The changing geography of social mobility in the United States

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Edited by Susan Hanson, Clark University, Worcester, MA, and approved October 13, 2020 (received for review May 20, 2020)

New evidence shows that intergenerational social mobility—the rate at which children born into poverty climb the income ladder—varies considerably across the United States. Is this current geography of opportunity something new or does it reflect a continuation of long-term trends? We answer this question by constructing data on the levels and determinants of social mobility across American regions over the 20th century. We find that the changing geography of opportunity-generating economic activity restructures the landscape of intergenerational mobility, but factors associated with specific regional structures of interpersonal and racial inequality that have "deep roots" generate persistence. This is evident in the sharp decline in social mobility in the Midwest as economic activity has shifted away from it and the consistently low levels of opportunity in the South even as economic activity has shifted toward it. We conclude that the long-term geography of social mobility can be understood through the deep roots and changing economic fortunes of places.

intergenerational mobility | geography | inequality | race | economic history

The United States has long been heralded as the land of opportunity, offering unique opportunities for hard-working people to escape poverty. This reputation has come under scrutiny in light of recent evidence showing that Americans' prospects of climbing the income ladder are no better than those of their counterparts living elsewhere (1–4). The long-term decline of American intergenerational social mobility (ISM) rates could be attributed to common structural changes in economies and occupational structures across the developed world (5–8); to comparatively less advantaged early-life influences related to parenting, family structure, and endowments (9–13); or to different national policies in shaping the labor market and educational impacts of structural economic change (14, 15).

Over the last 10 years, however, a new more nuanced perspective on American ISM has emerged. Recent research demonstrates the role of widely varying neighborhood and family contexts in shaping life chances (16–24). There is evidence of strong relationships between life chances and variation in childhood environments related to school quality, neighborhood segregation, population structure, social capital and community cohesion, and family structure. These findings indicate that low levels of intergenerational mobility can be partly understood as "a local problem" (16, p. 1620), such that average structural transformation of the economy at the national scale, national policies, and even family endowments, are underpinned by high levels of geographical variation. As there are some local circumstances that continue to generate high ISM, this new geographically differentiated perspective provides a more optimistic picture for improving intergenerational mobility rates than the national averages tend to suggest.

Much of the renewed interest in ISM has focused on recent neighborhood-scale variation. In our research, we extend on both this time frame and geographical scale in order to assess whether recently observed patterns of ISM are a continuation of long-term trends. We examine influences across 467 subregions of the country or "state economic areas" (SEAs) and further aggregate up to the scale of six broad regions. SEAs, rather than neighborhoods, are a more suitable scale for which to pursue a long-term analysis because the spatial boundaries and populations of neighborhoods can be particularly variable over time; we therefore do not attempt to replicate the neighborhood focus of recent studies. There have also been considerable changes in regional migration patterns over the long term and, thus, between places of childhood, where children are exposed to environments that affect their schooling and development, and the locales where, as adults, they intersect with economic opportunities and, hence, are (or are not) upwardly mobile. Thus, we also consider how changing migration patterns across regions relate to ISM.

We reach back to the early 20th century via a longitudinal sample of more than 1 million individuals (observed in 1920 and 1940) from the restricted complete-count decennial censuses of the United States. We build these data by applying record linkage algorithms to restricted census data made available through a collaboration between the Minnesota Population Center and Ancestry.com. To ascertain long-term changes in intergenerational mobility we combine these estimates with recently published data for the late 20th century from Opportunity Insights. These data allow us to follow children born to low-income parents from childhood to adulthood. ISM is defined as the average adult income rank of children born to parents at the 25th

Significance

Intergenerational social mobility in the United States has declined over the last century, sparking a national debate about how to improve equality of opportunity. By analyzing data spanning the 20th century, we demonstrate strong temporal patterns operating across regions. Some areas of the United States have witnessed significant declines in social mobility, while others have had persistent low levels all along. Thus, the contemporary national picture is shaped by both powerful forces of change that reduce intergenerational mobility in some regions and deeply entrenched long-term forces generating persistence in others. It follows that improving social mobility will be challenging, as policy would need to respond to both forces and do so according to their varying mixture across different regions.

Author contributions: D.S.C. and M.S. designed research; D.S.C. and M.S. performed research; D.S.C. contributed new reagents/analytic tools; D.S.C. analyzed data; and D.S.C. and M.S. wrote the paper.

The authors declare no competing interest.

This article is a PNAS Direct Submission.

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This article contains supporting information online at https://www.pnas.org/lookup/suppl/doi:10.1073/pnas.2010222117/-/DCSupplemental.

First published November 16, 2020.

percentile of the national income distribution and growing up in one of the 467 SEAs. Our goal here is not to definitively separate contextual from individual influences, a classic challenge in social science (25), but to measure changes in the regional geography of intergenerational mobility.

This analysis allows us to investigate how ISM relates to two interacting forces. On the one hand, the geography of income and work is transformed through large-scale creation and destruction of employment, due to waves of technological change. For example, metropolitan Detroit ranked sixth among metro areas in per capita personal income in the United States in 1970, at the beginning of the most recent wave of creative destruction, but is now ranked 59th. As people navigate this type of major structural change, they can undergo upward or downward mobility. However, their preparation for navigating such creative destruction depends in part on deeply rooted local structures that vary considerably across the country (26–32). We might say that in the former case, regional ISM is restructured by economy-wide forces that reshuffle regional employment, while in the latter case, regional differences reflect persistent local selection and shaping of those forces through childhood environments. In what follows, we will consider the relative contributions and combinations of these economy-wide or structural forces, and historical local influences that we refer to as "deep roots."

Results

Long-Term Spatial Patterns in ISM. Fig. 1 maps upward mobility for the early and late 20th century at the scale of SEAs (Fig. 1 *A* and *B*) along with a cluster-derived regionalization of these patterns (Fig. 1*C*). Fig. 1 *A* and *B* present our preferred estimate of ISM: the expected adult income rank of children born to low-income parents at the 25th percentile. While our preferred outcome measures are identical to those presented in recent cutting-edge studies (16), in *SI Appendix*, we show that our geographical estimates are highly robust to decisions around measurement.

These maps reveal several instances of persistence in ISM through time. This is most evident for the South, where the ISM of children born to lower income parents has consistently lagged their counterparts elsewhere in the country. In the early and late 20th century, the average adult income attainment of children born to parents at the 25th percentile in the South has often failed to exceed the 40th percentile. Thus, low-income children across much of the South have faced particularly severe constraints on upward mobility throughout the 20th century.

The second source of persistence is the relatively higher ISM of children in higher income regions over 20th century. Across the century, low-income children growing up in the SEAs of the Northeast, the Midwest, and the West enjoyed some of the highest average income rank attainment as adults. Although these regions exhibited particularly high levels of ISM in the early 20th century, their advantage had receded somewhat by the late 20th century. Nonetheless, SEAs in these regions have continued to exhibit higher rates of upward mobility than have their counterparts in the South.

Fig. 1*C* presents an algorithm-based grouping of these outcomes over time (*SI Appendix*, S5). Using nearest-neighbor clustering methods for the two variables presented in Fig. 1 *A* and *B*, we derived a series of spatiotemporal clusters. These clusters capture the intergenerational mobility experiences of six regions: Northeast, Midwest, South, Northern Plains and Mountain, Southern Plains and Mountain, and the West. These clusters are not meant to be an exhaustive regional classification of upward mobility experiences but rather provide a series of regional trajectories to aid our discussion. We prefer these clusters to more widely used aggregations, as they are derived from the data at hand and strike an attractive balance between the four coarse census regions and the more granular, nine census divisions.

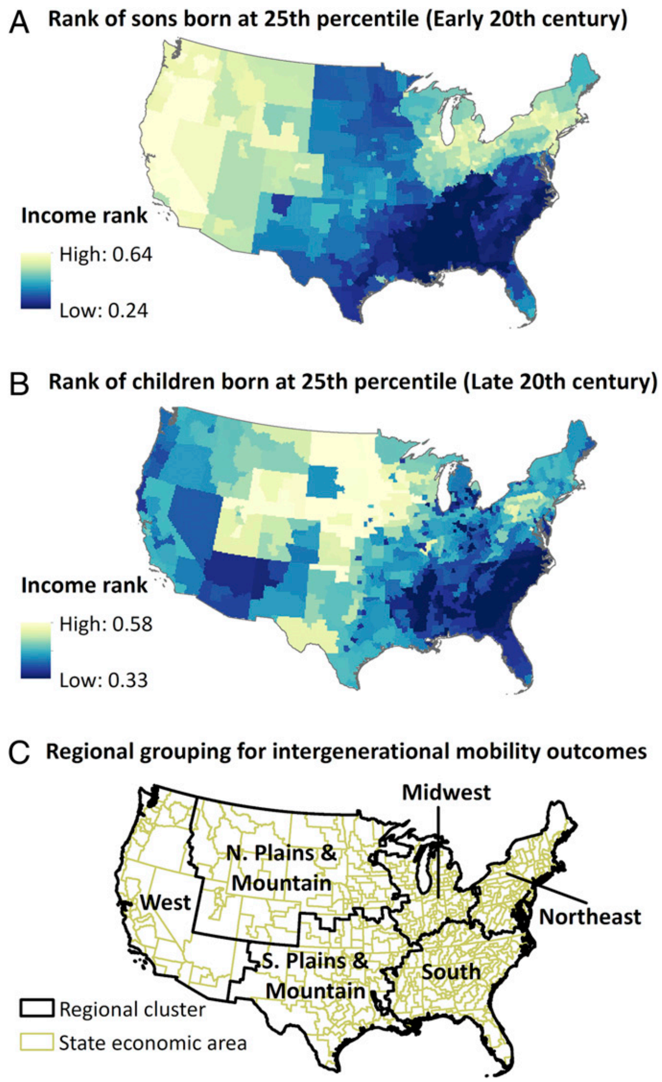

Fig. 1. The geography of intergenerational mobility in the early and late 20th century. Maps of average adult income rank for children born to parents at the 25th percentile in the early 20th century (*A*) and in the late 20th century (*B*) measured at the SEA scale, accompanied by a cluster-based aggregation of outcomes into six regions across both periods (*C*) (*SI Appendix*, SI5). Estimates from the early 20th century are based on the adult income scores for males from the 1900–1915 birth cohorts who were observed in 1920 and 1940 (*A*), and those from the late 20th century are based on estimates for 10 million children from the 1980 to 1982 birth cohorts observed in Internal Revenue Service records in the 1990s and as adults between 2011–2012 (*B*) (see *SI Appendix*, SI2 for discussion of measures). Maps were rendered using the Lambert Conformal Projection.

We use this grouping in Fig. 2 to summarize trajectories of ISM across regions. We also split these regions by whether the majority of their SEA populations lived in a census-defined urban area, and we add dotted lines to represent the national averages for each period. In this scatterplot, urban and nonurban areas of the South are consistently below the national average and fare worse than the Northeast, the Midwest, and the West. This said, the advantage of these three regions in ISM over the South attenuated substantially as the century progressed.

In addition to these generally stable relationships, there are also some more notable changes in regional ISM performance, with two specific cases standing out. First, urban areas of the Midwest fell from having the third highest level of upward mobility in the early 20th century to having the third lowest level by

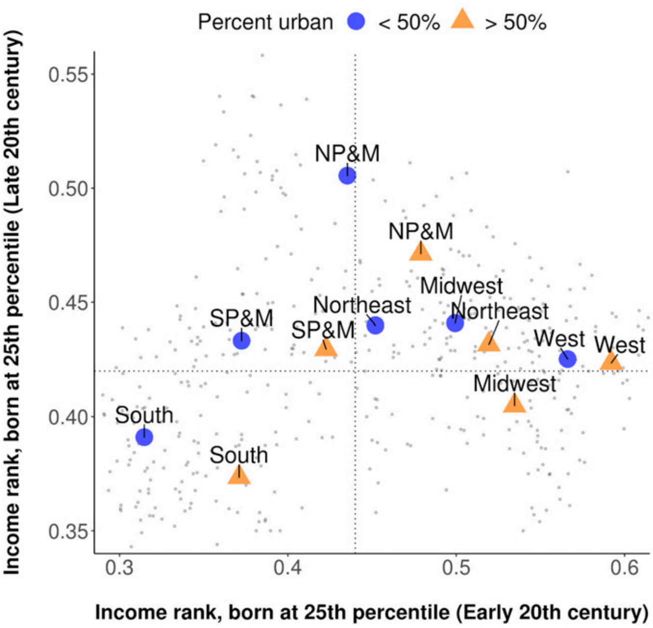

Fig. 2. Scatterplot of intergenerational mobility levels of SEAs and regions in the early 20th century and the late 20th century. The larger points in the foreground show the regional average adult income rank for children across the two periods of observation, and the smaller background points show the same values but for SEAs. The regions are split by SEAs with populations above and below 50% living in urban areas. The dotted lines along the *x* and *y* axes represent the national averages for the *x* and *y* values, respectively. For visual reasons, we abbreviate the Northern Plains and Mountain ("NP & M") and Southern Plains and Mountain ("SP & M") regions. As the regions are an exact aggregation of the SEAs, the SEA estimates uniquely correspond to a single region. We present the exact delineation of these coarser regions in Fig. 1*C*. The creation of this regional aggregation is described in *SI Appendix*, SI5.

the late 20th century. To put this decline in perspective, ISM in the urban Midwest fell from being comparable to the high-income Northeast and West regions in the early 20th century to being below the national average and only slightly above the less urban areas of the South by the late 20th century.

The second notable change is found in the Northern Plains and Mountain (NP & M) region which, over the 20th century, transitioned from being a region of relatively low ISM to being the national leader. It is important to note, however, that these patterns do not mean that children growing up in this region achieved high incomes by staying in place. Rather, these are the childhood contexts that are most strongly associated with upward mobility, and we later show that much of the upward mobility of the Plains and Mountain areas was likely realized by children from those regions residing as adults in other places.

There is another changing geographical pattern of ISM to note. In the early 20th century, more urbanized areas held an overwhelming advantage over proximate but less urbanized areas within every region. Across the United States, growing up in an urban place was predictive of greater upward mobility than was growing up in a less urbanized place. By the late 20th century, however, this relationship had become more varied. In some regions, adult outcomes were quite similar for children growing up in urban and rural areas (i.e., Northeast, Southern Plains and Mountain, and West), whereas in other regions, residing in an urbanized area came to constrain upward mobility by comparison to nearby less urbanized areas (i.e., NP & M, Midwest, South). These intraregional differences thus suggest a weakening influence of the simple fact of the urbanness of childhood contexts in producing upward mobility.

Characteristics of childhood context and ISM. We harness variation across our 467 SEAs to examine the short-term and long-term contextual factors associated with these varying levels of upward mobility. Fig. 3 provides a prospective analysis of the correlation between SEA attributes at the beginning of the century and upward mobility rates over the short term (early 20th century) and long term (late 20th century). These correlations therefore paint a picture of how, based on the characteristics of SEAs in the early 20th century, places fared in making upward mobility possible over the following century.

To capture the economy-wide structural forces mentioned above, we categorize our SEA attributes in terms of labor markets (Fig. 3*A*) and urbanization (Fig. 3*B*); to capture long-term local forces or deep roots, we measure historical intraregional inequality (Fig. 3*C*) and a set of factors typically associated with the long-run sociocultural attributes of regions (Fig. 3*D*). Fig. 3 *A* and *B* roughly corresponds to the types of jobs available in a region, while Fig. 3 *C* and *D* are indicators of early life social context. As noted, Fig. 3 *A* and *B* are likely to vary with creative destruction, through episodic rearrangements of the geography of the economy, manifested in the automation of older industries and the geography of employment in new sectors that arise through innovation. The geography of these forces also undergoes change due to domestic relocation and foreign offshoring. Taken together, they have introduced substantial turbulence into the income ranks of American regions since the mid-19th century. Fig. 3 *C* and *D*, by contrast, are more stable over the long term, and so we consider them to be indicators of deep local forces embedded in the socio-cultural structures and practices of each region ("deep roots"), even if their absolute magnitudes may be influenced by external changes.

Fig. 3 reveals strong correlations between upward mobility and economic structure (labor market characteristics and urbanization); these are related over the short term, but weakly or negatively associated over the long term (Fig. 3 *A* and *B*). This is particularly visible in the correlation coefficient for upward mobility and median household income per capita, which is exceptionally high at around +0.74 in the early 20th century but had attenuated to −0.10 by the late 20th century. The attenuation of these temporal correlations implies that the leading economic regions of the early 20th century weakened in being springboards for intergenerational mobility as the century progressed.

Historical forms of economic inequality within regions and deep roots, in contrast, exhibit a more consistent association with upward mobility (Fig. 3 *C* and *D*). In this regard, upward mobility is strongly correlated with the historical high school dropout rate, income inequality, and the Black population share (correlations range from −0.77 to −0.36 between the early and late 20th century). The enduring strength of these correlations stand in stark relief to the more variable associations between upward mobility and the local economic characteristics discussed above (Fig. 3 *A* and *B*). The persistence of Black racial subordination, inequality, and historical schooling outcomes across certain SEAs, therefore, appears to have left a mark on the US landscape of opportunity that remains highly visible, even into the 21st century.

Do these weakening intertemporal correlations between specific economic attributes (such as type of employment and income) and intergenerational mobility reflect the geography of creative destruction in the economy, or an overall waning of the influence of economic forces? We examine this question in Fig. 4 by measuring the stationarity of place attributes through time in relation to intergenerational mobility in each period. The blue circles reflect the share of variation in ISM explained by a given attribute in the early 20th, and the yellow circles show the same

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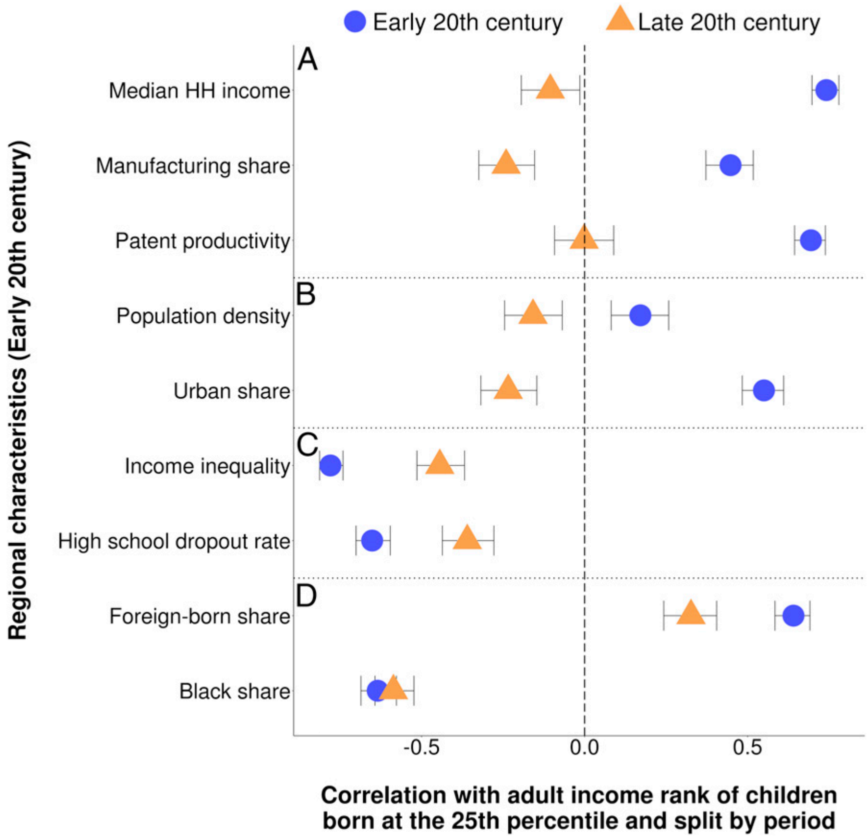

Fig. 3. Characteristics of state economic areas in the early 20th century with the adult income rank of children born to parents at the 25th percentile. This plot shows the correlation coefficients between the characteristics of state economic areas in the early 20th century with the average adult income rank children born at the 25th percentile in the early and the late 20th century. Most of these SEA characteristics were obtained from Opportunity Insights (late 20th century) or derived by us from the complete-count census of 1920 (early 20th century). We categorize the SEA attributes as relating to labor markets (*A*), urbanization (*B*), intraregional inequality (*C*) and factors typically associated with the long-run sociocultural attributes of places (*D*). *SI Appendix*, S3 provides full details on each of these characteristics and their derivation.

relationship but for the late 20th century. The value following the variables ("corr") represents the correlation coefficient for each attribute with itself across the two time periods: a measure of the temporal stability of place attributes.

Economic indicators—incomes, manufacturing employment, and patenting—have temporal correlations that range from 0.09 for the manufacturing employment share to 0.44 and 0.59 for patenting and median income, respectively. These correlations are substantially weaker than those for the urbanization measures, which range from 0.78 to 0.83. This implies that indicators of economic development are quite variable through time and do not simply track long-term urbanization patterns (33).

The weak correlations for manufacturing over time reflect the well-known process of creative destruction and its geography. The United States began the 20th century as an emerging manufacturing superpower riding the crest of the electrical and mechanical revolution; it finished the century as a prime example of a largely postindustrial economy that lead the world in digital technologies, finance, and other high-technology or service sectors. Not only did the manufacturing share of jobs in the economy decline by two-thirds from the mid-20th century to 2015, but US manufacturing jobs and other skilled activity increasingly shifted into Southern and Southwestern states (34). The US economy therefore experienced both an aggregate loss and a substantial internal reorganization of manufacturing employment, as well as the creation of other economic activity with a different geography from that of manufacturing in its heyday. The erosion of manufacturing is particularly notable in this respect because manufacturing jobs were well-remunerated in the mid-20th century and provided a key pathway to upward mobility in the past (35).

However, this restructuring of economic activity is not the sole driver of declining levels of upward mobility among the leading SEAs of the early 20th century. While economic indicators accounted for 18–55% of the variation in ISM in the early 20th century, the same indicators subsequently explain almost no variation in upward mobility in the late 20th century. Thus, not only did the spatial distribution of economic activity shift over time, but the power of economic indicators in accounting for ISM also attenuated. This is consistent with our earlier descriptive finding that, despite being quite sparsely settled, levels of upward mobility in the Plains and Mountain regions came to surpass higher income and more industrialized regions (i.e., the Northeast, Midwest, and West). This shift implies a fundamental change in how the geography of economic activity relates to intergenerational mobility across the century.

Factors linked to economic inequality within regions and deep roots explain some of this story. Owing to the historical concentration of African Americans in the South, the Black share of SEAs is highly correlated through time at 0.89. Further, with an R^2 value of 0.46, the Black share of the population is the most powerful single place-based predictor of upward mobility in the late 20th century. The share of variation in ISM explained by the Black population share also grew by around 15% across the century, suggesting that, at least geographically, the link between race and upward mobility may have strengthened over time,

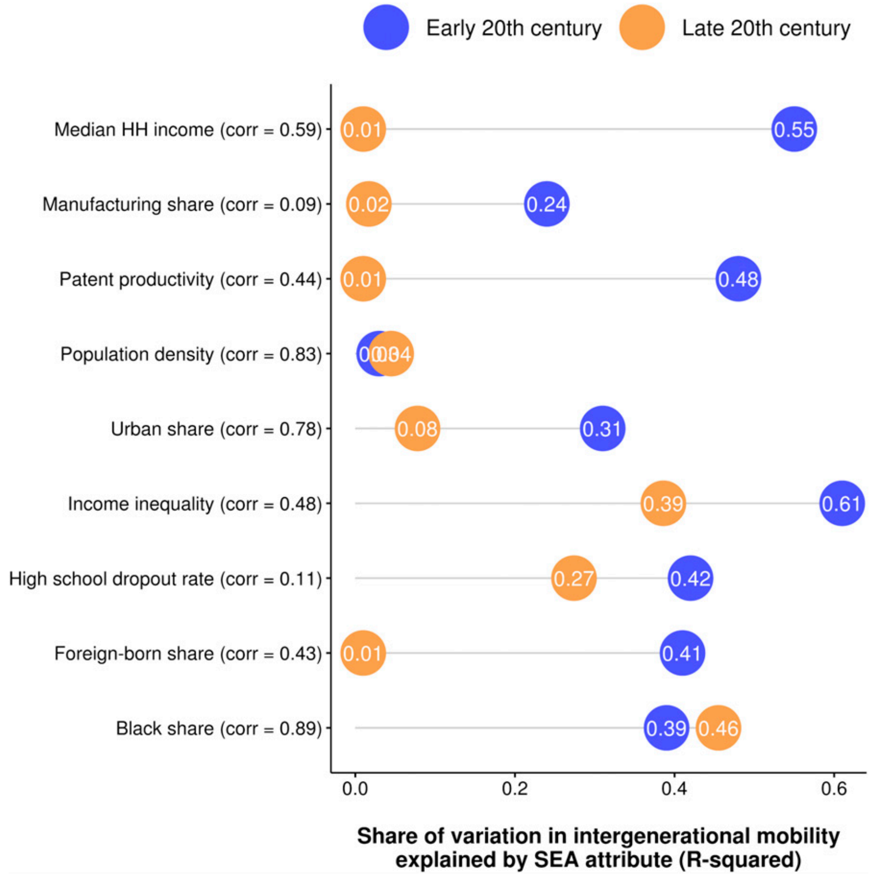

Fig. 4. Explanatory power of SEA characteristics in accounting for the average adult income rank of children born to parents at the 25th percentile. The chart shows the share of variation in the adult income rank of children explained by single SEA characteristics, early and late 20th century. The values inside the circles show the R^2 values from one of 18 univariate regressions where the dependent variable is the adult income rank of children born to parents at the 25th percentile in the early (yellow) or the late (blue) 20th century, and the independent variable is one of the nine SEA characteristics (*y* axis), observed is the early or late 20th century, respectively.

particularly in comparison to proximate economic determinants. Thus, both strong geographical persistence of deep roots and the increasing influence of local racial composition help explain why upward mobility in the South has continued to fare so poorly across the century. Furthermore, our geographical estimates of upward mobility are quite stable, even when we restrict our sample to White households only (*SI Appendix*, Table S4); this implies that the forces underlying the place-based link between the Black population share and upward mobility may constrain upward mobility for both White and Black children, as in the case of the South.

The high school dropout rate and income inequality are also associated with variation in upward mobility. Given the large shifts in the structure of these attributes across the century, it is not surprising that the geography of schooling (*corr* = 0.11) and income inequality (*corr* = 0.48) are not as highly correlated as the Black population share (*corr* = 0.89) over time. Even despite some attenuation, however, the power of these variables in explaining ISM has remained high, and much more so than the attributes directly measuring economic development.

When viewed alongside our findings for the Black population share, this suggests that factors operating through early childhood, and linked to local sociocultural contexts (deep roots) and historically specific forms of inequality in different regions, have taken center stage in driving upward mobility (36). Intuitive explanations of these patterns include the growing demand for human capital in the economy, the growing racial stratification of Northern cities following the Great Migration from the South, and the diminished role of manufacturing-related occupations as vehicles for upward mobility over the 20th century. It is possible that these patterns may have also differed by gender, but as we only observe males in the early 20th century sample, future work will need to need to examine geographical gender-based differences through time.

The coevolution of childhood context and ISM. We now assess the likelihood that these attributes are causally (rather than coincidentally) linked to shifts in upward mobility. It is possible that place-level associations such as those between racial composition, inequality, and upward mobility could reflect other unobserved but spatially correlated influences. For example, the negative correlation between the Black population share and upward mobility may be a product of enduring economic features of the South; such possibilities require that we adopt a more formal statistical approach.

Omitted variable issues are addressed by estimating a series of panel regression models with two-way fixed effects. Our dependent variable here is the upward mobility rate of SEA i in period t, which we model as a function of k time-varying attributes of places (Eq. **3**). By including time and place fixed effects, these models leverage within-SEA variation over time to better identify the factors associated with changing intergenerational mobility rates. Table 1 presents the results from a panel model including observations for all SEAs over time (column 1) and then also, due to the unavailability of data on the high school

Table 1. Panel regression model of upward mobility regressed on SEA characteristics in the early and late 20th century

		Y = Adult income rank of children born to parents at the 25th percentile	
		Model 1	Model 2
Economic structure and urbanization	Median household income (p.c.)	0.0134*** (0.004)	0.0140*** (0.004)
	Share in manufacturing	0.00831*** (0.003)	0.0130*** (0.003)
	Patent productivity	0.00294 (0.004)	−0.00606** (0.003)
	Urban share	−0.0100 (0.007)	0.00602 (0.006)
Intraregional inequality and deep roots	High school dropout rate	—	−0.0192*** (0.003)
	Income inequality	−0.0399*** (0.004)	−0.0221*** (0.004)
	Black share	−0.0373*** (0.009)	−0.0239*** (0.007)
	Foreign-born share	0.00844** (0.004)	0.00470 (0.004)
	Constant	0.439*** (0.002)	0.428*** (0.002)
Model summary	Observations	934	728
	R^2	0.790	0.843
	Adjusted R^2	0.573	0.679
	SEA & period fixed effects	Yes	Yes
	Robust standard errors	Yes	Yes
	Restricted to SEAs with schooling data?	No	Yes

Table of coefficients from two panel regression models, where the dependent variables are the average adult income ranks of children in SEAs born to parents at the 25th percentile in the early or late 20th century. As we lack complete data on the high school dropout rate for the late 20th century, we present a model with full observations without the high school dropout rate (model 1), and a model with reduced observations that includes the high school dropout rate (model 2). All independent variables are transformed into standard units with a mean of zero and a SD of one. In *SI Appendix*, Table S13, we show that our estimates are robust to dropping the South from the analysis. SEs in parentheses, $^*P < 0.10$, $^{**}P < 0.05$, $^{***}P < 0.01$.

dropout rate of many places in the later 20th century, a model with a reduced observation count (column 2). The fixed effects included in these models help account for potentially distorting unobserved time-invariant differences across SEAs.

In all models, median household income per capita has a strong positive coefficient. This implies that improvements in median incomes is predictive of rising upward mobility. In view of the discontinuity in the economic correlations above (Fig. 3 *A* and *B*), this robust significant effect indicates that improvements in local income levels do have a significant positive effect on upward mobility. However, recall that above we showed a sharply declining overall national effect of median household income on mobility. With this decline in mind, the positive effect of average incomes on upward mobility should be qualified by the fact that other determinants of mobility grew in importance over the century.

Likewise, the manufacturing employment share is also significantly positively associated with upward mobility, indicating that regions that have increased manufacturing employment (or not lose it) continued to enjoy relatively higher levels of upward mobility across the century. However, due to automation and offshoring, there is now less manufacturing employment in the economy to generate this effect. Furthermore, after adjusting for the high school dropout rate (model 2), patenting holds a significant negative association with upward mobility, implying that high-innovation regions are not necessarily those with the most ISM. When taken together with the positive coefficient for manufacturing employment, it may be that traditional industrial occupations, different from the highly skilled jobs related to innovation, are strong vehicles for upward mobility. Overall, our estimates imply that better economic performance tends to be associated with improvements in upward mobility, but economic improvements have been uneven and no longer reproduce the overall early-20th century pattern of intergenerational mobility.

The remaining coefficients in Table 1 yield one further set of insights into recent changes in the wellsprings of ISM. Increases in intraregional income inequality, Black population shares, or high school dropout rates predict declining upward mobility. Of these variables, the Black share and income inequality have particularly strong effects: An increase of one SD in either variable is associated with a reduction of up to 2.4 percentile ranks in the adult earnings of children born to low-income parents. By contrast, these effects are around 50% larger than that for median household income (model 2), suggesting that deep roots and sociocultural forces are more tightly coupled to upward mobility than are indicators of economic development. Taken together, these estimates conclusively point to the growing importance of racial subordination and overall inequality in shaping the national landscape of intergenerational mobility.

Internal Migration and ISM. So far, we have documented that the geography of income, manufacturing jobs, inequality, and early childhood contextual factors related to race influence upward mobility, but we have yet to explain how intergenerational mobility varies so widely across low-income places, or why the Plains and Mountain regions came to generate such high levels of upward mobility. This is evident in Fig. 2, where we showed persistently low levels of upward mobility in the South but large increases over the century for other low-income regions, particularly the NP & M region. Our final analysis provides descriptive insight on the likely role of migration in these patterns.

In *SI Appendix*, we show that compared to the South, the Plains and Mountain regions fare reasonably well in terms of factors linked to childhood context and intraregional inequality (*SI Appendix*, Table S11). Compared to the South, the Plains and Mountains have lower high school dropout rates, lower levels of income inequality, and are more racially homogenous. In terms of income levels, however, the South and the Plains and Mountain regions all lag behind the Midwest, West, and Northeast, despite the South having the second highest concentration of manufacturing—otherwise favorable to mobility—of the six regions. Given that the NP & M region holds no serious advantage in economic activity or urbanization but does appear to differ in terms of factors typically linked to intraregional inequality and early childhood context, we hypothesize that much of the elevated upward mobility associated with the NP & M region is driven by a combination of childhood conditions with many individuals subsequently migrating out of the region to access higher wage labor markets elsewhere.

If this is true, we would expect the NP & M region to exhibit both higher rates of outmigration and higher gains for these migrants relative to those from other low-income regions. Fig. 5 shows the rate of outmigration and returns to migration for children born into low-income families across the century. First, we find that the returns to migration are higher for people leaving the Plains and Mountain regions and the South than their counterparts leaving higher income regions like the Northeast, Midwest, and the West (Fig. 5*B*). This intuitive pattern is consistent across the century and confirms the role of outmigration in providing a path to upward mobility for people growing up in lower income places.

This latter intuition emerges from the fact that people leaving the NP & M region have traditionally gained more in income rank compared to the people they leave behind than have outmigrants from the South. Outmigrants from the Southern Plains and Mountain have also tended to gain more than their counterparts in the South, but not nearly by as much as those from the NP & M region. This indicates that outmigrants from the NP & M are either more advantaged by their childhood backgrounds or they are moving to labor markets that are providing them with greater opportunities than outmigrants from these other regions; however, we are unable to distinguish between these hypotheses.

The difference in the outmigration rates are also striking in this respect (Fig. 5*A*). While relative differences in outmigration are quite consistent across the century—low for higher income regions and high for lower income regions—the South and the NP & M stand out. Despite the South having some of the highest outmigration rates early in the century, Southern outmigration plummeted relative to the Plains and Mountain regions toward the end of the century. By contrast, the NP & M climbed to have the highest outmigration rate later in the century. The ascendance of the NP & M to be the leading (childhood) location for upward mobility coincided with people leaving the region in large numbers, likely benefitting by doing so. Targeted further research is needed to understand exactly why children born into poverty in the NP & M region may have behaved and fared differently compared to their counterparts elsewhere.

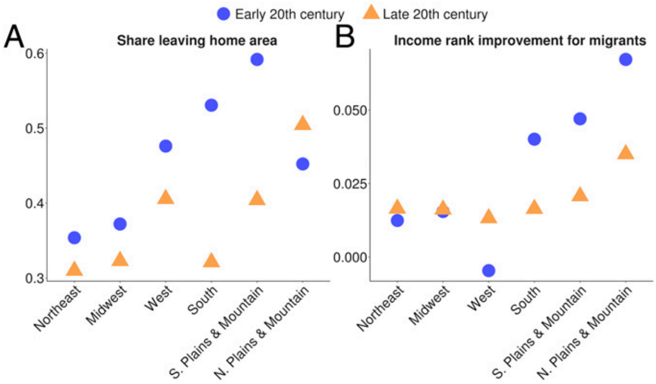

Fig. 5. Outmigration rates and within-region comparison of returns to migration by region. The label for the *y* axis of each figure is presented in the title of each respective graph. For the late 20th century, our measure of outmigration is from Opportunity Insights and is based on tract-level observations of the share of individuals leaving their childhood commuting zones. The data from the early 20th century are derived directly from our linked sample and capture whether males left their childhood state economic area. While the discrepancy in measurement scale of these data sources may introduce some measurement error into the intertemporal comparison, the distortion to the regional scale estimates is likely minimal. Furthermore, we want to specifically highlight that our early 20th century analysis is based on men only, and it is possible that the inclusion of women could change the magnitudes of our estimates. *SI Appendix*, S4 describes these characteristics and their measurement.

Discussion

New evidence reveals that specific economic and social attributes of places have large causal impacts on childhood development and later-life outcomes (18, 37). These findings have attracted a wide range of attention and are stimulating thinking about possible place-based policies to improve those early childhood environments that limit ISM. These geographical differences are observed at several different scales—within the family, the neighborhood, or the local labor market (11, 38). We have not attempted to identify the precise causal pathway through which places affect upward mobility, but rather to document the shifting regional geography (and geographical relationships) of upward mobility over the 20th century. Our analysis reveals that the long-term geography of intergenerational mobility can be explained through two interacting forces: the deep roots and the changing economic fortunes of places.

Early childhood environments appear to have, if anything, become more important for upward mobility, as contemporary forms of economic development seems to have a weaker relationship to ISM than development did a century ago. This does not mean that development is inherently unimportant to social mobility but rather that the recent period is characterized by development that is very strongly skill-biased and, hence, has a narrower opportunity-leveraging character than in previous periods, because it strongly depends on educational mobility and social networks. In this light, the changes we observe in upward mobility are strongly a function of the growing value placed on education in the contemporary economy, with education depending heavily on schooling and schooling on family structures in early life. Upward mobility is favored when deeply rooted and entrenched structures reduce intraregional interpersonal inequality and expand schooling access. In the context of today's economy that strongly rewards education, these work together to spread new economic opportunities to more of the region's households.

The overall reshuffling of the geography of jobs and incomes in the American economy has generated substantial change in the landscape of intergenerational mobility. Upward mobility has declined sharply in the Midwest and risen sharply in the NP & M region. For the former case, industrial automation and economic restructuring have reduced economic opportunity in the region (39), hampering subsequent upward mobility. The creation and destruction of better basic labor market conditions and higher household incomes pose unique policy challenges, as decisions on where new opportunities will locate is not entirely in local hands. The wider geographical restructuring of the economy thus provides one explanation for why economic performance in the early 20th century has not had a reliably long-lasting effect on upward mobility.

The most favorable combination of local circumstances is obviously better local labor market conditions and inclusive access to quality schooling in early life. As with other recent analyses of spatial inequality (20, 40), our findings of persistence are particularly revealing in this respect: Much of the South, which compares unfavorably in terms of schooling and other social contextual influences, has resisted major improvements in upward mobility despite considerable growth in employment and economic output; in relative terms, the Northeast and the West compare favorably along both dimensions.

Moreover, we find a persistently strong link between upward mobility and income inequality, on which the South again fares particularly poorly. This adds another layer to the more commonly discussed forces of economic opportunity and childhood environment. While we cannot nail down exactly why income inequality reduces upward mobility (41, 42), we suspect that higher local inequality limits the willingness of communities to invest in public goods and also stratifies the labor market so as to

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inhibit individuals from climbing the national income ladder (16, 32). This research therefore situates income inequality as a structure that interacts with early childhood contexts and labor markets to constrain upward mobility.

An additional insight generated by this work is that migration strongly affects upward mobility patterns. In the NP & M region, the combination of favorable early-life conditions with outmigration from the region has provided a pathway to higher income jobs. The relatively high upward mobility and outmigration rates of the NP & M region are particularly remarkable when considered in light of the long-term decline in interregional migration rates across the United States (28, 43, 44). This raises a crucial question for continued research: Why is outmigration not uniformly high across various low-income places and the children who grow up there? There has already been a great deal of discussion relevent to this question, even recently so with attention to race (28, 45). The present research begins the task of developing a greater understanding of the linkages between changing migration and social mobility rates. By further leveraging vast new spatial and temporal data sources such as those employed here, additional inquiry could examine the gender, nativity, and race dimensions of migration and mobility.

This said, we have not fully contended with the role of race here. The average outmigrant from the South is more likely to be Black than the average outmigrant from the Plains and Mountain regions. Although, in *SI Appendix*, we show that our geographical estimates are robust to restricting our sample to only White fathers and sons, we still do not know how much of the regional difference in the rates and returns to migration are attributable to childhood context (also influenced by race relations), and how much is due to racial discrimination in labor markets, locally or at migrants' destinations. While both factors are likely at play, disentangling the complicated pathways through which race and racial subordination influence upward mobility requires sustained and focused work (45, 46).

We conclude by highlighting two additional challenges to fully understanding long-term intergenerational mobility patterns. First, while the contemporary ISM data capture the experiences of both males and females, the historical data only apply to males. The historical focus on males reflects technical constraints in following females from childhood to adulthood, due to last name changes through marriage. While we cannot currently resolve this issue, we anticipate future work on gender-based differences in intergenerational mobility over the long term. Second, while we employ the most up-to-date approaches to measure income in the past, our income measures are not fully consistent between the early and late 20th century. As such, we have avoided making strong claims regarding shifts in overall intergenerational mobility levels. Further work that leverages smaller samples with detailed income data are better positioned to undertake such an investigation (47).

Materials and Methods

This analysis rests on linking previously published estimates of intergenerational mobility from the late 20th century with new intergenerational mobility estimates for the early 20th century. For the late 20th century, we relied on county-level estimates published by Opportunity Insights of the expected (adult) income rank of children whose parents were at the 25th percentile of the national income distribution based on rank-rank regression analysis and constructed using linked data from the Internal Revenue Service. In prior studies, this measure has been referred to as "absolute upward mobility" (16).

We generate a comparable measure for the early 20th century using income scores (*SI Appendix*, S2). The census did not collect consistent information on annual income prior to 1940, and then only did so for waged workers, excluding farmers and the self-employed. Thus, there is no direct income measure in the 1920 census and only a partial measure for the 1940 census. We overcome this constraint by using the income returns from 1940 to impute an income score in 1920 and 1940 (48, 49). This income score is the log of earnings associated with the interaction of three-digit occupation (50), immigrant status, and census division, as measured in the 1940 census. We estimate farmer income levels by applying ratios between the wages of farmers and laborers derived from the 1960 census (51).

We use these imputed income scores with a newly linked sample of 1.3 million father-son pairs, observed in 1920 and 1940. We created this sample by applying automated record linkage algorithms to the restricted non-anonymized 1920 and 1940 censuses of the United States (52, 53). We describe these approaches in detail in *SI Appendix*, S1, where we also demonstrate the robustness of our results to a wide range of contentious record linkage issues including false positives, inconsistent reporting, and sample attrition (54, 55). To summarize these robustness exercises: The large sample size and the aggregation of our upward mobility estimates to SEAs heavily dampens bias due to record linkage errors (*SI Appendix*, Table S4).

We used these data to estimate upward mobility rates across childhood locations in the early 20th century. We first ranked all children and parents on their income score by birth cohort in 1920 and 1940. Then, restricting the sample to children born to parents below the 50th percentile of the income score distribution in 1920, we measured the average income rank of children growing up in each SEA or region. We estimated geographical variation in intergenerational mobility using the following model:

$$Y(\textit{Son rank } 1940)_{ij} = B_0 + B_1 \textit{SEA } 1920_1 + B_2 \textit{Birth cohort}_2 + B_3 \textit{Father rank } 1920_3, \quad [1]$$

where the *SEA* 1920 parameter in Eq. **1** references the impact, conditional on birth cohort and fathers' rank, of growing up in each state economic area for the adult income rank of sons born to these low-income fathers. We use this model then to generate an average adult income rank for sons born at the 25th percentile of the national distribution in each SEA. These estimates can be interpreted as the expected 1940 income rank of sons who were 32 y old in 1940 and whose fathers were at the 25th percentile in 1920, based on a regression where the observations are families below the 50th percentile in 1920.

To examine change over time within our panel model framework, we stack the early 20th century estimates of upward mobility with the late 20th century estimates from Opportunity Insights. Combining these estimates with other SEA characteristics allows us to estimate the two-way fixed effect regression models presented in Table 1 (56). Which, in its general form, is specified as:

$$Y_{it} = a_i + \gamma_t + BX_{it} + \varepsilon_{it} \quad [2]$$

Where a_i and γ_t are unit and time fixed effects, respectively, and BX_{it} refers to a given variable of interest. In our context, these models are specified as:

$$Y(\textit{Upward mobility})_{it} = \textit{SEA}_i + \textit{Period}_t + \sum_{k=1..k} BX_{kit} + \varepsilon_{it}, \quad [3]$$

where the dependent variable is our measure of absolute upward mobility for SEA *i* in time *t*. *SEA* and *Period* refer to the two-way fixed effects for unit and time, respectively, and our *k* variables of interest are measured independently for each SEA *i* in period *t*. In our models that include the two-way fixed effects, our primary source of variation are within-unit differences over time. If increases in a given SEA attribute (e.g., median household income, high school dropout rate) are positively associated with upward mobility, we expect $\beta_k > 0$, and if that attribute is negatively associated with upward mobility, we expect $\beta_k < 0$.

Data Availability. Geographical estimates of intergenerational mobility data and replication files have been deposited in the repository of the Inter-university Consortium for Political and Social Research (ICPSR), available at https://doi.org/10.3886/E125701V1.

ACKNOWLEDGMENTS. We thank our thoughtful anonymous editor and reviewers. This work was supported by a generous Donald J. Treiman Research Fellowship through the California Center for Population Research at the University of California Los Angeles (UCLA), and a National University of Ireland (NUI) Travelling Studentship awarded by the NUI. For their comments and suggestions, we thank Leah Boustan, Dora Costa, Judith Seltzer, Rob Mare, Donald Treiman, David Rigby, Jamie Goodwin-White, Billie Lee Turner II, Gerald Mills, Trisalyn Nelson, Sebastien Breau, Peter Kedron, Amy Frazier, Cameron Campbell, and Fabian Pfeffer. We also received helpful comments from talks at the UCLA Economic History proseminar, the Broom Center for Demography at the University of California, Santa Barbara, the School of Geographical Sciences and Urban Planning at Arizona State University, the Department of Geography at the

University of Colorado Boulder, the Department of Geography at the University of Hong Kong, the Division of Social Sciences at the Hong Kong University of Science and Technology, the Department of Geography at Umea University, and the annual meetings of the Population Association of America and the American Association of Geographers. Mia Bennett provided excellent advice on visuals.

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