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Who gets left behind by left behind places?

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We document that children growing up in places left behind by today's economy experience lower levels of social mobility as adults. Using a longitudinal database that tracks over 20,000 places in the USA from 1980 to 2018, we identify two kinds of left behind places: the 'long-term left behind' that have struggled over long periods of history; and 'recently left-behind' places where conditions have deteriorated. Compared to children of similar baseline household income levels, we find that exposure to left behind places is associated with a 4-percentile reduction in adult income rank. Children fare considerably better when exposed to places where conditions are improving. These outcomes vary across prominent social and spatial categories and are compounded when nearby places are also experiencing hardship. Based on these findings, we argue that left behind places are having 'scarring effects' on children that could manifest long into the future, exacerbating the intergenerational challenges faced by low-income households and communities. Improvements in local economic conditions and outmigration to more prosperous places are, therefore, unlikely to be full remedies for the problems created by left behind places.

Keywords: social mobility, inequality, left behind places, spatial inequality, economic geography, demography

JEL Classifications: J62, R23, J15

Introduction

Growing political discontentment across Europe and North America has triggered a new wave of studies that examine economic disparities across regions and communities (Connor et al., 2023; Ganong and Shoag, 2017; Gyourko et al., 2013; Kemeny and Storper, 2023). Places that are being left out or left behind by current regimes of economic growth look precarious with respect to personal incomes, livelihoods, social infrastructures and innovation (MacKinnon et al., 2022). Existing studies highlight these places as sites of growing populist political sentiment (Lee et al., 2018; Rodríguez-Pose, 2018), rising inequality and job insecurity (Tomlinson, 2016), and declining life expectancy (Case and Deaton, 2020). What remains uncertain, is how long the effects of living in a left behind place today will last into the future and over the coming generations.

Research on intergenerational mobility suggests that the life chances of children today will be determined,

in part, by how the communities in which they live are adapting to the New Economy. Growing up in contexts with high levels of family and community stability, well-funded schools, and low levels of poverty are all predictive of upward income mobility (Chetty et al., 2014; Connor et al., 2022; Sampson, 2019), albeit moderated by other dimensions of social inequality such as race and ethnicity (Abramitzky et al., 2021; Chetty et al., 2016a). While these place effects can be highly persistent over time and have 'deep roots' in history, they are also subject to cycles of change in regional economic fundamentals (Connor and Storper, 2020). The punishing effects of economic restructuring on workers, families and communities has long been noted in the literature (Putnam, 2016; Wilson, 1996). If exposure to the economic and social disadvantages that characterize left behind places does curtail the life chances of residents, then a failure to change the prospects of these places will compound negative future

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effects and amplify inequality through its scarring effects on children. This will be particularly true if these contexts shape attitudes, behaviours, and the development of skills early in life, with lasting repercussions.

By studying the adult economic outcomes of the people who grew up in these contexts, this article provides new insight into the inequality-generating effects of left behind places. Our primary hypothesis is that children growing up in places left behind by the current era of economic change will experience constrained upward mobility, even after accounting for baseline family conditions. Using new data that links four decades of economic change across communities in the USA to local upward income mobility, we provide a first set of insights on how growing up in a left behind place could curtail the long-term economic prospects of children. We investigate whether such effects vary according to sex, race, ethnicity and location, and attend to additional issues of spatial scale, trajectory and dimensionality among left behind places.

The determination of what counts as a 'left behind place' has implications for both scientific analysis and policy action (Houlden et al., 2022). Yet, despite growing interest in left-behindness as a concept, there remains ambiguity about its identifying features. Using a longitudinal database to track the characteristics of over 20,000 Incorporated and Census Designated Places in the USA from 1980 to 2018, we classify places based on changes over the study period along four dimensions: education levels, poverty and unemployment rates and average incomes. Based on these observations, we classify places into one of four mutually exclusive trajectories: the long-term left behind; the recently left behind; the no longer left behind; and the never left behind. We investigate the impacts of children's exposure to these contexts, while also considering the scalar structure of these places with respect to nearby communities and to the regional contexts in which they are embedded.

Our analysis thus contributes to two strands of literature: work on how geographic forces shape intergenerational mobility (Berger and Engzell, 2019; Chetty et al., 2022; Connor and Storper, 2020; O'Brien et al., 2022; Rothwell and Massey, 2015) and studies concerned with the problems with places that are left behind (Kemeny and Storper, 2020; Lee et al., 2018; MacKinnon et al., 2022; Martin et al., 2021). We contribute to work on left behind places by proposing a new way of theorizing and measuring left-behindness that is sensitive to scalar issues, urban and rural differences, intertemporal change, and differentiation among left behind contexts, specifically, between the long-term, the recently and the no longer left behind. Descriptively, we show that these community trajectories are distinct from one another, in terms of a wide range of local demographic attributes, and their effects play out differently according to gender, race, ethnicity and migrant status. Our findings support

the call for the multifaceted conceptualization and measurement of left-behindness. Similarly, we demonstrate that it is not just a person's home community that affects his or her prospects, but also the economic trajectories of neighbouring communities. To the growing literature on intergenerational mobility, our study documents how place-based patterns of economic change (and also the patterns of nearby places) are linked to differences in upward income mobility.

After adjusting for a wide range of community characteristics, as well as the regional labour market areas ('commuting zone') in which places are situated, we find that exposure to left-behindness is associated with lower rates of upward mobility. Growing up in a place that is characterized as either long-term or recently left behind is associated with a 4-percentile reduction in the adult income rank of children from low-income households. Approximately a quarter of this penalty can be attributed to the child's exposure to the place in question, while the remaining three quarters can be explained by the influence of neighbouring places and broader regional labour market conditions. These estimates point to the inequality-exacerbating effects of left-behindness and the multi-scale nature of the problem.

Not all forms of left-behindness exhibit the same kinds of links to intergenerational mobility. In particular, long-term left behind regions exhibit the largest mobility penalties, followed by recently left behind, and then the no longer left behind. Although children from this latter trajectory of places—locations where conditions are improving—exhibit higher levels of upward mobility than individuals from struggling places, they do not fully close the gap with their peers from places with no recent experience of left-behindness.

We conclude the analysis by examining how these associations play out by gender, race, ethnicity and migrant status. First and foremost, Black, Hispanic and Native American households are overrepresented in left behind places, and are, by virtue of this fact, more exposed to the issues that are arising in these contexts. This finding, however, comes with an important caveat: Whites exhibit some of the greatest variance in outcomes across different kinds of places. The largest within-group inequality in upward mobility is between Whites who grew up in left behind places and those who do not. In fact, among households from left behind places, low-income Whites experience lower levels of upward income mobility than do their Hispanic peers. This finding is in line with other recent studies focused on the spatial and political polarization of working-class Whites over recent elections (Fotheringham et al., 2021; Miller and Grubestic, 2021; Monnat and Brown, 2017). We conclude by showing that the curtailed upward mobility associated with left behind places is evident among males and females, and even among those who decided to leave their childhood region. This implies that

policies which seek to remedy these problems by incentivizing migration out of left behind places will fail to eliminate the scars that these places have left on individuals.

Contributions to literature

We contribute to two related, but as yet largely unlinked, literatures: one focused on the causes and impacts of regional left-behindness; the other on intergenerational social mobility. To the literature on left behind places, we introduce a multidimensional perspective on the concept of left-behindness that attends to underexamined issues of temporal and spatial scale. We similarly emphasize the potential importance of spatial scale within the intergenerational mobility literature by examining contextual effects at the local and regional levels.

In recent decades, subnational disparities in incomes, output, and productivity have grown in Europe, the USA, the UK and many other economies (Ehrlich and Overman, 2020; Kim, 2008; Rice and Venables, 2021). Research on these disparities has commonly focused attention on a particular subgroup of locations that is seen to be increasingly being 'left behind' by the highest-performing local economies (Kemeny and Storper, 2020). Studies show that spatial income disparities between these and other locations are linked to place-based gaps in job insecurity and joblessness (Austin et al., 2018; Tomlinson, 2016); career advancement (Eckert et al., 2022); race-based exclusion (Sitaraman et al., 2020); health (Case and Deaton, 2020; Singh et al., 2017), and especially cultural and political polarization and the rise of populist politics (Abreu and Öner, 2020; Cramer, 2016; Dijkstra et al., 2020; Hendrickson et al., 2018; Lee et al., 2018; McCann, 2020; Rodríguez-Pose, 2018). Yet, despite this growing attention, we remain at an early stage in terms of how we understand left behind places and what is happening to the people within them (MacKinnon et al., 2022).

The identification of a left behind place is an area in need of much greater consensus. What features mark a place as left behind? Existing work suggests that we should focus on locations that have not adapted successfully to secular processes of economic change, in particular those that are deindustrializing as well as those that are rural (MacKinnon et al., 2022). Yet left-behindness is likely to be multidimensional, incorporating social, demographic and cultural considerations (Gordon, 2018). Despite this, many studies proxy left-behindness by focusing on measures like low levels of gross domestic product per capita (Iammarino et al., 2019). While such measures may be reasonably well correlated with other aspects of welfare, there remain significant national scale residuals (Jones and Klenow, 2016), which are also likely to be found at the subnational scale.

Existing research suggests that the temporality of left-behindness is as important as its social and economic di-

mensions. For instance, studies like Gordon (2018) and Lee et al. (2018) argue that medium- and long-term dynamics—especially downward change in economic circumstances—play an important role in shaping local voting patterns (that is, Gordon, 2018; Lee et al., 2018). Implicitly, what matters is not just where a place is now, but where the place came from as well as its likely trajectory into the future. Recent work like Houlden et al. (2022); Connor et al. (2019); Connor and Storper (2020), and Kemeny and Storper (2023) build on this idea, using explicitly longitudinal tools to characterize groups of places and regions following comparable economic pathways through time. Such work reveals that spatial inequality is highly differentiated and, depending on the trajectories of places, the prospects for economic convergence will be varied and uncertain with respect to individual and community outcomes.

A further, and surprisingly little explored dimension of this problem is that of spatial scale. At what scale should we be looking for features of left-behindness? Existing empirical work has mostly operationalized left-behindness at the scale of subnational regional economies. Dijkstra et al. (2020) and Essletzbichler et al. (2018), for example, consider gaps among European NUTS3 regions as well as metropolitan areas. Both of these units approximate functionally integrated regional economies, with each constituted by a much larger collection of smaller places and communities. At a finer scale, Jennings and Stoker (2018) contrast the political choices of residents in British towns and cities. In the USA, Austin et al (2018) consider differences in non-employment among public-use microdata areas—a statistical concept which divides states into contiguous zones of no less than 100,000 residents. The decision to focus on the regional scale is not purely a methodological consideration. Even if not fully articulated, a focus on regions asserts a specific conceptualization for how key outcomes are produced; it may influence findings; and will ultimately direct policy in some directions at the expense of others. As a starting point, our best guess is that left-behindness is not an essential property of one spatial scale or another, but should rather be considered based on what we know of the outcomes of interest.

In addition to our connection to the literature on left behind places, the present study contributes to a rapidly growing body of work on the geography of intergenerational mobility. Intergenerational mobility refers to the degree to which children move up the economic hierarchy relative to their parents. The ability for individuals to climb the economic ladder through hard work has been a long-lasting societal value of the USA, and one that has been used to justify a tolerance for high income inequality (Long and Ferrie, 2013). These values are however under threat, due to mounting evidence that US intergenerational mobility has fallen over time (Song et al., 2020), as opportunity

increasingly selects for households and places with schooling advantages (Connor and Storper, 2020; Tan, 2022).

Shifting from a long tradition of examining mobility outcomes at the scale of individuals or societies (Becker and Tomes, 1979; Blau and Duncan, 1967), the last decade of research has seen a veritable explosion of work on the role of intermediate geographic forces on intergenerational outcomes, beginning mainly with Chetty et al. (2014). This recent work has examined the determinants of intergenerational mobility at the scale of neighbourhoods (Chetty et al., 2016b; Sampson, 2019), communities and places (Connor et al., 2022; Putnam, 2016), counties (Chetty et al., 2014; Ewing et al., 2016; Leonard and Smith, 2021), and regions (Connor and Storper, 2020; Delajara et al., 2022). These studies find that local contexts play a key role in shaping upward mobility because they shape norms, aspirations and the acquisition of human capital early in life, with sizeable effects on labour market outcomes later in life.

One area where relatively little is known is how local economic change may affect opportunities for upward intergenerational mobility. Connor and Storper (2020) demonstrate that long-term shifts in the regional geography of opportunity are linked with broader changes in the location of economic activity. Analyses of the contemporary period also document negative associations between exposure to automation and intergenerational mobility (Berger and Engzell, 2022), perhaps because of the deterioration of local tax bases through the loss of activity (O'Brien et al., 2022) and related unfavorable patterns in rural poverty, inequality and household conditions (Connor et al., 2022). The findings of these studies point to forms of localized economic trauma that trickle down into communities, subsequently limiting children's long-term prospects for upward mobility. We know little, however, about where and at what scale these changes are playing out, whose intergenerational mobility is being curtailed, and how these patterns might fit with our current understanding of left behind places.

Is upward mobility, and how it is shaped by economic geography, fundamentally a question for communities and neighbourhoods, for regions, or for both at once? The former are relevant contextual units for social interaction, political decision making, and human development. At the same time, regional economies condition possibilities for skill development and good jobs, which should be material for intergenerational mobility. Moreover, regions and the neighbourhoods within them interact through the exchanges of goods and services and commuting flows. These interactions may themselves shape local landscapes of opportunities. While the formal examination of spatial spillover effects is common in regional science, in the literatures on intergenerational mobility and on left behind places, such spillovers have only been lightly explored.

Data and methods

To study the association between left-behindness and social mobility, we need to measure the recent economic trajectories of places and integrate this information with intergenerational income mobility data. As articulated in a recent study by Houlden and colleagues, we approach left-behindness through an analytic framework that emphasizes the trajectories of places, is sensitive to spatial scale, and also contends with the challenge of multidimensionality (Houlden et al., 2022). Taking these issues seriously, we assembled a place-level longitudinal dataset that characterizes the economic and social conditions of places over time, with sufficient spatial resolution for investigating issues related to local spatial contexts.

Longitudinal database of places

Our longitudinal database of places is constructed using place-level census data drawn from the National Historical Geographic Information System and the American Community Survey. The rural components of this dataset were prepared in earlier work (Connor et al., 2022; Hunter et al., 2020; Uhl et al., 2023), which has set the stage for our integrated analysis of urban and rural places. This dataset contains information across a range of place-level demographic and socioeconomic variables in 1980, 1990, 2000, 2010, and 2018 for over 20,000 places in the United States. The 2010 and 2018 data are drawn from the five-year estimates of the American Community Survey. When combined, this information allows us to characterize the trajectories of places over time.

Our focal units of analysis are Incorporated and Census Designated Places. These place-level units were once a popular scale for analysis in rural demographic research, such as in Fuguitt's (1971) appropriately titled work the 'The Places Left Behind'. Places have recently re-emerged as an insightful scale of analysis. This is because, as compared with other common units of analysis like counties or census tracts, places better cohere with the scales of rural and urban contexts around which individuals immediately live their lives (Hunter et al., 2020). Moreover, in a recent study of rural places, Connor et al. (2022) document that a large share of the variation in intergenerational mobility is between places within the same county.

Classifying left behind places

We define left-behindness as a multidimensional process driven by the change of several social and economic factors: poverty rate, median household income, unemployment rate and college attainment. We measure left-behindness based on the change in a rank-based index of these four factors for four main reasons. First, as is clear from our review of the literature, left-behindness refers to a set of local conditions that cannot be directly linked to any single economic indicator. Second, measuring

left-behindness with a single variable invites measurement errors. For example, a plant closure could temporarily depress local employment levels, while the local poverty rate remains unchanged or the stock of human capital remains intact. By measuring left-behindness along multiple dimensions, we can better address such transitory economic shifts and avoid misclassification of local contexts. Third, we use the rank of places along each factor to construct our index, recognizing that left-behindness refers to a form of *relative* performance within the broader economic system. Fourth, we define left-behindness across time because we are interested in the trajectory of local performance.

We use a four-step process to assign places to trajectories. First, for each period t within our 1980–2018 study period, we identify the percentile rank of each place i within the national distribution of places for each of our four indicator variables. Second, we then calculate the Left Behind Index (LBI) from the average rank across our four indicator variables for each period as:

$$\text{Left Behind Index}_{it} = \frac{r\text{Pov}_{it} + r\text{Inc}_{it} + r\text{Unemp}_{it} + r\text{Edu}_{it}}{4} \quad (1)$$

Third, we then rank order these average ranks. If, in a given year, a place falls below the 25th percentile of the Left Behind Index, we identify it as left behind at that point in time. Finally, because we are interested in the trajectory of a place, we assign places into one of four trajectory categories. We present the relative size and criteria associated with these trajectories in [Table 1](#). A place is never left behind ('Never LB', 70%) if it did not fall below the 25th percentile of average ranks at the starting point (1980 or 1990) or at the end point of our analysis (2010 or 2018). A place is no longer left behind ('No longer LB') if it is below the 25th percentile of average ranks at the starting point, but above the 25th percentile at the endpoint (8%). A place is recently left behind ('Recently LB') if it was above the 25th percentile at the start point but was below the 25th percentile of average ranks at the endpoint (9%). Finally, a place is long-term left behind ('Long-term LB') if it is below the 25th percentile at both the start and end point (13%). We use the Never LB trajec-

tory as a benchmark for assessing outcomes across our three left behind trajectories.

[Figure 1](#) uses an alluvial plot to visualize the movement of places in terms of the quartiles of their average economic ranks at the start (1980–1990) and end (2010–2018) of our study period. The size of the flows refers to the number of places within a given transition. The long-term left behind places are exclusively confined to the lowest quartile across our four economic indicators (light red). Most of the recently left behind (dark red) places fall only a short distance, from initially being in the second lowest quartile on the four economic variables to dropping into the lowest quartile. A minority of recently left behind places fall from the higher baseline quartiles. Similarly, most of the no longer left behind places move up to the second quartile, but some rise up even higher.

Measuring intergenerational social mobility

We measure the intergenerational mobility levels of children who grew up in these places with recently published data from Opportunity Insights ([Chetty et al., 2018](#)). Opportunity Insights have published the richest set of US-based intergenerational mobility and migration estimates to date. These estimates detail the adult income and migration outcomes of 20.5 million (or over 96%) children from the 1978 to 1983 birth cohorts, who were born in the USA or arrived as authorized immigrants during childhood. The original data assigns children to neighbourhoods based on the proportion of their childhood that they spent in a given neighbourhood (census tract). Although these estimates are purely observational, Chetty et al. (2018) have validated the data against findings from experimental research such as the Moving to Opportunity program ([Chetty et al., 2016b](#)).

Our preferred dependent variable captures the adult income levels of children who grew up in low-income households. The construction of this measure relies on income measurements at two points in time. The parent's income is measured when the individuals of concern are in childhood. As we are interested in upward income mobility, we

Table 1. Classification of left behind places by trajectory.

Trajectory	1980 or 1990	2010 or 2018	N	Share (%)
(1)	(2)	(3)	(4)	(5)
Long-term left behind	Yes	Yes	2573	13
Recently left behind	No	Yes	1934	9
No longer left behind	Yes	No	1688	8
Never left behind	No	No	14,375	70

Notes: A table highlighting the criteria used to categorize the trajectory of left behind and other places. Column 1 shows the trajectory names. Columns 2–3 show a matrix of the conditions required in the base (1980 or 1990) and end periods (2010 or 2018) to be classified to each trajectory based on the average percentile rank of college attainment, median household income, unemployment share, and the share in poverty. We refer to the combination of these variables as the 'Left Behind Index'. Columns 4 and 5 show the count and total share of places in each trajectory.

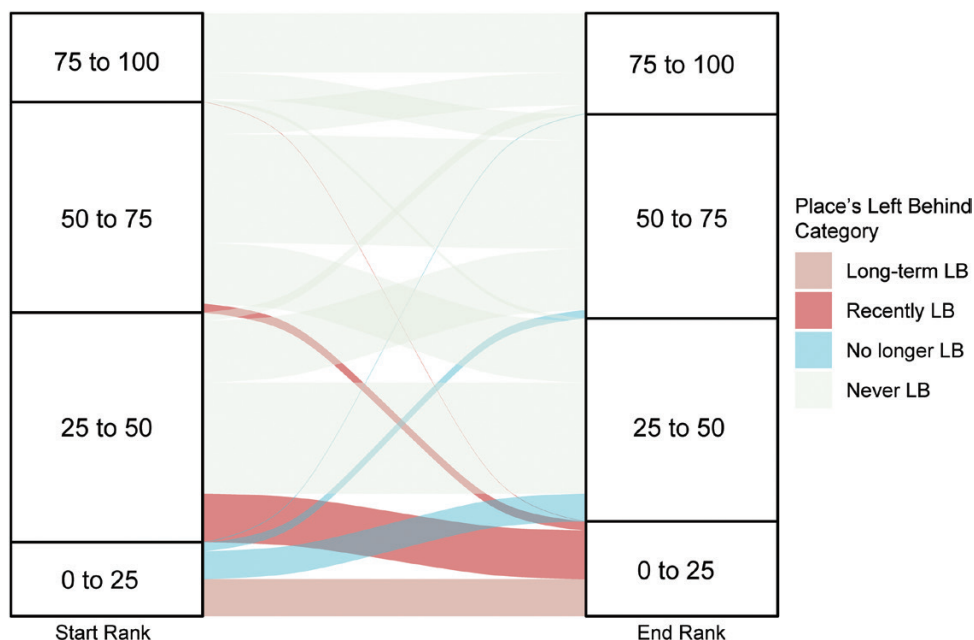


Figure 1. Trajectories of places across economic rank quartiles.

Notes: A flow chart highlighting the movement of places by economic quartile. The rank measure is defined in Equation (1). The starting period refer to 1980 or 1990 and the end period refers to 2010 or 2018. We colour the flows according to the four trajectories. The salmon flow represents long-term left behind places. The red flow shows the downward movement in rank for recently left behind places. The blue flow shows the upward movement of no longer left behind places, which remain outside of the 25th percentile categories. The light green flows show the movement of never left behind places.

focus on children whose parents had incomes at the 25th percentile of the national income distribution.¹ The 25th percentile of the national income distribution is equivalent to around \$27,000 in annual income. Our dependent variable is therefore derived from the adult personal income rank of these children in the national income distribution in the 2014–2015 period.

As the intergenerational mobility estimates from Opportunity Insights are published at the tract scale, we needed to rely on estimates that have been areal-interpolated to the place scale (Goodchild et al., 1993). Connor et al. (2022) generated these place-based estimates by applying the methods of ‘dasymetric refinement’ to census tract data (Leyk et al., 2013). Connor and collaborators used ancillary satellite-based raster imagery from the 1992 National Land Cover Database to perform this re-estimation procedure. The result of this work is that all tract-level intergenerational mobility estimates are available at the scale of places and available for use here.

Measuring ‘neighbourhood effects’ for left behind places

A key strength to studying left-behindness at a sub-regional scale, as we do, is that it enables us to examine neighbourhood or regional effects from the ‘bottom up’. This flexibility helps us to incorporate the exposure of

individuals to nearby local and regional conditions (for example, Kwan, 2018), and to avoid or investigate potential aggregation issues such as the Modifiable Areal Unit Problem (MAUP), or by its newer name the ‘Openshaw effect’ (Goodchild, 2022; Openshaw, 1984). Specifically, we can examine whether the effects associated with exposure to left behind places are amplified when other nearby places are also experiencing hardship.

We follow the approach employed by Chetty et al. (2018), in their examination of the poverty rate of neighbouring census tracts and census blocks on upward mobility in the 50 largest commuting zones. They find that at the neighbourhood scale, the association between poverty is ‘hyper local’ with an estimated 20% of the variation being attributable to the census block and 80% being attributable to the 10 nearest nearby census blocks. At the scale of census tracts, however, they find that percentages flip, with the majority of the variation being within the tract and a small share variation being attributable to neighbouring census tracts. As we are working at a coarser geographic unit, it is not clear whether the findings of Chetty et al. on neighbourhood poverty, will also be reflected at the place scale that we study here, which capture entire rural municipalities, towns, and cities.

We investigate this issue by measuring the wider ‘neighbourhoods’ for each of our ~20,000 places. For each place,

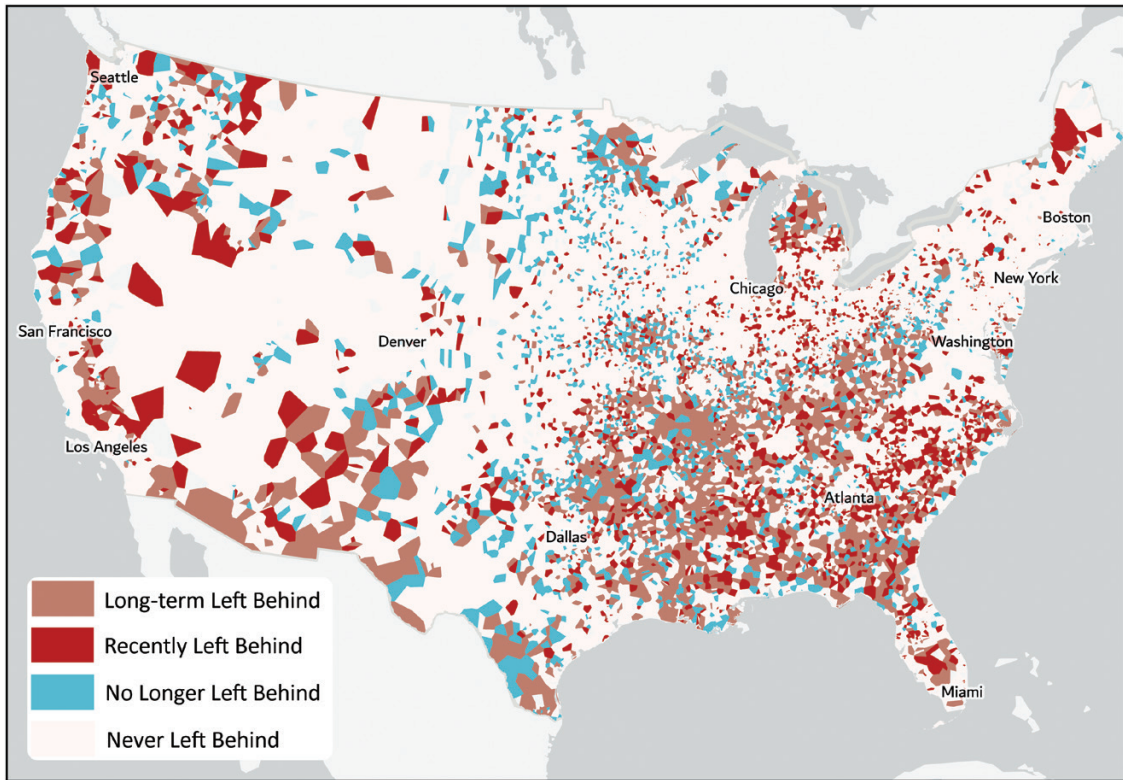


Figure 2. Map of place-level trajectories across the United States.

Notes: A map showing the geography of place-level trajectories across the United States. This map is generated using exploded place polygons to improve visualization at this scale. These shapefiles were generated by Uhl et al. (2023).

we measure the left-behindness within focal neighbourhoods of its ten nearest neighbouring places. We do this by first counting the number of neighbouring places that fall into each of our four left behind trajectories (see Table 1 above). We use these counts to calculate the proportion of a place's neighbours that are represented by those categories. This calculation is performed in Equation (2) as follows:

$$\text{Neighbours}_i = \frac{\sum_{j=1}^n X_j}{n} \quad (2)$$

where the variable captures the proportional representation of left behind trajectories that are among the ten nearest neighbours n of each place i . We index summation as j , which initializes at the first nearest neighbour (1) and terminates after summing to the 10th nearest neighbour. We divide the count by 10 (n). We replicate this calculation three times to generate three separate measures, capturing the representation of the three left behind trajectories within each focal neighbourhood.

Descriptive statistics

Figure 2 maps our four place-level trajectories. The long-term and recently left behind places (red) are

scattered throughout the country, but particularly so throughout South. Long-term left behind places also tends to be situated in rural regions of the country, either in the South or the Southwest. Places moving out of left-behindness—the no longer left behind—are disproportionately concentrated in the middle of the country in states like Minnesota, Wisconsin and areas of Texas. Earlier research has pointed to rising levels of upward mobility in these regions (Connor and Storper, 2020).

Table 2 presents broader descriptive statistics for our four place-level trajectories. Although we present statistics on all independent and dependent variables, we focus attention on the sociodemographic variables and neighbour shares of our four place-level trajectories. The recently and long-term left behind places have lower shares of white households than do the more prosperous trajectories (no longer left behind and never left behind). Left behind places have higher shares of Black, Native American, Hispanic and single-parent households, confirming that populations that have traditionally been identified as more socially vulnerable also tend to be more exposed to left-behindness.

Beyond the maps above, we describe the geography of these trajectories in two other ways. First, we observe large

Table 2. Descriptive statistics on all independent and dependent variables.

	Period	All places	Long-term left behind	Recently left behind	No longer left behind	Never left behind
N		20,570	2573	1934	1688	14,375
%		(100%)	(13%)	(9%)	(8%)	(70%)
Input variables						
Income (\$)	1980	49,581	33,081	42,831	34,974	55,161
	2018	66,645	40,384	45,271	55,391	75,362
Poverty share	1980	0.13	0.25	0.15	0.20	0.10
	2018	0.15	0.29	0.24	0.16	0.12
College share	1980	0.12	0.06	0.09	0.05	0.14
	2018	0.22	0.09	0.12	0.13	0.26
Unemployment share	1980	0.07	0.11	0.07	0.11	0.06
	2018	0.06	0.11	0.10	0.05	0.05
Upward mobility						
All	1980–2015	0.45	0.41	0.42	0.45	0.46
Stayed in CZ	1980–2015	0.43	0.40	0.40	0.42	0.44
Moved from CZ	1980–2015	0.47	0.44	0.45	0.48	0.48
Female	1980–2015	0.41	0.37	0.38	0.40	0.42
Male	1980–2015	0.49	0.45	0.46	0.49	0.50
White	1980–2015	0.46	0.42	0.43	0.46	0.47
Black	1980–2015	0.41	0.40	0.39	0.40	0.42
Hispanic	1980–2015	0.45	0.44	0.43	0.44	0.46
Asian	1980–2015	0.57	0.51	0.52	0.55	0.57
Native American	1980–2015	0.38	0.39	0.40	0.41	0.37
Demographics and controls						
Non-White share	1980	0.07	0.19	0.12	0.08	0.05
White share	1980	0.93	0.81	0.88	0.92	0.95
Hispanic share	1980	0.03	0.06	0.03	0.04	0.03
Native American share	1980	0.01	0.03	0.01	0.01	0.01
Single Parent share	1980	0.11	0.15	0.13	0.11	0.10
Population	1980	7641	3363	4291	1235	9532
Rural Share	1980	0.40	0.62	0.44	0.63	0.33
Rank change	1980–2018	-0.32	-1.10	-15.36	17.76	-0.01
Ten nearest neighbours						
Long-term LB share	1980–2018	0.12	0.35	0.19	0.19	0.06
Recently LB share	1980–2018	0.09	0.14	0.18	0.09	0.07
No longer LB share	1980–2018	0.08	0.13	0.09	0.16	0.06
Never left behind share	1980–2018	0.70	0.38	0.55	0.55	0.80

Notes: A descriptive statistics table showing the share of places that input variables for generating the trajectories, social mobility measures, the share of neighbours by trajectory, and other demographic characteristics. We split these descriptive statistics by the place-level trajectory. 'Period' refers to the years of measurement. The 'input variables' show the average differences over time of the variables used to generate the place-level trajectories. The 'upward mobility' measures refer to the adult income ranks of children from households that were at 25th percentile of the national income distribution. The 'rural share' shows the share of places that are classified as rural in each trajectory. 'Rank change' shows the average change in the composite measure of the ranks of the four input variables. The 'ten nearest neighbours' refers to the average share of the four trajectories among each place's ten nearest neighbouring places.

differences with respect to the rurality of these trajectories.² Long-term left-behind places are disproportionately rural. Specifically, while around 40% of all US places are rural, this share rises to 62% for long-term left-behind places. Similarly, around 63% of the no longer left be-

hind places were rural at baseline, suggesting that the improving conditions of these places may in part be linked to patterns of local urban development or annexation. In contrast to these two cases, only 42% of recently left behind places are rural, perhaps pointing to more urban

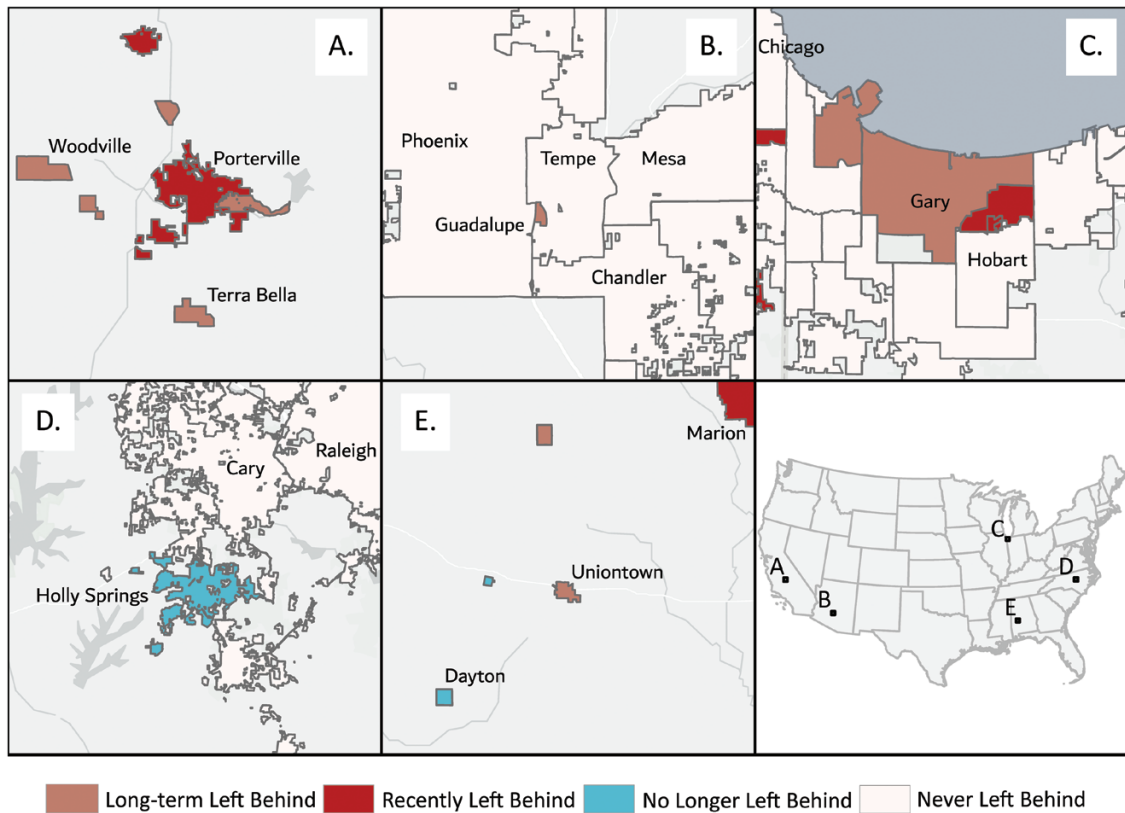


Figure 3. Map of five exemplar places.

Notes: A six panel map showing the locations of five places: (A) Porterville, California; (B) Guadalupe, Arizona; (C) Gary, Indiana; (D) Holly Springs, North Carolina; (E) Uniontown, Alabama; and the locations of these five places on the US map.

decline in this trajectory than for the long-term or no longer left behind.

Secondly, we can describe the geography of these place-level trajectories based on trajectories of their neighbours. Table 2 shows the percentage of a place's 10 nearest neighbours that are represented by each of our four trajectories. It is particularly instructive to look to the share of neighbours that are in the same trajectory as one another. Never left behind places comprise about 70% of all places but are 80% of the neighbours of other never left behind places. This implies that the never behind places are more likely to be near to one another than would be expected due to random chance. Spatial clustering is even stronger among the remaining three categories. Recently left behind and the no longer left behind are twice as likely to be neighbours than would be expected due to chance (8% and 9% overall, but 16% and 19% of neighbours), and the long-term left behind are almost three times more likely to be neighbours (13% overall, 35% of neighbours). At the same time, it is worth noting that while we document strong spatial clustering among our trajectories, left behind places still only make up a minority of the neigh-

bours of other left behind places. This provides strong justification for investigating both the regional and sub-regional dimensions of left-behindness.

Before turning to our main analysis, we contextualize the many experiences of left-behindness through a set of examples. We map five distinctive places in Figure 3: Porterville in the Central Valley of California (A); the urban tribal community of Guadalupe, Arizona (B); the former industrial city of Gary, Indiana (C); Uniontown, Alabama (D); and the urbanizing town of Holly Springs, North Carolina (E). We present basic summary statistics for these places in Table 3.

Gary, Indiana, is a quintessential example of a now long-term left behind place. Situated just east of Lake Michigan, Gary was one of the historic cores of North American steel production and experienced rapid development across the early 20th century. With the restructuring of US heavy industry and global steel production over the post-war decades, Gary's economy entered a long period of contraction. The population fell from a 1960 peak of 180,000 residents to fewer than 70,000 today. The children of Gary have not only faced challenging labour

Table 3. Five exemplar left behind places.

Name	Classification	LB neighbours	Left Behind Index		Population		Income mobility
			1980/1990	2010/2018	1980	2018	
Gary, Lake, IN	Long-term LB	70%	21.00	13.75	151,953	76,677	0.40
Guadalupe, Maricopa, AZ	Long-term LB	10%	9.75	7.50	4,506	6405	0.38
Uniontown, Perry, AL	Long-term LB	40%	16.25	5.25	2,112	1969	0.39
Porterville, Tulare, CA	Recently LB	100%	32.5	15.00	19,707	59,797	0.42
Holly Springs, Wake, NC	No longer LB	0%	13.00	85.25	688	33,341	0.40
USA average	—	20%	50.47	50.45	7467	10,645	0.45

Notes: A table showing statistics on five exemplar left behind places. The scores on the Left Behind Index are based on the lowest index value in either 1980 or 1990 and 2000 or 2018. We also show the population and average adult household income of children born to parents at the 25th percentile in this place (*income mobility*). The LB neighbours column is calculated from the share of a place's neighbours that fall into either the recently or long-term left behind categories.

market conditions but also long-term funding cutbacks to essential services and schools (see also O'Brien et al., 2022).

Uniontown and Guadalupe are also long-term left behind places but with very different histories to Gary. Uniontown is situated in the region known as the 'Black Belt' (Wimberly and Morris, 2002) and the town's economy historically depended on the cotton industry and cotton plantations. Today, more than 95% of the residents of Uniontown identify as Black and the town has recently been at the centre of a long fight regarding environmental racism, issues claimed to have particularly adverse effects on local children.³ Turning to the Southwest, Guadalupe is a small town at the heart of the Phoenix metropolitan area. The town is a centre of the Yaqui people, and most residents are of Native American or Mexican descent. Although the city is situated in a fast-growing metropolitan area, the children of Guadalupe are growing up in a place where the poverty rate is over three times the national average, and high school completion rates are very low.⁴ Despite already ranking toward the bottom of the Left Behind Index in 1980, Guadalupe and Uniontown have both fallen further down the scale.

Porterville is situated in the eastern most region of the Central Valley, where approximately 70% of the city's 63,000 residents identify as Hispanic. As a recently left behind place, the city has experienced a dramatic fall from 32.50 to 15.00 on the Left Behind Index. Porterville is situated in Tulare County, a region often labelled as the epicentre of the Great California Drought from 2012 to 2017 (Pompeii, 2020).⁵ The poverty rate of Porterville has doubled since 1980 and its foreign-born population share has almost tripled. In many respects, Porterville highlights the precarious conditions that often accompany industrialized agricultural (Lobao and Stofferahn, 2008).

Finally, Holly Springs differs from the cases above in that it has ascended out of left behindness. The town's fate is linked to its location at the heart of North Carolina's Research Triangle, less than 20 miles from downtown

Raleigh. In recent decades, the population has grown more than 50-fold from 700 to over 40,000, and the poverty rate is now only a fraction of the national average. These changes have been spurred by the town's increasing incorporation into Raleigh and the arrival of several large biopharmaceutical firms like Amgen and Novartis. The experience of Holly Springs resembles many others in this category: small places that have been annexed by nearby agglomeration economies.

Each of these contexts have its own unique historical experiences that have resulted in these places being left behind. Yet for all five places, we observe income mobility levels that are below the US average (Table 3). In most cases, these areas also tend to be situated near other struggling contexts, which points to the probable importance of the spatial concentration of left behind places. The sections that follow formally test these links between left behind places and the average income mobility levels of local children.

Regression analysis

Estimation strategy

We assess how childhood exposure to left-behindness might impact social mobility with a model of the following form:

$$y_i = \alpha_1 + \beta_1(\text{LeftBehind}_i) + \beta_2(\text{CZ}_i) + \sum_{k=1..k} \beta_k X_{ik} + \varepsilon_i \quad (3)$$

where the outcome y captures the social mobility level of children from low-income households in place i . The main variable of interest *LeftBehind* is a categorical variable that indicates the membership of a place in one of the four left behind trajectories. We include k independent variables to adjust for characteristics of place i that may be correlated with left behindness, such as population size, racial and ethnic composition, and the local share of single-parent households.

We assess the regional context in which a place is embedded in two ways. First, we include a fixed effect in

Table 4. Regression of upward mobility on place-level trajectories.

	Upward income mobility		
	(1)	(2)	(3)
Trajectory (ref = 'never left behind')			
Long-term left behind	-0.045*** (0.001)	-0.014*** (0.001)	-0.007*** (0.001)
Recently left behind	-0.040*** (0.001)	-0.013*** (0.001)	-0.010*** (0.001)
No Longer left behind	-0.010*** (0.001)	-0.004*** (0.001)	-0.002*** (0.001)
Constant	0.458*** (0.0004)	0.375*** (0.005)	0.393*** (0.005)
Observations	20,562	20,555	20,555
R ²	0.111	0.607	0.627
Adjusted R ²	0.111	0.592	0.613
CZ FE		X	X
Controls			X
	*p < 0.10 **p < 0.05 ***p < 0.01		

Notes: A table showing estimates from three regression models, where the dependent variable is the adult income rank of children born to households at the 25th percentile of the national income distribution ('upward income mobility'). The independent variables of interest are the place-level trajectories, referenced against the 'Never left behind' category. Model (1) has no additional control variables. Model (2) adds a fixed effect for commuting zones. Model (3) adds additional place-level controls for rural and urban status, share Native American, share of single parent households, share non-White, share Hispanic, and the total population, all measured in 1980.

Equation (3) that captures the j labour market region or commuting zone (CZ) to which a place belongs. Our second approach is to incorporate the proportional measures of left behindness from each place's focal neighbourhood, as described above in Equation (2). Models exploring this second approach take the following form:

$$y_i = \alpha_1 + \beta_1(\text{LeftBehind}_i) + \beta_2(\text{Neighbours}_i) + \sum_{k=1..k} \beta_k X_{ik} + \varepsilon_i \quad (4)$$

where the equation is indexed identically to Equation (3) above, but where we incorporate the three *Neighbours* variables to measure the influence of the local share of left behindness within the focal neighbourhood of each place i . Due to collinearity, we do not include a spatial lag for the never left behind places.

One further attractive feature of the Opportunity Insights data is the decomposition of upward mobility estimates across various subpopulations. Published estimates are segmented by race, ethnicity, sex, and migrant status. We use these data to test for differences in the effect of left-behindness by whether the respondent was Black, White, Hispanic, Native American, Asian, male, female or if they left their childhood commuting zone (move or stay). We do this by estimating a series of models like that shown in Equation (3), but where the dependent variables are derived exclusively from the sepecific subpopulations above.

Our intuition is that the exposure of a child from a low-income household to different kinds of place-level

trajectories—a left behind place as opposed to a more prosperous, never left behind place—will impact their average chances of upward income mobility. One concern is that the skill-, personality-, or ability-based sorting of individuals across places could bias our estimates (Combes et al., 2008). For example, more motivated individuals may be more attracted to dynamic labour markets which could, in turn, upwardly bias the associations between these locations and upward mobility. This is less of a concern in our case, as the childhood locations are pre-determined by the decisions of the parents.

Upward mobility outcomes

We begin in Table 4 by estimating the association between growing up in a left behind place and the upward mobility of all children from households below the 25th percentile. Column 1 examines the differences in the average adult income rank of children based on their place-level trajectory. Children in low-income households growing up in long-term and recently left behind places exhibit a 4.5 and 4.0 percentile rank reduction (roughly 10%), respectively, in upward mobility relative to the base level (0.46). There is only a 1.0 percentile rank deficit for children from no longer left behind places, pointing to greater upward mobility in places that move out of left-behindness.

As exposure to a left behind place may be correlated with regional economic conditions, Column 2 controls for the commuting zones in which places are embedded.

After making this adjustment, the place-level coefficients attenuate by approximately two-thirds. This implies that a substantial portion of the negative association between left behindness and upward mobility can be attributed to the broader conditions of the regions in which these places are embedded. Conversely, even when we compare places within the same region, we find persisting differences in the upward mobility of children by whether or not their childhood place has experienced left behindness.

We then adjust for a range of other baseline place-level characteristics including ethnic and racial composition and rurality (Column 3). Despite further attenuating the association between left behindness and upward mobility, the coefficients remain sizeable and statistically significant. Importantly, these additional variables are co-determined with our trajectories of left-behindness. We include them here mainly to ascertain whether the economic variables used to construct the trajectories have independent weight or if, instead, the trajectories capture other markers of left behindness such as rurality or racial segregation. Our estimates are robust to these additional control variables.

These findings reinforce several insights into the phenomena of left-behindness and the existing literature surrounding it. Residence in a left behind place is associated with lower levels of upward mobility, which implies that these places are exacerbating the existing challenges faced by children from lower-income households. Additionally, the inclusion of an economically relevant regional level measure clearly improves the model, reinforcing conceptualizations of left-behindness as more than a localized phenomenon. The persistence of intra-regional differences also indicates that region is insufficient for explaining localized variation.

Neighbouring influences

We now turn to examining how a place's nearest neighbours within a commuting zone may impact its upward mobility levels. We begin in Figure 4 by testing whether adjacency to other left behind places is predictive of upward mobility, conditional on the left behindness of one's own place of residence. To ease interpretation, we collapse the recently and long-term left behind places into a single 'left behind' indicator variable. In Panel A, we plot the regression coefficients for this indicator for the place of residence (neighbour number = 0) and the 10 nearest neighbouring places (neighbour number = 1 to 10). Panel A presents estimates that are only conditional on the left behindness of the place of residence (neighbour 0), and Panel B includes all other relevant control variables.

The first pattern revealed in Figure 4 is that the left behindness of the place of residence has a significantly larger influence on upward mobility than does the status of its neighbours. This is evident in the large negative association for neighbour 0 and the sharp attenuation in the

coefficients of neighbours. Furthermore, we do not observe a gradual attenuation in the influence of neighbours with distance, suggesting a relatively large and more regionalized footprint for a place's focal neighbourhood. Were we to sum the associations of neighbours, we would find that a place of residence can account for 15% (Panel A) to 26% (Panel B) of the influence of left behindness on upward mobility. The status of neighbouring places in terms of left behindness are correlated with one another, and these neighbouring effects are therefore not simply additive. Therefore, in the regression analyses that follow, we use the proportional neighbourhood measures described above in Equation (4). These estimates are nonetheless suggestive of sizeable 'neighbourhood effects' that are similar in magnitude to those found previously at the finer census block scale (see Chetty et al., 2018).

In Table 5 we approach this process more formally by presenting three models that include the proportional representation of left behind places among each place's 10 nearest neighbours. These estimates are generated under the assumption that each neighbouring place makes an equal contribution to the neighbourhood effect, irrespective of the neighbour's total population size.⁶ The addition of these spatial lag terms in Column 1 yields two findings of note. First, the neighbour estimates are statistically significant and have associations that move in the anticipated directions: high proportions of long-term and recently left behind places among neighbours are associated with reduced upward mobility. Conversely, the presence of no longer left behind places among neighbours is positively linked to a place's upward mobility levels.

The second point of note relates to trajectories for the main place coefficients of interest. By comparison to the estimates shown earlier (see Column 1, Table 4), the trajectory of neighbours attenuates the main place-trajectory coefficients by between a half and a third. For example, the initial estimates from Table 3 imply that the upward mobility levels were 4.5 percentile ranks lower in long-term left behind places relative to never left behind places, but this deficit is reduced to 1.7 percentile ranks after accounting for neighbouring left behindness. The fact that these patterns are evident across all three left behind trajectories implies that upward mobility outcomes are strongly linked to what is happening in the surrounding areas.

Next, we show that these neighbouring place associations are not simply a reformulation of the regional commuting zone influences that we documented above. After introducing the commuting zone fixed effect (Table 4, Column 2) and the place-level controls (Column 3), we find that the coefficients for neighbours attenuate but remain statistically significant. The one notable difference is that the influence of nearby no longer left behind places turns negative after we adjust for the commuting zone, suggesting that proximity to any form of left-behindness, irrespective of whether conditions are improving or not, is associated with reduced levels of upward mobility.

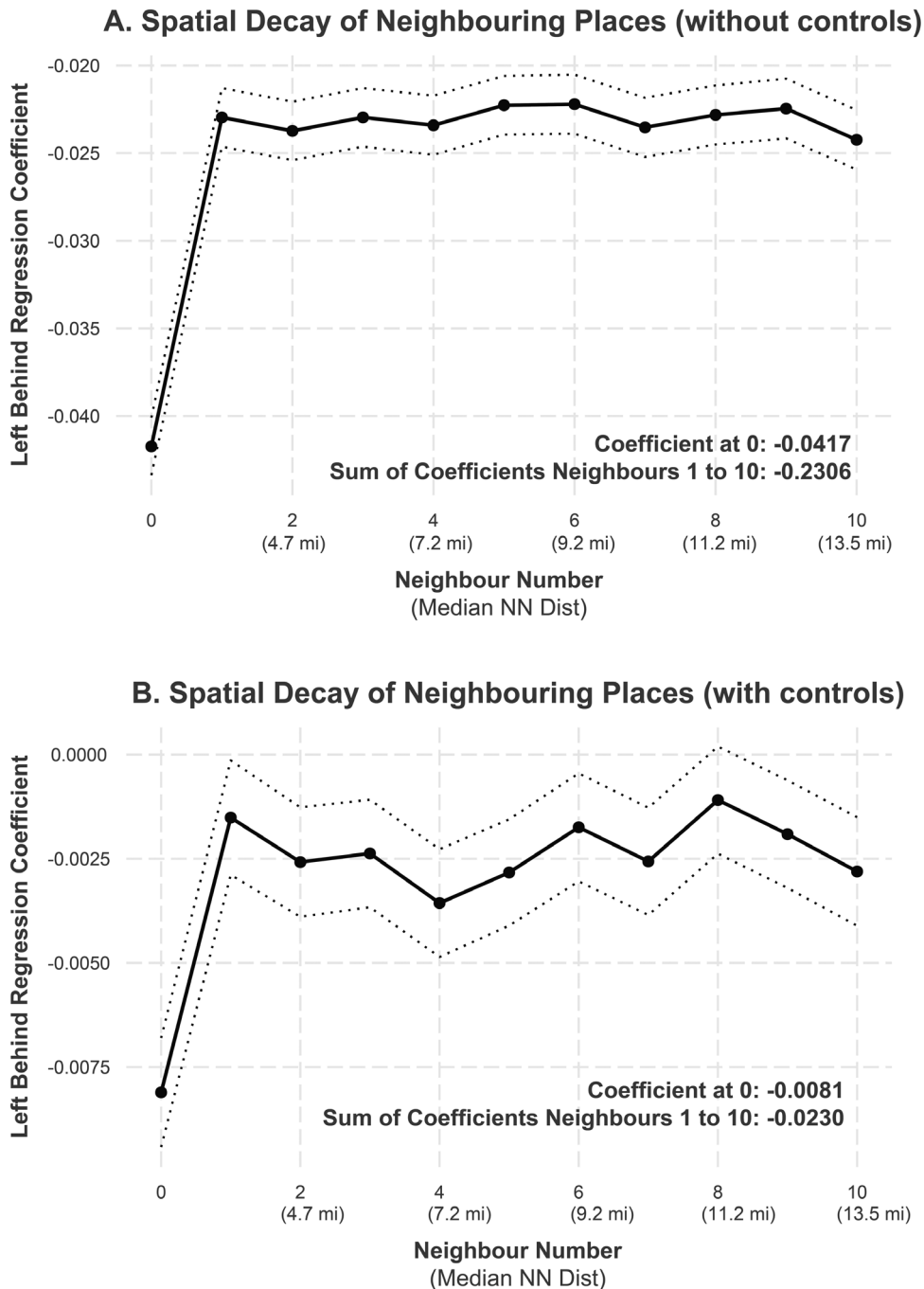


Figure 4. Spatial decay of left behindness on neighbouring places.

Notes: Two figures inspired by Chetty et al. (2018), Figure VII, showing the regression coefficients for left behind places on upward mobility based for focal places (neighbour number 0) and their ten nearest neighbours (neighbour number 1 to 10). In Panel A and B, are each based on 11 separate regressions models. In Model 0, we only examine the association between an indicator for whether a place is left behind, as defined by the long-term and recently left behind categories, and the upward mobility of the place. In Model 1, we assess the impact of the first neighbour's left behindness on a focal place's upward mobility, conditional on whether the focal place is left behind. In Model 2, we assess the impact of the second neighbour's left behindness on a focal place's upward mobility, conditional on whether the focal place is left behind, and so on.

Table 5. Regression of upward mobility on place-level and neighbouring trajectories.

	Upward income mobility		
	All places		
	(1)	(2)	(3)
Trajectory (ref = 'never left behind')			
Long-term left behind	-0.017*** (0.001)	-0.012*** (0.001)	-0.005*** (0.001)
Recently left behind	-0.019*** (0.001)	-0.011*** (0.001)	-0.009*** (0.001)
No longer LB	-0.00005 (0.001)	-0.003*** (0.001)	-0.001 (0.001)
Neighbour %			
Long-term left behind	-0.008*** (0.0002)	-0.002*** (0.0002)	-0.002*** (0.0002)
Recently left behind	-0.011*** (0.0003)	-0.003*** (0.0003)	-0.003*** (0.0003)
No longer left behind	0.002*** (0.0003)	-0.001*** (0.0003)	-0.002*** (0.0003)
Constant	0.470*** (0.0005)	0.381*** (0.005)	0.398*** (0.005)
Observations	20,562	20,555	20,555
R ²	0.236	0.610	0.631
Adjusted R ²	0.236	0.596	0.618
CZ FE		X	X
Controls			X

Notes: A table showing estimates from three regression models, where the dependent variable is the adult income rank of children born to households at the 25th percentile of the national income distribution (*upward income mobility*). The independent variables of interest are the place-level trajectories, referenced against the *never left behind*' category, and also the share of long-term, recently, and no longer left behind places among the ten nearest neighbouring places. Model (1) has no additional control variables. Model (2) adds a fixed effect for commuting zone. Model (3) adds additional place-level controls for rural and urban status, share Native American, share of single parent households, share non-White, share Hispanic, and the total population, all measured in 1980.

We also show in [Supplementary Table A2](#) that these associations are highly consistent across urban and rural places.⁷

We conclude our examination of neighbours by visualizing the association between the trajectories of neighbouring places and upward mobility. [Figure 5](#) presents average upward mobility levels for our four place trajectories according to the share of their neighbours that are long-term left behind (A), recently left behind (B), and no longer left behind (C).

In contexts where none of a place's ten nearest neighbouring places are recently or long-term left behind, we observe large differences in upward mobility based on a place's own trajectory. As the share of neighbours that are recently or long-term left behind increases toward 50%, we observe that upward mobility in all places gets pulled down. As these places are pulled down, we observe convergence in the outcomes of places on different trajectories too. This association is strong enough that when 50% or more of neighbours are left behind, a place's own trajec-

tory is only of marginal importance. Put differently, the circumstances of neighbouring places appear to overwhelm a place's own effect on upward mobility, once enough neighbouring places are experiencing hardship.

Race, ethnicity, gender and migrant status

We now turn to investigating how the impact of left behindness on social mobility might interact with race, ethnicity, sex or migrant status. In the descriptive statistics, we documented that children in low-income households are distributed differently across places by race and ethnicity, with non-White households being more exposed to left behind places. In the analysis here, we examine whether there are group-specific differences in outcomes within places.

[Figure 6](#) begins by showing average differences in upward mobility based on whether the child's household is classified as White, Black, Hispanic or Native American. In broad terms, we observe mostly similar patterns across all

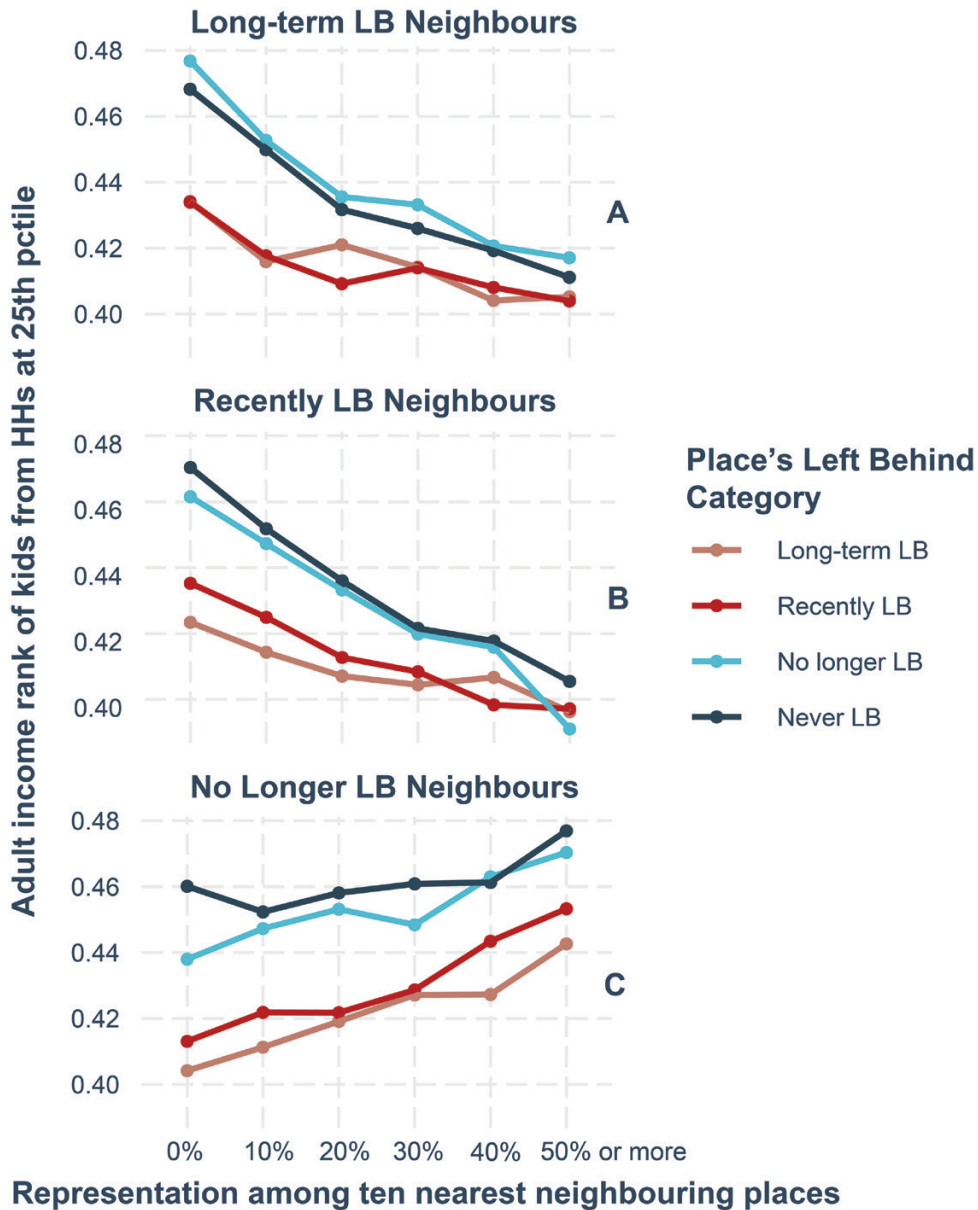


Figure 5. Upward mobility by trajectories of neighbours, split by place trajectory.

Notes: Three-line graphs showing the average adult income of kids from households at the 25th percentile (base period) based on a place's ten nearest neighbours left behind category, split by place's own trajectory. We show neighbours for long-term left behind (A), recently left behind (B), and no longer left behind (C). The vertical axis shows the average adult income rank or upward mobility. The horizontal axis shows the share of neighbours that are categorized according to three of the four different trajectories. A place at 0% has zero neighbours in a given category and 50% is equivalent to having 50% of the neighbours in that category. The top panel (A) shows the mobility change for each additional neighbour that is classified as long-term left behind. The middle panel represents the mobility change for each additional recently left behind neighbour. The bottom panel (C) highlights the change in upward mobility for each additional no longer left behind neighbour.

four place-level trajectories: Black and Native American upward mobility levels are generally lower than those of Hispanics and Whites. The persistently low levels of upward mobility for Black and Native American children

within each trajectory suggests that the constraining effects of left-behindness on upward mobility are not simply a reflection of the racial composition of these places (for example, Black households, who experience lower levels

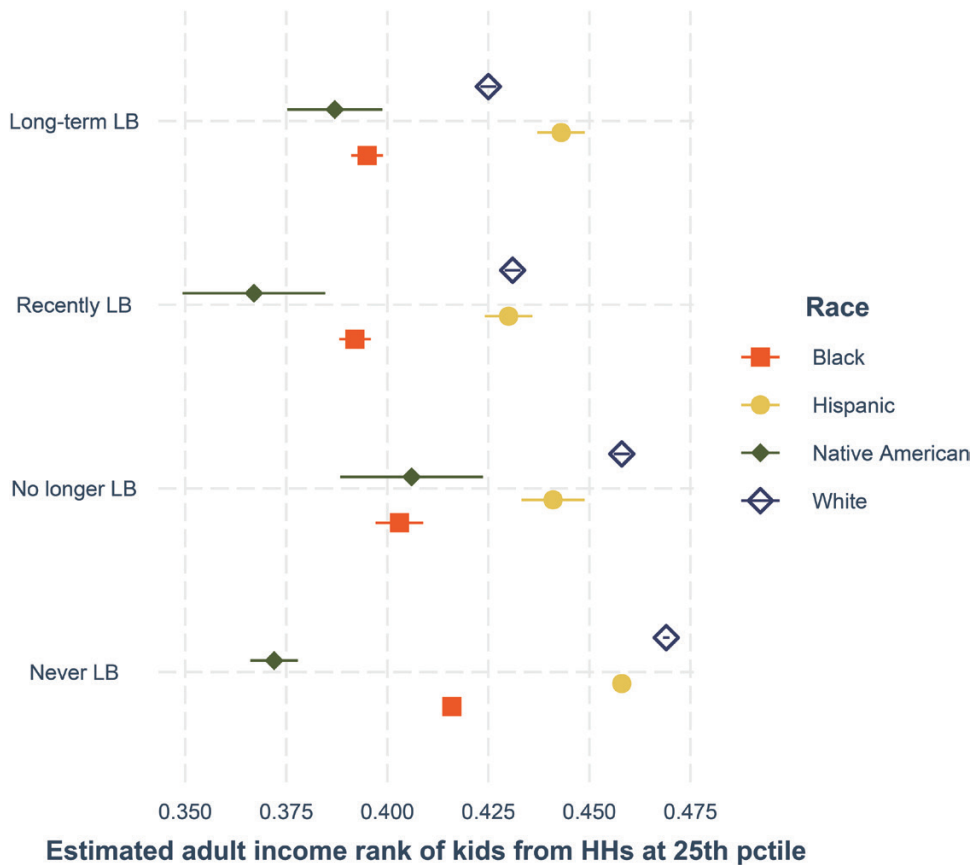


Figure 6. Upward mobility, split by race and ethnicity.

Notes: A point plot showing fitted values for upward mobility across different racial and ethnic groups. The dependent variable is the adult income of children from households at the 25th percentile with 95% confidence intervals.

of upward mobility on average, being more likely to live in left behind places).

There are also notable differences in the relative outcomes of groups across trajectories. In general, all four groups exhibit lower levels of upward mobility in left behind places. However, children from White low-income households exhibit large variation in outcomes across the four trajectories. Despite attaining the highest levels of upward mobility when exposed to never left behind places, Whites fare far worse in recently and long-term left behind places. In fact, the outcomes of Whites fall behind those of their Hispanic counterparts in long-term left behind places and are similar to them in recently left behind ones.⁸

Figure 7 considers the role of sex (Panel A) and migrants' status (Panel B) in moderating the link between left behind places and upward mobility. Across all four trajectories, we find that male upward mobility levels are substantially higher than those of females, and children from low-income households who leave their childhood locations are more upwardly mobile than

those who stay, perhaps due to the selective nature of migration (Lee et al., 2018). In all four cases, however, children who grew up in left behind places do not fare as well, on average, as children who grow up elsewhere.

The differences by migrant status, particularly the disparate outcomes of the movers, are illuminating as to the sources of variation in upward mobility outcomes. If the effect of left behindness was chiefly rooted in the availability of local labour market opportunities, we would expect that the effect of left behindness would sharply attenuate among those who leave for opportunities elsewhere. On the contrary, we observe a very similar pattern of inequality in upward mobility among the migrants, based on where these individuals grew up. This indicates that the forces curtailing upward mobility are likely internalized early in life (for example, by limiting schooling and access to human capital) and are transported by the migrants to their new places of residence. Increased outmigration is therefore unlikely to be a full remedy for the problems posed by left-behindness.

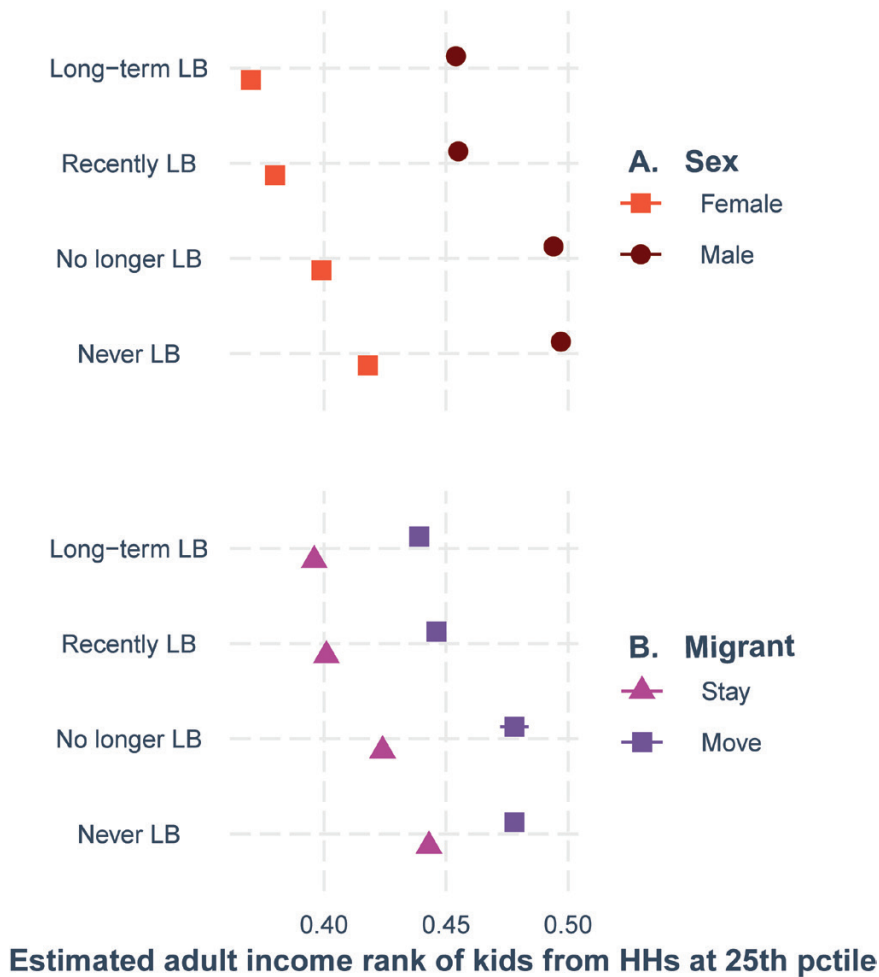


Figure 7. Upward mobility, split by sex and migration status.

Notes: Two point plots showing fitted values for upward mobility by sex and migrant status. The dependent variable is the adult income rank of children from households at the 25th percentile with 95% confidence intervals. Panel A Shows male and female differences. Panel B shows differences between individuals who left their childhood commuting zones (move) and those stayed (stay).

Robustness

We make several decisions with our data in order to produce our main results. This section tests the robustness of our findings to these choices. First, we used the bottom quartile as a threshold value for defining left behind places. To show that this decision did not produce an arbitrarily favourable result, we reproduce our main specification in the [Supplementary Table A3](#), where we define alternate threshold values. These alternate results are consistent with our earlier findings. In [Supplementary Figure A2](#), we also visually describe the association between our preferred threshold and upward mobility outcomes. In [Supplementary Table A4](#), we re-specify that model so that instead of making categorical distinctions to describe movement in and out of left-behindness, we

include the base categorization alongside the rank change on the Left Behind Index over the study period. This clarifies that the differences we observe in our main specification are not solely driven by the starting position of places on the Left Behind Index. We also note that while the initial categorization and the rank change on the Left Behind Index are of consequence, the initial categorization holds a particularly large association with upward mobility.

Due to imposing a strict threshold for left behindness, it is also possible that our results could be distorted by small marginal shifts across the threshold. For example, a place with a Left Behind Index of 26 in the base period and 24 in the end period will be considered as a Recently Left Behind place. We test the impact of this decision in [Supplementary Table A5](#) by limiting the Recently Left Behind and No Longer Left Behind places to only those

that fall or rise by at least 25 ranks. We find that this additional restriction modestly strengthens our main results, suggesting that the relationships that we highlight here may be even stronger than is suggested in our main specifications. To provide further reassurance on this point, [Supplementary Table A6](#) shows the average movement of places on the Left Behind Index by trajectory. Places that are no longer left behind move up the Left Behind Index by approximately 20 percentile ranks, and places that are recently left behind fall by around 18 percentile ranks. The large quantitative size of these moves reinforces the significant changes occurring in these places. Finally, [Supplementary Table A7](#) shows that these place-level results hold even when we downscale the analysis and the dependent variable from places to census tracts.

Conclusions and policy considerations

Left behind places have emerged as a leading challenge for regional policy and theory. While we continue to learn more about the links between the condition of left-behindness and a range of social, political, economic and medical outcomes, major gaps in our understanding remain, including the potential long-term impacts of these places. Even if one could design policies that lifted up today's left behind, the impacts of these contexts could live on through the people who were temporarily exposed to these places. This paper investigates this issue from one perspective: the upward income mobility of children born to low-income parents.

Drawing on a longitudinal database of over 20,000 places in the USA, we have proposed a multidimensional framework for studying trajectories of left-behindness that is sensitive to both time and space. From this framework we identified three specific categories of places: the long-term left behind, the recently left behind and the no longer left behind. We contrast these three groups against the remaining places, which we term the never left behind. From here, we documented significant local variation and effects across these categories, suggesting that regions are not an appropriate alternative to these finer scale classifications.

The focus of this paper is on addressing the question: who gets left behind by left behind places? To address this question, we have examined children across the United States who grew up in low-income households over the 1980s and 1990s. Our analysis of these children in terms of their exposure to left behind places has yielded four distinct answers. First, children growing up in challenging circumstances face particularly large barriers to economic attainment when they spend their childhoods in left behind places. This means that exposure to left-behindness compounds the already sizeable challenges faced by children from lower income backgrounds.

Second, these negative effects are amplified when the place in question is situated in a region with many other left behind places. These neighbouring effects are powerful enough that they can even overwhelm the strength of the place in question as a determinant of upward mobility. By rough decomposition, we estimate that around a quarter of the penalty associated with growing up in a left behind place can be attributed to the place itself. The remaining three quarters can be explained by the trajectory of groups of neighbouring places or by the regional economy. This leads us to conclude that policies aimed at addressing the problems of left-behindness need to not only contend with issues at the regional scale but also with sensitivity to the interactions among people and places within regions.

Third, when it comes to interpersonal outcomes, we have shown that left behind places not only reinforce existing patterns of inequality (for example, especially low levels of upward mobility among children from low-income Black and Native American households), they are also linked to large differences within ethnic and racial groups. The differences between children from White and Hispanic households are perhaps most notable in this respect. In places that fare reasonably well over our study period—the no longer left behind and the never left behind—Whites attain higher levels of upward mobility than Hispanics. This pattern reverses for left behind places, however, where Hispanic upward mobility is higher than that of Whites. In general terms, these patterns point to the intersectionality of personal outcomes with left-behindness. More specifically, our findings of polarization in the outcomes of Whites speak to a larger literature that has highlighted the deterioration of personal outcomes for working-class Whites in rural and deindustrializing communities; an issue that has been linked to populist voting patterns and what has been referred to as a 'rural revolt' and the 'the revenge of places that don't matter' ([Monnat and Brown, 2017](#); [Rodríguez-Pose, 2018](#)).

Finally, the effects of left behind places appear to persist even when individuals leave their childhood locations for other regions, indicating that left behind places may be scarring individuals in ways that continue to be expressed even after they change their surroundings. This point is particularly relevant to calls for *people-based policies* that may incentivize migration, as substitutes for *place-based policies* that aim to improve local conditions (see [Kline and Moretti, 2014](#); [Parker et al., 2022](#)). Our results suggest that the penalties associated with left-behindness are portable through migration, indicating that migration may dislocate some of the problems of left behind places, but there may be lingering effects among the migrants at the new destinations. Whether or not these effects extend beyond income-based penalties is a topic for further investigation.

What are the mechanisms through which left behind places exacerbate the intergenerational transmission

of disadvantage? While we want to be clear that we do not attempt to test the mechanism through which left behindness matters here, we can carefully speculate on the possible channels as they pertain to policy. The two dominant lines of thinking are policies that aim to expand human capital and opportunities at a young age, and those that promote local and regional economic growth. The existing body of literature suggests that in today's economy, proximity to economic growth and opportunity is not enough, and that early childhood environments may matter even more (Chetty, Hendren, and Katz, 2016b; Heckman, 2008; Jackson, 2015). The assumption here is that positive early childhood circumstances facilitate movement to opportunity. The challenge for policy is that these two forces—economic growth and human capital expansion—are interdependent. Connor and Storper (2020) showed that prosperous places undergoing contraction also experience a deterioration in upward income mobility and earlier-life educational attainment, partly due to the additional stresses placed on family conditions. We have built on this evidence here to show similar relationships playing out across left behind places. In as far as we can speculate, policies aimed at equitable economic growth must also consider the inequities of economic contraction and long-term left behindness. That is, tackling the local mixture and productivity of jobs and firms will not be enough, and policy must also attend to the circumstances of the young people growing up in these places. Tackling local jobs and education are challenging enough and are likely to be even more so in the USA, where key infrastructure like schools heavily depend on local tax bases.

In summary, our findings document serious long-term consequences associated with left behind places. Left behindness is a chronic and potentially progressive problem that may be transmitted across generations. The outmigration of children from left behind contexts also does not appear to be a remedy for these issues. Without targeted attention that improves the fortunes of low-income families, and the children coming of age within these places, the scars of left-behindness may be visible for decades to come.

Endnotes

- 1 Parents were linked to their children based on the first parent to claim the child as a dependent on the 1040 tax form.
- 2 This database has been augmented by Uhl et al. (2023), who developed a continuous urban-rural index that enables identification of urban and rural places. Following Connor et al. (2022), we define urban places as those falling below 0.55 on Uhl's index, with rural places scoring above this threshold.
- 3 In 2007, Alabama's largest municipal-waste site opened in Uniontown, leading the Black Belt Citizens Fighting for

Health and Justice organization to unsuccessfully petition the Environmental Protection Agency to intervene. The 1000-acre landfill site, which serves 33 states, has been highly disruptive to Uniontown's residents and children through the site's release of corrosive particles and toxic coal ash. It is reported that many residents are reluctant to let their children play outside due to fears for their health (Hitson, 2022).

- 4 The history of Guadalupe has received focused scholarship (for example, see Trujillo, 1998). A newspaper report from 2015 highlights the lack of community businesses and a high school graduation rate of only 50% as particularly pronounced challenges being faced by the community (Scott, 2015).
- 5 The city and its neighbour, East Porterville, have received considerable attention due to the water insecurity crisis faced by the Hispanic community (Egge and Ajibade, 2021; Méndez-Barrientos et al., 2022).
- 6 We provide an alternative set of population-weighted estimates for the neighbouring effects in [Supplementary Table A1](#). These estimates reveal that our results are not particularly sensitive to the decision to weigh the contributions of neighbours. We opt against using weights in our main specifications because it is not entirely clear in this context whether the population sizes of nearby places are good measures of their influences on children. Ideally, future work would be able to observe and measure the relevant spatial interactions between places that affect social mobility outcomes.
- 7 As differences in upward mobility across rural and urban places have been studied elsewhere (for example, Connor et al., 2022; Weber et al., 2017), we do not devote much attention to these outcomes here.
- 8 In [Supplementary Figure A1](#), we also include estimates for children from Asian households. We chose not to include them in the main figure because their exceptionally high rates of upward mobility—which vary little across the left behind categories—distort the image, making it difficult to interpret the outcome magnitudes for children from non-Asian households.

Supplementary material

Supplementary material is available at *Cambridge Journal of Regions, Economy and Society* online.

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