Determinants of Ethnic Differences in School Modality Choices During the COVID-19 Crisis

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A growing body of research and popular reporting shows racial differences in school modality choices during the COVID-19 crisis, with White students more likely to attend school in person in the fall of 2020 and spring of 2021. This in-person learning gap raises serious equity concerns. We use unique panel survey data to explore possible explanations. We find that a combination of factors may explain these differences. School districts' offerings, political partisanship, perceived risk from the pandemic, and local COVID-19 outbreaks are all meaningfully associated with and plausibly explain the in-person learning racial gap. Our results illustrate how not only policy decisions but also political leanings and individuals' beliefs could contribute to inequality in access to learning and illustrate the need for a better understanding of the factors behind observed racial inequalities in education.

Keywords: at-risk students; COVID-19; descriptive analysis; econometric analysis; educational policy; ethnicity; learning options; minorities; parents and families; policy analysis; race; racial gaps; survey research

In the spring of 2020, the COVID-19 pandemic closed schools throughout the United States. The resulting shift to remote learning created a significant strain on teachers, students, and families. School districts created policies and repurposed technology to facilitate remote learning, often with dramatically different results for different students. One analysis of districts' remote learning policies found that students from high-poverty communities were typically held to less rigorous expectations, such as student work not completed for a grade (Malkus, 2020). Additionally, analyses of internet search data (Bacher-Hicks et al., 2021) and online math instructional software use (Chetty et al., 2020) indicate that families and students in high-poverty communities engaged with remote learning resources at significantly lower rates than their more affluent peers from March 2020 through the 2020–2021 school year.

In the fall of 2020, schools began to reopen using in-person, hybrid, and remote learning models. However, lack of centralized decision making often left these reopening decisions to individual school districts, resulting in a patchwork approach where students in neighboring communities may have different opportunities and experiences. Studies of district reopening plans during this time compared district survey responses with district demographics and determined that Black and Hispanic students returned to school completely remote at a higher rate than White students. An analysis from the Brookings Institution argues that race functions as a proxy for urbanity, and that larger, urban school districts took more extreme measures to limit the spread of COVID-19 (Smith & Reeves, 2020). A separate investigation argues that a combination of politics and parental preferences may be responsible for the underrepresentation of minority students in in-person learning (Belsha et al., 2020).

Understanding the nature of this racial gap is of significant importance. In early 2021, President Biden stated that the reopening of schools to in-person learning was a national imperative (U.S. Office of the Press Secretary, 2021). In the president's statement and subsequent federal legislation, the focus has been on helping schools reopen. Some evidence indicates that families became more interested in in-person learning as schools reopened in the spring of 2021 (Kogan, 2021). However, a significant racial gap remained in the spring of 2021 (U.S. Department of Education, Institute of Education Statistics, 2021). If racial gaps in attendance modality are motivated by factors other than the availability of in-person learning, reopening for in-person learning may not be sufficient to ensure a full return to the classroom for all students.

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In this article, we use data from the Understanding Coronavirus in America Tracking Survey (UCA), an internet panel comprising a nationally representative sample of American households, to study potential factors associated with observed racial differences in learning mode during the fall of 2020. We merge these data with election polling from the same respondents to capture political leanings, measures of local COVID-19 outbreaks, and information on available school learning options from a database of school district reopening plans. We find that political partisanship, modality availability, the extent of local outbreaks, and individuals' perceived risk from COVID-19 play sizeable roles in explaining observed differences in families' use of in-person and remote learning options.

Connections to Existing Research

The impact of COVID-19 on students and families is an emerging field of research and estimating the pandemic's impact on student achievement has been a particularly active segment of this literature. Initial analyses of student achievement and growth during the pandemic indicate that students of color, economically disadvantaged students, and younger students have been most severely affected (Hamilton & Gross, 2021).While few studies have examined heterogenous effects by mode of instruction, those that did found that remote learning is associated with the largest deficits (Kogan & Lavertu, 2021; Sass & Goldring, 2021). State summative assessments and college entrance exam data show that the COVID-19 pandemic appears to have more substantially affected students' progress in mathematics than language arts but that these trends were not uniform across students or schools (Betebenner et al., 2021). While creative proposals for addressing the potential consequences of COVID-19, such as high-dosage tutoring (Robinson et al., 2021) or summer learning programs (McCombs & Augustine, 2021), hold some promise, they are largely predicated on a return to in-person schooling.

Despite the policy objectives of political leaders and districts, a successful return to in-person learning did not occur during the 2020–2021 school year for many students in the United States. Data from a federally administered survey of school offerings and attendance indicate that nearly all school districts offered either hybrid or in-person learning by May of 2021, yet nearly a quarter of all students were still learning remotely at that time. While only 34% of White students participated in remote or hybrid learning in May 2021, 59% of Black and 55% of Hispanic students used either of those modalities during that same period (U.S. Department of Education, Institute of Education Statistics, 2021). The racial gap in in-person enrollment is found around the country including in states such as Arkansas, Texas, and Florida where schools were ordered to be open for in-person learning throughout the school year. The persistence of this gap across time and state policies highlights the importance of examining not just learning options availability but also factors that may affect families' uptake of those options.

Parolin and Lee (2020) analyze cellphone geodata and claim that school buildings with high proportions of non-White students and students who qualify for free or reduced-price lunch were more likely to appear closed during the fall 2020 semester. However, with these data, it is difficult to disentangle district offerings from individual decisions and this distinction may be important. For example, by early October of 2020 almost all New York City public schools had reopened for in-person learning. However, by the end of the month, only 26% of students had attended a single in-person class (Shapiro, 2020).

There is reason to believe that racial and ethnic minorities may be especially hesitant to return to in-person learning. Black and Hispanic individuals have been disproportionately afflicted by the pandemic, with hospitalization rates almost five times that of Whites for both groups (Centers for Disease Control and Prevention, 2020). Shapiro et al. (2021) claim that Black families may be skeptical of in-person learning due to both the disproportionate impact of COVID-19 on their communities and historic abuse by government and medical establishments.

Adding to the complexity, early responses to the pandemic were politicized (Grossmann et al., 2021; Shao & Hao, 2020) with Republicans calling for an immediate reopening of schools and Democrats urging a more cautious reopening in the fall of 2020. Persistent low rates of in-person learning among Black and Hispanic students as compared with White students may be a result of individuals in those communities tending to support Democratic party positions. Not only are individual perceptions of the pandemic influenced by politics but also are districts' reopening decisions. An analysis using a survey of school districts found that a local conservative political leaning was the strongest predictor of districts' decisions to open in-person (Hartney & Finger, 2020). The interplay of demographic, political, epidemiological, and district offerings on learning modality choice creates a gordian knot that previous research has been unable to untie. We leverage unique data drawn from a nationally representative sample of American households to better document observed racial differences in learning modality during the fall of 2020 and study the role of important factors. To our knowledge, this is the first analysis to use family-level data to explore racial differences in students' learning modes following the COVID-19 school closures.

Data and Descriptive Statistics

Starting in March of 2020, the Dornsife Center for Economic and Social Research at the University of Southern California has collected data about the pandemic's impact on American households through the UCA.[1] Participants in the survey were recruited from the nationally representative Understanding America Study (UAS) online panel, resulting in a sample of over 6,000 individual respondents who to date have completed 29 waves. For the first year of the pandemic, the UCA was administered as biweekly survey waves that varied in focus but collected information about labor status, perceived COVID-19 risk, educational experiences for children in the household, psychological distress, and mask usage, among other topics.

We use responses from Wave 15 of the UCA,[2] which were gathered between September 30th and October 26th, 2020.[3] In Wave 15, respondents with school-age children in the household provided information on a series of education-related questions including mode of learning attendance (in-person, hybrid, remote, or homeschool) and type of school (public, charter, private, or homeschool). For respondents with multiple children,

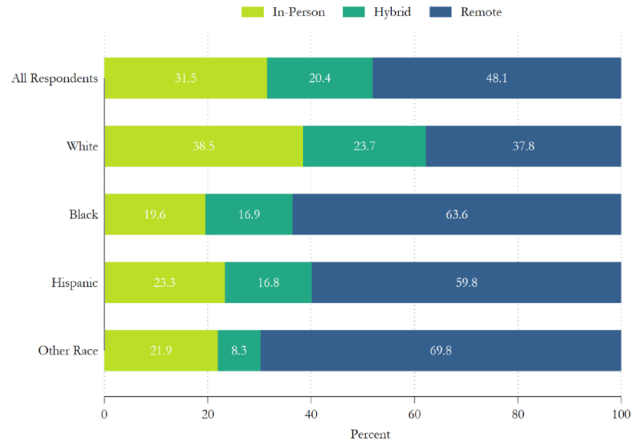

FIGURE 1. *Learning modality by race.*
Source. From wave 15 of the Understanding Coronavirus in America Tracking Survey.
Note. Results weighed using population weights to the Current Population Survey benchmarks.

questions were exclusively asked about a randomly selected child in the household.

As our focus in this study is the racial gap in student mode of attendance, we restrict our sample to UCA respondents with school-age children in the household who are not homeschooled. The UAS was designed to capture information about American households and for that aim, once a household is selected to be part of the UAS, all adults aged 18 years and older in the household are eligible to participate. As a result, some households provide multiple responses about the same child. Because our focus is to study the learning experiences of individual students, we unduplicated households in our sample. To do so, we retained the designated primary respondent's[4] response for those households with multiple respondents and excluded duplicate observations ($N = 127$) caused by multiple members of the household completing the survey. This results in a sample of 1,191 respondents from unique households.

The top bar in Figure 1 represents the overall proportion of respondents choosing each learning option while the four lower bars disaggregate mode of attendance by race. Most American parents (69%) reported either remote or hybrid learning for their school-age children in October 2020. The disproportionality in in-person attendance noted by others is present in our analytic sample. Black and Hispanic students appear less likely to attend school in-person than White students, with 81% of Black and 77% of Hispanic respondents declaring their children attend school through fully remote or hybrid learning options, as compared with 62% of White parents.

The UAS collects important demographic and socioeconomic information of participating families that we use in our analysis. Racial information of the respondents in our sample is coded into four categories: White, Black, Hispanic, and other race. Our analysis also includes information about the level of education of the respondent (high school degree or less, some postsecondary education with no degree, and postsecondary degree earned) and reported family income (<$40,000, $40,000-$100,000, and >$100,000 per year) to capture the economic circumstances of the family. Similarly, a dummy variable for the respondent being employed at the time of survey helps us capture additional economic circumstances of the family as well as child care needs. We also use information about the grade level of the randomly selected child in the household (elementary school student, middle school student, or high school student) to allow for different levels of required supervision and educational support for children of different ages.

Families' hesitancy to return to in-person learning for their children may reflect dissatisfaction with their local schools. Wave 15 respondents were also asked to "grade" their child's school using an A to F scale across several dimensions for three time periods (pre-COVID-19, spring 2020, and fall 2020). We use respondents' reverse-coded assessment of overall education quality, quality of feedback from teachers, student's relationship with their teachers, student's academic engagement, instructional quality in math, English, and science, and ability of the school to keep their child healthy before the pandemic to construct a measure of school quality via principal components factor analysis.[5]

The levels of trust in news agencies and government health officials could affect families' perceived risk of COVID-19 and alter their preferences for in-person learning for their children. The UCA included a series of questions in Wave 7 (June 10 to July 8, 2020) that allow us to construct measures of media trust[6] and trust in public health organizations. Our media trust measure is calculated via principal component factor analysis[7] using respondents' ratings of five news sources (*ABC, CBS, CNN, NBC*, and national newspapers). We similarly construct a measure of trust in public health organizations from respondents' ratings of three public health information sources (the Centers for Disease Control, U.S. Department of Health and Human Services, and public health officials generally). Together, these variables allow us to estimate the extent to which popular media coverage or guidance from health organizations may predict modality choice.

Political and ideological leanings could also be an important factor predicting school modality choices, given polarization surrounding the response to the COVID-19 crisis. UAS members were asked to participate in a biweekly election tracking poll from August through early November of 2020. We match Wave 15 UCA respondents with their closest in time election polling response to determine their political leaning. On average, respondents completed the election poll within 4 days of completing Wave 15 and 31% of respondents in our analytic sample completed both the poll and survey on the same day. We use a hypothetical question asking respondents who they would vote for if the election was held on that day. We then classified respondents as supporting Biden, Trump, another candidate, or as undecided voters. All participants in the election tracking poll were prompted to respond, including unlikely voters which allows us to have political leaning information of all respondents regardless of voting status.

The local impact of the COVID-19 pandemic along with personal perceived health risks could also be important determinants of parents' choices. To control for the local level of COVID-19 outbreaks, we merge the UCA data with county-level[8] measures constructed using information from *The New York Times*[9] and U.S. Census Bureau.[10] We construct a measure

of COVID-19 incidence rate representing the proportion of a county's population that has tested positive for COVID-19. We also construct a measure of the case-fatality ratio for each county which is defined as the proportion of confirmed deaths among those who have tested positive for COVID-19. To better capture the extent to which respondents' decision-making context may have been shaped by prior outbreaks of COVID-19, we use data from the first day of Wave 15 when constructing these measures. In addition, we use factor analysis to construct a measure of respondents' perceived risk from COVID-19 using the self-reported probability of contracting the disease in the next 3 months and, if infected, their probability of being hospitalized or dying. These variables allow us to capture to what extent learning modality decisions may be motivated by parents' health concerns.

Moreover, the UAS election poll data, described above, indicate if a respondent lives in a rural, urban, or mixed locale which helps us better capture population density along with infrastructure for remote learning such as high-speed internet in respondents' locales. The categorization provided in the UAS data is based on the share of individuals within a respondent's zip code tabulation area (ZCTA) that also live in a census-designated urbanized area. The respondent is classified as urban or rural if all or no residents in their ZCTA live in one of the country's nearly 500 urbanized areas. If some, but not all, residents of the ZCTA live in an urbanized area they are classified as mixed-urban. Using these variables from the UAS election poll allows us to proxy for factors associated with different levels of urbanicity as they help capture different levels of vulnerability to the pandemic and may play a significant role in the mode of school attendance (Smith & Reeves, 2020).

Finally, the supply of different learning options is hypothesized to be a key determinant of parents' school modality choices. To study the influence of the supply of learning options, we merge the UCA data with estimates of learning options supply at the census-tract level when possible and county level when we are unable to merge at the tract level.[11] Data for these supply estimates come from MCH Strategic Data,[12] which has regularly collected information on school district reopening options since the summer of 2020 and has obtained information on 92% of school districts in the country. This is, to our knowledge, the most comprehensive source of information on school reopenings and the supply of learning options. We use MCH survey data as reported in October 2020, when Wave 15 was collected. At this point, MCH had processed reopening plan data for 78% of districts nationwide. Thus, we construct census-tract and county-level estimates of remote learning prevalence as the proportion of students in the tract's school districts that are only offered remote learning. While many districts offered combinations of hybrid and in-person learning for families to choose from, the remote learning measure as defined by MCH represents the absolute unavailability of in-person learning in any form. We match 90% of respondents with a census tract where either no districts are remote only or all districts are remote only. Ten percent of respondents live in census tracts with multiple modalities offered by different districts. For these respondents, we estimate the probability of their students attending a remote-only district by constructing a weighted average representing the proportion of students in the tracts' districts that are remote only.

In addition to district-provided information on school offerings described above, Wave 15 asks whether respondents' chosen school allowed them to choose their student's learning modality. We also include this variable in our analysis to better model actual attendance as a function of both parental choice and school offerings. It is important to note that being given a choice does not fully determine a given learning modality. For example, 56% of respondents who report having chosen their student's mode of attendance selected remote learning and 18% of respondents who report using an in-person modality indicate that they were not offered a choice of modality. Finally, we also include variables indicating the type of school (public school, private school, or charter school) as different school sectors provided different school modality options for parents (e.g., private schools reopened for in-person learning at higher rates even when local-school districts decided to keep public schools fully remote). A full description of the variables and their correlations can be found in the online supplemental Appendix B (available on the journal website).

We report descriptive statistics for our analytic sample using sampling weights[13] in Table 1. To test for statistically significant differences by race, we use an adjusted Wald test with the null hypothesis of no differences across racial or ethnic groups ($\mu_{white} = \mu_{black} = \mu_{hispanic} = \mu_{other}$). Trends seen in our descriptive statistics largely align with our prior expectations. While 48% of our analytic sample reports their children attending remotely there are large differences by race. Only 38% of White respondents report using remote learning while 60% to 64% of Black and Hispanic respondents report the same. Overall, there appears to be an even proportion of Biden and Trump voters in our sample. Among White respondents, Donald Trump appears to be the preferred candidate while Joe Biden is the preferred candidate among non-White respondents. Interestingly, remote learning appears to be prevalent in 35% of respondents' census tracts but reported as the modality for 48% of respondents. This may indicate the importance of studying family decisions as opposed to just districts' offerings.

Analytic Strategy

We study the determinants of the probability of respondent i selecting attendance modality j (i.e., fully in-person learning, fully remote, or hybrid) for their school-age child, conditional on a set of covariates x_i, using a multinomial logit model:

$$P\left(Y_i = j|x_i\right) = \frac{\exp\left(\beta_j' x_i\right)}{\sum_{l=1}^{3} exp(\beta_l' x_i)} \quad j = \begin{cases} 1 & \text{for InPers.} \\ 2 & \text{for Remote} \\ 3 & \text{for Hybrid} \end{cases}$$

To explore the role of different factors in explaining observed racial differences in learning options, we define the following four sets of covariates and include them sequentially in our models:

Table 1
Wave 15 Respondent Characteristics

	Overall (N = 1,191)	White (N = 756)	Black (N = 116)	Hispanic (N = 243)	Other Race (N = 76)	p
Mode of attendance						
In-person	0.315	0.385	0.196	0.233	0.219	.000
Hybrid	0.204	0.237	0.169	0.168	0.083	.005
Remote learning only	0.481	0.378	0.636	0.598	0.698	.000
Income						
<$40,000	0.334	0.264	0.598	0.335	0.381	.000
$40,000–$100,000	0.410	0.421	0.339	0.470	0.219	.007
$100,000+	0.256	0.315	0.064	0.195	0.399	.000
Education						
High school degree or less	0.364	0.372	0.395	0.354	0.230	.215
Some postsecondary	0.174	0.137	0.214	0.249	0.144	.045
Degree earned	0.462	0.491	0.391	0.397	0.626	.029
Grade level						
Kindergarten/elementary	0.392	0.385	0.386	0.410	0.405	.968
Middle school	0.308	0.311	0.271	0.357	0.158	.027
High school	0.300	0.304	0.342	0.232	0.436	.110
Voter intentions						
Biden voter	0.414	0.276	0.823	0.493	0.602	.000
Trump voter	0.415	0.579	0.061	0.231	0.233	.000
Undecided voter	0.076	0.059	0.068	0.134	0.032	.110
Other	0.096	0.086	0.049	0.142	0.133	.227
School type						
Public school	0.883	0.891	0.921	0.837	0.901	.350
Charter school	0.055	0.034	0.067	0.101	0.059	.126
Private school	0.062	0.076	0.013	0.062	0.040	.000
Employed	0.696	0.697	0.670	0.707	0.714	.944
Media trust	0.259	0.080	0.500	0.484	0.650	.000
Public health trust	−0.093	−0.173	−0.180	0.064	0.388	.000
School quality	0.035	0.061	−0.233	0.085	0.248	.040
COVID-19 perceived risk	−0.130	−0.181	0.002	−0.061	−0.223	.199
Incidence rate	0.020	0.018	0.027	0.023	0.021	.000
Case-fatality rate	0.026	0.026	0.029	0.025	0.025	.629
Given choice of modality	0.712	0.730	0.719	0.661	0.705	.647
Remote learning prevalence	0.354	0.263	0.414	0.504	0.555	.000

Note. Sample restricted to respondents with school-aged children enrolled in a public, private, or charter school and attending via remote, hybrid, or in-person learning. Sampling weights used. p-values are the result of an adjusted Wald test of statistical significance.

$$x_i' = \{\text{race}_i\} \quad \text{(A)}$$

$$x_i' = \left\{ \begin{matrix} \text{race}_i, \text{income}_i, \text{education}_i, \text{employed}_i, \\ \text{gradeLevel}_i, \text{state}_i \end{matrix} \right\} \quad \text{(B)}$$

$$x_i' = \left\{ \begin{matrix} \text{race}_i, \text{income}_i, \text{education}_i, \text{employed}_i, \\ \text{gradeLevel}_i, \text{SchoolQuality}_i \\ \text{mediaTrust}_i, \text{publicHealthTrust}_i, \\ \text{politics}_i, \text{percievedCovidRisk}_i \\ \text{incidenceRate}_i, \text{caseFatality}_i, \text{urban}_i, \text{state}_i \end{matrix} \right\} \quad \text{(C)}$$

$$x_i' = \left\{ \begin{matrix} \text{race}_i, \text{income}_i, \text{education}_i, \text{employed}_i, \\ \text{gradeLevel}_i, \text{SchoolQuality}_i \\ \text{mediaTrust}_i, \text{publicHealthTrust}_i, \\ \text{politics}_i, \text{percievedCovidRisk}_i \\ \text{incidenceRate}_i, \text{caseFatality}_i, \text{urban}_i, \\ \text{schoolType}_i, \text{choice}_i, \text{remote}_i, \text{state}_i \end{matrix} \right\} \quad \text{(D)}$$

In Specification A, we include respondent race as the sole explanatory factor to assess initial racial and ethnic differences in learning options. Next, in Specification B we add controls for respondents' sociodemographic and family context information including the level of income, education, employment status,

and grade level of the randomly selected child. We also include state fixed effects to capture state-level remaining unobserved characteristics. Specification C builds on this with the inclusion of our trust and school quality variables, a categorical variable indicating political leaning, a measure of perceived risk from COVID-19, variables measuring the local extent of COVID-19 outbreaks, and the level of urbanicity of the respondent's residence. Finally, in Specification D, our most complete specification, we add controls for the supply of options provided to parents including information on the type of school the child is attending (public, private, or charter), whether respondents were offered a choice of attendance modality by their school,[14] and prevalence of remote learning as described in the previous section. To maintain national representativeness, our estimates are weighted using UCA sampling weights.

Results

To aid interpretation, we present our estimates as average marginal effects (AME) for each covariate x_i by modality j. Tables 2 to 4 describe our estimates for Specifications A to D, which sequentially introduce additional covariates as explained above, for in-person, remote, and hybrid learning modalities, respectively. While we do not report AME for income and education, they are largely insignificant.[15]

Looking at the results in Table 2, Specification A, without controls, non-White respondents are 15 to 19 percentage points less likely to attend school in-person than White students. These estimates are significant at the 95% and 99% confidence levels. With the inclusion of sociodemographic controls and state fixed effects in Specification B, we no longer observe statistically significant differences between Hispanic and White respondents in the probability of choosing fully in-person learning. However, holding sociodemographic and grade-level information constant, being Black is associated with a 17 percentage point decrease in the probability of attending in-person learning as compared with White respondents. Student grade level also appears important. Holding sociodemographic information constant, being in middle school or high school is associated with a 12 to 13 percentage point decrease in the likelihood of attending in-person as compared with being in kindergarten or elementary school. This result could be due to the lower needs of supervision and school support in higher school grades.

Racial differences are no longer significant at conventional confidence levels in Specification C with the inclusion of controls for media trust, trust in public health officials, perceived school quality, political leanings, and measures of pandemic vulnerability (i.e., perceived COVID risk, urbanity, and measures of local COVID-19 outbreaks). Political leaning, perceived risk due to COVID-19, and the prevalence of COVID-19 cases in a respondent's county all appear to be significantly associated with the probability of attending school in person. All else equal, intending to vote for Trump in the November 2020 election is associated with a 12 percentage point increase in the probability of attending school in-person as compared with being a Biden voter. A 1 standard deviation increase in perceived risk from COVID-19 is associated with a 4.4 percentage point decrease in the probability of attending school in-person, ceteris paribus. Holding all else equal, a 1 percentage point increase in county-level COVID-19 incidence rate is associated with a 5.4 percentage point decrease in the probability of attending school in-person. These estimates are significant at the 95% confidence level.

As reported in Table 3, Specification A, without controls, non-White respondents are between 22 and 32 percentage points more likely to attend school remotely as compared with White students. Like our results for in-person attendance, we find no statistically significant differences between Hispanic and White respondents once we control for sociodemographic and family context information and state fixed effects in column B. In this specification, the estimated AME of being Black on the probability of attending remotely is, however, large in magnitude and remains statistically significant. Holding all else equal, being Black is associated with a 22 percentage point increase in the probability of reporting remote learning as compared with being White. In line with the results shown in Table 2, older students appear more likely to participate in remote learning. Holding all else equal, middle and high school students are between 9 and 12 percentage points more likely to learn remotely as compared with elementary and kindergarten students. These estimates are significant at the 95% and 99% confidence levels, respectively.

Adding in controls for media trust, trust in public health officials, perceived school quality, political leanings, perceived COVID-19 risk, urbanity, and measures of local COVID-19 outbreaks, in column C, results in the racial gap between White and Black respondents becoming statistically insignificant at conventional confidence levels. Political leanings, the extent of local outbreaks, and urbanity are meaningfully associated with participation in remote learning. Intending to vote for candidate Trump in the November 2020 election is associated with a 14 percentage point decrease in the probability of selecting remote learning as compared with being a Biden voter. This estimate is significant at the 99% confidence level. Holding all else constant, rural respondents are 15 percentage points less likely to participate in remote learning as compared with mixed urbanity respondents, significant at the 99% confidence level. The lower population density in rural areas could reduce perceived pandemic vulnerability and increase families' willingness to use in-person education. Additionally, a 1 percentage point increase in respondents' county-level COVID-19 incidence rate is associated with an 8.6 percentage point increase in the probability of participating in remote learning. This estimate is significant at the 99% confidence level.

Results of our preferred specifications for the probability of choosing fully in-person and fully remote learning, including controls for the local supply of school mode options, are presented in column D of Tables 2 and 3, respectively. In these full specifications, racial differences are no longer statistically significant. Holding all else equal, attending a private school is associated with a 39 percentage point increase in the probability of attending school fully in-person and a 29 percentage point decrease in the probability of attending fully remotely, as compared with enrollment in a public. This result could be explained by the fact that private schools were free to decide to remain open for in-person learning independently of what local public

Table 2
Average Marginal Effects (AME)—In-Person Modality

	A (N = 1,191)		B (N = 1,190)		C (N = 936)		D (N = 876)	
	AME	*SE*	AME	*SE*	AME	*SE*	AME	*SE*
Race: Black	–0.189***	0.050	–0.173***	0.049	–0.111	0.079	–0.048	0.077
Race: Hispanic	–0.151***	0.051	–0.045	0.059	–0.004	0.069	0.053	0.062
Race: Other	–0.165**	0.076	–0.044	0.092	–0.009	0.112	0.094	0.098
Employed			0.033	0.040	0.083*	0.043	0.053	0.044
Middle school student			–0.121***	0.041	–0.172***	0.042	–0.191***	0.044
High school student			–0.129***	0.040	–0.178***	0.043	–0.177***	0.045
Media trust factor					–0.027	0.021	–0.019	0.022
Public health trust factor					0.000	0.022	0.007	0.021
School quality factor					0.019	0.018	0.001	0.018
Trump voter					0.120**	0.047	0.147***	0.049
Undecided voter					0.011	0.064	0.027	0.074
Other candidate					–0.035	0.064	–0.020	0.067
COVID-19 perceived risk					–0.044*	0.023	–0.045**	0.022
Rural					0.077	0.048	0.079*	0.044
Urban					–0.028	0.048	0.013	0.055
Incidence rate					–5.435**	2.428	–3.328	2.351
Case-fatality ratio					–1.079	1.016	–1.331	1.027
Charter school student							–0.179***	0.057
Private school student							0.389***	0.061
Given choice of modality							0.119***	0.044
Schools only offer remote							–0.167***	0.047
Demographic controls	No		Yes		Yes		Yes	
State fixed effects	No		Yes		Yes		Yes	
McFadden's pseudo R^2	.031		.236		.316		.381	

Note. Sampling weights used. Demographic controls also include income and education.
*$p \leq .1$. **$p \leq .05$. ***$p \leq .01$.

school districts decided. Conversely, charter school students are estimated to be 18 percentage points less likely to engage in in-person learning and 19 percentage points more likely to engage in remote learning as compared with public school students, all else equal. These estimates are significant at the 99% and 95% confidence levels, respectively.

Respondents whose schools gave them a choice of their children's learning modality were 12 percentage points more likely to select in-person learning and 17 percentage points less likely to report remote learning as compared with those who report not being able to make a choice, ceteris paribus. These estimates are significant at the 99% confidence level. The offerings of local public school districts also appear important. All else equal, if respondents live in areas where most districts offer only remote learning they are 17 percentage points less likely to report in-person learning and 15 percentage points more likely to report remote learning as compared with areas where more options are available.

Other factors remain significant predictors of the probability of respondents reporting their children attending fully in-person or fully remote schooling in Specification D. Consistent with our results from Specification C, we find statistically significant effects for political indicators. Holding all else constant, intending to vote for candidate Trump is associated with a 15 percentage point increased probability of attending school fully in-person and a 14 percentage point decreased probability of attending fully remotely. These estimates are significant at the 99% confidence level. Additionally, with our full set of controls we find that perceived COVID-19 risk is meaningfully associated with learning modality. Holding all else equal, a 1 standard deviation increase in perceived COVID-19 risk is associated with a 4.5 percentage point decrease in the probability of reporting in-person learning and 4 percentage point increase in the probability of reporting remote learning. These estimates are significant at the 95% confidence level.

For in-person learning, we find that our estimated effects of local COVID-19 incidence rates and case-fatality ratios are imprecisely estimated and statistically insignificant at conventional confidence levels. However, the COVID-19 incidence rate appears to be meaningfully associated with remote learning. Holding all else equal, a 1 percentage point increase in the local COVID-19 incidence rate is associated with a 6.5 percentage point increase in the probability of reporting remote learning. Additionally, older students appear more likely to be participating remotely and less likely to attend in person. Holding all else constant, middle school students are 19 percentage points less likely to attend in-person and 14 percentage points more likely to attend remotely as compared with kindergarten and elementary

Table 3
Average Marginal Effects (AME)—Remote Modality

	A (N = 1,191)		B (N = 1,190)		C (N = 936)		D (N = 876)	
	AME	*SE*	AME	*SE*	AME	*SE*	AME	*SE*
Race: Black	0.258***	0.058	0.220***	0.060	0.100	0.076	0.019	0.064
Race: Hispanic	0.221***	0.056	0.059	0.055	0.007	0.062	−0.034	0.053
Race: Other	0.320***	0.080	0.103	0.095	0.028	0.102	−0.056	0.082
Employed			−0.054	0.039	−0.051	0.044	−0.030	0.047
Middle school student			0.087**	0.041	0.126***	0.040	0.137***	0.042
High school student			0.118***	0.042	0.140***	0.044	0.117***	0.045
Media trust factor					0.042*	0.022	0.041*	0.024
Public health trust factor					−0.021	0.022	−0.022	0.022
School quality factor					−0.012	0.017	0.007	0.017
Trump voter					−0.136***	0.049	−0.138***	0.051
Undecided voter					−0.008	0.070	−0.045	0.071
Other candidate					0.016	0.073	0.049	0.077
COVID-19 perceived risk					0.039*	0.022	0.040**	0.020
Rural					−0.146***	0.047	−0.155***	0.044
Urban					0.037	0.050	−0.003	0.052
Incidence rate					8.607***	2.414	6.472***	2.298
Case-fatality ratio					−1.970*	1.053	−1.568	1.002
Charter school student							0.188**	0.081
Private school student							−0.292***	0.054
Given choice of modality							−0.166***	0.042
Schools only offer remote							0.153***	0.041
Demographic controls	No		Yes		Yes		Yes	
State fixed effects	No		Yes		Yes		Yes	
McFadden's pseudo R^2	.031		.236		.316		.381	

Note. Sampling weights used. Demographic controls also include income and education.
*$p \leq .1$. **$p \leq .05$. ***$p \leq .01$.

students. These estimates are significant at the 99% confidence level. Similarly, high school students are 18 percentage points less likely to attend in-person and 12 percentage points more likely to attend remotely as compared with kindergarten and elementary students, significant at the 99% confidence level. Finally, the estimated effect of living in a rural location on in-person schooling is positive and marginally significant at the 90% confidence level, living in a rural location is associated with a 16 percentage point decreased probability of reporting remote learning. This estimate is significant at the 99% confidence level.

Table 4 reports our findings for the probability of respondents reporting a hybrid modality for their school-age children. We find fewer statistically significant predictors of hybrid modality. In our most controlled specification, we find no statistically significant differences by race. Holding all else constant, private school students are 10 percentage points less likely to attend via a hybrid model as compared with public school students. This estimate is significant at the 95% confidence level. Interestingly, while the COVID-19 incidence rate is not statistically significant the local case-fatality rate is. Holding all else constant, a 1 percentage point increase in the COVID-19 case-fatality rate is associated with a 3 percentage point increase in the probability of reporting hybrid learning. This estimate is significant at the 99% confidence level. Like our results for in-person learning, we find that the effect of living in a rural location is positive and marginally significant at the 90% confidence level. Other factors, such as intention to vote for Donald Trump, enrollment in a charter school, trust in media and public health organizations are imprecisely estimated and statistically insignificant in this case.

Conclusion

The current COVID-19 crisis has put a strain on teachers, students, and families. Although many schools reopened for in-person to a limited amount during the 2020–2021 school year, participation in in-person learning varied considerably. As a result, not all students had the same learning experiences. We observe important racial differences in the learning modality of students during the fall of 2020 with Black and Hispanic students returning to school remotely more frequently than White students. Although most parents (69%) in the United States used fully remote or hybrid learning for their students during this period, Black and Hispanic respondents reported doing so at higher rates. A total of 81% of Black and 77% of Hispanic families report fully remote or hybrid education for their children as compared with 62% of White parents. These observed racial differences along with recent reports of bigger learning losses for students attending school remotely during the pandemic

Table 4
Average Marginal Effects (AME)—Hybrid Modality

	A (*N* = 1,191)		B (*N* = 1,190)		C (*N* = 936)		D (*N* = 876)	
	AME	***SE***	**AME**	***SE***	**AME**	***SE***	**AME**	***SE***
Race: Black	−0.069	0.048	−0.048	0.050	0.011	0.067	0.029	0.066
Race: Hispanic	−0.069	0.045	−0.014	0.054	−0.003	0.058	−0.019	0.052
Race: Other	−0.154***	0.045	−0.059	0.066	−0.019	0.074	−0.038	0.064
Employed			0.021	0.035	−0.032	0.037	−0.023	0.037
Middle school student			0.035	0.037	0.046	0.037	0.054	0.040
High school student			0.011	0.037	0.038	0.037	0.060	0.037
Media trust factor					−0.015	0.019	−0.022	0.020
Public health trust factor					0.020	0.020	0.016	0.019
School quality factor					−0.007	0.015	−0.008	0.015
Trump voter					0.016	0.043	−0.009	0.043
Undecided voter					−0.003	0.064	0.018	0.071
Other candidate					0.019	0.062	−0.029	0.063
COVID-19 perceived risk					0.005	0.022	0.005	0.021
Rural					0.069	0.045	0.076*	0.045
Urban					−0.009	0.036	−0.010	0.037
Incidence rate					−3.172	2.034	−3.144	1.960
Case-fatality ratio					3.049***	0.932	2.898***	0.881
Charter school student							−0.009	0.083
Private school student							−0.098**	0.044
Given choice of modality							0.047	0.044
Schools only offer remote							0.014	0.041
Demographic controls	No		Yes		Yes		Yes	
State fixed effects	No		Yes		Yes		Yes	
McFadden's pseudo R^2	.031		.236		.316		.381	

Note. Sampling weights used. Demographic controls also include income and education.
*$p \leq .1$. **$p \leq .05$. ***$p \leq .01$.

(Hamilton & Gross, 2021; Kogan, 2021; Sass & Goldring, 2021) raise serious equity concerns.

In this article, we study which factors could help explain the observed racial differences in school modality choice. Our results first demonstrate the important role of the political choice of reopening schools for in-person learning. Giving parents the option to choose the mode of learning increased the probability of participating in in-person learning by 12 percentage points while living in an area where local public schools remained remote increased the probability of attending school fully remote by 15 percentage points. In addition, the type of school attended had a significant influence. Attending a private school, a school sector that largely remained opened for in-person learning, increased the probability of attending in-person by 39 percentage points.

However, other individual factors were also significant predictors of in-person learning participation. Political leanings were also an important and significant predictor of attending in-person or fully remote. Intending to vote for President Trump was associated with a 15 percentage point increase in the probability of attending school in person. Our results go in line with those of Grossmann et al. (2021) who also found that those leaning Republican were more favorable toward in-person learning than those leaning Democrat. Similarly, perceived COVID-19 risk was also a significant factor. A one standard deviation increase in perceived COVID-19 risk is associated with an increase in the probability of attending school remotely of 4 percentage points.

Given the presence of other important individual factors determining families' decisions for learning mode, the reopening of schools for in-person learning might not be enough to fully eliminate observed racial differences in students' mode of instruction. Families that lean more Democratic or have higher perceived COVID-19 risk might decide to keep their children in remote learning. To the extent that Black and Hispanic families tend to favor more Democratic candidates and policies and have been hit harder by this pandemic, which could increase their perceived COVID-19 risk, we might continue to observe racial disparities in learning modality during this pandemic. According to reports by the Institute of Education Sciences,[16] by February 2021, 79% of all school districts offered the option to attend school either in-person or with hybrid instruction, and more than half of non-White respondents indicated that their children were still learning remotely. By May 2021, 66% of White students participated in school in-person as compared with 41% of Black students and 45% of Hispanics. According to the most recent data collected by the UCA between June 9th and July 21st, 2021, while 90% of White families intended to have their K–12 children attend in-person school during the 2021–2022

academic year, only 75% of Black families and 74% of Hispanic families did so.

Significant efforts to provide reassuring information to families may be necessary for students to fully participate in in-person learning opportunities. In this sense, as political messaging changes and school adapt mitigation measures to control the spread of the virus, it is possible that the influence of political leanings and COVID-19 perceived risk fades out over time. However, as the pandemic continues, investments in quality remote teaching and remediation efforts would be needed to help students who fall behind and to avoid increasing learning gaps.

Despite the rich data we were able to leverage, we acknowledge several limitations of our work. We were only able to match respondents with school offerings at the census or county level and did not have information of their exact school district's offerings and circumstances. Although in most of the cases a census track contained only one school district or the multiple school districts offered the same option, the lack of matches at the local school district level may induce measurement error in our local school supply options variables that could downward bias our estimates.

In any case, overall, our results illustrate how both policy decisions, but also political leanings and individuals' beliefs could contribute to inequality in access to learning and illustrate the need for a better understanding of the factors behind observed racial inequalities in education.

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NOTES

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[1]See https://uasdata.usc.edu/index.php

[2]Other survey waves (8, 14, 18–24) asked questions about respondents' educational experiences. However, we selected Wave 15 because it occurred close to the 2020 election which allowed us to match respondents' election polling responses with minimal attrition. While Wave 14 also occurred near the election (September 16th to October 14th), it did not ask respondents what type of school (public, private, and charter) their child was enrolled in which we anticipated to be an important factor. Despite lacking key information, we have performed an analysis using Wave 14 data as a robustness check. The overall results of this robustness analysis are similar to those in our main analysis and are available from the authors on request.

[3]A total of 93% of respondents completed the survey before October 15, 2020.

[4]For a small number of households with no primary respondent ($N = 3$), we randomly selected which response to keep. Our results are robust to keeping duplicate responses in the sample.

[5]For details of this variable's construction, see the online supplemental Appendix B (available on the journal website).

[6]Indeed, 12% of Wave 7 respondents with school-aged children did not participate in Wave 15. To study the potential bias induced by this attrition in the sample, we regress an indicator for Wave 15 response onto demographic characteristics and our media trust measure for all Wave 7 respondents. The only significant predictors of attrition in the sample were racial demographics and income levels in the direction of more privileged respondents presenting higher levels of attrition. As we use wave-specific sampling weights in our estimates to maintain national representation of the sample in terms of gender, age, race, education, household income, and marital status these should correct for the potential bias induced by this sample attrition.

[7]For details of the media trust variable's construction, see the online supplemental Appendix B (available on the journal website).

[8]For 1.2% of respondents, we were unable to merge any local outbreak information.

[9]See https://github.com/nytimes/covid-19-data

[10]See https://www.census.gov/programs-surveys/popest.html

[11]In all, 4.8% of respondents were merged at the county level instead of the census-track level. Unfortunately, we were unable to merge any learning options supply information for 0.2% of respondents.

[12]See https://www.mchdata.com/covid19/schoolclosings. See also online supplemental Appendix A (available on the journal website) for more details on the MCH data.

[13]Note that weights aligned to the characteristics of U.S households with K–12 or higher education students are not provided in the UAS. Provided sample weights bring the sample in line with the U.S. adult population.

[14]While our main analysis models the probability of observing respondents' school-age children in each learning option which results from a combination of parents' preferences and district's offerings, we also conduct a sensitivity analysis restricting our sample to those who declare being given a choice of learning mode by their schools. We find very similar results. Results available from the authors on request.

[15]Full set of results available from the authors on request.

[16]See https://ies.ed.gov/schoolsurvey/

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