WORKPLACE SEGREGATION BETWEEN COLLEGE AND NON-COLLEGE WORKERS

By FRANCIS DILLON, EDWARD L. GLAESER, AND WILLIAM KERR *

How segregated are the workplaces of Americans in terms of skills? For sixty years, social scientists have worried about residential segregation (Taeuber and Taeuber, 1965; Murray, 2012; Athey et al., 2021). But the typical employed American spends more than eight hours at work on a normal workday, far more than the less than one hour per day that adults usually spend "socializing and communicating" and in "organization, civic and religious activities."[1] Moreover, events at work seem far more likely to shape long-term economic outcomes than neighborhood events.

We measure the level of educational segregation in US workplaces experienced by non-college workers using the Longitudinal Employer-Household Dynamics (LEHD) data. Educational dissimilarity of the workplace is comparable in magnitude to neighborhood racial segregation and rising. A companion paper, Dillon et al. (2025), finds that workplace segregation negatively impacts the future careers of non-college workers.[2] The growing educational segregation of our workplaces may limit the ability of younger, less-skilled workers to learn on-the-job from their more educated, elder peers, diminishing the acquisition of skills that promote higher-paid future employment (Blair et. al., 2020).

I. National Trends

The LEHD is collected from unemployment insurance records and covers around 95% of all

private sector workers. Our project has access to 22 states with full records for 1998-2020 that comprise slightly less than one-half of the American population. We include all workers aged 20-64 in each year where we have non-imputed education data. Dillon et al. (2025) provides a more extended data description.

Table 1 considers the level of education and the workplace segregation of skills over time. The first column shows the well-known fact that American workers are becoming more educated. Sixty-eight percent of workers lacked a college degree in 2000. By 2020, that share had fallen to sixty-two percent.

[Insert Table 1]

One metric of educational segregation is the isolation index (Taeuber and Taeuber, 1964):

$$(1)\ Isolation\ Index = \sum_{Establishments} \frac{Group_{Est}}{Total_{Est}} \frac{Group_{Est}}{Group_{Total}}$$

where $Group_{Est}$ is the number of non-college workers in the establishment, $Total_{Est}$ is the total number of workers in the establishment, and $Group_{Total}$ is the total size of the non-college workforce across all establishments. This index measures the share of non-college workers in the establishment of the average non-college worker. Column 2 shows that this index has declined from 0.787 in 2000 to 0.767 in 2020, suggesting that non-college workers are exposed to slightly fewer non-college

workers than in the past. This is unsurprising given the overall decline in the share of non-college workers in Column 1. The third column shows an adjusted isolation index which corrects for this aggregate trend by subtracting the population share of the group:

$$(1')\quad Adjusted\ Isolation\ Index = Isolation\ Index - \frac{Group_{Total}}{Total_{Total}},$$

where $Total_{Total}$ is the total population of workers. The adjusted isolation index subtracts the total national share of non-college workers from the basic isolation index and shows an increase over time from 0.11 to 0.15. One interpretation is that non-college workers are being exposed to more college-educated workers over time, but the increase in exposure is less than what one would expect given the overall increase nationally in education levels.

This view is supported by the dissimilarity index in Column 4, defined as

$$(2)\ Dissimilarity\ Index = \frac{1}{2}\sum_{Establishments} \left| \frac{Group_{Est}}{Group_{Total}} - \frac{Non-Group_{Est}}{Non-Group_{Total}} \right|,$$

where $Non-Group_{Est}$ is the number of college-educated workers in the establishment and $Non-Group_{Total}$ is the total number of college-educated workers in the workforce. This measure represents the share of non-college workers (or, equivalently, college-

educated workers) who would need to move across establishments to create an even distribution of education across workplaces. The index rose from 0.52 to 0.55 between 2000 and 2020. These figures are comparable to the 0.53 racial dissimilarity index for the median large metropolitan area in 2020.[3]

Figure 1 shows the change in the adjusted isolation indices of college-educated and non-college workers since 2000. The growth in the isolation of non-college workers has been larger and more consistent than the growth in the isolation of college-educated workers.[4]

[Insert Figure 1]

The growth in the dissimilarity index, which is the same for both groups, shows a less steady pattern in Figure 2. The index rose modestly from 2000 to 2010, rising before the global financial crisis and then dipping after. But between 2010 and 2019, the index's rise was steady and dramatic. There was a down tick in dissimilarity in 2020, but it is too early to know whether this is a shift in the long-term trajectory or temporary. One possible reason for an increase in segregation is that firms have

increasingly outsourced some specialized, less-educated operations, such as janitorial services.

[Insert Figure 2]

II. Heterogeneity

Table 2 looks at the changes in workplace segregation by demographic and regional subgroups.[5] Men had higher adjusted isolation and dissimilarity indices than women, and they have experienced greater growth in them. The patterns by race are more mixed. White non-college workers were in more skill-segregated workplaces than minorities in 2000, but the measures disagree on which group's skill isolation increased more since then. Across age groups, young non-college workers experience the most workplace isolation, and this age gap has been growing. Workplace segregation is highest and growing most quickly in the West. Segregation is lowest in the Northeast. These patterns stand in contrast with those of racial segregation, which are highest in old large metropolitan areas and lowest in western cities (Cutler, Glaeser and Vigdor, 1999). One potential explanation for this divergence is that

---

[3] City Observatory: America's least (and most) segregated metro areas: 2020. (https://cityobservatory.org/most_segregated2020/).

[4] These two series need not mirror each other. For example, consider an economy with three firms, two perfectly segregated by skill and the other mixed. If the non-college workforce grows by adding to the skill-segregated firm, and the college-educated workforce grows by adding to the skill-mixed firm, then the isolation of the non-college workers can increase while the isolation of college workers falls.

[5] Our measures for demographic groups, such as men (second row of Table 2), can be best thought of as the average workplace isolation to which the group is exposed. We continue to measure workplace isolation for establishments using all workers and their education levels (men and women, in this case), but we weight the relative importance of establishments by the number of men working there. We also continue to adjust the isolation index by the share of non-college workers in our full sample, not a group-specific share.

residential segregation has been declining over time, and consequently it is lowest in our newest communities. Conversely, workplace segregation is rising and may be highest in cities least likely to reflect the past.

[Insert Table 2]

Table 3 shows the indices across classes of firms. In 2000, goods-producing firms were somewhat more integrated, by either measure, than services-producing firms. The adjusted isolation index increased by less in goods-producing firms, although the dissimilarity index increased similarly in both types of firms. Isolation and dissimilarity were both lower in multi-unit than in single-unit firms, suggesting complex organizations have more mixing of education groups. However, adjusted isolation and dissimilarity rose much more in multi-unit firms. Again, this may reflect an increase in outsourcing specialized tasks and/or the superstar firm phenomenon.

[Insert Table 3]

Small establishments were considerably more segregated by education than larger establishments in 2000. Measured segregation is typically larger in smaller units because of largely mechanical reasons. If a unit is a single person, then segregation is always perfect, and if a unit is the entire population, then segregation is always zero. Both of our measures of segregation rose more in small establishments, which are less influenced by these mechanical features. Similarly, both measures of educational segregation were higher in new firms in 2000 and the increase in segregation was bigger for the new firms.

Table 4 shows the five industries contributing the most to the national increase in isolation. Workplace segregation rose due to the shift of non-college workers into extremely isolated industries. Four of the five industries that contributed most to rising isolation are not themselves becoming more isolated, but they account for a growing share of the non-college workforce (e.g., warehousing and storage). Restaurants contribute through both growing sector size and because its establishments are becoming more segregated. These industries explain 43 percent of the increase in adjusted isolation between 2000 and 2020.

[Insert Table 4]

III. Future Directions

The educational segregation of US workplaces is sizable and growing. In Dillon et. al. (2025), we demonstrate how proximity to college workers in the workplace boosts career prospects for non-college workers. We are extending this work to measure types of skill accumulation (e.g. abstract vs. routine) by

examining occupational change in the workplace. We also plan to jointly consider racial and educational segregation.

REFERENCES

Athey, S. Ferguson, B., Gentzkow, M., & Schmidt, T. (2021). Estimating experienced racial segregation US cities using large-scale GPS data. *Proceeding of National Academy of Sciences* 118 (46) e2026160118.

Barzu, R., Glaeser, E., Hidalgo, C., & Viarengo, M. (2024). Cities as engines of opportunity: Evidence from Brazil. NBER Working Paper.

Blair, P.Q., Castagnino, T.G., Groshen, E.L., Debroy, P., Auguste, B., Ahmed, S., Garcia Diaz, F., & Bonavida, C. (2020). Searching for STARs: Work experience as a job market signal for workers without bachelor's degrees. NBER Working Paper No. 26844.

Cutler, D., Glaeser, E., & Vigdor, J. (1999). The rise and decline of the American ghetto. *Journal of Political Economy* 107 (3): 455-506.

Dillon, F., Glaeser, E., & Kerr, W. (2025). Segregated workplaces and the careers of less-educated workers. Working Paper.

Murray, C. (2012). Coming apart: The state of white America, 1960–2010. Crown Forum.

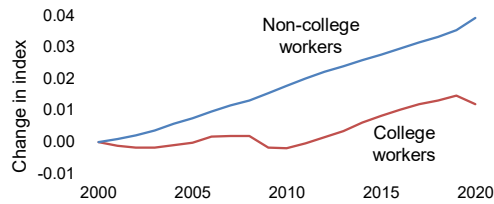Taeuber, K.E., & Taeuber, A.F. (1965). Negroes in cities: Residential segregation and neighborhood change. Aldine Publishing Company.

FIGURE 1: CHANGE IN ADJUSTED ISOLATION INDICES, 2000-2020

Notes: Figure plots changes in workplace isolation from starting level in 2000. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY23-P2766-R11646, R11898.
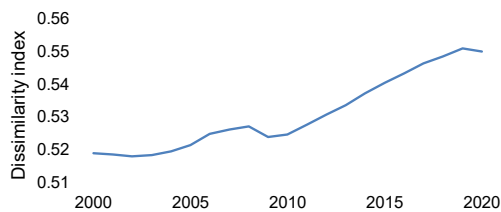

FIGURE 2: DISSIMILARITY INDEX, 2000-2020

Notes: Figure plots workplace dissimilarity index from 2000 to 2020. The index measures the share of the less-educated workforce (or, equivalently, more-educated workforce) that would need to move establishments in order to produce a uniform education share across workplaces. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY23-P2766-R11646, R11898.

TABLE 1: TRENDS IN WORKPLACE SKILLS AND SKILL SEGREGATION

	Share of non-college workers (1)	Isolation index, non-college (2)	Adjusted isolation index, non-college (3)	Dissimilarity index (4)
2000	0.679	0.787	0.108	0.519
2010	0.643	0.768	0.126	0.525
2020	0.620	0.767	0.147	0.550
Δ 2000-2020	-0.059	-0.020	0.039	0.031

Notes: Table documents trends in workplace skills and skills segregation using our LEHD dataset with 22 states present from 2000 to 2020. Included individuals are aged 20-64 and working in a private-sector establishment with at least 9 other employees. Column 1 presents share of workers in LEHD without a college degree. Column 2 presents the isolation index for non-college workers. Column 3 provides the isolation index that adjusts for workforce shares of education types. Column 4 provides the dissimilarity index. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY23-P2766-R11646, R11898.

Source: Author calculations.

TABLE 2: TRENDS IN WORKPLACE ISOLATION FOR NON-COLLEGE WORKERS BY WORKER TYPE

	Adjusted isolation index, 2000 (1)	Dissimilarity index, 2000 (2)	Δ Adjusted isolation index, 2000-2020 (3)	Δ Dissimilarity index, 2000-2020 (4)
Total	0.108	0.519	0.039	0.031
Men	0.141	0.523	0.046	0.042
Women	0.069	0.515	0.034	0.020
White	0.111	0.522	0.041	0.026
Minority	0.091	0.504	0.037	0.052
Young (18-29)	0.125	0.518	0.062	0.044

	Adjusted isolation index, 2000	Dissimilarity index, 2000	Δ Adjusted isolation index, 2000-2020	Δ Dissimilarity index, 2000-2020
Middle Aged (30-49)	0.105	0.519	0.026	0.036
Older (50-64)	0.097	0.519	0.051	0.016
Northeast	0.091	0.503	0.029	0.022
Midwest	0.108	0.515	0.038	0.024
South	0.110	0.529	0.034	0.020
West	0.116	0.523	0.047	0.044

Notes: See Table 1. Table documents changes in workplace isolation by worker type among non-college workers. For indices by worker demographic group, establishments are weighted by the number of people of indicated type. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY23-P2766-R11646, R11898.

Source: Author calculations.

TABLE 3: TRENDS IN WORKPLACE ISOLATION FOR NON-COLLEGE WORKERS BY FIRM TYPE

	Adjusted isolation index, 2000 (1)	Dissimilarity index, 2000 (2)	Δ Adjusted isolation index, 2000-2020 (3)	Δ Dissimilarity index, 2000-2020 (4)
Total	0.108	0.519	0.039	0.031
Goods-producing	0.048	0.482	0.025	0.036
Services-producing	0.121	0.503	0.038	0.035
Single-unit firm	0.141	0.602	0.042	0.018
Multi-unit firm	0.082	0.451	0.043	0.054
Small establishment	0.126	0.626	0.052	0.054
Medium	0.082	0.461	0.024	0.022
Large establishment	0.082	0.366	0.027	0.015
New firm	0.157	0.630	0.056	0.073
Existing firm	0.102	0.506	0.041	0.035

Notes: See Table 1. Table documents changes in workplace isolation by firm type among non-college workers. Small establishments have between 10 and 99 workers, medium establishments have between 100 and 999 workers, and large establishments have at least 1,000 workers. New firms are founded between 1996-2000, and existing firms must be founded in 1995 or earlier. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY23-P2766-R11646, R11898.

Source: Author calculations.

TABLE 4: MAJOR INDUSTRIES CONTRIBUTING TO RISE IN ADJUSTED ISOLATION INDEX

	Share of non-college workers, 2000 (1)	Δ Share of non-college workers, 2000-2020 (2)	Isolation index, 2000 (3)	Δ Isolation index, 2000-2020 (4)	Percent contribution to adjusted isolation index, 2000-2020 (5)
Restaurants and other eating places	3.68	0.43	0.872	0.055	13.9
Warehousing and storage	0.68	1.58	0.871	-0.031	9.3
General merchandise stores	0.98	1.01	0.887	0.000	8.3
Services to buildings and dwellings	1.20	0.53	0.917	-0.005	5.5
Grocery stores	2.02	0.39	0.887	-0.005	5.4

Notes: See Table 1. Table documents major industries contributing to rise in adjusted isolation index. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY23-P2766-R11646, R11898.

Source: Author calculations.