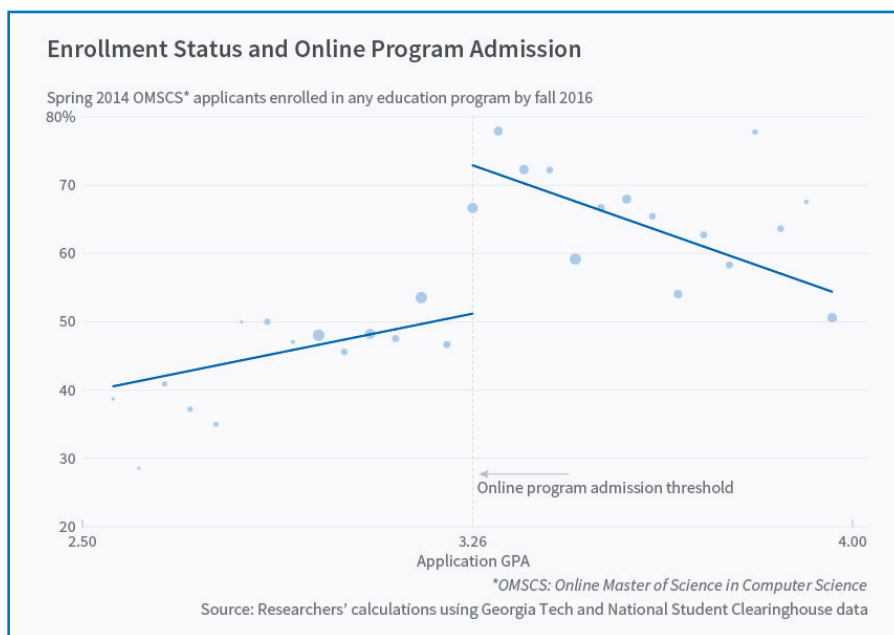


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What Online Education Has Meant for Students and Institutions



Can Online Delivery Increase Access to Education?

Online coursework has been heralded as potentially transformative for higher education, but little is known about whether it increases the number of people pursuing education or simply substitutes for existing options. In **Can Online Delivery Increase Access to Education?** (NBER Working Paper No. 22754), [Joshua Goodman](#), [Julia Melkers](#), and [Amanda Pallais](#) provide the first evidence that online education can expand access to students who would not otherwise have enrolled in an educational program. They study the earliest educational model to combine the inexpensive nature of online education with a degree program from a highly-ranked institution.

In spring 2014, the Georgia Institute of Technology's Computer Science Department

started enrolling students in a fully online version of its highly ranked master's degree. The Online Master of Science in Computer Science (OMSCS) costs about

Georgia Tech results suggest that online programs could significantly increase the production of master's graduates in computer science.

\$7,000, less than one-sixth the price of its in-person counterpart. The OMSCS degree is not labeled “online” and is in name fully equivalent to the in-person degree. Georgia Tech designed OMSCS such that its courses are online versions

(continued as Access on page 2)

The Competitive Effects

Does competition from virtual schools make their brick-and-mortar counterparts better?

In **The Competitive Effects of Online Education** (NBER Working Paper No. 22749), [David J. Deming](#), [Michael Lovenheim](#), and [Richard W. Patterson](#) explore that question by analyzing the impact of online education on colleges with less-selective admissions policies.

What they learn both confirms and contradicts their hypotheses. They find that per-pupil spending increases, at public colleges at least, in

The threat of ‘disruption’ from online education may induce traditional schools to improve quality.

response to competition from on-line education providers. They do not, however, find any evidence of tuition cuts from brick-and-mortar incumbents.

As of 2012, 6 percent of all U.S. bachelor's degrees were awarded for online study. The researchers investigate the impact of on-line entry on the behavior of traditional non-selective colleges. They focus on these schools because they are far more likely to draw students from a narrow geographic area than are their more selective counterparts. In 2013, nearly 40 percent of students at selective schools came from out of state, compared with 14 percent at less-selective four-year colleges and less than 6 percent at community colleges.

The researchers work with a sample of 8,782 schools. Roughly one third of them are public colleges or universities, and just over half are four-year institutions. They use a standard index of market concentration, the Herfindahl Index, to identify geographic regions where nonselective schools face

(continued as Competition on page 2)

Access, from page 1

of the same courses in-person students take, designed by the same faculty and graded using the same standards.

The researchers document very high demand for OMSCS, now the nation's largest computer science master's degree program, particularly from mid-career Americans who do not appear interested in the in-person version. Some 80 percent of those admitted to the online program enroll, suggesting few find compelling alternative educational options.

To study whether on-line education is just a substitute for an in-person alternative, the researchers exploit the fact that the first cohort of OMSCS applicants faced a GPA threshold that generated quasi-random variation in admission among otherwise identical applicants. Those just above the threshold were roughly 20 percentage points more likely to be admitted than those just below it. Moreover, the authors find that nearly all of those who were just above the threshold, and who were

admitted, chose to enroll in OMSCS. Very few applicants enrolled in non-OMSCS programs. Those just below the admission threshold were no more likely to enroll elsewhere than those just above it, which implies that the online program did not substitute for other educational options. These findings suggest that on-line access substantially increases the overall number of students enrolling, and that the higher education market was failing to meet demand for this online option.

Blind grading of exams suggests OMSCS students learn as much as their in-person counterparts. They also persist at rates substantially higher than in many online settings, with likely degree completion rates between 60 and 90 percent. Such persistence rates among the nearly 1,200 Americans enrolling each year implies OMSCS will produce at least 725 new American master's degrees annually. Roughly 11,000 Americans earn their master's degree in computer sci-

ence each year, implying this single program will boost annual national production of American computer science master's degrees by about seven percent.

The researchers suggest that online programs using the low-cost, high-quality model highlighted here could tap unmet demand for skill upgrades in other fields. They note that the University of Illinois Urbana-Champaign offers an online version of its MBA, that Yale is developing an online master's degree for physician assistants, and multiple universities in the edX consortium are offering "micro-master's" in various subjects.

"Online education can provide mid-career training without forcing individuals to quit their jobs or move to locations with appropriate educational institutions," they write. They point out that a key unresolved question is the effect of an on-line degree, relative to a traditional degree, on earnings and labor market outcomes.

— Steve Maas

Competition, from page 1

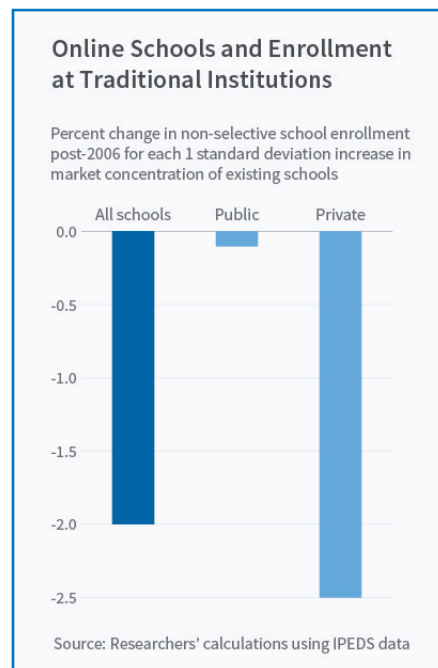
comparatively less competition.

The key shift in the intensity of competition from on-line institutions, which underpins the study's analysis, comes from 2006 changes in federal law which dramatically increased the prevalence of online institutions. Until then, an educational institution could not award online degrees unless at least 50 percent of its students attended classes in person. As part of the 2006 changes, this rule was eliminated.

The researchers studied the years 2000 through 2013 and found that "less-competitive markets experienced relative declines in enrollment after the expansion of online degree programs." They found particularly convincing evidence of enrollment decline for less-selective private institutions, which they point out "are likely to be online schools' closest competitors."

The study found that four-year public colleges pumped up per-pupil instructional spending when they faced increasing online competition. However, this was not the case at two-year schools or private institutions. In the face of revenue shortfalls from declining enrollment, they appear to have reallocated spending to keep instructional levels steady.

Private nonselective schools partially made up for lower enrollment by increasing tuition. While that response might appear counterintuitive, the researchers note that student sensitivity to price changes is mitigated by the availability of government grants and loans.



The study did not explore changes in tuition at public schools, on the ground that this "is not primarily determined by market competition."

In addition to studying the effects of the 2006 change in federal law, the researchers also use interstate differences in the degree of Internet penetration — which is a measure of the potential competitive role of online education — to assess the impact of such competition. They find that, after 2006, a 10 percent increase in penetration is associated with a 0.7 percent reduction in enrollment at nonselective schools and an increase of \$1,587 per student in instructional expenditures. They caution that these results, while suggestive, lack the precision of their earlier analysis, which exploits differences in the degree of competition between brick-and-mortar educational institutions across Metropolitan Statistical Areas or counties.

The researchers conclude that "the threat of 'disruption' from online education may cause traditionally sluggish and unresponsive institutions to improve quality or risk losing students."

— Steve Maas

The Earnings Gap between Black and White Men

Since the end of slavery a century and a half ago, differences between the earnings of black and white Americans have been a reality of the U.S. labor market. Among working men, this gap narrowed sharply between 1940 and 1970 and has remained largely stable ever since. In **Divergent Paths: Structural Change, Economic Rank, and the Evolution of Black-White Earnings Differences, 1940–2014**, (NBER Working Paper No. 22797), Patrick Bayer and Kerwin Kofi Charles point out that focusing only on those who are employed fails to account for the growing numbers of men who are not working for a number of reasons. This group includes those who are unemployed, disabled, or no longer searching for work, as well as the rising number of individuals who are incarcerated.

Among working men, “the median earnings gap between blacks and white fell by almost 60 percent from 1940 to 1980 (with large decreases in the 1940s and 1960s) but has been essentially flat ever since, remaining in the 35-40 percent range in every sample from 1980–2014,” the researchers report. But when they consider the entire population of men, they find that the earnings gap has actually widened substantially in recent decades. In 2010, the gap in the population as a whole was comparable to that in 1950.

Their analysis, which focuses on the black-white earnings differences among prime-aged men from 1940 through the Great Recession, “points to the incredible lack of progress and, in many cases, regress in closing the gaps in labor market outcomes for black and white men.”

The findings are most striking among median- and low-income blacks, whose position relative to median-income whites

changed little in the seven-decade study period. In 1940, the earnings of a median-income black earner fell at the 24th percentile of the earnings distribution for whites. At the time of the Great Recession, the comparable black earners’ earnings fall at the 27th

Over the past 75 years, the racial gap in economic rank has narrowed sharply among men at the top of the earnings ladder but changed very little among those at the middle and bottom.

percentile of the earnings distribution for whites — only a slight improvement in rank over the entire 75-year study period.

In contrast, a black earner at the 90th percentile of the distribution for African Americans saw progress relative to the earnings of whites. In 1940, the earnings of the 90th percentile black were comparable to those of

connection between education and economic rank, the researchers find. “Racial convergence in educational attainment would have led to strong positional gains for black men at the median and below, except that these men faced strong structural headwinds from the

simultaneously rising returns to education, both in terms of wages and in the probability of employment,” the researchers find.

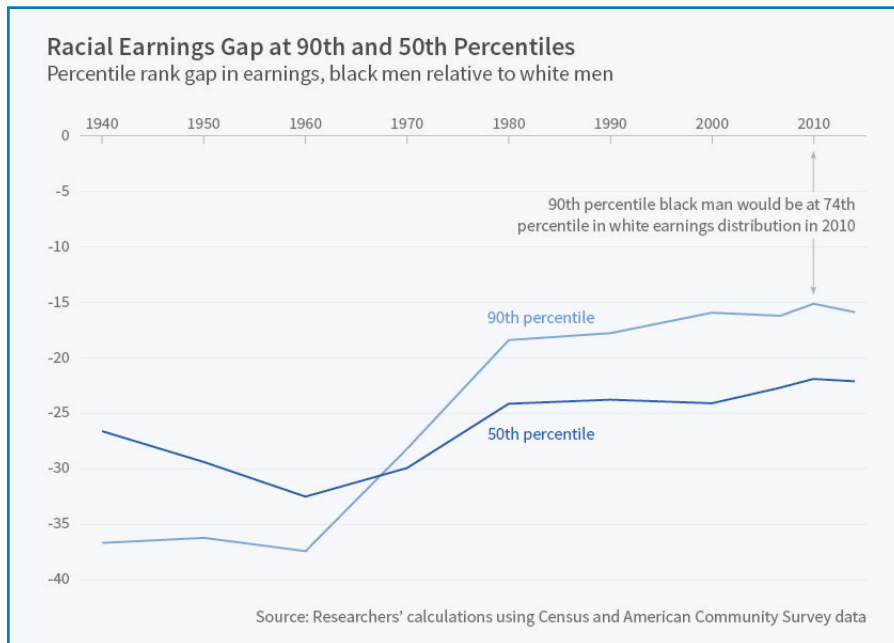
By contrast, high-skilled black men have moved closer to their white counterparts in income, which the researchers suggest has been due to more-equal access to quality higher education and high-skilled occupations.

“While the entire economy has experienced a marked increase in earnings inequality, this increase has been even more dramatic for black men,” the researchers find, “with those at the top continuing to make clear gains within the earnings distribution, and those at the bottom being especially harmed by the era of mass incarceration and the failing job market for men with low skills.”

The impact of rising incarceration is particularly striking: The incarceration rate tripled for black men between 1980 and 2010, from 2.6 percent to 8.3 percent of the population. The rate quintupled for white men, but remained much lower, at 1.5 percent of the population.

The researchers conclude that education “has played a subtle but extremely important role in the evolution of the racial earnings gap,” both fueling and stalling progress.

—John Laidler



the median white, but by the late 2000s, this earnings level had risen to the 75th percentile in the white earnings distribution.

The racial earnings gap around the median narrowed from 1940–70, due largely to broad economic forces which reduced the income disparities among all workers. But since then, the relative gains made by low-skilled blacks through improved education have been countered by the growing overall

Does ‘Gift Exchange’ Increase Charitable Giving?

How do potential donors respond to receiving gifts from organizations that appeal to them for support? That’s the central question in **It’s Not the Thought That Counts: A Field Experiment on Gift Exchange and Giving at a Public University** (NBER Working Paper No. 22867).

Researchers Catherine C. Eckel, David H. Herberich, and Jonathan Meer investigate whether gifts to donors raise giving by more than they cost. Their findings indicate that gifting, at least on a relatively small scale, does not pay off.

Previous experiments suggested that gifts are more appealing to donors if they can be used to indicate an affiliation with a prestigious or significant organization. With that in mind, the researchers partnered with an alumni association, the Association of Former Students (AFS) at Texas A&M University, and used luggage tags branded with the association’s logo as rewards.

In a direct mail appeal, the researchers contacted 140,642 Texas A&M alumni who had not donated the prior year or had recently graduated. Seven different treatments were used in the mailings to measure responses to requests for donations. Some solicitations included what the study terms an “unconditional” gift which came with the request for a donation and required no response. Some unconditional gift recipients received a leather luggage tag and some a plas-

tic one, to enable researchers to evaluate the impact of a gift’s quality on potential donors. Other treatments offered a “conditional” gift of a plastic tag which would be sent if a donation were made. As a

Researchers found higher likelihood of giving but no difference in donation size between the control group of potential donors that was not offered a gift and groups that were offered embossed luggage tags.

control, some mailings neither contained nor offered gifts. Noting that a significant number of subjects in previous studies had claimed they wished charities would save money on overhead by not offering gifts, the researchers offered

of as a more altruistic motivation,” the researchers conclude. “Rather, the motivation appears to be, at least in part, a desire for the item itself, whether for its direct value or the signaling value of an

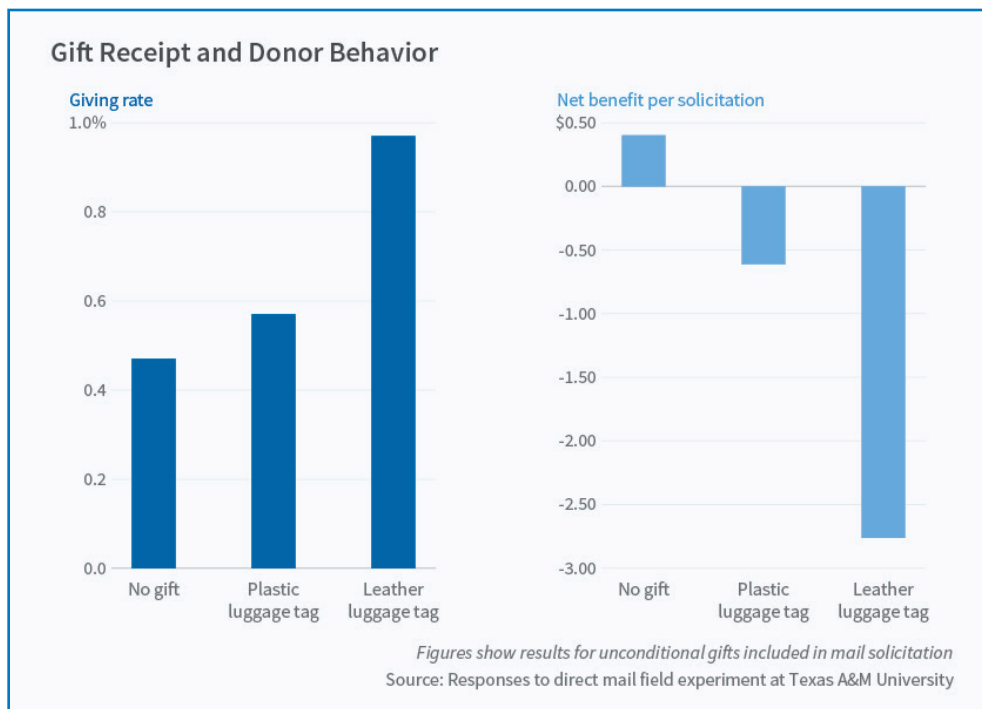
AFS-branded tag.” Most significantly for organizations planning donor appeals, the researchers found that there was no difference in donation size between the control group and the group that was offered a

luggage tag if they sent in a donation. Donations were higher when the luggage tag was included in the initial mailing as an unconditional gift. The quality of the gift also had an impact on donations; the leather unconditional gifts were associated with a higher likelihood of donations being made than the plastic unconditional gifts.

Those results notwithstanding,

the expense of shipping the item to all prospective donors exceeded the larger donations gained from the recipients of unconditional gifts. Solicitations including the unconditional leather gift produced a net loss of almost \$3 per solicitation. Solicitations that included the unconditional gift of a plastic tag lost \$0.70. Solicitations that did not offer a gift registered a net gain of \$0.26.

—Jen Deaderick



opt-in and opt-out choices in some of the conditional mailings. In addition, some envelopes had the text “special offer” displayed on the front.

The most surprising finding was that nearly two-thirds of those who donated to the appeal and were offered a gift opted to accept it. “This provides evidence that donors are not motivated by the desire to maximize the impact of their donation, which could be thought

Fiscal Adjustments and Economic Output

Economists have long studied and debated how fiscal adjustments affect economic output. New data, and new methods of analysis, continually influence this dialogue. At a very general level, changes in fiscal policy can take two forms: changes in taxes, and changes in government spending. Whether changes in taxes have the same effect on output as equal magnitude, but opposite signed, changes in spending, and whether the relative effects of tax and spending vary over the business cycle, are both open questions.

In **Is It the “How” or the “When” That Matters in Fiscal Adjustments?** (NBER Working Paper No. 22863), [Alberto Alesina](#), [Gualtiero Azzalini](#), [Carlo Favero](#), [Francesco Giavazzi](#), and [Armando Miano](#) address both of these questions. They test whether government expenditure reductions and tax increases have similar effects on output and investigate whether the effects of these policy actions depend on aggregate economic conditions prevailing when they are adopted. They find differences: At least in the short run, when governments pursue contractionary policies, tax-based adjustments are costly in terms of output losses, while expenditure reductions have very low output costs. This difference appears to be independent of the business cycle.

The researchers observe that actual fiscal policies “have little resemblance to the isolated fiscal ‘shocks’ often studied in the literature.” They point out that shifts in fiscal policy typically are designed to take effect

over a period of years; they are adopted after lengthy debates, and may be modified in unexpected ways by political deals made in legislatures shortly before they take effect. Also, they often are modified after implementation. Rather than study the effects of isolated fiscal shocks, the researchers study the effect of “fiscal plans,” which they define

Whether fiscal adjustments are implemented via tax or expenditure changes is an important determinant of their impact on national income, independent of the business cycle.

as announced deviations from the fiscal policy status quo that are implemented over a period of years.

Using original budget documents at the country level, the researchers reconstruct the historical fiscal plans carried out by 16

The classification variables allow the researchers to compare the results of similar fiscal plans announced in different countries at different points in the business cycle, and also to compare fiscal plans that rely primarily on tax and on spending adjustment. Their findings point to different effects for tax-based and expenditure-based plans. Expenditure-based fiscal adjustments imply output declines not far from zero, an average which can be the results of some having substantial costs and others being possibly expansionary. Tax-based adjustments induce recessions,

with output losses as large as three per cent of GDP after a few years, for an adjustment measuring one percent of GDP. By comparison, they find relatively little difference in the effect of a given plan announced at different points in the business cycle.

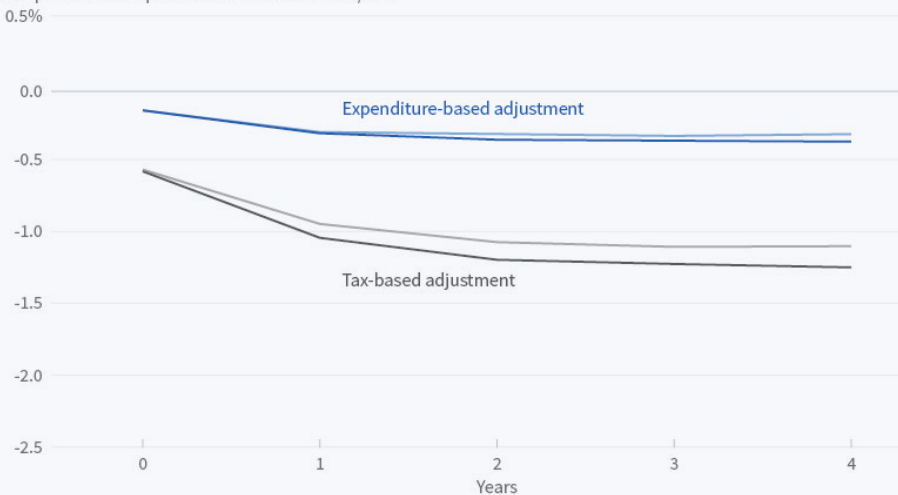
The researchers caution that they address effects on output, not on welfare. They remind readers that “losing one per cent of GDP when the

economy is already in a recession can be more harmful than losing the same amount of output when the economy is expanding.” They also remind the reader that the paper studies fiscal retrenchments; their results have nothing to say about fiscal expansions.

—Linda Gorman

Cumulative Output Effect of a Deficit Reduction Corresponding to 1% of GDP

Output effect of 1 percent reduction in deficit/GDP



Dark lines: economy is in an expansion; light lines: economy is in a recession
Source: Researchers' calculations using data from 16 OECD countries

OECD countries between 1978 and 2014, classify the measures that compose these plans as either “expected” or “unexpected,” and treat any unexpected amendment to an announced plan as a new plan. They classify each plan as tax-based or expenditure-based, and they construct a measure of business cycle conditions at the time the plan is announced.

Potential Biases of Ride-Sharing Drivers

The advent of the ride-sharing industry is rapidly changing the marketplace for transportation. New services are crowding the traditional taxi industry, which is subject to an array of local regulations, including strict anti-discrimination laws designed to prevent taxi drivers from offering differential services to potential passengers from different age, racial, or other groups. A new study explores whether drivers in the ride-sharing industry differentiate among potential customers.

In **Racial and Gender Discrimination in Transportation Network Companies** (NBER Working Paper No. 22776), Yanbo Ge, Christopher R. Knittel, Don MacKenzie, and Stephen Zoepf report the findings of field experiments in two cities, Seattle and Boston. Their results suggest that drivers for ride-sharing services are prone to discriminate against African Americans, making blacks wait longer for rides when they can identify the race of the ride-hailer and frequently cancelling rides when alerted to African American-sounding names. The disparities are particularly pronounced for black males. The researchers also find that ride-sharing drivers take female passengers on longer rides.

In each of the cities in which they

fielded their experiment, the researchers measured the performance of ride-sharing services via field experiments in which research assistants — whites and blacks, males and females — were randomly dispatched into

An experiment in two cities suggests that African Americans have to wait longer for pickups from ride-sharing services.

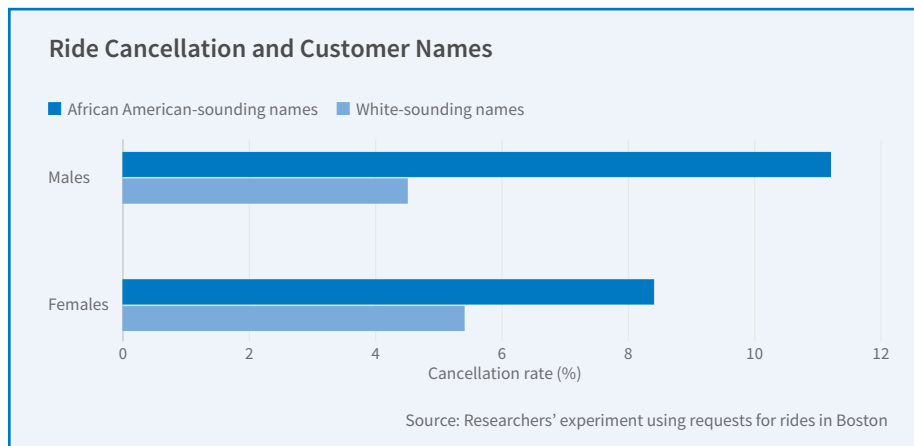
the field, at varying times of the day and to varying locations, to order, wait for, and ride in transportation network companies' vehicles. The research assistants carefully monitored and recorded pre-determined performance metrics for every ride they took, including how long it took drivers to accept ride assignments, how long passengers had to

In Seattle, the main finding was that African Americans had considerably longer waiting times for rides — as much as 35 percent more. In Boston, the researchers could measure the cancellation rates of the driv-

ers from some services after they had preliminarily accepted ride assignments. They modified their experiments so that some students hailing rides used "white-sounding" names while others used "African-American-sounding" names. They found more frequent cancellations — roughly twice the level for white-sounding names — when the students used African American-sounding names. Male passengers requesting a ride in low-density areas, such as in the country or suburbs, were nearly four times more likely to have their trips canceled when they used an African American-sounding name than when they used a white-sounding name.

The researchers note in conclusion that changing the information about potential customers which ride-sharing services provide to their drivers might affect some of the patterns that they observed.

—Jay Fitzgerald



wait until drivers arrived, and how long and expensive rides were for each passenger. In all, research assistants conducted nearly 1,500 individual rides in Seattle and Boston. In each city, the research assistants summoned rides from several ride-sharing firms.

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