.

In addition to the reductions in study hours, we also observe a notable increase in leisure time for both primary and middle school students, as shown in Column (4) of Panels A and B. The increase in leisure time is 0.577 hours for primary school students and 0.542

hours for middle school students, suggesting that the relaxation of educational pressure has led to more free time for students to engage in leisure activities. In high school (Panel C), leisure time also increases significantly by 0.763 hour. Therefore, we suggest that the decrease in study hours and the increase in leisure activities jointly explain the potential improvements in mental health and overall well-being observed following the relaxation of educational policies.

Table 3: 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
Panel C: High School				
Treatment Group ($1987 \leq t \leq 1995$)	0.205	0.042	0.022	0.763***
	(0.169)	(0.097)	(0.080)	(0.113)
Municipality FE	Y	Y	Y	Y
N	6513	6513	6513	6513

Notes: The dependent variables are the changes in average hours per day spent on total study, study at school, study outside school, and leisure activities. The treatment group includes cohorts born between 1987 and 1995 who were exposed to the relaxed policy during their schooling years. The control group includes age- and grade-matched cohorts who were not affected by the policy. Each panel corresponds to a different educational stage: Panel A (Primary School), Panel B (Middle School), and Panel C (High School). All regressions include municipality fixed effects, age fixed effects, and birth-year fixed effects. Standard errors are clustered at the municipality level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

7 Conclusion

This study sheds light on the short-term mental health effects of relaxation-oriented education policies by exploiting Japan's 2002 Yutori reform as an exogenous shift in academic pressure. Our DID estimation shows that prolonged exposure to a less demanding curriculum led to notable improvements in student mental health, especially during the years of direct exposure. These results suggest that reducing academic burden can be a viable policy tool to address the mental health crisis facing students in high-pressure education systems.

Mechanism analysis points to reduced study hours and increased time for leisure as key pathways through which the reform enhanced students' psychological well-being. By easing the daily academic load, the Yutori policy created space for restorative activities and personal autonomy, both of which are critical for adolescent mental health.

However, the benefits of such relaxation appear to be short-lived. While students experience notable mental health improvements during their school years, these gains diminish sharply around the time of high-stakes university entrance exams and ultimately vanish in the long run. A plausible explanation is that the relaxed curriculum may have impaired students' academic preparedness, adversely affecting their performance in competitive entrance examinations. This, in turn, could constrain their access to higher education and high-paying jobs, leading to increased stress from limited economic opportunities later in life. In other words, our heterogeneity analysis uncovers a striking health-wealth tradeoff: although students—particularly those from economically disadvantaged backgrounds—benefit mentally from reduced academic pressure in the short term, these same individuals may face greater stress and economic vulnerability in adulthood due to weakened educational and labor market outcomes.

In sum, relaxation-oriented education reforms such as the Yutori policy can deliver meaningful, albeit temporary, improvements in student mental health. However, our findings suggest that excessive relaxation may come at the cost of academic preparedness and future labor market performance. This underscores the importance of calibrating the intensity of curriculum easing: too much relaxation risks undermining long-term human capital development, while too little may fail to alleviate psychological distress. Policymakers should

carefully evaluate whether reductions in instructional time—particularly in core academic subjects—are necessary or whether alternative forms of stress mitigation can be pursued. Ultimately, education policy should strike a balance between mental well-being and academic rigor, especially for students from disadvantaged backgrounds, to avoid replacing short-term relief with long-term disadvantage.

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Appendix

Table A.1: 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

Notes: This table reports the estimated heterogeneous impact of the Yutori education reform on academic and labor market performance variables. All regressions control for age fixed effects, birth cohort fixed effects, municipality fixed effects, and survey wave fixed effects. Additional covariates include gender, municipality-level residential status, marital status, household size, per capita household expenditure, the number of income earners in the household, housing type, and social insurance coverage. We also control for birth month (centered on April) to account for variation in school entry age due to Japan's enrollment cutoff system. Columns (2)–(4) further include educational attainment as a covariate. Standard errors are clustered at the municipality level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.2: Impact of relaxation of education reform on mental health

Dependent variable	Stress	Mentalpoint	Mentaladd	Sleepwell
	(1)	(2)	(3)	(4)
$I(1987 \leq t \leq 1995) \times Post$	-0.011**	-0.095**	0.000	-0.025*
	(0.005)	(0.045)	(0.001)	(0.013)
$Post$	-0.005	-0.080**	-0.002**	0.028**
	(0.005)	(0.039)	(0.001)	(0.012)
Working hours	0.001***	-0.002***	-0.001***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)
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	215,239	239,661	270,520	152,429

Notes: This table presents the estimated impact of the relaxation of educational reform on various measures of mental health, as specified in Eq. 1. All specifications include age fixed effects, birth cohort fixed effects, municipality fixed effects, and survey wave fixed effects. Control variables include gender, residence type at the municipality level, marital status, household size, per capita household expenditure, number of income earners in the household, housing type, and social insurance coverage. Additionally, birth month centered on April is included as a covariate to account for variation in school entry age due to Japan's school enrollment cutoff. Standard errors are clustered at the municipality level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table A.3: Construction of Treatment and Control Groups in the STULA

Group	Birth Year	Survey Year
Primary School		
Treatment	1993–1995	2001, 2006
Control	1988–1990	1996, 2001
Middle School		
Treatment	1990–1992	2001, 2006
Control	1985–1987	1996, 2001
High School		
Treatment	1987–1989	2001, 2006
Control	1982–1984	1996, 2001

Notes: Data are from the Survey on Time Use and Leisure Activities (STULA), conducted by the Ministry of Internal Affairs and Communications (MIC) and the Statistics Bureau of Japan. This table illustrates how individual-level data are aggregated to cohort-level data, and how birth years and survey years are defined for the treatment and control groups across different schooling stages. Treatment cohorts experienced the relaxed curriculum during the relevant education level, while control cohorts did not. This classification underpins a DID identification strategy to estimate the reform's impact on student time use.

Table A.4: Activity categories in the STULA

Code	Activity	Group
1	Sleep	-
2	Personal errands	-
3	Eating	-
4	Commuting to work and school	-
5	Work	-
6	Study (schoolwork)	Study Time
7	Housework	-
8	Care/Nursing	-
9	Childcare	-
10	Shopping	-
11	Travel (excluding commuting)	-
12	Television, radio, newspapers, magazines	Leisure Time
13	Rest/Relaxation	Leisure Time
14	Study/Research (other than schoolwork)	Study Time
15	Hobbies/Entertainment	Leisure Time
16	Sports	Leisure Time
17	Social activities	Leisure Time
18	Socializing	Leisure Time
19	Medical examination/Recuperation	-
20	Other	-

Notes: Data are from the Survey on Time Use and Leisure Activities (STULA), conducted by the Ministry of Internal Affairs and Communications (MIC) and the Statistics Bureau of Japan. This table lists the 20 activity categories from the STULA. "Study Time" includes schoolwork and non-school study or research, while "Leisure Time" includes media consumption, relaxation, hobbies, sports, and social activities. Reclassifying certain activities (e.g., travel or socializing) as leisure does not materially affect our results.