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Vive la différence? Intergenerational Mobility in France and the United States during the Nineteenth and Twentieth Centuries

The United States and Europe followed strikingly different redistributive policies during the second half of the twentieth century: The United States had relatively low taxes and transfers compared to most of the European economies. The last decade, however, has seen a series of attempts to understand how these countries reached these vastly different outcomes; the United States and Europe now show similarities in their respective technologies, their economic and political systems, their cultures, and their demography, among other characteristics. The divergence in redistributive policy is all the more remarkable in light of the convergence in intergenerational mobility between these areas. Despite virtually identical mobility profiles during the second half of the twentieth century, the United States and Europe have adopted policies that seem to reflect fundamentally different beliefs about the need for redistribution.[1]

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1 Thomas Piketty, "Social Mobility and Redistributive Politics," *Quarterly Journal of Economics,* CX (1995), 551–584; Roland Bénabou and Jean Tirole, "Belief in a Just World and Redistributive Politics," *Quarterly Journal of Economics,* CXXI (2006), 699–746.; Alberto Alesina and Edward Glaeser, *Fighting Poverty in the U.S. and Europe: A World of Difference* (New York, 2004); Robert Erikson and John H. Goldthorpe, *The Constant Flux: A Study of Class Mobility in Industrial Societies* (New York, 1992); Gary Solon, "Intergenerational Mobility in the Labor Market." in Orley Ashenfelter and David Card (eds.), *Handbook of Labor Economics*

Notwithstanding the commonalities of today, observers once described the United States as an exception to patterns emerging in Europe. As he toured the United States in the early 1830s, Tocqueville, a young French aristocrat, contrasted the extensive social and economic mobility that he witnessed in the new nation with what he knew from his homeland: "Among aristocratic peoples, families remain for centuries in the same condition and often in the same place. . . . Among democratic peoples [for example, in the United States], new families continually spring from nowhere while others disappear to nowhere and all the rest change their complexion."[2]

Although recent research on occupational mobility across generations has found few differences among advanced, industrialized countries, nineteenth-century observers, such as Tocqueville and Marx, saw vast differences in mobility between the United States and Europe. This perception persists to this day despite the evidence of modern mobility rates. Long and Ferrie's comparison of U.S. and British mobility rates during the last 150 years shows that substantial differences in intergenerational occupational mobility are discernible in the middle of the nineteenth century, even after accounting for differences in these countries' occupational structures, but that those differences disappeared by the second half of the twentieth century.[3]

The comparison between the United States and Britain, though of great interest because of the long historical and economic ties between them, may reflect differences in the two countries' economic development in the mid-nineteenth century: Britain had already largely evolved from an agricultural economy to an urban one; by 1850, it was well into the Second Industrial Revolution. The United States remained a largely rural and agricultural economy at that time, despite substantial industrial activity, particularly in New England. France in the mid-nineteenth

(New York, 1999), III, 1787; *idem,* "Cross-Country Differences in Intergenerational Earnings Mobility," *Journal of Economic Perspectives,* XVI (2002), 59–66.

2 Alexis de Tocqueville (trans. Henry Reeve), *Democracy in America* (New York, 1945; orig. pub. 1835), II, 98–99.

3 *Idem, Democracy;* Karl Marx, "Value, Price, and Profit," in *idem* and Frederick Engels, *The Collected Works of Karl Marx and Frederick Engels. XX, Works 1864–68* (New York, 1975; orig. pub. 1865); Jason Long and Ferrie, "The Path to Convergence: Intergenerational Occupational Mobility in Britain and the U.S. in Three Eras," *Economic Journal,* CXVII (2007), C1–C11.

century was more like the United States than was Britain, judging from its predominantly rural population, the size of its farm sector, and its degree of industrialization; the differences between the United States and France in mobility rates during the nineteenth century cannot be attributed to differing trajectories in their economic development. France and the United States, however, diverged in other important respects—for example, in the movement of wealth from generation to generation, in demographic behavior, and in the willingness to invest publicly in education. These sorts of issue may well have had an effect on the extent to which sons could match the economic status of their fathers.

Sociologists study intergenerational mobility to explain the creation and the reproduction of social structures in a society. But this topic is also of major concern for economists. Not only does it have some bearing on equality—or equal opportunity, as defined by Roemer—in a given economy, but it also implicates the issue of work incentives. People work harder if they know (or, at least, believe) that they are helping their children to improve their lot in the future: Even if they do not get rich in return for their work, their children will. Upward mobility is thought of as a reward for hard work. Thus, intergenerational mobility is crucial to public policy. Esping-Andersen claims that social programs must take into account the various ways in which parents affect the outcomes of their children. In other words, merely helping children to attain higher education may not be sufficient to establish equality of opportunity, should parental influence take other channels.[4]

Generational mobility also appears to be a key to understanding the persistence, and acceptance, of inequalities. Piketty models a process of "dynastic learning" whereby two economies, as a result of differences in past patterns of mobility, adopt and maintain vastly different redistributive regimes despite the convergence of their mobility patterns. He asserts, "The multiplicity of steady states explains at the same time why different countries can remain in different redistributive equilibria, although the underlying structural parameters of mobility are essentially the same. This is particularly likely if a country exhibited for some time in the past a

4 John E. Roemer, *Equality of Opportunity* (Cambridge, Mass., 1998); Gosta Esping-Andersen, "Unequal Opportunities and the Mechanisms of Social Inheritance," in Miles Corak (ed.), *Generational Income Mobility in North America and Europe* (New York, 2004), 289–314.

significantly different experience of social mobility before joining the 'common' pattern. The 'canonical' application is the United States, whose nineteenth century mobility and class structure differed significantly from that of Europe before the two countries [sic] converged in the twentieth century." Bénabou and Ok modeled a society in which the majority of the population was poor (below mean income) and without any political support for redistribution. They formalized the hypothesis that poor people do not favor a redistribution scheme that persists into future periods because they expect to be rich one day or, at least, their children to be. As they put it, "The key determinant of their vote is therefore how they assess their prospects for upward and downward mobility, relative to the rest of the population."[5]

It is essential not only to study generational mobility patterns but to explore them in the long run. People use information about past mobility to estimate actual or future mobility (Piketty), to demonstrate how past (and present) mobility may explain the intractability of inequality patterns (Benabou and Ok), or to trace the influence of mobility schemes on public policies (Esping-Andersen), which can be assessed only by comparing generational mobility over time. Few studies, if any, analyze mobility in the long run even though generational mobility is widely acknowledged to fluctuate considerably. For instance, in their analysis of successive cohorts, Mayer and Lopoo found that the intergenerational transmission of economic status in the United States evolved over time: The observed intergenerational income elasticity decreased from 0.45 to 0.25 during a ten-year period. On an even broader scale, Aaronson and Mazumder observed sharp changes in economic mobility after World War II, though they lacked historical references to enable extensive comparison. This article constructs such references by comparing mobility across time and place.[6]

Much remains to be learned from patterns of mobility studied throughout a long period. However, such patterns cannot be ex-

5 Piketty, "Social Mobility," 554; Bénabou and Efe A. Ok, "Social Mobility and the Demand for Redistribution: The POUM Hypothesis," *Quarterly Journal of Economics,* CXVI (2001), 452.

6 Susan E. Mayer and Leonard M. Lopoo, "Has the Intergenerational Transmission of Economic Status Changed?" *Journal of Human Resources,* XL (2005), 169–185; Daniel Aaronson and Bhashkar Mazumder, "Intergenerational Economic Mobility in the U.S.: 1940 to 2000," *ibid.,* XLIII (2008), 139–172.

plored easily, if at all, without employing a proxy for other measures of mobility, such as income or wealth. Hence, this article focuses on occupational mobility as a way to estimate socioeconomic status from the middle of the nineteenth century to the middle of the twentieth century. The specific questions at issue are whether differences in generational mobility between France and the United States were actually as great as contemporary observers reported, why such differences might have existed, and how such differences between these two economies might have evolved from the nineteenth to the twentieth century.[7]

The socioeconomic status of sons relative to that of their fathers roughly thirty years earlier is established using (1) a set of four broad categories that defined status consistently for both France and the United States and (2) a measure of the association between fathers' and sons' categories that abstracts from differences either across countries or within countries over time in the distribution of people across socioeconomic status and that does not require an imposed ordering of the categories.

PREVIOUS RESEARCH ON INTERGENERATIONAL MOBILITY IN THE LONG RUN Certain commentators have viewed generational mobility as a significant feature of an economy and a reflection of its dynamism. A high level of mobility is generally associated with great vitality and a large capacity to change, innovate, and grow. It has also been linked to greater individual freedom, offering a broader range of opportunities and choices; societies in which status and position are fixed at birth, transmitted from father to child through rigid schemes, are often thought to have little room for innovation and fulfilment at either the individual or collective level. This study takes no position on these views of mobility, focusing instead on the narrower question of measuring how mobility differs by place and time.

7 Alesina and Glaeser, *Fighting,* surveyed the then-existing state of the literature on comparative mobility in the nineteenth century. They concluded, "The U.S. was somewhat more mobile . . . but the differences are not overwhelming, especially given the problems with the data. One would hardly expect an 8 percent gap in upward mobility rates to produce such massive differences in beliefs about the determinants of income and such massive differences in redistribution" (66–67). Long and Ferrie, "Path," describe the shortcomings of the existing studies cited in Alesina and Glaeser, and the analysis herein suggests that past differences in mobility may have had more of a lasting influence on current attitudes and policies than Alesina and Glaeser could have been expected to see when they wrote.

Throughout the nineteenth century, contemporary observers and social analysts took pains to note differences in social mobility across countries. Tocqueville was particularly firm in his belief that mobility (both socioeconomic and geographical) was substantially greater in the United States than in Europe. Three decades later, Marx made much the same point. By the early twentieth century, both Sombart and Turner were attributing the lack of a radical labor movement and attendant political party to the unusually high degree of social mobility in the United States. According to all of these observers, the rigid social structures of the older European countries hindered their economic development; the United States exhibited extraordinary flexibility and dynamism. Despite the long pedigree of these notions, little data has been available to assess the magnitude of this contrast and to appreciate how mobility evolved on both sides of the Atlantic over the long haul.[8]

Socioeconomic mobility depends simultaneously on the structure of the economy ("forced" or "structural" mobility) and on the fluidity of the job market ("exchange" or "circulation" mobility). Therefore, long-term changes in mobility patterns may result either from an evolution of the economic structure—due to, for example, industrialization—or from changes in the degree of a society's "openness." For instance, the possibility of becoming a farmer may decline as the proportion of farmers in the economy declines, whereas the opportunity of becoming a lawyer may grow, without any change in the proportion of lawyers in the society, as more and more people have access to education.[9]

Historians have focused on the "metamorphosis of the social structure" as a determinant of changes in status mobility over time. The French Revolution broke down the "société d'ordres" (composed of the *tiers Etat, clergé,* and *noblesse*) into what was supposed to be a much more fluid society in which "privilèges" no longer

8 Werner Sombart (trans. P. Hocking and C. T. Husbands), *Why Is There No Socialism in America?* (New York, 1906; orig. pub. 1876); Frederick Jackson Turner, *The Frontier in American History* (New York, 1921). It was too early for these observers to describe what they saw as "social mobility," since this field of inquiry did not emerge until the second part of the twentieth century. Dominique Merllié, "Les travaux empiriques sur la mobilité sociale avant la Première Guerre mondiale," *Revue Française de Sociologie,* XXXVI (1995), 5–31, surveys historical studies of mobility in France.

9 A more detailed presentation of this distinction is to be found in François Héran, "La mobilité sociale, du passé au présent," in Graziella Caselli, Jacques Vallin, and Guillaume Wunsch (eds.), *Démographie: Analyse et Synthèse. VI. Population et société* (Paris, 2004), 389–418, which shows precisely how these notions developed in the twentieth century.

existed. Hence, the postrevolutionary period should have introduced greater opportunity and mobility. However, as Charle demonstrated, even if the Napoleonic era was characterized by many rises and falls in economic status, its duration was too short to establish a new regime of generational mobility. The restoration that began soon afterward, which again established inequalities of position and property, made the diffusion of a high mobility pattern impossible.[10]

During the remainder of the nineteenth century, predominantly rural and agricultural France began to urbanize and industrialize, at a slower rate than many other European countries. Thélot and Marchand identified certain major transformations of the social structure in France: Until around 1914, peasants increasingly became the owners of their farms, and the share of agricultural wage earners declined; only after World War I did the number of farms decline. This development accompanied both an increase in the share of independent workers until the middle of the nineteenth century, followed by a drop in their proportion of the workforce, and an increase in the share of urban workers. At this time, the distinction between workers and small bourgeoisie shopkeepers or craftsmen remained small; successful workers might own their own (small) business by the end of their lives.[11]

In Sewell's words:

> [. . . P]ossession of capital was usually far more important than any other faculty in determining the shape of industrial contracts. Those who had nothing to offer but their labour found themselves at a serious disadvantage by comparison with owners of capital—unless they possessed skills that were in very short supply. The theoretically equal individuals who came together in the market quickly sorted out in two groups: possessors of capital who offered work to the others and those whose lack of capital obliged them to be wage worker. These two groups corresponded essentially to the masters and the journeymen of the old regime. But this is not to say that nothing had changed. There were no legal barriers keeping a journey man from becoming a master; he could go into business for himself as soon as his savings enabled him to do so, rather than having to obtain an expensive and jealously guarded maîtrise from the

10 Olivier Marchand and Claude Thélot, *Le travail en France: 1800–2000* (Paris, 1997); Christophe Charle, *Histoire sociale de la France au XIXe siècle* (Paris, 1991).

11 *Ibid.*

> corporation. By the same token, an entrepreneur whose business fared badly now faced a greater risk of falling into the ranks of wage workers, because there was no privileged corporation to assure him a niche in the market or to alleviate his misfortunes by means of charités.[12]

Mobility appears to have declined substantially in the United States since the period from 1850 to 1920, perhaps as a consequence of declining opportunities for improvement through migration. Ferrie summarized recent research, using samples of fathers and sons linked across successive U.S. federal population censuses. The most striking result is the relatively low mobility that occurred during the second half of the twentieth century, compared to that from 1850 to 1920. Erikson and Goldthorpe found few differences in modern mobility patterns across generations when comparing the advanced, industrialized United States with Europe during the second half of the twentieth century. According to these studies, as well as research on income mobility, social mobility is almost identical in the United States and Europe.[13]

Almost none of these comparative works on socioeconomic mobility in the past, however, compare mobility across both countries and time spans. Much of the research on mobility across generations in both France and the United States during the nineteenth century has been conducted at the local level—following individuals who remained within a specific location across several life events or census enumerations (Marseille as studied by Sewell and Boston by Thernstrom).[14]

Alhough this work provides valuable detailed information about the occupations of fathers and sons, it misses a crucial part of the population—those who were geographically mobile and may

12 Wiliam H. Sewell, *Structure and Mobility: The Men and Women of Marseille, 1820–1870* (New York, 1985).

13 Ferrie, "History Lessons: The End of American Exceptionalism? Mobility in the United States Since 1850," *Journal of Economic Perspectives,* XIX (2005), 199–215; Erikson and Goldthorpe, *Constant Flux;* Solon, "Cross-Country."

14 Sewell, *Structure;* Stephan Thernstrom, *Poverty and Progress* (Cambridge, Mass., 1964); *idem, The Other Bostonians* (Cambridge, Mass., 1973). One exception to the lack of comparative work is Hartmut Kaelble, *Social Mobility in the Nineteenth and Twentieth Centuries: Europe and America in Comparative Perspective* (New York, 1986). Despite its shortcomings—especially in using excessively aggregated groups—it concurs that rates of mobility were not vastly different in Europe and the United States, even in the nineteenth century.

well have differed in socioeconomic mobility from persisters. The recent creation of nationally representative, longitudinal data for both France and the United States that does not suffer from this shortcoming now permits a more systematic examination of how intergenerational mobility changed over time.[15]

This article evaluates intergenerational mobility within nineteenth- and twentieth-century France and the United States via two datasets built on individual-level data. The data for France come from two sources: (1) French civil records documenting the occupation at marriage or death of several thousand pairs of fathers and sons throughout the nineteenth century and (2) the Formation Qualification Professionnelle (FQP) survey of 4,700 father/son pairs from the late twentieth century. The data for the United States also come from two sources: (1) census information documenting the occupations of 75,000 father/son pairs from 1850 to 1910 and (2) the 1973 Occupational Changes in a Generation (OCG) survey of 10,000 father/son pairs. The evidence for both countries, in both periods, enables comparisons of intragenerational mobility (between an individual's status at around age twenty and his status at around age fifty) and intergenerational mobility (between the status of fathers and sons at the same age, either at the beginning or at the end of their active lives).

The focus herein is intergenerational mobility, not as reflected by variations in the distribution of individuals across status categories and countries, but by variations that arise from more fundamental characteristics, such as the amount of human capital necessary to achieve a given status. Differences in mobility between France and the United States may have been due to certain hidden elements (after accounting for differences in the distribution of socioeconomic status), the significance of which may have fluctuated from period to period. For instance, in France, taxes on

15 Ferrie, "Migration to the Frontier in the Mid-Nineteenth U.S.: Re-Evaluating the 'Turner Thesis,'" working paper (Northwestern University, 2004), in considering the link between migration to the western U.S. frontier and mid-nineteenth-century economic mobility, found that the performance of migrants was systematically different from that of nonmigrants. Noël Bonneuil and Paul-André Rosental, "Changing Social Mobility in 19th-Century France," *Historical Methods,* XXXII (1999), 53–73, compares the intergenerational mobility of those who moved and those who stayed in nineteenth-century France. Steven Herscovici, "Migration and Economic Mobility: Wealth Accumulation and Occupational Change among Antebellum Migrants and Persisters," *Journal of Economic History,* LVIII (1998), 927–955, considers intragenerational mobility for those who moved and those who stayed in nineteenth-century Newburyport. Both articles reach conclusions similar to Ferrie's.

the transfer of wealth within families across generations tended to be low, wheras the taxes on other transfers of wealth tended to be high, thus creating a bias in favor of wealth remaining in families. In the United States, however, because wealth transfers incurred either little or no taxation, this bias was largely absent. The two countries also evinced distinctive demographic patterns: France exported and imported little of its population and had comparatively low birth rates, but the United States was a net importer of population throughout the nineteenth century and exhibited high (though declining) birth rates. These characteristics might help to explain the extent to which France and the United States differed in mobility.

THE DATA The data for the nineteenth-century United States were compiled by following individuals across census enumerations. The IPUMS sample for 1850, a nationally representative 1 percent sample from the U.S. population census, was linked forward to the 1880 complete census transcription; the IPUMS sample for 1910, also a nationally representative 1percent sample from the U.S. population census, was then linked backward to the same 1880 file. This strategy yielded more than 30,000 linked observations. In each dataset, a father's occupation is observed in the initial year (1850 or 1880) and his son's occupation is observed thirty years later (1880 or 1910). The principal difficulty with these linked samples is that only about one-third of those sought were successfully located; the unlinked observations are systematically different from those that are linked.[16]

The linkage rate is entirely explained by shortcomings at each stage of the linkage process: The nineteenth-century census enumeration was probably no more than 85 percent complete, and individuals—even if they were successfully enumerated—often

16 IPUMS samples come from Steven Ruggles, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander, *Integrated Public Use Microdata Series: Version 3.0* [Machine-readable database] (Minneapolis, 2004). For a detailed description of the sample's construction and tests of its representativeness, see the appendix to Long and Ferrie, "'Everything in Common . . . [But] Language'?: Intergenerational Occupational Mobility in Britain and the U.S. Since 1850," working paper (2007). Note, however, that this sample's exclusive focus on native white men means that two potential biases could arise from its use. On one side, the omission of African Americans certainly entails an overestimation of generational mobility, especially in the nineteenth century, and their mobility was probably low in the twentieth century as well. On the other side, the omission of immigrants may underestimate generational mobility, since immigrants are thought to be a highly mobile component of U.S. society.

misreported name, age, or birthplace, all of which were used in the linkage process. In a small number of cases (3 percent), an individual from the source sample was linked to two or more individuals in the target census who had the same name, year of birth, and birthplace. These cases were dropped. In order to force the linked sample to mimic the observable characteristics of the general population, weights were generated through iterative proportional fitting. When the weights (based on either initial or terminal-year characteristics) are imposed on the individuals who were linked, there are no longer any characteristics that allow us to distinguish linked individuals from the general population. The results that follow are insensitive to whether initial-year weights, terminal-year weights, or no weights are imposed.[17]

The data for France from "The 3,000 Families Survey" follows individuals who married between 1803 and 1902 and whose surname begins with the letters "Tra" (for example, "Travers"). These individuals were subsequently located in French civil records of the births and the marriages of their children, and in the records of their own deaths. The next generation was researched in a similar manner. The sample includes more than 45,000 marriages and successfully mimics patterns of wealth accumulation and demography within the broader French population. An important difference between the "Tra" sample and the linked samples from the U.S. census is that the former was logged according to life events—the circumstances of individuals (location, occupation, and wealth) recorded at the time of particular events in their lives (marriage, the birth of a child, a child's marriage, and death). However, this difference is unlikely to induce major bias, since the same scale for measuring socioeconomic status is constructed in both samples (see infra and Table A-6).[18]

17 An additional concern is that noise generated by the linkage process will generate spurious intergenerational mobility: For example, if, despite the cautious assumptions built into the linkage algorithm, a son whose father's occupation is observed in 1850 is linked to the wrong individual in 1880, and the probability of such mistaken linkage is random with respect to the son's occupation in the terminal year, the likelihood that in an observed father/son pair, both will have the same occupation will be lower than if all matches were genuine. The analyses that follow have been performed both with and without individuals whose characteristics matched up exactly in the two years (for example, the spelling of the surname differed slightly, or the age differed by a year or more). The difference between occupational mobility in France and in the United States is insensitive to this exercise. The results that follow include those inexactly matched individuals.

18 "The 3,000 Families Survey" is described in detail in Jacques Dupâquier and Denis Kessler (eds.), *La société francaise au XIXe siècle* (Paris, 1992). In brief, the choice of the letters T,

To compare these two samples, they must be as close as possible. A sub-sample that best approximates the characteristics of the U.S. sample was extracted from the French database for two periods, the nineteenth and early twentieth centuries. In each case, sons were observed approximately at the same age as their fathers, between twenty-six and thirty-four years later. Fathers came under observation during the years 1836 to 1874 (period 1) and 1875 to 1905 (period 2).

In the U.S. "Occupational Changes in a Generation" (OCG) 1973 cohort (10,000 father/son pairs, respondents reported the occupations held by their fathers when the respondents were sixteen years of age. In the French Formation Qualification Professionnelle (FQP) 1977 survey (4,700 father/son pairs), sons, at the completion of their schooling, were asked to state the occupation of their fathers when the sons completed their schooling. In examining these representative samples of the United States and France, the analysis controls for the ages of fathers and sons to keep the twentieth-century samples consistent with those from the nineteenth, though, unfortunately, simultaneous control of the ages of both fathers and sons and the length of time between the first occupation (the father's) and the second (the son's) is not possible.

Both the French and American cases present more occupational titles (several thousand) than can be productively employed to analyze differences in mobility across countries or over time. Thus, these specific titles must be collapsed into a workable set of

R, and A was based on pre-surveys aiming at answering three issues: (1) "Tra" surnames were distributed in the whole France and representative of its population; (2) The "Tra" combination is easy to read in hand writing and relatively robust to misspelling and changes across time; and (3) the expected number of "Tra" individuals was neither too high nor too low to constitute a manageable sample (34–35). Overall, the "Tra" sample is representative of the French population at the time of the survey, see Bourdieu, Gilles Postel-Vinay, and Akiko Suwa-Eisenmann, "Défense et illustration de l'enquête 3000 familles," *Annales de démographie historique* (2004), 19–52. The intergenerational sample, a subsample from the "Tra," is particular with regard to father/son pairs. Fathers were selected from the whole population by their own status: The fact that farmers are overrepresented in the father group because they potentially married earlier and thus had children earlier explains the clear difference between the fathers' and the sons' occupational distributions for those in the same cohort. The differences are large for France: 31 % of sons in 1875 were farmers. but 54 % of fathers in 1875, even though they were at the same age, whereas in the United States, 17 % of sons in 1880 had white-collar occupations, but 12 % of the fathers, again of the same age, had them (see Tables A-3 and A-4). The difference in the proportion of farmers for men in the same cohort at the same age is explained by different marital and fertility patterns.

broad categories that are internally homogenous, permitting the creation of mobility matrices of reasonable size that can be easily interpreted. The occupations fall into four categories—unskilled, skilled/semi-skilled, farmer, and white collar—which correspond roughly to four levels of socioeconomic status.

This breakdown further manifests at least three types of differences among occupations—level of wealth or income, level of education, and level of independence (wage and non-wage earners). The differences are not, however, always clear-cut: Weavers are considered semi-skilled, although some of them can be unskilled low-wage earners, and others can be proprietors of large workshops, not too different from white-collar workers. Moreover, categories might not be completely stable as time passes: The position of primary-school teacher was no doubt an upper-class, white-collar occupation at the beginning of the nineteenth century but probably not so by the middle of the twentieth. Nonetheless, the constructed transition matrices capture the structural characteristics of the relationship between the status of fathers and the status of sons for each period of time and for each country.

MEASURING GENERATIONAL MOBILITY Comparing intergenerational mobility across two places or times requires comparison of two contingency tables. The assumption throughout is that the categories constructed to measure socioeconomic status are not ordered. If fathers and sons in location P can be found in either of two statuses, their intergenerational mobility can be shown in matrix form as $P = \begin{bmatrix} p_{11} & p_{12} \\ p_{21} & p_{22} \end{bmatrix}$, where fathers' status (1 or 2) are columns and sons' status are rows. The upper left entry (p_{11}) is the number of sons of status 1 fathers who also obtained status 1. The simplest measure of the overall mobility in P is the fraction of sons in statuses different from those of their fathers: $M_P=(p_{12}+p_{21})/(p_{11}+p_{21}+p_{12}+p_{22})$.[19]

19 We have chosen not to impose an ordering on the categories for two reasons: (1) The easiest metric to employ, income, has wide variation across some of the categories (for example, farmer and skilled/semi-skilled workers) that would prevent confident positioning of these categories within such an ordering; and (2) occupational titles and groupings differ along a variety of dimensions other than income (for example, standing in the community, control over one's daily activities, and the nature of the workplace) that are not so easily ordered as income and that might produce substantially different orderings than income. Nonetheless, the terms "downward" and "upward" mobility will appear occasionally in the discussion of the

This measure, unfortunately, has a shortcoming when mobility is compared across two matrices P and Q: It conflates difference in mobility due to a difference across the matrices in the distributions of fathers' and sons' statuses (Hauser labels this type as "prevalence") and due to a difference across the matrices in the association between fathers' and sons' statuses that may occur even if the distributions of fathers' and sons' statuses were identical in P and Q (Hauser labels this type as "interaction"). Consider $P = \begin{bmatrix} 10 & 5 \\ 5 & 10 \end{bmatrix}$ and $Q = \begin{bmatrix} 20 & 20 \\ 5 & 20 \end{bmatrix}$ for which $M_P = 10/30$ and $M_Q = 25/65$. As the marginal frequencies differ, it is unclear whether the difference in M results from this difference or from something more fundamental, such as differences between P and Q in the amount of human capital necessary to achieve status 1.[20]

One of the matrices can be adjusted to have the same marginal frequencies as the other. Such a transformation, achieved by multiplication of rows and columns by appropriate constants, does not alter the underlying association between rows and columns embodied in the matrix. Multiplying the first row of Q by $\frac{1}{2}$ and the second column of the resulting matrix by $\frac{1}{2}$ produces a new matrix Q' with the same marginal frequencies as in matrix P and an associated total mobility measure $M_{Q'}$. We can then be confident that the difference in mobility $M_P - M_{Q'}$ does not result from differences in the distributions of statuses between the two locations.[21]

Even if $M_P - M_{Q'} = 0$, however, there may still may be differences in mobility between P and Q that transcend differences in their marginal frequencies. The cross-product ratio is the fundamental measure of association between rows and columns in a mobility table. For P, the cross-product ratio is $p_{11}p_{22}/p_{12}p_{21}$, which can be rearranged as $(p_{11}/p_{12})/(p_{21}/p_{22})$—the ratio of the odds that sons of status 1 fathers achieve status 1 rather than status 2 to the

movement between the white-collar and unskilled categories, since these two groups are unambiguously at opposite ends of a spectrum from "higher" to "lower" status.

20 Robert M. Hauser, "Some Exploratory Methods for Modeling Mobility Tables and Other Cross-Classified Data," *Sociological Methodology,* XI (1980), 413–458.

21 Frederick Mosteller, "Association and Estimation in Contingency Tables," *Journal of the American Statistical Association,* LXIII (1968), 1–28; P. M. E. Altham and Ferrie, "Comparing Contingency Tables: Tools for Comparing Tables of Data Cross-Classified by Two Characteristics," *Historical Methods,* XL (2007), 3–16.

odds that sons of status 2 fathers achieve status 1 rather than status 2. In the case of perfect mobility, the cross-product ratio is unity: Sons of status 1 fathers would have no advantage in getting status 1 relative to sons of status 2 fathers. The more the cross-product ratio exceeds 1, the greater the relative advantage of having a status 1 father in attaining status 1. Since the cross-product ratio for both P and Q is 4, these matrices have the same underlying mobility.

A table with more than two rows or columns has several cross-products ratios, and a useful summary measure of association should take all of them into account. Altham offers such a measure: The sum of the squares of the differences between the logs of the cross-product ratios in tables P and Q. For two tables, each with r rows and s columns, the Altham statistic measures how far the association between rows and columns in table P departs from the association between rows and columns in table Q[22]:

$$d(P,Q) = \left[\sum_{i=1}^{r} \sum_{j=1}^{s} \sum_{l=1}^{r} \sum_{m=1}^{s} \left| \log\left(\frac{p_{ij}\, p_{lm}\, q_{im}\, q_{lj}}{p_{im}\, p_{lj}\, q_{ij}\, q_{lm}} \right) \right|^2 \right]^{1/2}$$

The statistic $d(P,Q)$ measures the distance between tables P and Q. A simple likelihood-ratio χ^2 statistic G^2 with $(r-1)(s-1)$ degrees of freedom can be used to test whether the matrix Θ with elements $\theta_{ij} = \log(p_{ij}/q_{ij})$ is independent; rejection of the null hypothesis that Θ is independent results in acceptance of the hypothesis that $d(P,Q) \neq 0$. Hence, the degree of association between rows and columns differs between table P and table Q. Although the statistic does not reveal which table has the stronger association, this determination can be made by calculating $d(P,I)$ and $d(Q,I)$, which use the same formula as $d(P,Q)$ but replace one table with a matrix of 1s. If $d(P,Q)>0$ and $d(P,I)>d(Q,I)$, mobility is greater in table Q (that is, mobility is closer in Q than in P to what would be evident under independence of rows and columns, in which the status of a father provides no information in predicting the status of his son).[23]

Since contingency tables are often dominated by elements

22 Altham, "The Measurement of Association of Rows and Columns for an r × s Contingency Table," *Journal of the Royal Statistical Society,* XXXII (1970), 63–73. Altham and Ferrie, "Tools," discuss the distance measure and test statistic, and provide algorithms for their computation.

23 Alan Agresti, *Categorical Data Analysis* (Chichester, 2002), 140; Altham and Ferrie, "Tools."

along the main diagonal (which, in the case of mobility, captures immobility or the inheritance of socioeconomic status), an additional version of $d(P,Q)$ must be calculated to examine only the off-diagonal cells. This result will show whether, conditional on status mobility occurring between fathers and sons, the patterns of mobility are similar in P and Q, thus testing whether P and Q differ in their proximity to "quasi-independence." For square contingency tables with r rows and columns, this additional statistic $d^i(P,Q)$ will have the same properties as $d(P,Q)$, but the likelihood ratio χ^2 statistic G^2 will have $[(r-1)^2-r]$ degrees of freedom.

As a pure function of the odds ratios in tables P and Q, $d(P,Q)$ is invariant to the multiplication of rows or columns in either table by arbitrary constants; $d(P,Q)$ measures the difference in row–column association between two tables apart from that induced by differences in marginal frequencies. As a simple sum of the squares of log odds ratio contrasts, $[d(P,Q)]^2$ can be easily decomposed into its constituent elements: For an $r \times s$ table, there will be $[r(r-1)/2][s(s-1)/2]$ odds ratios in $d(P,Q)$. Calculating how much each odds ratio contributes to $[d(P,Q)]^2$ makes it possible to locate where in P and Q the differences between them are greatest.

The Altham statistic $d(P,Q)$ provides a straightforward way to estimate changes in mobility across time and place. Common practice in analysing contingency tables, especially in sociology, is to estimate, instead, log-linear models that decompose the influences on the log of each entry of the table into a sum of effects for its row and column and an interaction between the row and column effects. Controlling for row and column effects eliminates the effect of the distribution of fathers' and sons' occupations on mobility. The remaining interaction between rows and columns captures the strength of the association between rows and columns, which, in turn, measures mobility, though the coefficient on the interaction term has no meaning in itself as it is a component of a highly nonlinear system.

In comparing mobility in two tables, attention is generally focused on the statistical significance of the difference in the interaction effect rather than on its magnitude. In addition, a simple comparison of differences in the interaction term is seldom performed without the imposition of additional structure. For example, it might be supposed that all of the odds ratios in P differ in exactly the same degree from all of the odds ratios in Q, or that the odds ratios can be partitioned into sets that differ uniformly across

the tables. We perform such standard calculations as well (using the Xie statistic for the "log-multiplicative layer effect"), but we emphasize the Altham statistic for three reasons: (1) the straightforward interpretation of its magnitude as a distance in Euclidean space (shown graphically), which is useful in conducting a large number of comparisons and displaying trends over time; (2) its simple test statistic (the Xie statistic does not yield a direct test of the confidence that can be placed on observed differences in mobility across times or places); and (3) its easy decomposition into the odds ratios that contribute the most to the differences in mobility between two tables.[24]

The analysis of how mobility differs between two tables proceeds in three steps: (1)calculation of the total mobility for each table as the ratio of the sum of the off-diagonal elements to the total number of observations in the table and of the difference in total mobility between *P* and *Q;* (2) adjusting one of the tables to have the same marginal frequencies as the other and re-calculation of the difference in total mobility to eliminate the influence of differences in the distribution of statuses; and (3) calculation of $d(P,Q)$, $d^i(P,Q)$, $d(P,I)$, and $d(Q,I)$ and the likelihood ratio χ^2 statistics G^2.

MOBILITY IN FRANCE AND THE UNITED STATES SINCE THE MID-NINETEENTH CENTURY Because Ferrie already examined the changing patterns of intergenerational mobility over time within the United States, this article concentrates on changes over time in the French patterns and on changes in French mobility compared to United States mobility at different points in time. The raw transition matrices are shown in Tables A-1 and A-3 in the Appendix; tables with all of the marginal frequencies standardized to 100 are shown in Tables A-2 and A-4.[25]

Table 1 presents a summary measure of mobility (the fraction of sons who attain statuses different from their fathers), derived from both the raw frequencies (M) or from the frequencies after the margins have been standardized to $100(M^s)$. The raw measure in column 1 suggests that this simple measure of mobility has risen in France since the nineteenth century. The measure that holds the status structure constant, however, reveals a different pattern for France—a sharp increase in mobility in the last quarter of the

24 Yu Xie, "The Log-multiplicative Layer Effect Model for Comparing Mobility Tables," *American Sociological Review,* LVII (1992), 380–395.

25 Ferrie, "End."

Table 1 Percentage Outside Father's Status in France and the United States

PERIOD	M FRANCE	M U.S.	M^S FRANCE	M^S U.S.
1. 1850–1880	48.4	50.2	48.6	59.5
2. 1880–1910	47.4	56.7	52.3	56.9
3. 1950–1977	53.0	56.3	44.5	49.4

NOTE M is the simplest measure of mobility: Percentage off the main diagonal. It is the percentage of sons who ended in a group different from that of their father; M^S is the same measure based on standardized marginal frequencies (see Tables A-2 and A-4).

nineteenth century, followed by a sharp fall in the twentieth, by which time mobility is actually lower than it was at the outset. For the United States, late nineteenth- and twentieth-century mobility exceed that of the mid-nineteenth century if the raw frequencies are used, but both nineteenth-century samples display substantially more mobility than the twentieth century if the standardized frequencies are used.

The Altham statistics (Table 2) clearly show that within France, mobility follows an inverted U-shaped pattern: It rises from the mid-nineteenth century to the late nineteenth century and falls during the twentieth century (the Altham statistic runs from 19.46 to 15.55 to 26.16). At each point in time, mobility is greater in the United States than in France; the differences are always statistically significant, though the magnitude of the difference and its statistical significance are lowest in the final quarter of the nineteenth century. The decline in mobility from the mid-nineteenth century to the twentieth century is also large and statistically significant for both countries. Figure 1 gives a short visual summary of mobility patterns in the two countries.[26]

At each date, the United States was more mobile (closer to generational independence in occupation), but the gap narrowed in the late nineteenth century before widening in the twentieth. Mobility in late nineteenth-century France was similar to that in the United States throughout the nineteenth century. By the

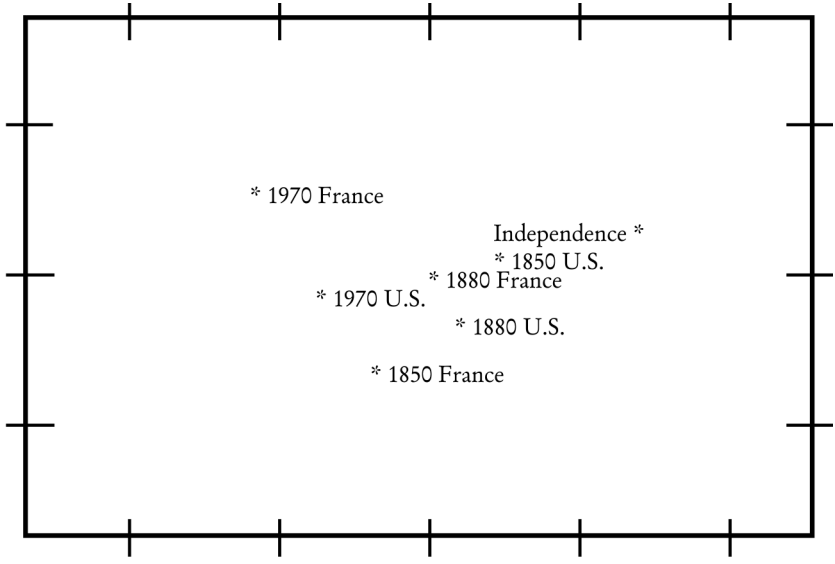
26 The figure exploits the ability to interpret the Altham statistic as a distance measure: We calculated all of the pairwise "distances" from the row-column association in each of the six samples to the row-column association in each of the other five samples, as well as the distance from each sample's row-column association to that observed under independence, and used this information to "map" each sample, using multidimensional scaling, into a two-dimensional space relative to an arbitrarily located origin ("independence"). In the same way, an entire country can be mapped without knowing the absolute geographical coordinates of each location, but only knowing the distances between all pairs of cities.

Table 2 Summary Measures of Mobility in France and the United States

	M	M'	d(P,I)	G^2	d(Q,I)	G^2	d(P,Q)	G^2	d^1(P,Q)	G^2
COMPARISON	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. France 1836–74 (P)	48.4	42.4	19.46	1,455.03***			9.42	140.79***	4.79	25.92***
vs. U.S. 1850–80 (Q)	50.2	55.6			11.46	1,245.52***				
2. France 1874–1905 (P)	47.4	53.8	15.66	331.22***			4.37	15.90*	2.48	2.70
vs. U.S. 1880–1910 (Q)	56.7	51.4			14.04	4,439.90***				
3. France 1950–77 (P)	56.0	53.0	26.16	2,128.19***			9.60	47.56***	7.35	35.82***
vs. U.S. 1950–73 (Q)	56.3	56.4			21.30	723.21***				
4. France 1836–74 (P)	48.4	53.5	19.46	1,455.03***			12.19	172.05***	5.44	23.23***
vs. France 1950–77 (Q)	42.3	53.0			26.16	218.19***				
5. U.S. 1850–80 (P)	50.2	59.4	11.46	1,245.52***			11.74	114.67***	4.57	19.97***
vs U.S. 1950–73 (Q)	56.3	40.6			21.30	723.21***				

NOTE M is total mobility (percent off the main diagonal); M' is total mobility using the marginal frequencies from the other table; G^2 is the likelihood ratio χ^2 statistic with significance levels *** < 0.01 ** < 0.05 * < 0.10. Degrees of freedom: 9 for columns (4), (6), and (8); 5 for column (10).

Fig. 1 Two-Dimensional Representation of Mobility Measures (Altham Statistics) Generated by Multidimensional Scaling for France and the United States, Mid-Nineteenth Century to 1970s



twentieth century, both countries moved far from independence, and a gap between them was again apparent. But the gap was less remarkable than how far both moved from independence: The Altham statistics for both France and the United States rose substantially by the twentieth century. The remaining gap between them in the twentieth century indicates that, though both are far from independence today, they differ from each other in the manner by which they differ from independence (the odds ratios that generate the greatest portion of the departure from independence are not the same for the two countries).[27]

For France, when we abstract from change between the fa-

27 The decrease in mobility in the late nineteenth-century United States is likely the result of a change in the composition of the population: Ferrie, "End," uses consistent samples (which focus throughout on white, native-born males aged thirteen through nineteen when their fathers are observed and who are themselves aged thirty-three through thirty-nine when their own occupations are observed) and finds no discernible change in mobility across three twenty-year spans (1860 to 1880, 1880 to 1900, and 1900 to 1920). The samples used in Table 2 for the United States are not restricted by race, birthplace, or age, the better to enhance comparability with the French data. Even the use of consistent samples, however, discovers a substantial decrease in mobility when comparing any of these three spans to mobility in the second half of the twentieth century.

thers' and sons' generations in the marginal frequencies and from change over time in these frequencies (Table A-2), the probability that a son would have had the same status as his father is much higher for farmers and white-collar workers than for unskilled and skilled/semi-skilled workers, particularly in period 1. This pattern may be due, at least in part, to the construction of the group itself. Because sons whose fathers were in the highest (white-collar) group could not move up any further, they were much more likely to stay in the same group as their father. But the pattern also shows the predominance of upward over downward mobility.

Sons of unskilled fathers were more likely to become white-collar workers or farmers in the second period than in the first, whereas sons of craftsmen more often entered the white-collar ranks in successively later cohorts. Between periods 1 and 2, white-collar sons had increasing difficulty remaining in that group; they were almost equally distributed between the three other groups (16 to 18 percent in each one). Downward mobility increased during the last period of the nineteenth century. In brief, the trend is for intergenerational mobility to increase from the middle to the end of the nineteenth century. Overall, sons had more chances to move into a different status than their fathers during the last period than during the first one. In all cases, France seems to have been much less mobile in the twentieth than in the nineteenth century. Even when the structure is held constant between the two centuries (a period that saw a significant decrease in farmers and landowners and an increase in employees and civil servants), mobility had diminished substantially by the twentieth century.

Farmers generally comprised the most stable socioeconomic group, but this stability decreased with time as the share of farmers within the total population decreased. From the perspective of a constant structure, the probability for a son of a farmer to become a farmer did not vary across time, reaching 77 percent by the twentieth century. The same holds true for unskilled laborers. The socioeconomic structure changed substantially between the beginning and the end of the nineteenth century, from a mainly agricultural society to a society with more industrial and civil-servant positions.

In both countries, generational mobility (as expressed by the raw frequencies) is affected by the evolution of the socioeconomic structure, which was hardly straightforward. For example, while

the share of white-collar jobs increased continuously, more than doubling (from below 5 percent to above 10 percent), farmers did not decline steadily as might have been expected, mainly because this group contained only independent farmers (owners). The share of both sons and fathers in farming increased during the second period and dropped in the final period to an extremely low level. Finally, the skilled/semi-skilled and unskilled groups were of equal size except for the last period, when the unskilled become a larger group.

Until the last period, sons of farmer moved into all three other groups to a large extent, but a large number of farmers remained. In the last period, however, the farming group attracted few from any of the other groups and is too small even to accommodate all of the farmers' sons (a large part of whom landed in the unskilled group). The influx into farming from the other groups was low except for period 2, when farming appears to have been an attractive option; no less than one out of five white-collar sons joined the group of the farmers. At the opposite extreme, the white-collar group appears to have been largely closed, despite becoming slightly more open between the first and second periods (for the standardized matrix, 60 percent of sons with white-collar fathers became white-collar in period 1; 56 percent did so in period 3 and 49 percent in period 2).

Standardized matrices avoid compositional effects: Diagonal frequencies measure the level of auto-reproduction for each group. As expected, this level is generally larger for the two extreme groups, unskilled and white-collar. The greater accessibility of schooling and the liberalization of the labor market would have increased mobility for the least skilled. Levels of schooling may be less important in promoting mobility than the distribution of access to schooling across social classes. Skilled/semi-skilled laborers show less immobility.

If two standardized matrices are significantly different, implying significant changes in the structure of mobility, an increase in mobility and the manner of its increase are not trivial issues. The major change that appears once structural effects are discarded is the place of farmers. The assumption might be that, as time passed, farming would become less and less attractive. For instance, in the last period, only 8 percent of the sons of non-farmers became farmers. This effect is due mostly to the low proportion of farming as a son's occupation in this period (only 7 percent). The sons of

non-farmers did not become farmers simply because farming positions were in short supply.

A second important feature linked with dropping the effect of composition is the degree of openness of the unskilled and semi-skilled groups. The relatively closed nature of the unskilled category and the greater openness of the semi-skilled one with regard to the actual composition of the population seem to have increased with time. Reproduction of occupation in the unskilled group eventually reached nearly 60 percent. Yet, skilled/semi-skilled sons almost randomly distributed into the white-collar, farmer, and especially skilled/semi-skilled group. In the United States, however, mobility appears to have originated less from the skilled/semi-skilled group than from the white-collar group. As a rough explanation, leaving aside differences in the distribution of socioeconomic groups, mobility was greater in the United States because of a higher level of mobility toward and away from the white-collar group, whereas mobility in France occurred mainly among skilled/semi-skilled workers.

CHANGING MEASURES AND PATTERNS OF MOBILITY To what extent do these findings depend on the method of measuring mobility and defining socioeconomic status employed herein? The robustness of the findings can be assessed in two ways—first, by employing an alternative method to estimate generational mobility across time and places and, second, by considering alternative groupings of occupations, using mobility matrices with five or six socioeconomic groups.

The "log-multiplicative layer effect" model is an apt alternative measure of mobility. This measure, devised by Xie, is the standard tool for comparing mobility across contingency tables in sociology. In brief, it considers mobility according to a three-dimensional matrix—for example (1) father's status, (2) son's status, and (3) country-period. For each country-period layer, the statistic, φ, gives the number by which this layer's row-column association must be multiplied to have the same association between rows and columns—that is, father's and son's status—as in the whole table. It thus assesses the mobility of one layer (a country or period) relative to another.[28]

28 See Xie, "Log-multiplicative Layer Effect Model," for technical specifications and details about the construction of the statistic. A smaller value for one layer corresponds to a weaker row-column interaction for that layer than for the overall table, and therefore corresponds to a

Showing the Xie statistic for all three periods to compare generational mobility between France and the United States and within the same country for two different periods, Table A-5 gives the estimated values for each layer (country-period) and the difference between the two layers. Though there is no way to assess the statistical significance of the difference in φ across layers, we have bootstrapped 99 percent confidence intervals. The difference in the degree of association between fathers' status and sons' status is statistically significant if 0 is not within the 99 percent confidence interval around the difference.

Using this alternative mobility measure does not change the results as previously established: The hierarchy between countries and periods is the same regardless of whether the Altham statistics or the log-multiplicative layer-effect model is used. For both mobility measures, the United States was considerably more mobile than France in the middle of the nineteenth century; the gap between the two countries disappeared at the end of the nineteenth century; and a gap in mobility emerged again in the late twentieth century.

The definition of socioeconomic status herein follows standard practices. The main rules are that entrepreneurship or intellectual occupations are classified as white collar, that farmer correspond to all agricultural workers except for farm laborers, that the skilled and semi-skilled group consist mainly of craft workers and skilled factory workers, and that the unskilled group be composed of common laborers (including farm laborers) and domestic servants. Within the farmer category, landless farmers are not distinguished from those who own land. The main difference between agricultural laborers (classified herein as unskilled) and other agricultural workers (classified herein as farmers) is the type of contract that they had. Wage-earning agricultural workers are grouped with unskilled workers since neither have long-term employment and both, in most cases, have only day-to-day work (in France, *journaliers* means literally "day" *[jour]* laborers). The constructed

higher degree of mobility than does a larger value. Because the values are specific to a table composed of two particular layers, they cannot be compared across tables (hence, the statistic for the United States from 1850 to 1880 obtained from a comparison of mobility in that sample to mobility in early nineteenth-century France cannot be compared to the statistic for the United States from 1880 to 1910 obtained from a comparison to mobility in late nineteenth-century France). The statistic permits only binary comparisons.

social groups allow a comparison of fathers' and sons' positions through time and space. Social position, as so construed, roughly reflects economic position, although it misses mobility within each group. For instance, some heterogeneity may remain within the farmers' group, depending on the size of the farm and the type of land. For instance, the sons of farmers where farming was intensive may have been more prone to become farmers than the sons of farmers where the land was more productive. Nevertheless, these differences appear to be slight compared to those between farmers and the other groups, such as unskilled workers or white-collar workers.

Table A-6 compares socioeconomic status for the nineteenth century, showing the two most numerous occupations in each group for each country. This comparison roughly demonstrates that these groups are similar in France and the United States. Even though occupational titles were not identical in both countries, the more important occupations fell into the same group in both countries. This point is important for the results herein; it ensures that classifications of socioeconomic status differ only across countries at the margin and by negligible amounts. Hence, even if certain occupations were coded incorrectly, they would represent only small numbers of observations and likely have little influence on the results.

The possibility remains that the boundaries drawn between categories have influenced the results. For example, if more movement took place between semi-skilled and skilled in one country or time period than in another, the amount of mobility will have been understated, and a spurious finding of similar rates of mobility, due to grouping skilled and semi-skilled workers together, will have been generated. To account for this possibility, the groups have been slightly modified.

Where there are sufficient observations to populate each cell, we can consider five groups instead of four—by, for example, splitting the skilled and semi-skilled group into two and comparing generational mobility estimated for these new matrices. The white-collar group can also be divided into clerical and sales workers (low white-collar) and professional and technical (high white-collar) occupations. These alternative organizations of the data permit an assessment of the results according to how socioeconomic status between groups is distributed.

As Table A-7 shows, the change from four to five categories does not alter any of our substantive findings: Intergenerational mobility was significantly higher in the United States than in France in the middle of the nineteenth century regardless of which category is split. France shows a rise in mobility from the middle to the end of the nineteenth century that is large, though not statistically significant.

As Tocqueville and Marx noted at the time, the United States was indeed an exceptionally mobile society in the mid-nineteenth century. After accounting for differences between the two countries in the distribution of socioeconomic status, intergenerational mobility in the middle of the nineteenth century was greater in the United States than in France, though the advantage of the United States over France was less than its advantage over Britain at the same time. By the last quarter of the twentieth century, the differences among all three countries had narrowed considerably.

The differences in mobility between the United States and France in the mid-nineteenth century, and the reason why they narrowed in the twentieth century, cannot be the result of differences in urbanization, the size of the farm sector, or the extent of industrialization; these factors were roughly equivalent at this time. Instead, the observed differences in mobility may correspond to differences in access to education (a difference that narrowed between the United States and France during the late nineteenth century); opportunities for occupational advancement through migration to rapidly growing and newly developing regions (the number of which was greater in the United States than in France, though it gradually declined within the United States); differences in demographic patterns, both internal (fertility declined in France earlier than in any other country at the end of the nineteenth century) and external (immigration was a major contribution to the evolution of the U.S. population, whereas both emigration and immigration were limited in France); and the extent to which political and social upheavals removed institutional impediments to mobility, the influence of landed wealth, and the growth of state employment.

Mobility rates in the mid-nineteenth century thus differed

between the United States and two prominent European economies in ways that correspond to later differences in their respective tax and transfer policies. This correspondence is particularly close when we consider intergenerational mobility rates that abstract from differences in the distribution of socioeconomic status across locations and countries. Though this pattern (high [low] mobility rates in the past paired with low [high] social transfer rates in the present) is broadly consistent with the model proposed by Piketty, several considerations prevent us from asserting that past mobility regimes *caused* the current policies to be adopted.

One difficulty in establishing such a link is that Piketty's model leaves unclear whether differences in absolute or differences in relative mobility rates matter in forming public perceptions of the need for a particular redistributive regime. For example, are unskilled fathers made less distressed (and thus less likely to support substantial income transfers) by their sons' prospects when the number of white-collar positions expands, and both white-collar and unskilled fathers see a larger number of their sons enter white-collar jobs, though in the same proportions as earlier? Or are unskilled fathers made less distressed when the total number of white-collar opportunities remains the same, but the chances of their sons entering white-collar positions improve at the expense of their white-collar counterparts? Another difficulty is that the differences in mobility between the United States and France actually narrowed to some extent during the last third of the nineteenth century—the period covered by the database that is closer to when the initial decisions about taxes and transfers were made.

The safest statement that can be made at this juncture is that mobility rates of the United States and France in the past (at least through the middle decades of the nineteenth century) differed in the very way suggested by contemporary observers, and that the greater mobility in the United States was not the result of superior economic development, since the two countries were similarly positioned during the middle of the nineteenth century. Although these differences in mobility did not necessarily generate later differences in social-transfer policies, the mobility differences between the United States and countries that later developed more complete welfare states were probably greater than was indicated

by the studies cited by Alesina and Glaeser. Alesina and Glaeser are certainly correct to maintain that differences in political systems and in the composition of populations are a substantial source of the differences between the welfare states that were to emerge, but the analysis in this article suggests that historical differences in mobility—perhaps as filtered through those different political systems and social make-ups—should also be considered an important factor.

APPENDIX: RAW TRANSITION MATRICES AND SENSITIVITY ANALYSIS

Table A-1 Intergenerational Mobility in France (Column Percentage)

	FATHER'S OCCUPATION				
SON'S OCCUPATION	WHITE-COLLAR	FARMER	SKILLED/SEMISKILLED	UNSKILLED	ROW SUM
France (1836–1874):					
White-collar	106.0	105.0	155.0	84.0	450.0
	(43.8)	(5.1)	(10.6)	(6.5)	
Farmer	32.0	1,156.0	158.0	222.0	1,568.0
	(13.2)	(56.1)	(10.8)	(17.1)	
Skilled/semi-skilled	74.0	331.0	736.0	379.0	1,520.0
	(30.6)	(16.1)	(50.4)	(29.2)	
Unskilled	30.0	467.0	412.0	611.0	1,520.0
	(12.4)	(22.7)	(28.2)	(47.1)	
Col. sum	242.0	2,059.0	1,461.0	1,296.0	
France (1875–1905):					
White-collar	35.0	56.0	44.0	24.0	159.0
	(38.9)	(8.2)	(16.9)	(10.3)	
Farmer	19.0	405.0	38.0	42.0	504.0
	(21.1)	(59.4)	(14.6)	(18.0)	
Skilled/semi-skilled	21.0	94.0	126.0	68.0	309.0
	(23.3)	(13.8)	(48.5)	(29.2)	
Unskilled	15.0	127.0	52.0	99.0	293.0
	(16.7)	(18.6)	(20.0)	(42.5)	
Col. sum	90.0	682.0	260.0	233.0	
France (1950–1977):					
White-collar	342.0	156.0	337.0	285.0	1,120.0
	(44.9)	(8.7)	(18.6)	(9.1)	

Table A-1 (Continued)

	FATHER'S OCCUPATION				
SON'S OCCUPATION	WHITE-COLLAR	FARMER	SKILLED/ SEMISKILLED	UNSKILLED	ROW SUM
Farmer	7.0	503.0	26.0	21.0	557.0
	(0.9)	(28.1)	(1.4)	(0.7)	
Skilled/semi-skilled	293.0	391.0	856.0	1,005.0	2,545.0
	(38.5)	(21.9)	(47.2)	(32.0)	
Unskilled	119.0	739.0	595.0	1,825.0	3,278.0
	(15.6)	(41.3)	(32.8)	(58.2)	
Col. Sum	761.0	1,789.0	1,814.0	3,136.0	

Table A-2 Intergenerational Mobility in France, Standardized Marginal Distributions (Column Percentage and Row Percentage)

	FATHER'S OCCUPATION				
SON'S OCCUPATION	WHITE-COLLAR	FARMER	SKILLED/ SEMI-SKILLED	UNSKILLED	ROW SUM
France (1836–1874):					
White-collar	60.4	8.7	19.2	11.8	100.0
Farmer	11.0	58.2	11.8	18.9	100.0
Skilled/semi-skilled	19.7	12.9	42.6	24.9	100.0
Unskilled	8.9	20.2	26.5	44.5	100.0
Col. sum	100.0	100.0	100.0	100.0	
France (1875–1905):					
White-Collar	49.4	12.2	23.9	14.6	100.0
Farmer	16.6	54.8	12.8	15.8	100.0
Skilled/semi-skilled	18.6	12.8	42.8	25.8	100.0
Unskilled	15.4	20.2	20.6	43.8	100.0
Col. Sum	100.0	100.0	100.0	100.0	
France (1950–1977):					
White-collar	55.6	4.4	25.8	14.2	100.0
Farmer	6.2	77.3	10.8	5.7	99.9
Skilled/semi-skilled	27.3	6.4	37.6	28.7	100.0
Unskilled	10.9	11.9	25.8	51.4	100.0
Col. sum	100.0	100.1	100.0	100.0	

Table A-3 Intergenerational Mobility in the United States (Column Percentage)

	FATHER'S OCCUPATION				
SON'S OCCUPATION	WHITE-COLLAR	FARMER	SKILLED/SEMI-SKILLED	UNSKILLED	ROW SUM
U.S. (1850–80):					
White-collar	260.0	715.0	424.0	142.0	1,541.0
	(38.1)	(13.0)	(22.6)	(15.0)	
Farmer	194.0	3,245.0	454.0	247.0	4,140.0
	(28.4)	(59.0)	(24.2)	(26.2)	
Skilled/semi-skilled	158.0	874.0	751.0	327.0	2,110.0
	(23.2)	(15.9)	(40.1)	(34.6)	
Unskilled	70.0	664.0	246.0	228.0	1,208.0
	(10.3)	(12.1)	(13.1)	(24.2)	
Col. sum	682.0	5,498.0	1,875.0	944.0	
U.S. (1880–1910):					
White-collar	1,472.0	2,202.0	1,596.0	658.0	5,928.0
	(57.8)	(20.0)	(31.0)	(22.1)	
Farmer	228.0	4,935.0	482.0	507.0	6,152.0
	(9.0)	(44.9)	(9.4)	(17.0)	
Skilled/semi-skilled	554.0	1,949.0	2,236.0	1,068.0	5,807.0
	(21.8)	(17.7)	(43.5)	(35.9)	
Unskilled	293.0	1,908.0	832.0	744.0	3,777.0
	(11.5)	(17.4)	(16.2)	(25.0)	
Col. sum	2,547.0	10,994.0	5,146.0	2,977.0	

Table A-3 (Continued)

U.S. (1950–1973):					
White-collar	751.0	195.0	592.0	196.0	1,734.0
	(70.6)	(26.0)	(39.2)	(30.2)	
Farmer	7.0	108.0	7.0	7.0	129.0
	(0.7)	(14.4)	(0.5)	(1.1)	
Skilled/semi-skilled	244.0	327.0	742.0	314.0	1,627.0
	(23.0)	(43.7)	(49.1)	(48.3)	
Unskilled	61.0	119.0	169.0	133.0	482.0
	(5.7)	(15.9)	(11.2)	(20.5)	
Col. sum	1,063.0	749.0	1,510.0	650.0	

Table A-4 Intergenerational Mobility in the United States, Standardized Marginal Distributions (Column Percentage and Row Percentage)

	FATHER'S OCCUPATION				
SON'S OCCUPATION	WHITE-COLLAR	FARMER	SKILLED/ SEMI-SKILLED	UNSKILLED	ROW SUM
U.S. (1850–1880):					
White-collar	42.6	16.1	25.4	15.9	100.0
Farmer	19.9	45.8	17.0	17.3	100.0
Skilled/semi-skilled	20.3	15.5	35.4	28.7	100.0
Unskilled	17.2	22.5	22.1	38.2	100.0
Col. sum	100.0	100.0	100.0	100.0	
U.S. (1880–1910):					
White-collar	47.6	12.9	24.0	15.5	100.0
Farmer	13.3	52.1	13.1	21.5	100.0
Skilled/semi-skilled	20.4	13.0	38.2	28.5	100.0
Unskilled	18.7	22.0	24.7	34.5	100.0
Col. sum	100.0	100.0	100.0	100.0	
U.S. (1950–1973):					
White-collar	52.5	5.7	26.0	15.9	100.0
Farmer	10.9	69.7	6.8	12.6	100.0
Skilled/semi-skilled	20.2	11.2	38.5	30.0	100.0
Unskilled	16.5	13.4	28.6	41.5	100.0
Col. sum	100.0	100.0	100.0	100.0	

Table A-5 The φ Measure Estimated Using Xie's "Log-Multiplicative Layer Effect" Model—Confidence Intervals Obtained by Bootstrapping (500 Repetitions)

	φ_1	φ_2	$\varphi_1 - \varphi_2$	99% CONFIDENCE INTERVAL	
France/U.S. (1850–1880)	0.8408	0.5414	0.2994	0.2225	0.3638
France/U.S. (1880–1910)	0.7881	0.6155	0.1727	−0.0023	0.2828
France/U.S. (1950–1973)	0.7572	0.6531	0.1041	0.0094	0.1986
France (1850–1880) France (1880–1910)	0.7432	0.6691	0.0741	−0.0493	0.2085
France (1850–1880) France (1950–1973)	0.5659	0.8245	−0.2586	−0.3407	−0.1785
France (1880–1910) France (1950–1973)	0.4999	0.8661	−0.3662	−0.4778	−0.2587
U.S. (1850–1880) U.S. (1880–1910)	0.6622	0.7494	−0.0872	−0.1602	−0.0250
U.S. (1850–1880) U.S. (1950–1973)	0.5079	0.8614	−0.3535	−0.4776	−0.2294
U.S. (1880–1910) U.S. (1950–1973)	0.6331	0.7740	−0.1409	−0.2286	−0.0532

NOTE See Yu Xie, "The Log-multiplicative Layer Effect Model for Comparing Mobility Tables," *American Sociological Review,* LVII (1992), 380–395.

Table A-6 Most Numerous Occupational Titles in Each Occupational Category, by Country (Nineteenth-Century Samples)

	FRANCE			UNITED STATES		
GROUP	TITLE	N	%	TITLE	N	%
White-collar						
	Rentier	266	20.1	Merchant	844	15.8
	Employé	77	5.8	Physician	309	5.8
	Total	1,327	100.0	Total	5,337	100.0
Farmer						
	Cultivateur	5,388	67.9	Farmer	22,624	94.0
	Proprietaire	903	11.4	Farming	496	2.1
	Total	7,933	100.0	Total	24,059	100.0
Skilled/semi-skilled						
	Maçon	460	8.0	Carpenter	1,793	13.1
	Tisserand	457	8.0	Shoemaker	904	6.6
	Total	5,727	100.0	Total	13,647	100.0
Unskilled						
	Journalier	1,077	20.0	Laborer	8,619	84.0
	Domestique	791	14.7	Overseer	150	1.5
	Total	5,393	100.0	Total	10,263	100.0

Table A-7 Summary Measures of Mobility with Five Occupational Categories

	$d(P,I)$	G^2	$d(Q,I)$	G^2	$d(P,I)$	G^2
COMPARISON	(1)	(2)	(3)	(4)	(5)	(6)
1. Skilled & semi-skilled separated						
France 1836–74 (P)	31.27	1559.40***			15.291	185.34***
vs. U.S. 1850–80 (Q)			19.03	1232.86***		
2. Skilled & semi-skilled separated						
France 1836–74 (P)	31.27	1559.40***			11.09	18.96
vs. France 1874–1905 (Q)			26.93	352.06***		
3. High & low white-collar separated						
France 1836–74 (P)	53.07	1494.49***			33.64	197.94***
vs. U.S. 1850–80 (Q)			19.34	1167.97***		

NOTE G^2 is the likelihood ratio χ^2 statistic with significance levels *** < 0.01 ** < 0.05 * < 0.10. Degrees of freedom: 9 for columns (2), (4), and (6).