

Street Harassment and Women's Educational Choices: A Geospatial Analysis

GIRIJA BORKER, WORLD BANK/BROWN UNIVERSITY

data2x^o

Introduction

How does the threat of street harassment affect women's lives? Using a combination of student surveys, Google Maps data, and crowdsourced information from mobile applications, this study looks at how safety concerns influence educational choices among women in New Delhi, India. The research finds that women choose poorer quality colleges, spend considerably more on transportation, and accept longer commute times in order to travel by routes that are perceived to be safer. In addition to the risks of harassment and assault, an unsafe public sphere inflicts serious educational and economic consequences on women. These costs are felt both immediately and over the course of a lifetime, in the form of reduced labor force participation and earnings.

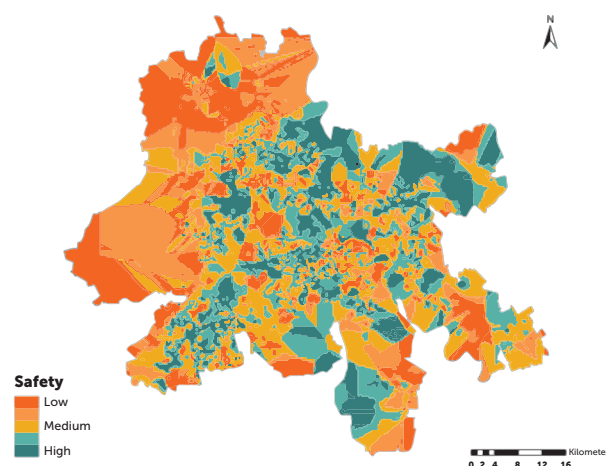
Our Approach

Delhi University (DU) is an umbrella entity comprised of several colleges spread across the city. Each college has its own campus and operates like an independent university, and selectivity in admissions provides a reliable indicator of college quality. A survey of 4,000 DU students identified the "choice set" of colleges available for each student, or the set of colleges that a student is eligible to attend based on their high school exam scores. The colleges captured in the sample span the range of quality in DU as a whole and the students in the sample are representative of the wider student body in the University.

An algorithm developed for this study used Google Maps to map all possible routes available for students to take to each college in their choice

set, where routes are defined as a combination of landmarks and travel modes.

Figure 1. Safety surface of the Delhi metropolitan area.

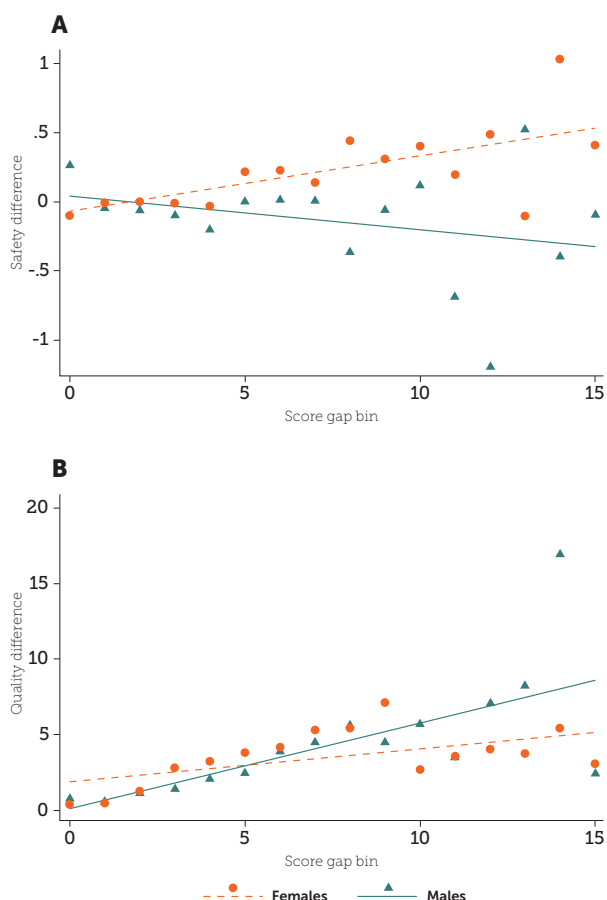


These routes are overlain on a "safety surface" (Figure 1) constructed using a crowd-sourcing mobile application, SafetiPin. Over 26,500 SafetiPin audits from November 2013 to January 2016 provided information about openness of spaces, visibility, presence of security personnel, condition of the walking path, presence of other people (especially women and children), access to public transport, lighting, and the overall feeling of safety. Students' actual and potential routes are assigned a safety score on the basis of the safety surface and safety associated with a travel mode. The latter is estimated using data from Safecity, which has over 5,500 reports of harassment on different modes of transport, including buses, rickshaws, metro, and walking. A comparison of male and female students with similar characteristics (same neighborhood, major, admission year, etc.) allows comparative analysis of the costs students pay — in terms of quality of college chosen, money, and time — for safety.

Results

Despite having better scores on high school exams, women choose worse quality colleges than men — both in absolute terms and within the set of colleges for which they are eligible. Generally, women are willing to trade a college in the top 20% of quality for one in the bottom 50% — on average, nearly nine ranks lower in their choice set — in order to travel by a route that offers about a one standard deviation (SD) increase in safety, which represents around a 3.1% decrease in the risk of rape. Men, on the other hand, choose colleges only about one rank lower in their choice set for the same degree of added safety. Figure 2 illustrates these gendered differences in decision making.

Figure 2. Gendered educational choice.



The horizontal axis represents differences in high school exam scores between students and their neighbors (other students of same gender, from the same residential area, studying the same major with the same admission year).

A higher score gap bin represents higher-achieving students with an expanded choice set of colleges who, absent safety concerns, should choose higher-quality colleges. The vertical axis shows differences in the safety of the chosen travel route (Panel A) and quality of attended colleges (Panel B) between students and neighbors. The graph in Panel A shows that as their choice set expands, female students (red dotted line) choose safer routes to travel by compared to males (solid blue line). Panel B shows the relationship between high school quality and college choice is weak for women, and much stronger for men.

Women also spend INR 20,000 (USD 310) more per year for added safety, nearly 16 times as much as men — a gap that is nearly double the average annual tuition at DU, and about 75% of annual per capita income in Delhi. Women are also willing to travel 40 minutes more daily for a safer route, in comparison to just four minutes more for men.

Implications

In Delhi, 95 percent of women between the ages of 16 and 49 report feeling unsafe in public spaces. In the sample used in this study, nearly nine out of ten female college students have faced some form of harassment, and 40% have been touched, groped, or grabbed. Public areas represent serious daily risks to the security of women and girls.

This study shows that the indirect costs of harassment are also very high. Choosing a worse quality college affects later academic training, peer network, access to jobs, and lifetime earnings — and may affect aggregate economic productivity for a society. In India, labor force participation rates for working-age women have stagnated at 26-28% in urban areas between 1987 and 2011. The drivers of this low participation rate are not clear, but lack of physical security in public areas may be a contributor. This study finds that policies to increase safety of travel routes — improving street lighting, funding self-defense programs, and assuring security on public transit, for example — can have powerful impacts on reducing gender gaps in school quality, costs of transport, and commute time.