

Differences in urban mobility and experienced isolation between young people and adults

Based on an analysis of mobile-phone data, students experience greater income-based and racial isolation than adults, and this gap is largest in the biggest metropolitan areas. Students also experience less urban mobility than adults. Yet, differences between students at different levels of income are even greater than those between students and adults.

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The question

City-dwellers have access to many amenities, such as commercial centres, public goods and social infrastructure. Yet proximity may not translate into use – particularly for lower-income youth, who lack funds and cars and whose highly local amenities may differ substantially from those in wealthy neighbourhoods. An alternative view is that those with a lower opportunity cost of time (that is, those for whom urban exploration does not come at the cost of leaving a high-earning job) are able to travel more and spend more time interacting with their environment.

To what extent do students take advantage of urban amenities relative to adults? Does household income moderate which students benefit from urban amenities, despite many free public goods in cities? These questions are especially pertinent considering recent work that shows that children in denser areas experience less upward economic mobility¹.

The observation

We have used GPS data from mobile phones to test whether students – lower-income students in particular – seem to take as much advantage of the city as their older and wealthier counterparts. We followed the work of Athey et al.², Browning et al.³, and other research groups in investigating experienced racial isolation as distinct from residential racial isolation. We also measured experienced income-based isolation, as well as a series of urban mobility outcomes including visits to amenities, exploration of new places and distance travelled. We then compared these measures between students and adults, and across different income groups.

We found that students experience more income-based and racial isolation than adults. The difference is starkest in the biggest cities. For example, in the smallest third of metropolitan areas, the racial isolation of students is less than 10% higher than that of adults, but is 42% higher in the largest third.

Turning to urban mobility, we found a more complex picture, with students generally experiencing less urban mobility than adults. Within the population of students, there is a strong positive relationship between urban mobility and income (Fig. 1). Higher-income students visit more amenities, spend more time outside the home and explore more unique locations than lower-income students. Controlling for tract of residence (that is, comparing only people that live in the same narrowly defined area of a city) reduces the effects by around half, suggesting that both highly local neighbourhoods and household income – separate from neighbourhood of residence – play a role in the effects we observe.

Future directions

Our work suggests that students live more isolated lives than their adult counterparts, especially in the largest cities. Moreover, lower-income urbanites seem to make less use of many urban amenities, which are themselves core benefits of urban life. Wealth seems to be a complement to, rather than a substitute for, enjoying the pleasures of urban life.

Students' urban mobility is higher in areas that have higher car ownership, are less dense, have higher neighbourhood income and have higher measures of social capital. These descriptive analyses highlight how city life varies by age and income, but we are not able to identify the underlying sources of urban mobility differences. Furthermore, although our research is partially motivated by the finding that children in denser areas experience less upward economic mobility, we cannot speak to the long-term consequences of reduced urban mobility. We hope future work will help shed light on why lower-income residents seem to get less out of cities and will quantify the long-term consequences of reduced urban mobility.

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EXPERT OPINION

“The mobile-phone data have clear advantages in their size, distribution across all large metro areas and long-term temporal coverage. In this sense, this paper is an important contribution to the emerging set of empirical findings drawn

from large-scale mobile-phone mobility data and, overall, is a rich set of descriptive analyses that is likely to advance research on the mobility patterns of important subpopulations.” **An anonymous reviewer.**

FIGURE

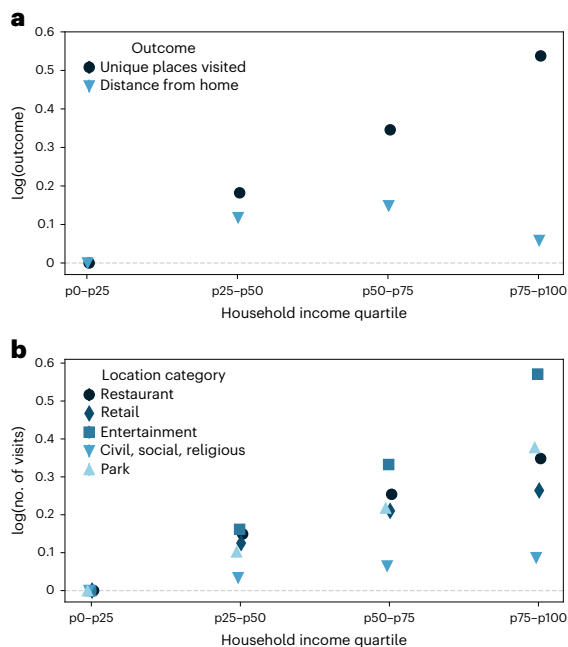


Fig. 1 | Urban mobility of students depends on income. Two measures of urban mobility that we have derived from GPS data – roaming range (a) and amenity visits (b) – are shown in relation to the quartile of household income. Higher-income students visit more amenities and explore more unique locations than lower-income students. © 2024, Cook, C. et al.

BEHIND THE PAPER

This project started with the following puzzle: why do adults benefit from living in cities while children seem to have reduced upward economic mobility in denser areas? Economic research has shown that wage growth for adults is faster in larger cities, but new research on economic mobility seems to suggest a less positive relationship for youth. We became curious about how recent

measures of experienced segregation for adults would look for youth. Once we began looking at experienced outcomes, we realized it could be insightful to examine a range of urban mobility measures and to see how they varied across neighbourhoods and between people. **L.C. & C.C.**

REFERENCES

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2. Athey, S. et al. Estimating experienced segregation in US cities using large-scale GPS data. *Proc. Natl Acad. Sci.* **118**, e2026160118 (2021). **This paper presents a measure of individuals’ exposure to diverse others in the places they visit over the course of their days.**
3. Browning, C. et al. Geographic Isolation, Compelled mobility, and everyday exposure to neighborhood racial composition among urban youth. *Am. J. Sociol.* **128**, 914–961. **This paper explores variation in the residential racial composition of everyday activity locations of youth.**

FROM THE EDITOR

“This paper struck me as a creative look at the reality that cities offer upward mobility to adults but not to the young. The finding suggests that exploration matters but that adult exploration of economic space, in the form of job options, is not reflected in youth’s exploration of physical space outside the home, a tension that bears further study.” **William Burnside, Chief Editor, Nature Cities.**