The COVID-19 Pandemic and Well-Being of Asians in the U.S. *

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Abstract

Rising discrimination and violence against Asians during the COVID-19 pandemic underscore the exigency of research on its consequences for Asians' well-being. We examine how the pandemic impacted this group using a large-scale survey of U.S. college students. Using a difference-in-differences approach and augmenting with institution-semester fixed effects, we find that Asian students experienced more discrimination, felt less safe during the day, and used fewer mental health services compared to White peers following the onset of the pandemic. Despite these effects, Asian students did not experience an accompanying deterioration in observable mental health outcomes, possibly due to enhanced social connections.

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1 Introduction

The COVID-19 virus was first identified in Wuhan, China, in December 2019, before spreading to other areas of the world. As with disease epidemics in the past, this outbreak led to concerns about social stigma against certain groups of people who became associated with the disease, based on characteristics such as race and ethnicity.[1] Survey evidence supports these concerns. The pandemic triggered a sharp rise in anti-Asian sentiment in the U.S, with anti-Asian hate crimes increasing nationally by 77 percent between 2019 and 2020 (Findling, Blendon, Benson, & Koh, 2022). One-third of Asian adults reported knowing an Asian person in the U.S. who was threatened or assaulted due to their race since the onset of the pandemic (Ruiz, Im, & Tian, 2023). These findings raise concerns about the extent of Asians' exposure to stigmatization as a result of the pandemic as well as the consequences of such exposure for mental health and well-being.

This paper studies how the COVID-19 pandemic affected individuals in the United States identifying as Asian and Pacific Islander (API) in ways that may be distinct from that of other racial and ethnic groups. We focus on students in U.S.-based postsecondary institutions using data from the National College Health Assessment (NCHA). This dataset is well-suited for our purposes because it disaggregates the broader classification of API students into ethnic subgroups such as East Asian and South Asian, so as to further distinguish between the experiences of those with varying perceived ties to the pandemic's origins. Another advantage is that the data captures multiple dimensions of student well-being, including experiences with discrimination, perceptions of safety, mental health, and belonging.

To measure the causal effect of the pandemic on the well-being of API students, we employ a difference-in-differences strategy. The preferred specification includes institution-by-semester fixed effects and relies on the assumption that trends in outcomes for API students relative to White peers in a school would have evolved in parallel, absent the pandemic. We provide support for validity of this assumption by showing no significant pre-pandemic differences in outcome trends between API and White students. Furthermore, we demonstrate that observed student- and institution-level characteristics are not changing significantly before and after the pandemic, suggesting stability in sample composition over time. Our empirical approach broadly defines the treatment to include events starting in March 2020, including the global lockdown and accompanying anti-Asian rhetoric espoused by public figures.

[1]Some examples of stigma and discrimination in responses to diseases include: HIV/AIDS: Altman et al. (2012); Herek and Glunt (1988). SARS: Person et al. (2004). Ebola virus: Prati and Pietrantoni (2016); Siu (2015).

We find that the pandemic increased the propensity that API students experienced any discrimination relative to White peers, a pattern not observed among other racial or ethnic groups. When focusing on discriminatory incidents that caused moderate or severe stress, we find that the pandemic heightened API students' already higher risk of these experiences relative to White students by one-third. This was accompanied by API students reporting lowered perceptions of safety during the day, both on and off campus. Event study graphs show substantial temporal overlap across these outcomes. API students experienced a sharp relative increase in discrimination from the onset of the pandemic that peaked in Spring 2021, while reports of daytime safety are lowest relative to White peers in the same semester. Disaggregating into Asian subgroups indicates that East Asian and Southeast Asian students experienced the greatest increase in discrimination and decline in safety perceptions. In contrast, South Asian and Pacific Islander students reported little relative change in these outcomes. These findings are consistent with the likely heightened stigma faced by East and Southeast Asians in the U.S. due to perceived affiliation with targeted groups in rhetoric such as "Chinese Virus" or "Wuhan Virus." Further examination of how effects vary across individual-, place-, and institution-specific attributes indicates that API students in larger cities and at institutions with higher enrollments were less likely to encounter discrimination.

Our findings on discrimination and perceived safety raise questions about how these experiences subsequently shape API students' relationship with their school communities and mental health. We show that despite the increased prevalence of discriminatory experiences, API students lagged further behind White peers in seeking mental health services after the onset of the pandemic. This amplifies a mental health service utilization gap relative to White students that was already larger than that of any other racial or ethnic group. Despite the lag in mental health service usage, we find no evidence that the pandemic significantly worsened API students' mental health outcomes relative to White peers. The gap in the likelihood of API versus White students reporting severe psychological distress remained stable through the pandemic, and API students' relative propensity to experience loneliness also did not worsen from the pandemic.

We show that the pandemic may have even narrowed the gap between API and White students in terms of feeling a sense of belonging at their college or university. Exploratory analysis of survey data suggests that the pandemic led to a relative increase in the time API students spent engaging in entertainment activities with others, defined as attending cultural events, movies, concerts, sports, or other entertainment activities with other people. Although these results are somewhat speculative, they suggest that strengthened social connections may have mitigated some of the negative impacts of the pandemic and

its consequences.

This paper speaks to multiple areas of research in economics and the broader social sciences. First, it contributes to our understanding of the distinctive experiences of Asian Americans, currently the fastest growing single racial or ethnic group in the U.S. (Budiman & Ruiz, 2021). Despite their increasing representation, Asians remain a relatively understudied demographic group. Existing economics studies on Asians in the U.S. largely focus on the experience of Asians in education (Arcidiacono, Kinsler, & Ransom, 2022; Grossman, Tomkins, Page, & Goel, 2023; Y. Shi & Zhu, 2023) and the labor market (Duleep & Sanders, 1992, 2012; Hilger, 2017; C. Kim & Sakamoto, 2010; M. Kim, 2003; Mar, 2005; Zhu, 2024). There have also been a number of influential and largely descriptive studies looking at health outcomes and disparities of Asian Americans in the psychology and health literatures.[2] This study provides evidence on the causal determinants of health outcomes for Asians in the U.S., with a focus on mental health. In doing so, it complements existing studies showing that many Asian Americans display lower willingness to use mental health services, compared to other racial and ethnic groups, despite experiencing comparable levels of psychological distress (Han & Pong, 2015; Matsuoka, Breaux, & Ryujin, 1997; Sue, 2000; Zhang, Snowden, & Sue, 1998). Furthermore, we examine the differential impact of the pandemic across ethnic subgroups of Asians. In our context, studying Asians in the U.S. as one monolithic aggregate group masks important differences across ethnic subgroups, which has been echoed by health studies documenting descriptive differences across Asian subgroups (Esperat, Inouye, Gonzalez, Owen, & Feng, 2004; Gordon, Lin, Rau, & Lo, 2019).

One particularly relevant paper for our context examines whether inflammatory rhetoric from then-president Donald Trump, in particular his use of the term "Chinese Virus" at the beginning of the COVID-19 pandemic, contributed to the rise in anti-Asian hate incidents (Cao, Lindo, & Zhong, 2023). The authors find that this rhetoric led to a significant increase in anti-Asian behavior, with effects most pronounced in areas with higher concentrations of Trump supporters. Our paper builds on this work in examining the link between the increased stigma towards Asians and their mental health and well-being.

Finally, our paper adds to a growing literature on the effects of the COVID-19 pandemic on mental health and well-being. Prior studies have documented the evolution of mental health and its correlates in the U.S. during the pandemic (Blanchflower & Bryson, 2022), the detrimental effects of pandemic-induced lockdowns on mental health (Brodeur, Clark, Fleche, & Powdthavee, 2021; Serrano-Alarcón, Kentikelenis, Mckee, & Stuckler,

[2]For example, see: Chen Jr. (2005); Huang, Calzada, Cheng, and Brotman (2012); J. Lee, Lei, and Sue (2000); Lin and Cheung (1999); Ye, Mack, Fry-Johnson, and Parker (2012).

2022), and the effects of vaccine distribution on mitigating negative mental health outcomes (Agrawal, Cantor, Sood, & Whaley, 2021; Coley, Carey, Baum, & Hawkins, 2023). Existing studies that look at the effects of the pandemic on mental health among college students rely on survey data taken after the onset of the pandemic to ask students about well-being (Li, Wang, & Huang, 2021; Wang et al., 2020). A drawback of these studies, especially when focusing on group differences, is that it is difficult to disentangle the effects of the pandemic from baseline outcome levels or differences between groups. This paper contributes to existing work in providing, to our knowledge, the first causal estimates of the effects of the COVID-19 pandemic focused on college students' relative well-being. This is an especially vulnerable population when it comes to mental health issues, and prior work has found that the determinants of college students' mental health to be nuanced with respect to mental health care utilization, mental health status, and related behaviors (Cowan & Hao, 2021).

We provide context on the increasing stigmatization of Asians after the onset of the pandemic in Section 2, before delving into data sources and descriptive statistics in Section 3. Section 4 presents the empirical strategy and evidence in support of identifying assumptions. We share results in Section 5 and conclude with a brief discussion of potential future research in Section 6.

2 Background

Concerns about stigma towards individuals of Asian descent arose shortly after the COVID-19 virus began spreading around the world. In response to these concerns, the World Health Organization put forth explicit guidelines in early 2020 to try to prevent and address social stigma. Specifically, they caution individuals not to "attach locations or ethnicity to the disease," as "this is not a 'Wuhan Virus', 'Chinese Virus' or 'Asian Virus'. The official name for the disease was deliberately chosen to avoid stigmatisation" (World Health Organization, 2020).

Despite these efforts, studies indicate that the COVID-19 pandemic did lead to increased stigmatization for Asians in the United States. Darling-Hammond et al. (2020) find that there was a large spike in Twitter retweets using phrase "Chinese virus" and related language, which led to increased implicit bias against Asian Americans. Cao et al. (2023) document that the use of "Chinese virus" in tweets by then-president Donald Trump was followed by a spike in anti-Asian tweets and subsequently an increase in anti-Asian hate incidents. Furthermore, survey reports indicate that 39 percent of Asian Americans reported experiencing discrimination based on their racial identity sometimes

or often during the COVID-19 pandemic, a 9 percentage point increase relative to pre-pandemic rates (Findling et al., 2022).

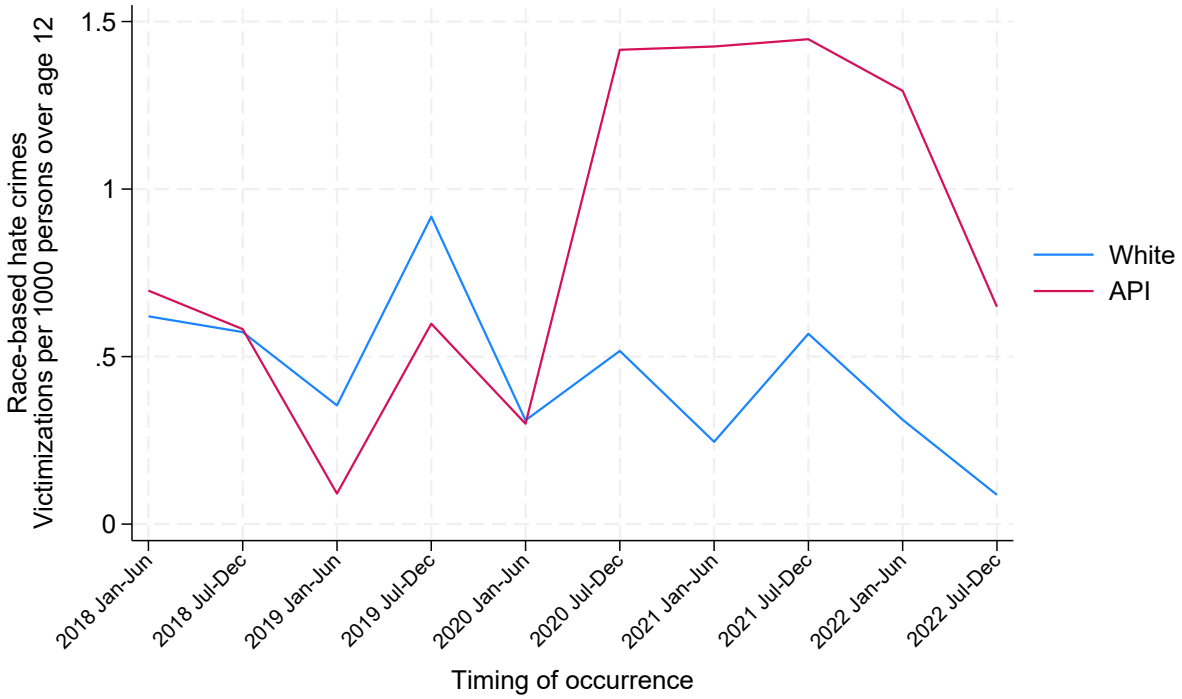
We find further support for these reports when looking at the evolution of reported hate crime prevalence against Asians in the U.S. using the National Crime Victimization Survey (NCVS). The NCVS is a nationally representative survey covering several hundred thousand households that is administered annually by the U.S. Census Bureau. It supplements official crime statistics by providing self-reported victimization data. A key advantage of the NCVS over other datasets is that it covers crimes not reported to the police, providing more comprehensive coverage of victimization in contexts where reporting rates might vary depending on factors such as respondents' degree of trust in law enforcement institutions and cultural norms. Alongside the Uniform Crime Reporting program, the NCVS is one of the two leading sources of hate crime data.

Figure 1 compares the evolution of race-based hate crimes experienced by Asian and Pacific Islander (API) respondents with White individuals.[3] Survey respondents are asked to recall all incidences of victimization experienced within a six-month period. The graph shows that in the months prior to the onset of the pandemic, API and White survey respondents reported similar levels of race-based hate crime victimization at an incidence of about 0.5 per 1,000 persons. After the onset of the pandemic, API respondents report a sharp uptick in the incidence of hate crime victimization rates, more than double that of pre-pandemic levels. In contrast, victimization rates for White respondents show no corresponding increase after the onset of the pandemic.

Trends from the NCVS data provide suggestive evidence that Asian Americans experienced an increase in discrimination after the onset of the COVID-19 pandemic. However, these data are limited in their ability to look at differential effects of the pandemic on discrimination across Asian ethnic subgroups. Additionally, they do not shed light on how any pandemic-induced increases in discrimination affected individuals' well-being. In the next section, we discuss the survey data we use in this paper, which allows us to conduct a nuanced analysis of the effects of the COVID-19 pandemic on Asian postsecondary students with respect to experiences with discrimination, perceptions of safety, and mental health and well-being.

[3] A hate crime classification requires the victim to provide evidence regarding the offender's motivation including: (1) The use of hate language, (2) the use of hate signs or symbols, or (3) confirmation from police investigators that victimization was a hate crime.

Figure 1: Race-Based Hate Crime Prevalence in the National Crime Victimization Survey



Notes: The figure displays the number of racially-motivated hate crimes that occurred within each six-month window per 1000 persons above age 12. An incident is classified as a racially-motivated hate crime if respondents perceive their victimization to be motivated by their being part of or associated with a particular racial or ethnic group. The figure separately plots victimization rates for Asian and Pacific Islanders and White respondents.

3 Data and descriptive statistics

3.1 Data

Data for this study come from the National College Health Assessment (NCHA), a survey administered each semester by the American College Health Association (ACHA). The ACHA has been running this survey since the fall of 2000, which was designed by health professionals to learn about mental and physical health behaviors, perceptions, and habits of college students. The NCHA captures institutional attributes, student sociodemographics, and various aspects of health behaviors and perceptions including nutrition, substance use, sexual health, mental health, physical health and medical conditions, and health service utilization.[4] The survey is particularly valuable for our study because it offers detailed racial and ethnic categorizations, including separate classifications for Middle Eastern and North African individuals, as well as distinctions between

[4]The extent of mental health and well-being outcome measures in the NCHA survey has led to its extensive use in studying these issues (see, for example, Braghieri, Levy, and Makarin (2022)).

East, Southeast, and South Asian subgroups.[5] Information on student attributes includes age, visa and enrollment status, and parental education. Additionally, a wide array of available mental and physical health measures enables studying the effects of the pandemic on several sets of outcomes, including exposure to discrimination, perceptions of safety, mental health service use, mental health conditions, and time use.

This study uses data from Wave III of the NCHA survey, which spans from Fall 2019 to Spring 2023. We do not include periods before Fall 2019 due to changes in the survey questionnaire structure that make responses incomparable across waves. Note that the Spring 2020 collection in Wave III excludes all data gathered after the onset of the COVID-19 pandemic, such that we are able to classify this semester as a pre-period, with treatment commencing in Fall 2020.

The NCHA is de-identified at the college level, although it does contain unique institution codes that allow for linking colleges across semesters within each survey wave. Participating institutions vary over time, and we account for the potential issues from these composition changes by limiting our analyses to colleges that appear in at least two different periods within our sample. This facilitates the inclusion of institution fixed effects in our specifications to account for time-invariant institution-specific factors that may lead to racial differences in well-being outcomes. The final sample consists of 235,394 observations across eight survey periods (semesters).

3.2 Descriptive statistics

Table 1 presents descriptive statistics at the student level. Women make up nearly two-thirds of the sample, which is somewhat higher than the share of women enrolled in postsecondary institutions, as measured by a 2020 national sample of colleges and universities.[6] White students constitute the majority racial or ethnic group at 57 percent, while Asian and Pacific Islander students comprise 15 percent. As such, API students are over-represented in our dataset compared to national data. Black and Hispanic students are under-represented, making up 4 percent and 15 percent of our sample, respectively. The average age of 23 is due to over a quarter of students in our sample enrolling in Master's, Doctoral, or professional degree programs. A sizable share comes from highly educated families, with 37 percent of students have at least one parent with a Master's

[5] East Asia includes China, Korea, Japan, or Mongolia. Southeast Asia includes Burma, Brunei, Cambodia, Indonesia, Laos, Malaysia, Singapore, Thailand, Philippines, and Vietnam. South Asia includes Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka.

[6] Appendix Table A1 displays characteristics across all schools in the Integrated Postsecondary Education Data System (IPEDS) for comparison.

degree or higher. Detailed student characteristics broken down by race and ethnicity and pre- and post- the COVID-19 outbreak are shown in Appendix Table A2.

Table 1: Student Characteristics

Women	0.64
White	0.57
Asian & Pacific Islander	0.15
Black	0.04
Hispanic	0.15
Other race	0.09
Visa	0.12
Age	23.18
Year in School	
Undergraduate	0.74
Master's	0.14
Doctorate/professional	0.12
Enrollment Status	
Full-time	0.91
Part-time	0.09
Parental Education	
High school or less	0.17
Some post-secondary	0.16
Bachelor's degree	0.30
Master's degree or higher	0.37
N	235,394

Notes: Table presents descriptive statistics for students in the sample. Parental education refers to the highest level of educational attainment for either parent of the student.

Table 2 shows institution-level characteristics. 69 percent of colleges and universities in our sample are public, which is consistent with the national average. Our sample skews towards large institutions, with over half serving at least 10,000 students, compared to 10 percent in the IPEDS sample in Appendix Table A1. Institutions in our sample are also spread out across the U.S.: 17 percent of schools are in the Northeast, 18 percent are in the Midwest, 33 percent are in the South, and 32 percent are in the West.

We next examine outcome variables that span multiple dimensions of student well-being. The first set of outcomes in Table 3 measures students' experiences with discriminatory treatment. *Discrimination* takes a value of one if an individual answers yes on the survey to experiencing "the unjust or prejudicial treatment of a person based on the group, class, or category to which the person is perceived to belong" within the past 12

Table 2: Institution Characteristics

Public	0.69
Religiously-affiliated	0.12
Minority-serving	0.21
Enrollment Size	
Less than 2,500	0.17
2,500-4,999	0.15
5,000-9,999	0.15
10,000-19,999	0.17
20,000 or more	0.37
Region	
Northeast	0.17
Midwest	0.18
South	0.33
West	0.32
N	171

Notes: Table presents descriptive statistics for schools in the sample.

months and zero otherwise. For those who affirmatively report discrimination, the survey further assesses the level of distress caused. *Discrimination (moderate/severe distress)* indicates that the individual experienced discrimination and furthermore that the discrimination caused moderate or severe distress. The table shows that after the pandemic, the share of students from every racial group experiencing discrimination and discrimination leading to distress increased.

The next set of outcomes in Table 3 measures students' perceptions of safety. Safety responses on the survey are collected on a 1 to 4 scale, ranging from "not safe at all (1)" to "very safe (4)." *Campus day (very safe)* is an indicator variable that takes a value of one if an individual responds with feeling very safe (4) when asked how safe they feel on their campus during daytime. Similarly, *Campus night (very safe)*, *Off-campus day (very safe)*, and *Off-campus night (very safe)* measure whether students feel safe on their campus during nighttime, in the community surrounding their campus during daytime, and in the community surrounding their campus during nighttime, respectively. Across racial and ethnic groups, students generally feel safer during the day than at night and feel safer on campus than they do off campus. After the pandemic, the share of students from every racial group experiencing reporting feeling very safe decreased, both on- and off-campus and at all times of the day.

Table 3: Descriptive Statistics: Outcomes

	Asian & PI		White		Black		Hispanic	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Discrimination	0.141	0.154	0.064	0.071	0.235	0.247	0.131	0.140
Discrimination (moderate/severe distress)	0.061	0.076	0.028	0.034	0.124	0.147	0.064	0.072
Campus day (very safe)	0.802	0.700	0.848	0.792	0.695	0.655	0.770	0.716
Campus night (very safe)	0.333	0.248	0.348	0.288	0.259	0.253	0.275	0.247
Off-campus day (very safe)	0.470	0.379	0.501	0.450	0.413	0.394	0.458	0.414
Off-campus night (very safe)	0.183	0.135	0.178	0.151	0.163	0.176	0.166	0.148
Mental health service use	0.183	0.215	0.313	0.383	0.247	0.298	0.234	0.315
Belonging (strongly agree)	0.196	0.181	0.273	0.244	0.201	0.208	0.255	0.216
Kessler (serious psychological distress)	0.176	0.216	0.165	0.206	0.194	0.219	0.207	0.252
ULS (loneliness)	0.520	0.540	0.468	0.497	0.553	0.565	0.500	0.528
N	34,354		133,898		10,188		35,415	

Notes: Table provides descriptive statistics for various outcome variables that capture students' well-being before and after the onset of the COVID-19 pandemic, categorized by race/ethnicity.

The third set of outcomes in Table 3 pertains to mental health status and service utilization. *Mental health service use* indicates whether the student received psychological or mental health services in the past 12 months, including both in-person and telehealth appointments, and thus is not affected by changes in modality during the pandemic. We then examine three mental health and well-being outcomes. In our first measure, students are asked about how much they feel that they belong at their college or university. Responses range from "strongly disagree (1)" to "strongly agree (6)". *Belonging (strongly agree)* is an indicator variable that takes a value of one if a student reports that they strongly agree to the statement that they belong at their college/university. The second measure is a clinical measure of psychological distress as measured by an individual's Kessler Psychological Distress Scale Score. This is a well-known screening scale used by clinicians that yields a global measure of psychosocial distress based on questions about recent levels of nervousness, agitation, psychological fatigue, and hopelessness. We code the outcome measure *Kessler (serious psychological distress)* as an indicator variable if

an individual exceeds the clinical threshold for serious psychological distress.[7] Another clinical measure of well-being we examine is a measure of loneliness, as measured by the UCLA 3-item Loneliness (ULS) Scale. The outcome measure, *ULS (loneliness)* takes a value of one if an individual meets the clinical threshold for loneliness and zero otherwise.[8]

We prefer the Kessler and ULS screening scales in lieu of more common measures of specific psychological illnesses such as depression and anxiety. The main rationale is that the way these latter measures are collected in the survey depends on students' attitudes and habits towards mental health services and providers.[9] However, we still include some measures of depression, anxiety, and stress in supplementary analyses, using measures from a survey question on how much each condition has affected academic performance in the past 12 months.[10] Descriptive statistics in Table 3 indicate generally worse mental health and well-being outcomes for all groups after the onset of the pandemic, along with increased usage of mental health services.

[7]Respondents are asked how often they feel each of the following during the last 30 days. Possible responses are all of the time (4 points), most of the time (3), some of the time (2), a little of the time (1), none of the time (0):

- Nervous
- Hopeless
- Restless or fidgety
- So sad nothing could cheer you up
- That everything was an effort
- Worthless

Scores are then aggregated, with a range of 0-24. Higher scores reflect higher levels of psychological distress and mental illness. A score of 13-24 reflects serious psychological distress.

[8]Respondents are asked to indicate how often each statement below is descriptive of them. Possible responses are hardly ever (1 points), some of the time (2), and often (3):

- How often do you feel that you lack companionship?
- How often do you feel left out?
- How often do you feel isolated from others?

Scores are then aggregated, with a range of 3-9. Higher scores reflect higher levels of loneliness. A score of 6-9 reflects loneliness.

[9]Students are asked sequentially if 1) they have ever been diagnosed as having anxiety or depression by a mental health professional and if yes, 2) whether they saw such a professional in the past 12 months for these conditions. If Asian students are less likely to interact with mental health professionals at baseline, this may confound our estimated prevalence of common psychological illnesses.

[10]We code the outcome variable as one if students respond to having experienced this issue, regardless of the extent of impact. The outcomes are zero if the student answered that they did not experience this issue.

4 Empirical strategy

We aim to estimate the differential effects of the COVID-19 pandemic on exposure to discrimination and other dimensions of individual well-being for Asian students compared to their White peers. Our preferred specification compares outcomes across racial groups before and after the onset of the pandemic, incorporating institution-by-time fixed effects. This approach allows us to juxtapose Asian students with those of their White peers within the same college and semester:

$$Y_{ijt} = (Race' \times Post)_{it}\beta_1 + Race_i'\beta_2 + X_{it}'\omega + \theta_{jt} + \epsilon_{ijt} \quad (1)$$

where Y_{ijt} represents the outcome of interest for student i in college or university j during period t, with t measured at the semester-year level. We regress this outcome on the interaction of $Race_i$ with $Post_t$. $Race_i$ is a vector of race and ethnicity variables while $Post_t$ indicates whether the student participated in a survey administered in Fall 2020 or later. The pre-period comprises both Fall 2019 and Spring 2020, with Spring 2020 data only retaining survey responses collected before the onset of the pandemic.[11] X_{it} controls for a vector of student characteristics, including age, gender, year in school, enrollment status, parental education level, and visa status. Finally, θ_{jt} represents institution-by-semester fixed effects, which account for any institution- and time-specific characteristics that might commonly affect all student outcomes at a school in a given period.

The parameter vector of interest, β_1, captures the differential effects of the COVID-19 pandemic for various racial and ethnic groups relative to White students. We specifically focus on how API students' responses compare to their White peers within the same institution and semester. The validity of this estimate rests on the assumption that in the absence of the COVID-19 pandemic, the evolution of outcomes for Asian students and White students would have evolved in parallel. There are two main threats to this identifying assumption. First, unobserved factors might be causing diverging trends in outcomes for API and White students independently of the pandemic. We evaluate the plausibility of this assumption by using event study specifications to check for pre-period differences.

Second, changes in college and student compositions over time could affect racial disparities in well-being outcomes. This is a potential issue since colleges enter and exit the sample over time, and student selection into the survey may vary. For example, if API students who are more prone to discrimination or mental health challenges are more likely

[11] The vast majority of survey responses were collected before March 16, 2020, and data collected after March 16 are excluded from the sample.

to participate in the survey after the pandemic, our estimates could be biased. To assess this second concern, we conduct balance tests to evaluate whether observable student and institutional characteristics are changing over time.[12]

We start by looking at changes in observable student characteristics before and after the onset of the pandemic, which could be affected by both the composition of institutions in our sample and the students within them. Among individual characteristics, we focus on gender, age, year in school (e.g., upperclassmen or graduate), parental education, and visa status. Table 4 regresses each of these observables on the interaction of $Race_i$ and $Post_t$ to examine whether the composition of Asian students differs from that of White students along each dimension as a result of the pandemic. Panel A presents results from the parsimonious regressions, while Panel B includes all remaining covariates outside of the outcome variable (e.g., if visa status is the outcome, included covariates are gender, age and age-squared, grade/degree level, and parental education). All estimates of the interactions between API and post-period indicators are statistically insignificant and small relative to baseline means, suggesting that the composition of Asian students does not diverge from that of White students following the onset of the pandemic. This provides reassurance that results are not being driven by underlying composition changes of students over time.

Next, we provide a direct assessment of the potential role of changes in institutional composition in Table 5. This analysis provides institution-level balance tests of the percentage of students with given attributes to address the concern that student-level balance tests in Table 4 may still mask heterogeneity in changes in composition within institutions over time. We construct an institution-semester level dataset and include institution fixed effects in models that aim to detect post-pandemic changes in student composition. Within institutions, we find no evidence that the Asian student body is shifting in the extent of internationalization, take-up of particular degree levels, or towards families of a particular class or education level relative to White peers as a result of the pandemic. These findings provide further reassurance that our estimation results are not driven by within-institution changes in student composition over time.

We provide additional robustness checks to concerns about sample selection changes in Section 5.3. Specifically, this section includes supplementary analyses that examine changes in response rates and API enrollment shares following the pandemic. We also re-estimate student-level balance tests using only the sample of non-international students

[12] Although this test cannot explicitly speak to sorting on unobservable characteristics, it is helpful since prior research has shown sorting on observable characteristics to be proportionally informative of sorting on unobservable characteristics (Altonji, Elder, & Taber, 2005).

Table 4: Student-Level Balance Test

			Year in school			
	Female	Age	Upper	Graduate	Parent education	Visa
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Without Controls						
Asian & Pacific Islander × Post	-0.000	-0.443	0.018	-0.017	-0.004	-0.006
	(0.015)	(0.284)	(0.017)	(0.027)	(0.010)	(0.026)
Panel B. With Controls						
Asian & Pacific Islander × Post	-0.002	-0.311	0.014	-0.006	-0.005	-0.006
	(0.015)	(0.215)	(0.015)	(0.018)	(0.009)	(0.023)
N	235,394	235,394	235,394	235,394	235,394	235,394
Institution-Semester FE	Y	Y	Y	Y	Y	Y

Notes: Outcomes are student characteristics listed in the column title. School year (upper) takes a value of one if the student is enrolled as an undergraduate in the third year or above. School year (graduate) takes a value of one if the student is enrolled in a Master's, professional, or doctoral program. Parent education takes a value of one if one of the student's parents has at least an Associate's degree. The top panel regresses individual outcomes on all race indicators and their interaction with $Post$ (omitted category is White students). The bottom panel includes covariates: gender, age and age-squared, grade/degree level (e.g., freshmen, Master's), parental education, and visa status. We do not control for the covariate used as an outcome variable (e.g., visa status is excluded from the set if it is the dependent variable). Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Institution-Level Balance Test

	Share of All API Students:			White-Asian Diff. in Shares:		
	With Visa	Undergrad	High Parent Ed	With Visa	Undergrad	High Parent Ed
	(1)	(2)	(3)	(4)	(5)	(6)
Post	-0.011	-0.032	0.020	0.022	0.010	-0.011
	(0.019)	(0.023)	(0.021)	(0.020)	(0.019)	(0.023)
Constant	0.380***	0.737***	0.295***	-0.339***	0.071***	0.071***
	(0.014)	(0.017)	(0.002)	(0.015)	(0.014)	(0.017)
N	361	361	361	361	361	361
Institution FE	Y	Y	Y	Y	Y	Y

Notes: Sample is at the institution-semester level. Columns 1-3 use as outcomes the share of all Asian and Pacific Islander students in a given college-semester who 1) have a visa, 2) are enrolled as an undergraduate student, and 3) reported their parents' highest level of educational attainment as a graduate degree. Columns 4-6 use as outcomes the difference in the shares of White vs. Asian students with each of the three attributes. Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1.

to address the concern that aggregate compositional changes might obscure shifts within the domestic student population.

5 Results

5.1 Main results

We begin by assessing racial differences in the effects of the COVID-19 pandemic on student experiences with discrimination. Table 6 shows estimates corresponding to β_1 from Equation 1 and are measured relative to the reference racial/ethnic group of White students. Prior to the pandemic, Asian and Pacific Islander, Black, and Hispanic students were all more likely to experience discrimination compared to their White peers. After the onset of the pandemic, there is suggestive evidence that discrimination increased for Asian and Pacific Islander students, further widening the existing API-White gap in exposure. There were notably no comparable increases for Black or Hispanic students.

Column 2 shifts to an outcome that is perceived by respondents to be more consequential: whether they experienced any discrimination causing moderate to severe distress. Existing studies commonly find that exposure to discrimination is linked to higher levels of distress (Chae et al., 2021; Cheah et al., 2020; L. Shi et al., 2022). API students experienced a 1.3 percentage point increase in this form of discrimination after the pandemic, equivalent to widening the pre-pandemic Asian-White gap by over one-third. For reference, as shown in Table 3, pre-pandemic rates of discrimination exposure are 14 percent among Asian students, with 6 percent experiencing discrimination that causes at least moderate distress. There is also suggestive evidence that Black students may have experienced an increase in distressing forms of discrimination relative to White peers, following the onset of the pandemic. While these results for Black students may be explained through pandemic-era mechanisms, we cannot rule out a role for the concurrent Black Lives Matter (BLM) movement and nationwide protests that culminated in the summer of 2020. Our analyses later in the paper indicate that BLM does not explain the findings for our core population of interest: API students.

The relative uptick in discriminatory experiences among API students post-pandemic echoes findings in the literature. If anything, the magnitudes of discrimination in our study are lower than levels reported in some previous research.[13] Scholars trace the increased discrimination to a confluence of factors that uniquely racialize Asians during the pandemic, including the perception of Asians as perpetually foreign (Tuan, 1999; Wu, 2015; Zhou, 2004), associating Asian bodies with virus spread (Tessler, Choi, & Kao, 2020), and the stigmatizing experience of mask-wearing for a population that has historically

[13] According to the 2020 FBI Hate Crime Statistics, anti-Asian hate crime incidents increased by 77% from 2019 to 2020. Several studies have found that about 29-33% of Asians have experienced discrimination or bias-victimization (Lantz & Wenger, 2022, 2023; Ruiz et al., 2023).

been more likely than many to adhere to this practice (Ma & Zhan, 2022).[14]

Table 6: Effects of COVID-19 on Discrimination by Race

	Discrimination	Discrimination (moderate/severe distress)
	(1)	(2)
Asian & Pacific Islander × Post	0.011*	0.013***
	(0.006)	(0.004)
Black × Post	0.005	0.018*
	(0.013)	(0.010)
Hispanic × Post	0.001	0.002
	(0.005)	(0.004)
Asian & Pacific Islander	0.085***	0.036***
	(0.005)	(0.003)
Black	0.172***	0.096***
	(0.013)	(0.010)
Hispanic	0.073***	0.038***
	(0.005)	(0.003)
Institution-Semester FE	Y	Y
N	235,394	235,394

Notes: Other racial/ethnic categories in model include American Indian, Middle Eastern/North African, other race, and non-responses on race. Omitted category is White students. Covariates include gender, age and age-squared, grade/degree level (e.g., freshmen, Master's), parental education, and visa status. Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1.

The discrimination and scapegoating documented are often not confined to individuals of Chinese descent, but rather all Asian Americans perceived as having any connections to China (Li & Nicholson, 2021; Tessler et al., 2020). This suggests that the effects of the COVID-19 pandemic may be felt across API subgroups, even if only a subset are explicitly targeted. Table 7 further disaggregates the effects of the pandemic by Asian subgroup.[15] Results indicate that the increase in discrimination experienced by API students during the pandemic is driven by the experiences of East Asian and Southeast Asian students. Specifically, East Asian students experience a 1.8 percentage point increase in discrimination, while the increase is more than doubled at 3.9 percentage points for Southeast Asian students. There are similar effect magnitudes when focusing on discrimination

[14] Anti-Asian crimes involving face masks reveal that these Asians are associated with sickness or disease, portrayed as the source of the pandemic, and generally marked for their foreignness (Ren & Feagin, 2021).

[15] Although the analysis in Table 6 includes all racial groups, coefficient estimates for these groups are not shown here. Panel A of Table 7 displays the aggregate results of the pandemic on discrimination outcomes for Asian and Pacific Islander students from Table 6, while Panel B shows estimates separately for East Asian, Southeast Asian, South Asian, and Pacific Islander students.

causing moderate or severe distress, although they amplify smaller Asian-White gaps at baseline. In contrast, South Asian and Pacific Islander students do not report an increase in discrimination after the onset of the pandemic. Our results suggest that heightened discrimination is concentrated among individuals who are most likely viewed as having East Asian (particularly Chinese) ancestry, consistent with place-based characterizations of the pandemic (e.g., "Chinese" or "Wuhan" virus).

Table 7: Effects of COVID-19 on Discrimination, Disaggregated by Asian Subgroups

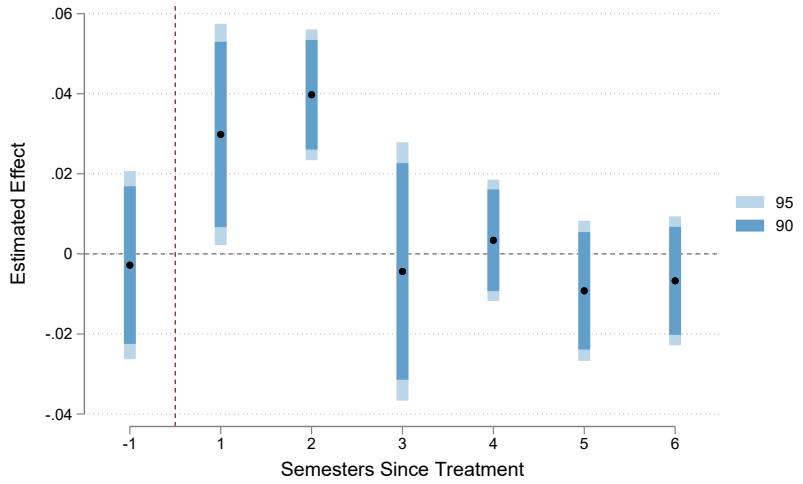
	Discrimination	Discrimination (moderate/severe distress)
	(1)	(2)
Panel A. Overall		
Asian & Pacific Islander × Post	0.011*	0.013***
	(0.006)	(0.004)
Asian & Pacific Islander	0.085***	0.036***
	(0.005)	(0.003)
Panel B. Disaggregated		
East Asian × Post	0.018**	0.014***
	(0.009)	(0.005)
Southeast Asian × Post	0.039***	0.037***
	(0.012)	(0.008)
South Asian × Post	-0.015	-0.001
	(0.009)	(0.006)
Pacific Islander × Post	0.025	-0.001
	(0.039)	(0.034)
East Asian	0.073***	0.031***
	(0.008)	(0.004)
Southeast Asian	0.074***	0.019***
	(0.010)	(0.006)
South Asian	0.095***	0.045***
	(0.009)	(0.005)
Pacific Islander	0.105***	0.064**
	(0.032)	(0.027)
Institution-Semester FE	Y	Y
N	235,394	235,394

Notes: Other racial/ethnic categories in model include Black, Hispanic, American Indian, Middle Eastern/North African, other race, and non-responses on race. Omitted category is White students. Covariates include gender, age and age-squared, grade/degree level (e.g., freshmen, Master's), parental education, and visa status. Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1.

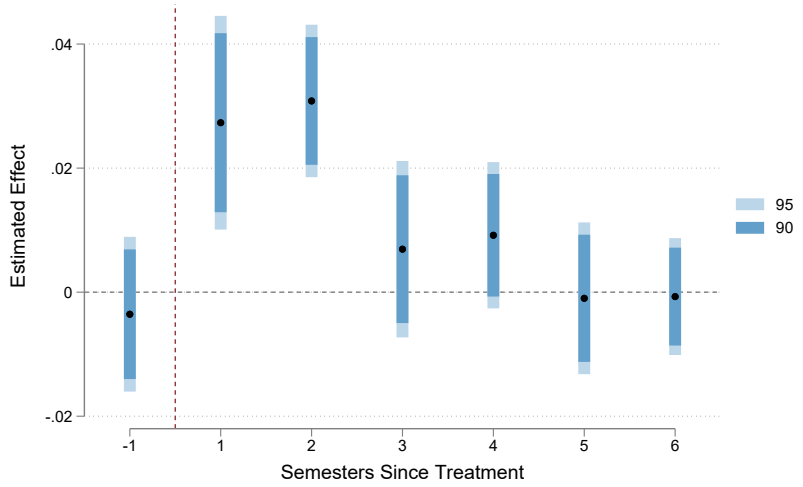
To evaluate the key identifying assumption in our empirical approach that in the absence of the COVID-19 pandemic, outcomes for Asian students and White students would have evolved in parallel, we provide event study estimates in Figure 2. Specifically, we test for pre-period differences in outcomes between White and Asian students. The omitted semester in our estimates is Spring 2020, representing the last survey wave

administered before the onset of the pandemic. Event study results indicate that for both discrimination outcomes, there is no significant difference in estimated effects between Fall 2019 and Spring 2020, providing reassurance that Asian and White students were not diverging in outcomes prior to the pandemic. In contrast, there is a sharp increase across discrimination outcomes experienced by API students in the first two semesters after the pandemic, during Fall 2020 and Spring 2021. Asian students' personal experiences with discrimination then converge towards their White peers in subsequent semesters, such that there are once again no distinguishable API-White differences by Fall 2021.

Figure 2: Effects of COVID-19 on Discrimination among APIs: Event Study Estimates



(a) Discrimination



(b) Discrimination – Caused moderate/severe distress

Notes: Figures display event study estimates on the effects of COVID-19 on discrimination outcomes for Asian and Pacific Islander students, relative to White students. The omitted racial/ethnic category is White students. The omitted semester at time zero is Spring 2020.

Exposure to discrimination may yield greater distress and diminish individuals' sense of security in their environment. Table 8 examines whether the pandemic also adversely impacted Asian students' perceptions of safety. Prior to the pandemic, Asian and Pacific Islander, Black, and Hispanic students all reported feeling less safe on and around campus across all hours compared to White peers. However, estimates indicate the pandemic uniquely eroded API students' relative sense of safety during the day, with API-White gaps in safety perceptions for on- and off-campus widening by one-third and one-half of baseline, respectively. Among the major racial and ethnic groups, API students are the least likely to respond post-pandemic that they feel very safe off-campus during the day. Black students are the least likely to feel very safe on-campus during the day, followed by API students. This contrasts with the pandemic's null effects on API students' feelings of safety at night.[16] As with the results on discrimination, disaggregating by Asian subgroups shows that impacts are driven by the experiences of East Asian and Southeast Asian students (Table 9). South Asian and Pacific Islander students do not report changes in perceptions of safety on or off campus relative to White peers after the onset of the pandemic.

Table 8: Effects of COVID-19 on Perceptions of Safety by Race

	Campus day	Campus night	Off-campus day	Off-campus night
	(1)	(2)	(3)	(4)
Asian & Pacific Islander × Post	-0.021**	-0.001	-0.027**	-0.003
	(0.009)	(0.010)	(0.013)	(0.009)
Black × Post	0.012	0.032**	0.013	0.023**
	(0.013)	(0.012)	(0.014)	(0.010)
Hispanic × Post	-0.016***	0.010	-0.011	0.005
	(0.006)	(0.007)	(0.008)	(0.006)
Asian & Pacific Islander	-0.066***	-0.063***	-0.051***	-0.019**
	(0.006)	(0.008)	(0.011)	(0.007)
Black	-0.118***	-0.048***	-0.031**	0.006
	(0.011)	(0.011)	(0.014)	(0.010)
Hispanic	-0.019***	-0.039***	0.001	-0.009*
	(0.005)	(0.007)	(0.008)	(0.005)
Institution-Semester FE	Y	Y	Y	Y
N	235,394	235,394	235,394	235,394

Notes: Other racial/ethnic categories in model include American Indian, Middle Eastern/North African, other race, and non-responses on race. Omitted category is White students. Covariates include gender, age and age-squared, grade/degree level (e.g. freshmen, Master's), parental education, and visa status. Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1

[16] Interestingly, while the propensity for Asian and Hispanic students to report feeling very safe relative to White peers does not change after the pandemic, Black students are more likely to report feeling very safe on- and off-campus at night.

Table 9: Effects of COVID-19 on Perceptions of Safety, Disaggregated by Asian Subgroups

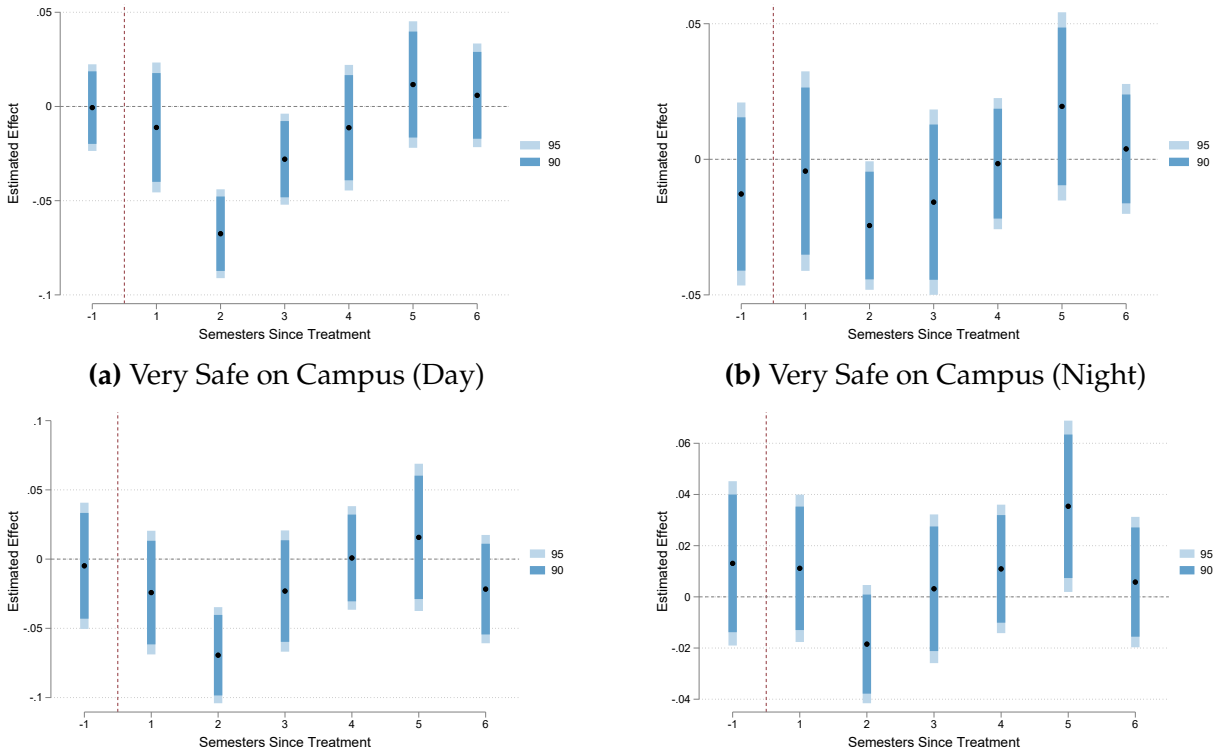
	Campus day (1)	Campus night (2)	Off-campus day (3)	Off-campus night (4)
Panel A. Overall				
Asian & Pacific Islander × Post	-0.021**	-0.001	-0.027**	-0.003
	(0.009)	(0.010)	(0.013)	(0.009)
Asian & Pacific Islander	-0.066***	-0.063***	-0.051***	-0.019**
	(0.006)	(0.008)	(0.011)	(0.007)
Panel B. Disaggregated				
East Asian × Post	-0.030***	-0.014	-0.045***	-0.012
	(0.010)	(0.013)	(0.015)	(0.013)
Southeast Asian × Post	-0.056***	0.012	-0.028	-0.011
	(0.019)	(0.015)	(0.017)	(0.014)
South Asian × Post	0.015	0.016	-0.005	0.016
	(0.016)	(0.016)	(0.020)	(0.013)
Pacific Islander × Post	-0.069	-0.048	0.016	-0.044
	(0.047)	(0.049)	(0.046)	(0.034)
East Asian	-0.077***	-0.063***	-0.067***	-0.015
	(0.007)	(0.010)	(0.013)	(0.012)
Southeast Asian	-0.075***	-0.116***	-0.071***	-0.032***
	(0.017)	(0.013)	(0.015)	(0.012)
South Asian	-0.036***	-0.029**	0.001	-0.009
	(0.010)	(0.014)	(0.017)	(0.010)
Pacific Islander	-0.059	-0.031	-0.113***	-0.024
	(0.044)	(0.042)	(0.041)	(0.030)
Institution-Semester FE	Y	Y	Y	Y
N	235,394	235,394	235,394	235,394

Notes: Other racial/ethnic categories in model include Black, Hispanic, American Indian, Middle Eastern/North African, other race, and non-responses on race. Omitted category is White students. Covariates include gender, age and age-squared, grade/degree level (e.g. freshmen, Master's), parental education, and visa status. Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1

The event study graph in Figure 3 shows no significant pre-treatment trends, providing reassurance that Asian and White students were not diverging in safety perceptions prior to the pandemic. Asian students' relative daytime safety perceptions begin trending down in Fall 2020, but only becomes significantly lower than White peers two and three semesters after the onset of the pandemic, in Spring 2021 and Fall 2021. Safety perceptions converge across these two groups in subsequent semesters, such that no distinguishable differences are apparent by Spring 2022. These temporal patterns of decreased daytime safety closely match or take place one semester after the increased discrimination exposure shown in Figure 2.

Taken together, the post-pandemic experiences of API students diverge markedly from those of White students and other racial/ethnic groups in their heightened exposure to discrimination and reduced perceptions of daytime safety. This prompts questions

Figure 3: Effects of COVID-19 on Perceptions of Safety among APIs: Event Study Estimates



(a) Very Safe on Campus (Day)

(b) Very Safe on Campus (Night)

(c) Very Safe Off Campus (Day)

(d) Very Safe Off Campus (Night)

Notes: Figures display event study estimates on the effects of COVID-19 on safety outcomes for Asian and Pacific Islander students, relative to White students. The omitted racial/ethnic category is White students. The omitted semester at time zero is Spring 2020.

about how these experiences shape students' attachment to their college communities and general mental health. Prior studies have found exposure to discrimination to have negative consequences for physical health (Armijos Bravo & Vall Castelló, 2021; Johnston & Lordan, 2012). Thus, to the extent that increased exposure to discrimination imposes additional psychological burdens, we may expect worse mental health outcomes among APIs alongside greater service utilization, under the assumption that they do not face differential costs of access or have distinct group-specific reasons to refrain from seeking care.

Table 10 begins by examining the pandemic's impact on API students' mental health service utilization relative to White peers. While all student groups exhibit higher rates of mental health service usage after the pandemic (Table 3), API students are relatively *less* likely to seek care after the pandemic's onset compared to White peers, despite being subject to greater risk factors such as discrimination. While other non-White racial/ethnic

groups increased their use of psychological or mental health services on a scale comparable with White students, APIs stand apart in the relatively small magnitude of increase. This further widens the double-digit White-API usage gap present before the pandemic by over 40 percent. The relative decline in service use is consistent with research showing Asian Americans are more reluctant to seek mental health services due to cultural stigma (Gee, Khera, Poblete, Kim, & Buchwach, 2020; Han & Pong, 2015; S. Lee et al., 2009). Another potential explanation is that Asian students were more likely to social distance during the pandemic and avoided health facilities for fear of catching the virus or discriminatory interactions, although this behavior should be mitigated by the availability of telehealth services.[17]

Table 10: Effects of COVID-19 on Mental Health Service Use, Belonging, and Well-Being by Race

	Mental Health Service Use	Belonging (Strongly Agree)	Kessler (Psychological Distress)	ULS (Loneliness)
	(1)	(2)	(3)	(4)
Asian & Pacific Islander × Post	-0.044***	0.023***	-0.010	-0.015*
	(0.009)	(0.008)	(0.007)	(0.008)
Black × Post	-0.018	0.026*	-0.008	-0.009
	(0.012)	(0.014)	(0.009)	(0.010)
Hispanic × Post	-0.008	-0.008	0.006	-0.002
	(0.009)	(0.007)	(0.006)	(0.007)
Asian & Pacific Islander	-0.109***	-0.084***	0.029***	0.059***
	(0.007)	(0.008)	(0.007)	(0.007)
Black	-0.052***	-0.068***	0.022***	0.085***
	(0.010)	(0.014)	(0.008)	(0.009)
Hispanic	-0.028***	-0.011	0.017***	0.017***
	(0.008)	(0.007)	(0.006)	(0.006)
Institution-Semester FE	Y	Y	Y	Y
N	235,394	235,394	235,394	235,394

Notes: Other racial/ethnic categories in model include American Indian, Middle Eastern/North African, other race, and non-responses on race. Omitted category is White students. Covariates include gender, age and age-squared, grade/degree level (e.g., freshmen, Master's), parental education, and visa status. Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1

Strikingly, API students maintain similar trajectories or close gaps with White students post-pandemic in reports of belonging, psychological distress, and loneliness, despite relatively increased exposure to discrimination and decreased perceptions of safety. The pandemic narrowed the API-White gap in the likelihood of feeling strongly that they belonged at their college or university by one-quarter, from a baseline difference of 8.4 percentage points. There is a marginally significant narrowing of the API-White gap in

[17]Some studies document an association between demographic variables such as Asian ethnicity and propensity to social distance (see, for example, Baradaran Motie and Biolsi (2021)).

likelihood of reaching the clinical threshold on loneliness. We find no evidence that the pandemic had a significant effect on API versus White students' propensity to experience severe psychological distress, as measured by the Kessler scale.

Table 11 breaks down estimates by Asian subgroup to highlight two findings. First, the pandemic's negative effects on mental health service utilization were pervasive across East, Southeast, and South Asians, with magnitudes that are statistically indistinguishable. We observe a negative coefficient for Pacific Islanders, but the effect is imprecisely measured. Second, East Asians consistently show improvements in belonging, psychological distress, and loneliness relative to White students. The results are more muted and inconsistent across the other Asian subgroups. This suggests that while a subset of Asians may have closed select well-being gaps with White peers, this does not fully account for the broadening Asian-White gap in mental health service use. Event study estimates in Figure 4 confirm that findings are not driven by diverging trends in mental health service uses, belonging, or well-being between API and White students leading up to the pandemic.

We verify our mental health findings using alternative measures on depression, anxiety, and stress, taken from student self-reports in response to a question about whether any of these conditions have affected academic performance.[18] API students are less likely to report experiencing depression relative to White peers after the pandemic, with significant declines among East and South Asian students (Tables A6 and A7). In contrast, there are no changes in anxiety-related disorders and an increase in stress among API students (particularly East and Southeast Asians) that is not observed in other groups. We interpret the results on depression as consistent with our findings on psychological distress and loneliness using clinical screening scales (i.e., Kessler and ULS). Heightened stress does not appear to translate into adverse mental health outcomes in our setting.

To probe why exposure to discrimination and resulting distress have not led to worse mental health outcomes, we turn to survey questions on time use. Students are asked to report their estimated weekly time use (in bins) across multiple activities. We examine whether a student spent at least one hour per week on each activity. Figure 5 shows that the pandemic increased the time API students spent on entertainment with others relative to White peers, defined as attending cultural events, movies, concerts, sports, or other entertainment activities with other people. There are no other significant changes in time use, except for a slight decrease in time spent on physical exercise or sports. After

[18]We do not include these results in the main manuscript, given concerns about Asian students' lower rates of mental health service use affecting their awareness of depression- and anxiety-related disorders and the manner in which these outcomes were solicited (via a question about effects on academic performance).

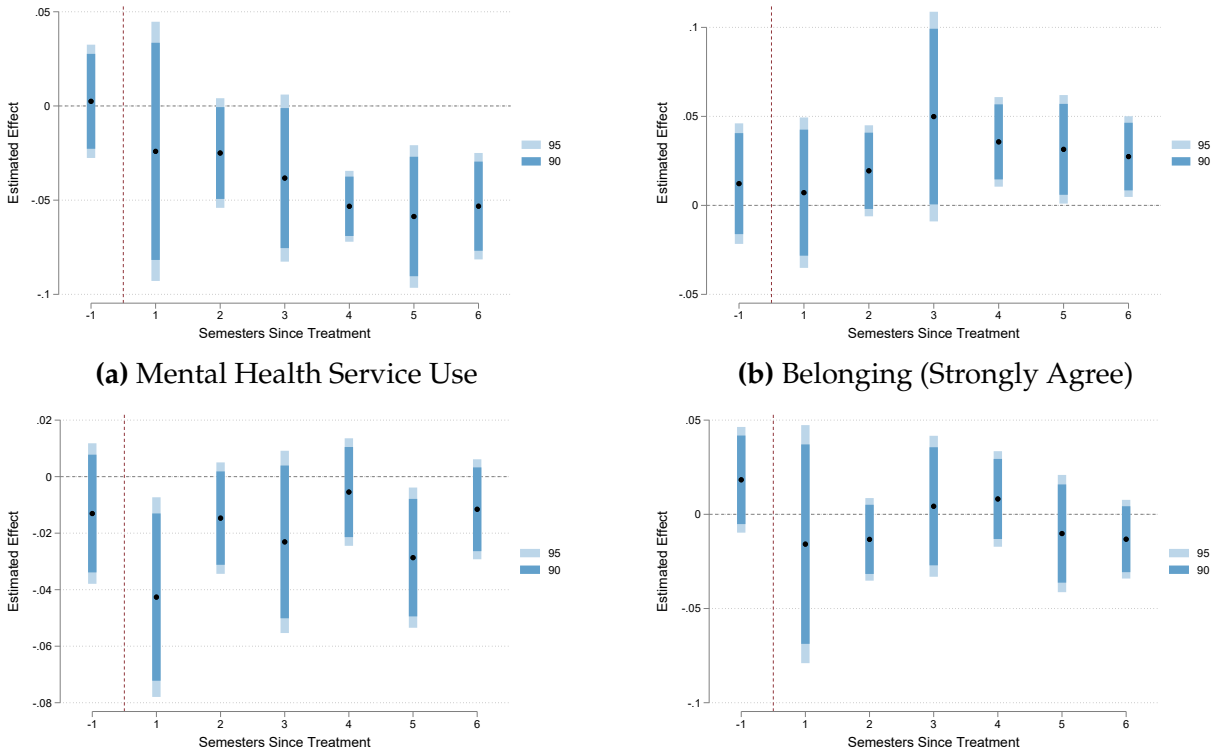
Table 11: Effects of COVID-19 on Mental Health Service Use, Belonging, and Well-Being, Disaggregated by Asian Subgroups

	Mental Health Service Use (1)	Belonging (Strongly Agree) (2)	Kessler (Psychological Distress) (3)	ULS (Loneliness) (4)
Panel A. Overall				
Asian & Pacific Islander × Post	-0.044***	0.023***	-0.010	-0.015*
	(0.009)	(0.008)	(0.007)	(0.008)
Asian & Pacific Islander	-0.109***	-0.084***	0.029***	0.059***
	(0.007)	(0.008)	(0.007)	(0.007)
Panel B. Disaggregated				
East Asian × Post	-0.053***	0.022**	-0.022**	-0.023**
	(0.013)	(0.010)	(0.009)	(0.011)
Southeast Asian × Post	-0.036**	0.002	0.015	-0.023
	(0.016)	(0.014)	(0.015)	(0.017)
South Asian × Post	-0.033***	0.038***	-0.009	-0.004
	(0.010)	(0.013)	(0.010)	(0.014)
Pacific Islander × Post	-0.072	0.044	-0.014	0.093
	(0.047)	(0.046)	(0.049)	(0.065)
East Asian	-0.124***	-0.107***	0.008	0.043***
	(0.010)	(0.010)	(0.008)	(0.010)
Southeast Asian	-0.091***	-0.097***	0.037***	0.078***
	(0.015)	(0.013)	(0.012)	(0.015)
South Asian	-0.105***	-0.032**	0.058***	0.083***
	(0.009)	(0.013)	(0.008)	(0.013)
Pacific Islander	-0.036	-0.057	0.045	-0.045
	(0.043)	(0.036)	(0.041)	(0.059)
Institution-Semester FE	Y	Y	Y	Y
N	235,394	235,394	235,394	235,394

Notes: Other racial/ethnic categories in model include Black, Hispanic, American Indian, Middle Eastern/North African, other race, and non-responses on race. Omitted category is White students. Covariates include gender, age and age-squared, grade/degree level (e.g., freshmen, Master's), parental education, and visa status. Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1

the pandemic, students across all racial/ethnic groups spent less time on socially oriented activities such as entertainment with others and socializing with friends, yet there was a smaller decrease among Asian students relative to their White peers. We view the increase of 5 percentage points for Asian students in spending at least an hour on entertainment as a modest increase (6 percent from baseline). We also cannot determine whether these interactions predominantly involve other Asian students. Even so, these results suggest that social connections may attenuate the adverse impacts of the pandemic and its consequences.

Figure 4: Effects of COVID-19 on Well-Being among APIs: Event Study Estimates



(a) Mental Health Service Use

(b) Belonging (Strongly Agree)

(c) Kessler - Positive for Psychological Distress

(d) ULS - Positive for Loneliness

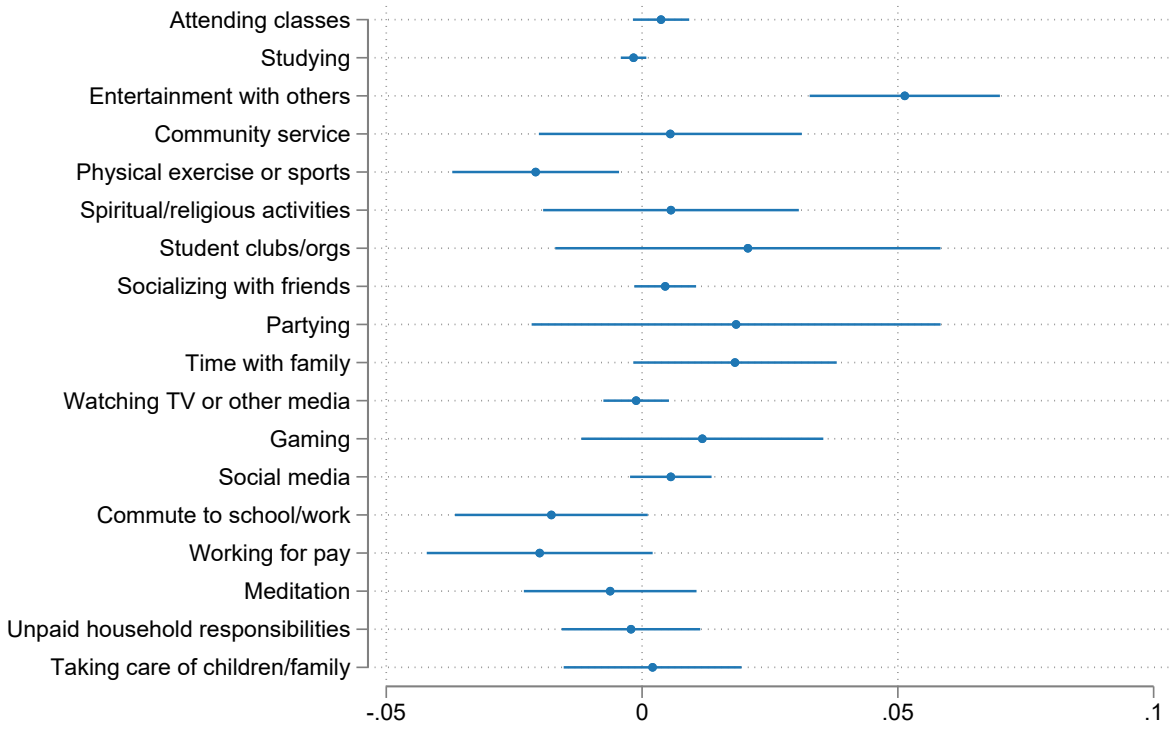
Notes: Figures display event study estimates on the effects of COVID-19 on well-being outcomes for Asian and Pacific Islander students, relative to White students. The omitted racial/ethnic category is White students. The omitted semester at time zero is Spring 2020.

5.2 Heterogeneity in Treatment Effects

Figure 6 examines whether treatment effects vary across different individual-, location-, and institution-level characteristics. For the sake of brevity, we focus on three characteristics: gender, whether the institution is in a larger city (defined as having a population of at least half a million), and institution size (larger institutions are defined as having student enrollment of at least 20,000). We present coefficient estimates from the triple-interaction of API_i, $Post_t$, and each of the above attributes.

When examining exposure to discrimination, several differences emerge. First, Asian women are significantly more likely to report experiencing any discrimination as a result of the pandemic, compared to Asian men. Although the coefficient for discriminatory incidents causing moderate or severe distress is positive, it is not statistically significant at conventional levels. While the risk of discrimination appears elevated for Asian women, Asian students in larger cities and colleges are somewhat buffered from exposure. For

Figure 5: Relative Effect for API Students on Spending At Least One Hour Per Week



Notes: Figure displays the effects of COVID-19 on weekly time use for Asian and Pacific Islander students, relative to White students. The omitted racial/ethnic category is White students. The figure plots both point estimates and 95% confidence intervals.

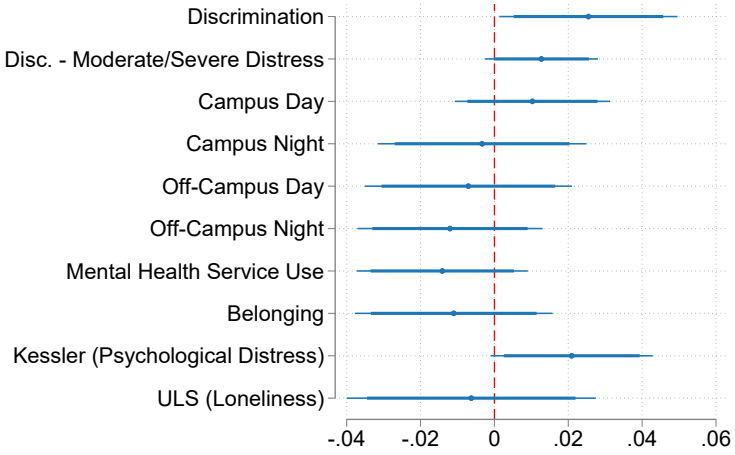
instance, Asian students in towns and cities with populations below 500,000 are more likely to report discriminatory experiences leading to distress. The same holds for Asian students in institutions with an enrollment of less than 20,000.

While there are distinct differences in discrimination exposure, they do not appear to systematically manifest in worse safety perceptions, differential service utilization, or heightened mental health challenges across the subpopulations examined. One exception is that Asian women are more likely to experience psychological distress (2.1 percentage points) as a result of a pandemic, compared to Asian men.

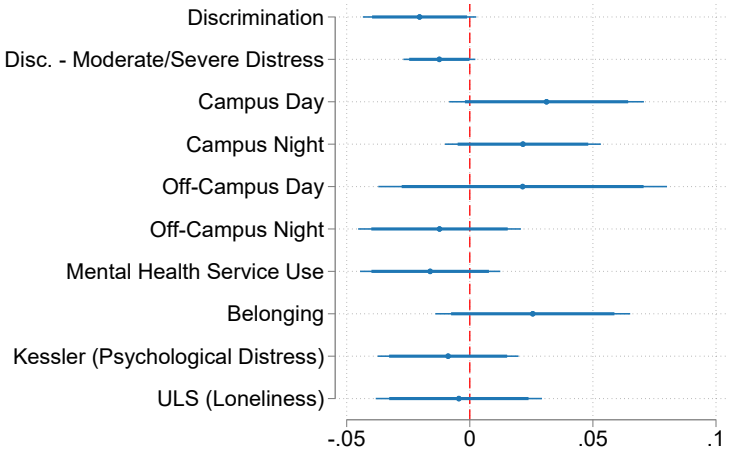
5.3 Robustness checks

We provide supplementary analyses that explore the feasibility of alternative explanations and provide further support for our identifying assumptions. First, the pandemic co-occurred with other influential movements and events, namely the BLM protests in the summer of 2020. One possibility is that our findings for API students are attributable

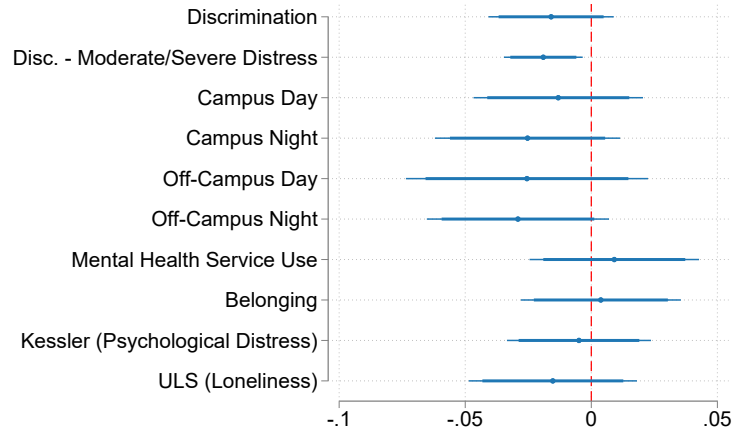
Figure 6: Heterogeneous Effects for APIs, by Individual, Place, and Institution Attributes



(a) Women vs. men



(b) Places with larger (500K+) vs. smaller population



(c) Institutions with larger (20,000+) vs. smaller enrollment

Notes: Figure for Panel (a) displays the coefficients on the interaction of API_i, $Post_t$, and $Woman_i$, and is interpreted as the differential treatment effect of the effects on women API students relative to male API students (compared to White peers of each gender group). Panel (b) shows the differential effects for API students in colleges in cities with a population of at least 500,000 relative to smaller cities, while Panel (c) shows the differential effects for API students in colleges with enrollments above 25,000 relative to smaller colleges.

to the combined influences of these events rather than to the more isolated role of the pandemic. One approach to distinguishing the contribution of the pandemic is to limit our sample to only API students and directly estimate the effect on the subset theorized to be more affected by the pandemic, relative to those groups of API students who are less impacted, under the assumption that the BLM movement and other concurrent events affect all API subgroups similarly. Table A3 compares the effects for non-South Asians, grouping together students who are more likely to be identified as Chinese, relative to South Asians which largely comprise students of Indian, Pakistani, and Bangladeshi descent. Results indicate that the pandemic led to greater rates of discriminatory experiences, decreased safety around campus during the day and off-campus at night, and lower mental health service utilization among non-South Asians. These results closely echo our main findings, suggesting that the BLM movement and other concurrent events are unlikely to assume a primary explanatory role.

We undertake a few additional checks to ensure the validity of our empirical approach. One current shortcoming of the data is that the onset of the Wave III NCHA survey in Fall 2019 constrains our event studies to a relatively short pre-period. The primary challenge in addressing this issue is that substantial survey changes across Waves II and III render them incomparable.[19] Most of our dependent measures varied substantially between the two waves. An exception is the set of survey questions on perceived safety on and off campus. Appending four semesters' worth of data from the last administration of the Wave II survey (Fall 2015 - Spring 2019), Figure A1 shows that there were no discernible differences in perceived safety among Asian and Pacific Islander students, relative to White peers, during the five pre-periods. The absence of pre-trends in this case is consistent with, although does not unequivocally demonstrate, the exogeneity of the treatment variable.

Next, we examine the possibility that changes in sample composition may explain our results. Tables A4 builds on the student-level and institution-level balance tests in Tables 4 and 5 by examining changes in institutional response rates and racial composition as a result of the pandemic. Using institution-by-semester data, we find no significant changes in response rates after the onset of the pandemic. We then look at Asian and Pacific Islander students as a share of overall college enrollment, both at the aggregate level and by subgroup. We do find a slight increase of 0.9 percentage points in the share of responses from API students. However, this increase is driven by South Asian stu-

[19]Survey items changed across waves. Some questions were unique to a particular wave, while the wording did not remain constant in other questions that were retained across waves. For example, the survey only began asking about recent discrimination in Wave III. Moreover, unique institutional identifiers allowed for tracking the same college within a wave, but not across waves.

dents, while East and Southeast Asian shares remain unchanged. Since our core results on discrimination and safety derive from these latter groups, the stability of these student shares is reassuring.

Table A5 re-estimates the student-level balance tests in Table 4 on a sample of non-international students only. This analysis assesses whether the aggregate compositional changes might obscure shifts in composition of domestic students without visas. As before, Panel A regresses individual outcomes on all race and ethnicity indicators and their interaction with $Post_t$ without covariates, while Panel B includes covariates. All estimates for the interaction term of Asian students with the post-period are statistically insignificant, with the exception of the interacted coefficient for the specification with controls looking at age as an outcome, which is marginally significant at the 10 percent level. Altogether, these results indicate the composition of non-international Asian students is not changing significantly relative to White peers after the onset of the pandemic. These results provide reassurance that estimations using only the sample of non-international students, which we provide in the ensuing set of robustness checks, are not being driven by underlying composition changes of students over time.

Lastly, we assess whether results are robust to the exclusion of international students, defined as students with a visa. These findings shed light on whether results are driven primarily by the experiences of Asian students who came to the U.S. for postsecondary education, as opposed to Asian American students. Figure A2 in the Appendix shows the estimated effects of the COVID-19 pandemic on discrimination outcomes for Asian American students compared to White peers, while Figure **??** shows estimated effects on safety outcomes. We find that the pandemic's effects on Asian American students look very similar to that of the full sample: these students experience increased discrimination in the periods shortly after the onset of the pandemic and effects fade out over time. Additionally, Asian American students experienced decreased perceptions of safety during the day shortly after the onset of the pandemic, with effects also fading out by later periods. These findings indicate that our results are not driven by the unique experiences of Asian international students that may have been due to stresses at home or with international travel restrictions after the onset of the pandemic.

6 Conclusion

The COVID-19 pandemic led to increased stigmatization of Asians and Pacific Islanders, fueled by racialized rhetoric around the virus. This study provides novel evidence on the effects of the pandemic on the well-being of Asians in the U.S. Using data from a national

survey of college students, we find evidence that the onset of the pandemic increased discrimination exposure among API students and decreased their perceptions of daytime safety on and around campus, relative to White peers. Disaggregated results by Asian subgroup and time indicate that findings are driven by the experiences of East Asian and Southeast Asian students, with outcomes for Asians largely converging with White peers by Spring 2022. Despite being subject to greater discrimination, Asian students became relatively less likely to seek mental health services after the pandemic, which further exacerbates the existing Asian-White mental health service utilization gap. Moreover, there was no discernible worsening in Asian students' relative mental health as measured by clinical scales on psychological distress and loneliness. The relatively more time Asian students spent on social connections may have attenuated the adverse impacts of the pandemic on mental health outcomes.

The evidence in this paper points to nuances and mechanisms meriting further research. Our results are consistent with previous work indicating that Asians in the U.S. display lower willingness to use mental health services compared to other racial and ethnic groups (Han & Pong, 2015; Sue, 2000). A deeper understanding of the barriers to access can inform efforts to serve this group in the context of heightened exposure to mental health risk factors. Our analyses also suggest that exposure to discrimination was attenuated among Asian students in larger cities and postsecondary institutions with higher enrollment. Future research can examine the attributes that can protect against stigmatization and discrimination, such as the existence of social networks sharing racial, ethnic, and cultural identities. While our findings point to the possibility of social interactions as a buffer, research on the nature of those interpersonal dynamics can illuminate the precise mechanisms for mitigating the consequences of discriminatory exposure.

References

Agrawal, V., Cantor, J. H., Sood, N., & Whaley, C. M. (2021). The impact of the COVID-19 vaccine distribution on mental health outcomes. *NBER Working Paper*.

Altman, D., Aggleton, P., Williams, M., Kong, T., Reddy, V., Harrad, D., … Parker, R. (2012). Men who have sex with men: stigma and discrimination. *The Lancet*, *380*, 439–445.

Altonji, J. G., Elder, T. E., & Taber, C. R. (2005). Selection on observed and unobserved variables: Assessing the effectiveness of catholic schools. *Journal of Political Economy*(1), 151–184.

Arcidiacono, P., Kinsler, J., & Ransom, T. (2022). Asian american discrimination in harvard admissions. *European Economic Review*, *144*, 104079.

Armijos Bravo, G., & Vall Castelló, J. (2021). Terrorist attacks, islamophobia and newborns' health. *Journal of Health Economics*, *79*.

Baradaran Motie, G., & Biolsi, C. (2021). County-Level Determinants of Social Distancing (or Lack Thereof) During the Covid-19 Pandemic. *Contemporary Economic Policy*, *39*(2), 264–279.

Blanchflower, D. G., & Bryson, A. (2022). Covid and mental health in america. *PLOS One*, *17*.

Braghieri, L., Levy, R., & Makarin, A. (2022, November). Social Media and Mental Health. *American Economic Review*, *112*(11), 3660–3693.

Brodeur, A., Clark, A. E., Fleche, S., & Powdthavee, N. (2021). Covid-19, lockdowns and well-being: Evidence from google trends. *Journal of Public Economics*, *193*, 104346.

Budiman, A., & Ruiz, N. G. (2021). *Asian americans are the fastest-growing racial or ethnic group in the u.s.* Retrieved from `https://www.pewresearch.org/short-reads/2021/04/09/asian-americans-are-the-fastest-growing-racial-or-ethnic-group-in-the-u-s/`

Cao, A., Lindo, J. M., & Zhong, J. (2023). Can social media rhetoric incite hate incidents? evidence from trump's "chinese virus" tweets. *Journal of Urban Economics*, *137*, 103590.

Chae, D. H., Yip, T., Martz, C. D., Chung, K., Richeson, J. A., Hajat, A., … LaVeist, T. A. (2021). Vicarious racism and vigilance during the covid-19 pandemic: mental health implications among asian and black americans. *Public Health Reports*, *136*(4), 508–517.

Cheah, C. S., Wang, C., Ren, H., Zong, X., Cho, H. S., & Xue, X. (2020). Covid-19 racism and mental health in chinese american families. *Pediatrics*, *146*(5).

Chen Jr., M. S. (2005). Cancer health disparities among asian americans. *Cancer*, *104*, 2895–2902.

Coley, R. L., Carey, N., Baum, C. F., & Hawkins, S. S. (2023). COVID-19 vaccinations and mental health among u.s. adults: Individual and spillover effects. *Social Science & Medicine*, *329*.

Cowan, B., & Hao, Z. (2021). Medicaid expansion and the mental health of college students. *Health Economics*, *30*(6), 1306–1327.

Darling-Hammond, S., Michaels, E. K., Allen, A. M., Chae, D. H., Thomas, M. D., Nguyen, T. T., … Johnson, R. C. (2020). After "the china virus" went viral: Racially charged coronavirus coverage and trends in bias against asian americans. *Health Education & Behavior*, *47*, 870-879.

Duleep, H. O., & Sanders, S. (1992). Discrimination at the top: American-born asian and white men. *Industrial Relations: A Journal of Economy and Society*, *31*(3), 416–432.

Duleep, H. O., & Sanders, S. (2012). The economic status of asian americans before and after the civil rights act. *IZA Discussion Paper No. 6639*.

Esperat, M. C., Inouye, J., Gonzalez, E. W., Owen, D. C., & Feng, D. (2004). Health disparities among asian americans and pacific islanders. In *Annual review of nursing research, volume 22, 2004: Eliminating health disparities among racial and ethnic minorities in the united states.* Springer Publishing Company.

Findling, M. G., Blendon, R. J., Benson, J., & Koh, H. K. (2022). Covid-19 has driven racism and violence against asian americans: Perspectives from 12 national polls. *Health Affairs Forefront*.

Gee, C. B., Khera, G. S., Poblete, A. T., Kim, B., & Buchwach, S. Y. (2020). Barriers to mental health service use in asian american and european american college students. *Asian American Journal of Psychology*, *11*(2), 98–107.

Gordon, N. P., Lin, T. Y., Rau, J., & Lo, J. C. (2019). Aggregation of asian-american subgroups masks meaningful differences in health and health risks among asian ethnicities: an electronic health record based cohort study. *BMC Public Health*, *19*(1), 1551.

Grossman, J., Tomkins, S., Page, L. C., & Goel, S. (2023). *The disparate impacts of college admissions policies on asian american applicants* (No. 31527). NBER Working Paper.

Han, M., & Pong, H. (2015). Mental health help-seeking behaviors among asian american community college students: The effect of stigma, cultural barriers, and acculturation. *Journal of College Student Development*, *56*(1), 1–14.

Herek, G. M., & Glunt, E. K. (1988). An epidemic of stigma: Public reactions to AIDS. *American Psychologist*, *43*, 886–891.

Hilger, N. (2017). Upward mobility and discrimination: The case of asian americans. *NBER Working Paper 22748*.

Huang, K.-Y., Calzada, E., Cheng, S., & Brotman, L. M. (2012). Physical and mental health disparities among young children of asian immigrants. *The Journal of Pediatrics*(2), 331–336.e1.

Johnston, D. W., & Lordan, G. (2012). Discrimination makes me sick! an examination of the discrimination–health relationship. *Journal of Health Economics*, *31*(1), 99–111.

Kim, C., & Sakamoto, A. (2010). Have asian american men achieved labor market parity with white men? *American Sociological Review*, *75*(6), 934–957.

Kim, M. (2003). Do asian men face wage discrimination in the united states? *Institute for Asian American Studies Publications*.

Lantz, B., & Wenger, M. R. (2022). Are asian victims less likely to report hate crime victimization to the police? implications for research and policy in the wake of the covid-19 pandemic. *Crime & Delinquency*, *68*(8), 1292–1319.

Lantz, B., & Wenger, M. R. (2023). Anti-asian xenophobia, hate crime victimization, and fear of victimization during the covid-19 pandemic. *Journal of interpersonal violence*, *38*(1-2), 1088–1116.

Lee, J., Lei, A., & Sue, S. (2000). The current state of mental health research on asian americans. *Journal of Human Behavior in the Social Environment*, *3*(3), 159–178.

Lee, S., Juon, H.-S., Martinez, G., Hsu, C. E., Robinson, E. S., Bawa, J., & Ma, G. X. (2009). Model minority at risk: Expressed needs of mental health by asian american young adults. *Journal of Community Health*, *34*(2), 144–152.

Li, Y., & Nicholson, H. L. (2021). When ”model minorities” become ”yellow peril”-Othering and the racialization of Asian Americans in the COVID-19 pandemic. *Sociology Compass*, *15*(2), e12849.

Li, Y., Wang, A., & Huang, H. (2021). Impact of the covid-19 pandemic on the mental health of college students: a systematic review and meta-analysis. *Frontiers in psychology*, *12*, 669119.

Lin, K.-M., & Cheung, F. (1999). Mental health issues for asian americans. *Psychiatric Services*, *50*(6), 774–780.

Ma, Y., & Zhan, N. (2022). To mask or not to mask amid the COVID-19 pandemic: how Chinese students in America experience and cope with stigma. *Chinese Sociological Review*, *54*(1), 1–26.

Mar, D. (2005). Asian americans in the labor market: Public policy issues. *AAPI Nexus*, *3*(2), 39–57.

Matsuoka, J. K., Breaux, C., & Ryujin, D. H. (1997). National utilization of mental health

services by asian americans/pacific islanders. , *25*(2), 141–145.

Person, B., Sy, F., Holton, K., Govert, B., Liang, A., Garza, B., … Zauderer, L. (2004). Fear and stigma: The epidemic within the SARS outbreak. *Emerging Infectious Diseases*, *10*, 358–363.

Prati, G., & Pietrantoni, L. (2016). Knowledge, risk perceptions, and xenophobic attitudes: Evidence from italy during the ebola outbreak. *Risk Analysis*, *36*, 2000–2010.

Ren, J., & Feagin, J. (2021). Face mask symbolism in anti-Asian hate crimes. *Ethnic and Racial Studies*, *44*(5), 746–758.

Ruiz, N. G., Im, C., & Tian, Z. (2023). *Discrimination experiences shape most asian americans' lives.* Retrieved from `https://www.pewresearch.org/2023/11/30/asian-americans-and-discrimination-during-the-covid-19-pandemic/`

Serrano-Alarcón, M., Kentikelenis, A., Mckee, M., & Stuckler, D. (2022). Impact of covid-19 lockdowns on mental health: Evidence from a quasi-natural experiment in england and scotland. *Health economics*, *31*(2), 284–296.

Shi, L., Zhang, D., Martin, E., Chen, Z., Li, H., Han, X., … others (2022). Racial discrimination, mental health and behavioral health during the covid-19 pandemic: a national survey in the united states. *Journal of General Internal Medicine*, *37*(10), 2496–2504.

Shi, Y., & Zhu, M. (2023). "model minorities" in the classroom? positive evaluation bias towards asian students and its consequences. *Journal of Public Economics*, *220*, 104838.

Siu, J. Y.-m. (2015). Influence of social experiences in shaping perceptions of the ebola virus among african residents of hong kong during the 2014 outbreak: a qualitative study. *International Journal for Equity in Health*, *14*.

Sue, S. (2000). Asian american mental health: What we know and what we don't know. In *Merging past, present, and future in cross-cultural psychology.* Garland Science.

Tessler, H., Choi, M., & Kao, G. (2020). The Anxiety of Being Asian American: Hate Crimes and Negative Biases During the COVID-19 Pandemic. *American Journal of Criminal Justice*, *45*(4), 636–646.

Tuan, M. (1999). *Forever Foreigners or Honorary Whites?* Rutgers University Press.

Wang, X., Hegde, S., Son, C., Keller, B., Smith, A., & Sasangohar, F. (2020). Investigating mental health of us college students during the covid-19 pandemic: Cross-sectional survey study. *Journal of Medical Internet Research*, *22*(9), e22817.

World Health Organization. (2020). *Social stigma associated with COVID-19.* Retrieved from `https://www.who.int/docs/default-source/coronaviruse/covid19-stigma-guide.pdf`

Wu, E. D. (2015). *The color of success: Asian americans and the origins of the model minority*.

Princeton University Press.

Ye, J., Mack, D., Fry-Johnson, Y., & Parker, K. (2012). Health care access and utilization among US-born and foreign-born asian americans. *Journal of Immigrant and Minority Health*, *14*(5), 731–737.

Zhang, A. Y., Snowden, L. R., & Sue, S. (1998). Differences between asian and white americans' help seeking and utilization patterns in the los angeles area. , *26*(4), 317–326.

Zhou, M. (2004). Are Asian Americans Becoming "White?". *Contexts*, *3*(1), 29–37.

Zhu, M. (2024). *New evidence on the underrepresentation of asian americans in leadership positions.* IZA DP No. 16230.

A Additional Tables and Figures

Table A1: Institution Characteristics - IPEDS

Student Demographics	
Women	0.57
White	0.49
Black	0.12
Hispanic	0.19
Asian & Pacific Islander	0.07
Public	0.68
Enrollment Size	
Less than 1,000	0.58
1,000-4,999	0.25
5,000-9,999	0.08
10,000-19,999	0.06
20,000 or more	0.04
Region	
Northeast	0.21
Midwest	0.23
South	0.35
West	0.21
N	6,035

Notes: Table A1 presents descriptive statistics for all schools in the Integrated Postsecondary Education Data System (IPEDS) for the 2019-2020 school year. Student demographics are weighted by enrollment size.

Table A2: Student Characteristics Broken Down by Race and Time Period

	All Students		Asian & PI		White		Black		Hispanic	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Age	22.623	23.366	22.679	23.166	22.591	23.356	23.163	24.812	22.462	23.048
Female	0.634	0.645	0.572	0.604	0.645	0.653	0.711	0.705	0.634	0.654
Visa	0.122	0.125	0.426	0.406	0.048	0.045	0.157	0.161	0.132	0.119
Year in School										
Undergraduate	0.798	0.717	0.641	0.583	0.811	0.737	0.797	0.685	0.867	0.786
Master's	0.107	0.155	0.198	0.243	0.097	0.139	0.118	0.191	0.078	0.127
Doctorate/professional	0.095	0.128	0.161	0.174	0.092	0.125	0.084	0.124	0.056	0.087
Enrollment Status										
Full-time	0.905	0.909	0.937	0.940	0.910	0.905	0.908	0.898	0.860	0.893
Part-time	0.089	0.085	0.057	0.055	0.083	0.090	0.088	0.097	0.135	0.101
Parental Education										
High School or less	0.173	0.171	0.180	0.187	0.113	0.109	0.227	0.228	0.373	0.390
Some Postsecondary	0.176	0.155	0.102	0.105	0.170	0.152	0.264	0.235	0.219	0.188
Bachelor's degree	0.297	0.300	0.301	0.315	0.324	0.325	0.241	0.245	0.215	0.211
Master's degree or higher	0.355	0.374	0.418	0.393	0.392	0.413	0.268	0.292	0.193	0.212
N	235,394		34,354		133,898		10,188		35,415	

Notes: Table shows descriptive statistics for student characteristics before and after the COVID-19 pandemic, categorized by race. "Parental education" indicates the highest level of education completed by either parent. "Some Postsecondary" refers to a parent who has either an associate degree, incomplete college education, or trade/technical training.

Table A3: Differential Effects Among API Student Sample

Outcomes	Non-South Asian X Post
Discrimination	0.035***
	(0.012)
Discrimination (moderate/severe stress)	0.019**
	(0.018)
Campus day (very safe)	-0.043***
	(0.016)
Campus night (very safe)	-0.026
	(0.017)
Off-campus day (very safe)	-0.026
	(0.019)
Off-campus night (very safe)	-0.032*
	(0.017)
Mental health service use	-0.026*
	(0.015)
Belonging (strongly agree)	-0.021
	(0.014)
Kessler (severe psychological distress)	-0.004
	(0.013)
ULS (loneliness)	-0.014
	(0.017)
N	6,035

Notes: The sample is limited to API students only. The column shows coefficients from Non-South Asian X Post, which captures the differential effects of the pandemic on non-South Asians, relative to South Asians. Covariates include gender, age and age-squared, grade/degree level (e.g. freshmen, Master's), parental education, and visa status. Standard errors are clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1.

Table A4: Institution-Level Balance Test - Response Rates and Racial Shares

	Response Rates	Enrollment Share				
		API	East Asian	SE Asian	South Asian	PI
	(1)	(2)	(3)	(4)	(5)	(6)
Post	-0.011	0.009***	0.001	0.002	0.006**	0.000
	(0.008)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)
Constant	0.137***	0.105***	0.050***	0.020***	0.027***	0.002***
	(0.006)	(0.003)	(0.002)	(0.001)	(0.002)	(0.000)
N	340	368	368	368	368	368
Institution FE	Y	Y	Y	Y	Y	Y

Notes: Sample is at the institution-semester level. Standard errors are clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Student-Level Balance Test - Non-International Students Only

			Year in school		
	Female	Age	Upper	Graduate	Parent education
	(1)	(2)	(3)	(4)	(5)
Panel A. Without Controls					
Asian & Pacific Islander × Post	0.008	-0.342	0.012	-0.010	-0.013
	(0.012)	(0.210)	(0.014)	(0.019)	(0.010)
Panel B. With Controls					
Asian & Pacific Islander × Post	0.006	-0.266*	0.010	0.003	-0.013
	(0.011)	(0.141)	(0.014)	(0.012)	(0.010)
N	206,178	206,178	206,178	206,178	206,178
Institution-Semester FE	Y	Y	Y	Y	Y

Notes: The sample excludes all international students with visas. Outcome: student characteristic listed in the column title. School year (upper) takes a value of one if the student is enrolled as an undergraduate in the third year or above. School year (graduate) takes a value of one if the student is enrolled in a Master's, professional, or doctoral program. Parent education takes a value of one if one of the student's parents has at least an Associate's degree. The top panel regresses individual outcomes on all race indicators and their interaction with *Post* (omitted category is White students). The bottom panel includes covariates: gender, age and age-squared, grade/degree level (e.g., freshmen, Master's), and parental education. We do not control for the covariate used as an outcome variable (e.g., parental education is excluded from the set if it is the dependent variable). SE clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1.

Table A6: Effects of COVID-19 on Mental Health Outcomes by Race

	Depression (1)	Anxiety (2)	Stress (3)
Asian & Pacific Islander × Post	-0.024***	-0.003	0.018**
	(0.008)	(0.009)	(0.008)
Black × Post	-0.004	-0.015	-0.008
	(0.012)	(0.015)	(0.010)
Hispanic × Post	-0.010	0.004	-0.002
	(0.008)	(0.008)	(0.006)
MENA × Post	-0.004	-0.005	0.030
	(0.025)	(0.027)	(0.021)
Asian & Pacific Islander	-0.030***	-0.103***	-0.065***
	(0.008)	(0.008)	(0.007)
Black	-0.024**	-0.102***	-0.050***
	(0.012)	(0.015)	(0.010)
Hispanic	-0.003	-0.020***	-0.004
	(0.008)	(0.007)	(0.005)
MENA	0.010	-0.023	-0.043**
	(0.025)	(0.024)	(0.017)
Institution-Semester FE	Y	Y	Y
N	234,135	233,374	234,320

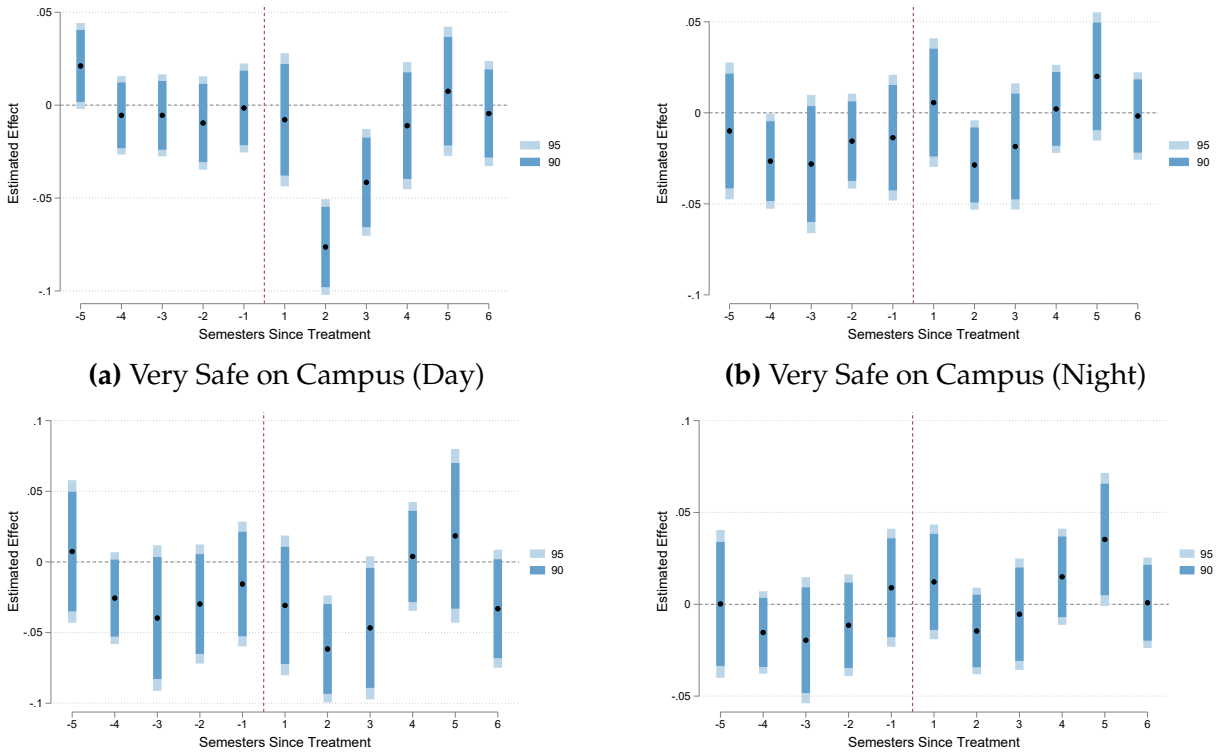
Notes: Other racial/ethnic categories in model include American Indian, other race, and non-responses on race. Omitted category is White students. Covariates include gender, age and age-squared, grade/degree level (e.g., freshmen, Master's), parental education, and visa status. Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1

Table A7: Effects of COVID-19 on Mental Health Outcomes, Disaggregated by Asian Subgroups

	Depression (1)	Anxiety (2)	Stress (3)
Panel A. Overall			
Asian & Pacific Islander × Post	-0.024***	-0.003	0.018**
	(0.008)	(0.009)	(0.008)
Asian & Pacific Islander	-0.030***	-0.103***	-0.065***
	(0.008)	(0.008)	(0.007)
Panel B. Disaggregated			
East Asian × Post	-0.023**	-0.004	0.023**
	(0.009)	(0.012)	(0.011)
Southeast Asian × Post	-0.008	0.006	0.036***
	(0.016)	(0.016)	(0.012)
South Asian × Post	-0.033***	-0.008	0.001
	(0.012)	(0.015)	(0.011)
Pacific Islander × Post	0.002	0.005	0.058
	(0.061)	(0.062)	(0.047)
East Asian	-0.037***	-0.118***	-0.080***
	(0.009)	(0.010)	(0.010)
Southeast Asian	-0.022	-0.069***	-0.032***
	(0.015)	(0.015)	(0.011)
South Asian	-0.032***	-0.110***	-0.073***
	(0.012)	(0.013)	(0.011)
Pacific Islander	-0.040	-0.081	-0.064
	(0.050)	(0.062)	(0.053)
Institution-Semester FE	Y	Y	Y
N	234,135	233,374	234,320

Notes: Other racial/ethnic categories in model include American Indian, other race, and non-responses on race. Omitted category is White students. Covariates include gender, age and age-squared, grade/degree level (e.g. freshmen, Master's), parental education, and visa status. Standard errors clustered at the institution level. *** p<0.01, ** p<0.05, * p<0.1

Figure A1: Effects of COVID-19 on Perceptions of Safety among APIs: Additional Pre-Periods



(a) Very Safe on Campus (Day)

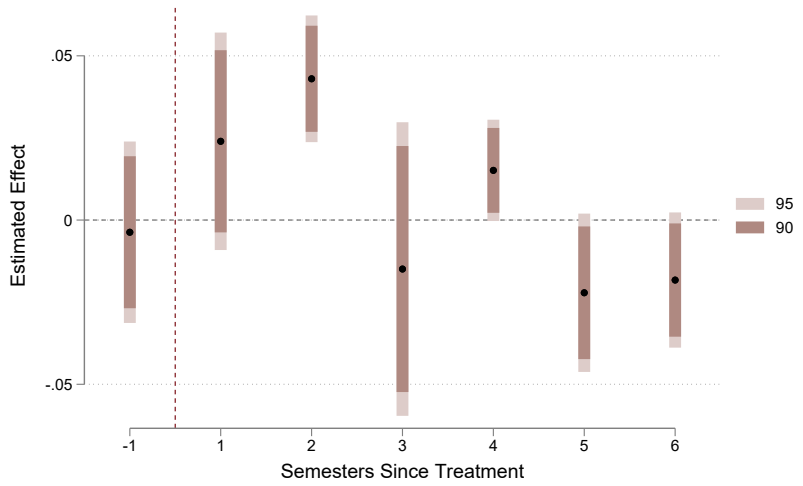
(b) Very Safe on Campus (Night)

(c) Very Safe Off Campus (Day)

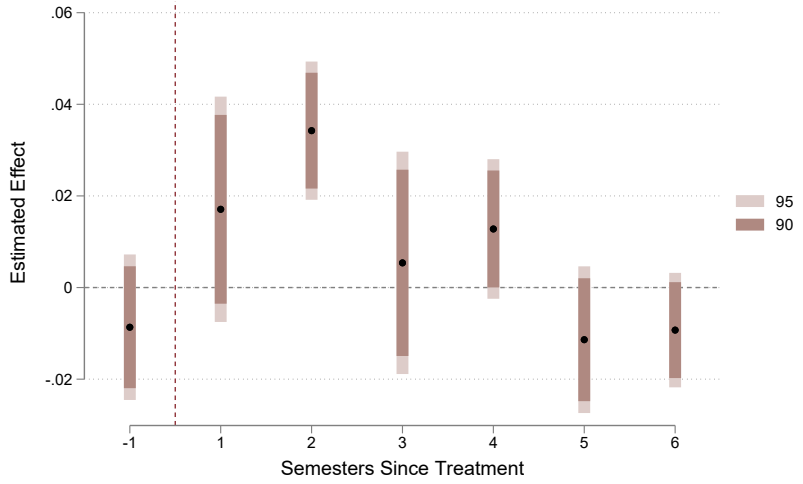
(d) Very Safe Off Campus (Night)

Notes: Figures display event study estimates on the effects of COVID-19 on safety outcomes for Asian and Pacific Islander students, relative to White students, using additional data from Wave II of the NCHA (Fall 2017-Spring 2019). Covariates include gender, age and age-squared, grade and degree level, and visa status. The omitted racial/ethnic category is White students. The omitted semester at time zero is Spring 2020.

Figure A2: Effects of COVID-19 on Discrimination for APIs - Excluding International Students



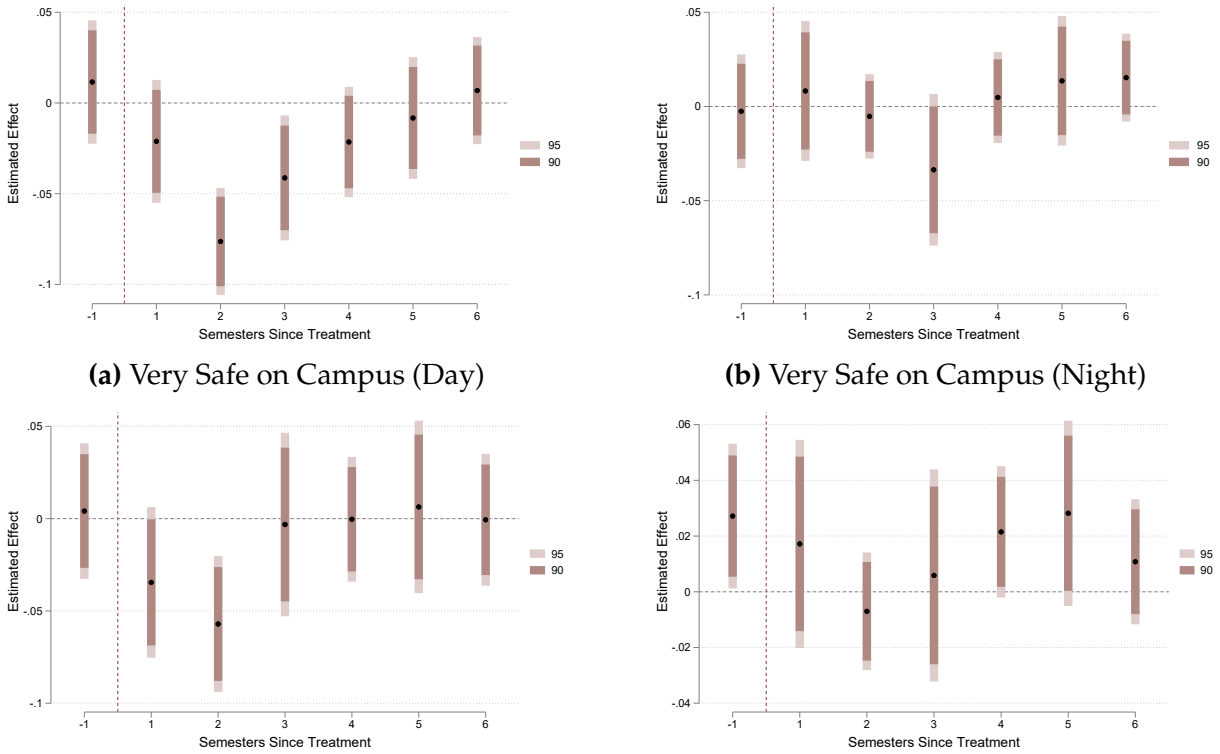
(a) Discrimination



(b) Discrimination – Caused moderate/severe distress

Notes: Figures display event study estimates on the effects of COVID-19 on discrimination outcomes for Asian students. The omitted racial/ethnic category is White students. The omitted semester at time zero is Spring 2020.

Figure A3: Effects of COVID-19 on Perceptions of Safety for APIs - Excluding International Students



(a) Very Safe on Campus (Day)

(b) Very Safe on Campus (Night)

(c) Very Safe Off Campus (Day)

(d) Very Safe Off Campus (Night)

Notes: Figures display event study estimates on the effects of COVID-19 on safety outcomes for Asian students. The omitted racial/ethnic category is White students. The omitted semester at time zero is Spring 2020.