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Florian R. Hertel & Fabian T. Pfeffer

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The Land of Opportunity?
Trends in Social Mobility and Education in the United States

Florian R. Hertel
European University Institute

Fabian T. Pfeffer
University of Michigan

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0. Introduction

This article provides insights into the long-term trends of intergenerational mobility of men and women born in the United States. We study both absolute and relative social mobility and analyze in some detail the relation between education and intergenerational mobility. By doing so, we provide some insights into possible drivers of relative mobility trends in the United States. Given the pervasive narrative of the U.S. as the land of opportunity (Grusky et al., 2015), it is astounding that the U.S. has not been part of the latest dedicated comparative research efforts on social class mobility (e.g. Breen, 2004a) – a gap that we hope to narrow with this contribution. The fundamental transformation of the U.S. education system, which raised American's average educational attainment above most other countries over much of the 20th century, makes an interesting case for the study of the association of class mobility and education (Goldin and Katz 2008, Garfinkel et al. 2010).

While findings on social mobility trends in the U.S. remain subject to controversial debate (Hout & Guest, 2013; Xie & Killewald, 2013; Mitnik et al., 2016), we also lack a full understanding of the determinants of these trends. Recently, there has been some progress towards a causal explanation of the influence of educational expansion on occupational attainment around the turn of the 19th into the 20th century (Rauscher, 2015); we seek to expand prior descriptive evidence on the role of education in shaping long-term mobility trends throughout the 20th and early 21st century (Pfeffer and Hertel 2015). While we confirm and expand the findings of prior studies for men (Hout, 1988; Torche, 2011; Pfeffer & Hertel, 2015), we also add new material for women who have often been ignored in most research on social class mobility.

The article is structured as follows: Section 1 provides a brief summary of the changing economic and social context within which mobility takes place. We then present a broad overview of U.S. social mobility studies in Section 2 and discuss the relationship between mobility and education as well as possible gender differences in mobility. In Section 3, we present the new database that we assembled for the study of long-term trends in social mobility and provide information on the conceptualization and measurement of our main variables. In Section 4, we provide an assessment of cohort changes in absolute mobility, studying two-way and three-way associations between origins, education and destinations in some detail. In Section 5, we provide a range of analyses on relative mobility and its relationship to education, with a focus on assessing the overall role of education and educational expansion in explaining cohort trends. The article concludes with a discussion of the main findings in Section 6.

1. Historical Context

In less than a century, or over the course of four generations, the United States shifted from a heavily agrarian and rural society to an industrial and, finally, post-industrial society (Fischer & Hout, 2006). This transformation was fundamental enough that, in terms of its economic context, the U.S. may have more in common with other Western capitalist societies today than with its own a hundred years ago (Long & Ferrie, 2013). Below, we highlight historical changes in three areas

that had perhaps the most profound societal impact: the occupational structure, the employment of women, and educational participation.

Economic change and the occupational structure

The shift in the demand for labor from the agricultural to the industrial and service sectors was profound. Between the early 1920s and the late 2000s, the share of individuals employed in agriculture or other extractive industries declined in the United States from 29 to two percent (data in this paragraph come from Singelmann, 1978; Castells, 1996 [2010]; ILO, 2014). Until the mid-1970s, Fordist mass production and mass consumption resulted in a boom in employment in manufacturing, utilities and construction industries. In 1970, around 33 percent of Americans worked in the transformative industries and, most frequently, in manufacturing. While technological advances over the following decades replaced manual labor, a demand shift, partly fueled by rising levels of economic well-being at the top, also drove employment growth in the service industries (Kollmeyer, 2009). Especially producer and business services (mostly banking, insurance, real estate, engineering, and accounting) and social services (mostly educational, health, and welfare services) grew substantially over the course of the 20th century. Employment in the former increased from three to 18 percent and employment in the latter surged from nine to 28 percent between 1920 and 2008. Over the same time, employment shares in the transformative industries declined to about 19 percent.

These sectoral shifts in the labor market amounted to a radical transformation of the occupational structure. The technologically driven demand for highly educated labor, especially for technicians, semi-professionals, and professionals in the growing social and business services sectors resulted in an upgrading of large parts of the occupational structure (Goldin & Katz, 2008; Oesch, 2013). At the same time, mechanization, automation, and routinization rendered routine manual and non-manual occupations unnecessarily costly to sustain (Autor et al., 2003), while low-wage non-routine service positions flourished under the American market-oriented welfare regime (Esping-Andersen, 1999; Esping-Andersen, 2000; Wren, 2013). In effect, the occupational structure gradually upgraded but also polarized in more recent decades as “bad jobs” also continued to grow (Kalleberg et al., 2000; Wright & Dwyer, 2003; Kalleberg, 2009).

Rising female employment

Another fundamental transition in the labor market over the 20th century was the increasing participation of female labor, which was fueled by the rise of white-collar work and, in particular, services, by increasing education and real wages, decreasing working hours, and decreasing fertility (Goldin, 1990; Buchmann & DiPrete, 2006; Diprete & Buchmann, 2006; Kearney, 2006). The rate of participation of women in the labor force increased from 19 percent in 1890 to 59 percent in the late 1990s, with little change since (Goldin, 1990, p. 17; England, 2011; Toossi, 2015, p. 10). In the Fordist heydays of the 1950s to the 1970s, working-class women frequently worked the assembly lines in food processing, e.g., in canneries (Ruiz, 1987), whereas middle class women worked in lower clerical occupations, forming the administrative backbone of the Fordist era (England & Boyer, 2009). The rise in social service occupations especially – particularly in

education, the health industry, and personal services – sustained women's, and mostly mothers', integration into the labor market, though many of these new jobs were associated with traditional female roles and yielded low pay (Esping-Andersen, 1999; England, 2010). As women moved increasingly into formerly male-dominated, middle-class positions, sex segregation in those occupations declined remarkably, from the 1950s, but remained virtually unchanged in working-class occupations where gender barriers continue to exist between blue collar and "pink collar" occupations (Bergmann, 2011; England, 2011).

Educational Expansion

Another fundamental transformation in the 20th century was rapidly increasing educational participation. However, as Goldin and Katz (2008) argue, the roots of this tremendous expansion reach back well before the 20th century: a high degree of local autonomy, the public funding and provision of education, the absence of church control, and early-tracking or gender selection are parts of a comparatively egalitarian U.S. tradition that facilitated mass education. Educational expansion over the 19th and 20th century entailed the creation of new schools, especially in rural areas, the creation of universities, and the abolition or reduction of school and university fees. At times, direct policy interventions further fostered educational expansion, in particular the GI bill, which provided educational opportunities to returning (white) veterans of WWII and the Korea war and led to a surge in men's college enrollment in the post-war era (Bound & Turner, 2002; Katznelson, 2005). From the 1960s onwards, racial desegregation of the educational system at the secondary level, by means of busing, and the post-secondary level, by means of affirmative action policies (e.g., in the form of quotas for discriminated groups) and financial aid to students from low-income families (e.g. Pell grants), sustained further educational attainment (Roksa et al., 2007).

As a result, secondary and tertiary school enrollment and graduation rates rose substantially over the 20th century. High school graduation among Americans aged 25 years and older surged between 1910 and 2014 from 14 to 88 percent; the share of university graduates increased from 3 to 32 percent (U.S. Department of Education, 2015). Finally, women began to outperform men in college graduation rates in the early 1980s, partly because men who grew up with less-educated or absent fathers fare particularly poorly (Jacobs, 1996; Buchmann & DiPrete, 2006). However, there is little indication that class differences in educational attainment declined markedly over recent decades (Roksa et al., 2007). Moreover, racial differences in educational attainment, though somewhat muted, very much survived the end of legal segregation in 1964 (Jencks & Phillips, 1998; McDaniel et al., 2011).

2. Prior Work on Trends in Mobility

Descriptions of Trends in Mobility

The historical trends in the economic and occupational structure just described had immediate implications for absolute intergenerational mobility patterns. Most obviously, the change from an agrarian society to an industrial society channeled many individuals from an agricultural family

background into manual industrial and non-manual positions at the beginning of the 20th century. In the second half of the 20th century, the surging service sector pulled many individuals from lower manual and non-manual backgrounds into the ranks of a swelling middle class (Hauser et al., 1975; Hertel, 2015). This structural change also accounted for increased upward and decreased downward mobility among women during the second half of the century (Beller & Hout, 2006).

Soon after the first set of empirical studies on social mobility (e.g. Lipset & Zetterberg 1959), the field began to focus on the question of how relative mobility chances could be studied separately from these large structural shifts; it was the introduction of log-linear models that allowed for the analysis of relative mobility chances, i.e. social fluidity (Goodman, 1969, 1979, 1984). The following research on relative class mobility established a slow increase in social mobility between the 1960s and 1980s (Featherman and Hauser 1978, Grusky 1986, Hout 1984a, Hout 1988, DiPrete and Grusky 1990). Though these analyses revealed moderate increases in social fluidity, cross-national comparative analyses still lent little empirical credibility to the notion of an exceptionally high level of intergenerational mobility in the U.S., i.e. the *leitmotiv* of the American Dream, i.e. (Erikson & Goldthorpe, 1985, 1992).

Research on more recent trends since the mid-1980s provides some evidence that social fluidity ceased to increase or, in select areas of the class structure, even declined. Beller (2009) found a significant decline in social class fluidity for men, but not for women, born between 1965 and 1979, once information on mothers' class was included in the construction of social origins (though only in a very particular way). Studying change in social fluidity of 25 to 40 year old Americans between the 1970s and the 2000s, Mitnik and colleagues (2016) also find that the strength of the intergenerational class association recently decreased after an initial increase of mobility chances.[1] The authors propose that this convex trend is driven by two main forces: the initial increase in social fluidity may have resulted from educational expansion, whereas they can show that the later decline stems from growing immobility in the professional-managerial classes, a finding they attribute to the surge of top-incomes that facilitated closure strategies among the upper classes.

Based on historical census data, Long and Ferrie (2013) draw different conclusions about long-term trends in relative social mobility: they find that relative mobility had in fact been exceptionally high in the late 19th century but has decreased steadily since. These findings, however, have been rejected upon reanalysis by Xie and Killewald (2013), as well as Hout and Guest (2013). Xie and Killewald uncover three factors that account for bias in Long and Ferrie's analyses: a selective sample arising from class differences in co-residence patterns between sons and fathers; the statistical modeling strategy that takes the independence of origins and destinations as reference[2];

[1] This result is stable across two different conceptualizations of social origins. Mitnik et al. measure social origins based only on father's class (as we do in the following) as well as based on the combination of mother and father's class as suggested by Beller (2009).

[2] Xie and Killewald note that Long and Ferrie's finding may be "simply an artifact of their statistical method" (Xie / Killewald 2013) based on the fact that the reference model used ("independence") assumes homogeneous proportions in social origins across classes (Powers / Xie 2008). The combination of a sharp decline in farming origins and a constantly high rate of occupational inheritance among farmers violates this assumption and biases the marginal adjustments used to make mobility tables from different cohorts comparable (Long / Ferrie 2013). Consequently, the finding of rising fluidity may merely reflect "the discrepancy of the conditional distribution of farmers' fathers from the marginal distribution of all fathers" (Xie / Killewald 2013).

and the high immobility among farmers, a point of critique further supported by Hout and Guest's separate reanalysis.

In contrast to Long and Ferrie, we have confirmed in our own prior work (Pfeffer & Hertel, 2015) the earlier stated broad trends in relative class mobility, i.e. moderate but steady increase in social fluidity during the second half of the 20th century and the first signs of a stalling or even reversal of this trend for the most recent cohorts. In that work, however, we also cautioned against taking these findings as a foundation for sweeping statements about changes in the openness of U.S. society. Not only do trends in inequality in class attainment based on other measures of family background differ (as they do for parental education; ibid: pp.160ff), but we were also unable, much like most prior research, to marshal evidence for women (but see ibid, Appendix B). The additional data presented here allows us to do just that.

Relating Mobility Trends to Changes in Education

While long-term trends in social mobility continue to be subject to debate, little disagreement exists about the pivotal role of education for the intergenerational association between social origins and destinations (Bernardi & Ballarino, 2016). Trends in educational attainment may be related to trends in social class mobility through multiple avenues: changes in educational inequality (association between origins [O] and education [E], OE), changes in class returns to education (association between education [E] and destination [D], ED), changes in the mediating role of education for intergenerational class associations (OD association conditional on E), and the "compositional effect" (OD association as it varies over E; also discussed below).

Regarding trends in educational inequality (OE), prior research has consistently shown that the massive educational expansion of the 20th century had little effect on class differentials in educational attainment (Mare, 1981; Hout et al., 1993; Mare, 1993; Hout & Dohan, 1996). While there has been some decline in gender and racial differences in access to higher education, class inequality in education has proven remarkably stable in the United States (Roksa et al., 2007). Thus, despite early saturation of secondary education among upper classes, inequality at that level has remained largely stable and so has class inequality at the tertiary level.

Long-term trends in the association between education and class destinations (ED) are less well established. Our own prior work found no consistent trend for men in social class returns to education (Pfeffer & Hertel 2015). Most other prior research focused on educational returns using different measures of economic destinations: based on measures of occupational status, returns to education appear to be quite stable (Grusky & DiPrete, 1990; Hauser et al., 2000; Torche, 2016), while income returns have been rising rapidly (Autor et al., 2008; Goldin & Katz, 2008). The findings are not necessarily in conflict, since we also know that the income variance within classes has also changed over time (Weeden & Grusky, 2012).

While no prior contributions have tracked potential changes in the mediating role of education in social class mobility (OD conditional on E), the three-way interaction between education, class origins, and class destinations has been at the center of a number of important contributions to

the literature on social class mobility. Most notably, Hout (1984a, 1988) found a lower intergenerational class association among college graduates and proposed that this interaction may account for much of the observed mobility trends. Through this "compositional effect" (Breen & Jonsson, 2005), educational expansion is expected to increase social fluidity: the more individuals attain college education, the larger the share of the population whose social destinations are less dependent on their social origins. This lower OD association among college graduates could result from less discriminatory recruitment in labor market segments that are exclusively available to the highly educated (Torche, 2016).[3] The compositional effect has also been detected in other countries (Breen, 2010), in more recent cohorts of U.S. college graduates, and in other dimensions of socio-economic associations, such as family income, parental occupational status, and parental education (Torche, 2011, 2016).[4] Finally, the compositional effect has been confirmed, as suspected by Hout, to account for most of the observed mobility trends among American men (Pfeffer & Hertel, 2015).

Gender Differences in Mobility

In many ways, trends in educational and occupational attainment were even more radical for American women and can thus be expected to heavily influence female mobility rates over the century. While male dominated agricultural and manual origins declined, mixed or female dominated non-manual classes grew, resulting in structurally induced upward mobility. Growing educational attainment and improved employment prospects should facilitate women's rise in the occupational structure, their ability to avoid downward mobility, and their capacity to reproduce their father's (higher) class status. In effect, we would expect convergence of gender difference in the class structure as women access middle-class positions formerly restricted to men (England, 2010, 2011).

Abstracting from these structural changes, expectations about gender differences in mobility (i.e. relative mobility) are unclear. Prior evidence is mixed: employing a period design, Mitnik et al. (2016, p. 159 (Table 4A) find that social fluidity significantly increased among women but not men of all age groups between the 1970s and 1990s and decreased again in the 2000s. In contrast, Beller (2009, p. 523) finds a decrease in relative mobility (though statistically insignificant) for women born between 1965 and 1979 compared to those born between 1945 and 1954 – a trend

[3] An alternative interpretation of the OED interaction effect has been proposed by Goldthorpe (2007), who suggests that it is not the relationship between origins and destinations that differs by education (OD conditional on E) but the relation between education and destinations that differs by origin (ED conditional on O). That is, the link between education and social class is weaker among individuals with high social class backgrounds, presumably because higher class families can achieve social reproduction also outside the educational system. This interpretation is also in line with findings from Great Britain that document how individuals from higher social origins successfully use further education to correct for initial educational failures (Bukodi 2016).

[4] Torche (2011) also documented a re-emergence of the OD association among those with a post-graduate degree. We revisit this finding in the analyses below.

that she also determined to be similar to that for men, especially when additionally considering mother's class.

Furthermore, the substantive interpretation of gender differences in social fluidity trends calls for considerable care. For instance, Goldthorpe and collaborators caution against interpreting findings of increasing fluidity for women as proof of expanding opportunity for women (Goldthorpe & Mills, 2004, 2008; Bukodi et al., 2015). They find that rising fluidity for British women resulted from a decreasing association between origins and destinations in the highest classes (Bukodi 2017).[5] In other words, rather than female progress, in this case it is the decreasing ability of higher-class women to reproduce their family status that drives increasing fluidity trends. In our own analyses, we are therefore careful to interpret changing gender differences in mobility not only in terms of overall levels of fluidity; we also investigate mobility patterns to render potential gender differences in fluidity more substantively meaningful.

3. Data and Measures

We base our analyses on four different surveys, each of which had to meet two criteria to be considered for inclusion in this study. First, we require detailed information on each respondent's education and occupation as well as their father's occupation during the respondent's childhood. Second, the surveys have to comprise nationally representative samples of adults in the United States. The four datasets that qualify are the General Social Survey (GSS), the Occupational Changes in a Generation Survey (OCG-II), the Survey of Income and Program Participation (SIPP), and the Panel Study of Income Dynamics (PSID). In the following, we briefly present each dataset before adding more detail on our analytic sample and the measures used.

The GSS is one of the cornerstone datasets of U.S. social sciences and currently covers the years from 1972 until 2014 (Smith et al., 2015). It was conducted as a cross-sectional survey annually from 1972 until 1993, with the exception of 1979 and 1981, and biannually from 1994 onwards. The sample universe includes all English-speaking and, since 2006, Spanish-speaking adults of 18 years of age or older living in the United States.

OCG-II was conducted as a supplement to the 1973 March Current Population Survey, CPS (Featherman & Hauser, 1975). As such, it is a nationally representative cross-sectional survey covering civilian, non-institutional households in the United States with an oversample of people of color and Hispanics.

The SIPP is a household survey designed as a continuous series of nationally representative panels administered from 1984 onwards. Its sample includes civilian, non-institutionalized households. Here, we use the three waves from the SIPP panel that run between 1986 and 1988 (Census, 1989, 1990b, 1990a, 1991b, 1991a, 1992).

[5] Bukodi et al. (2017) speculate that family-orientation (and, we add, the lack of arrangements that help balance family demands with work demands) may inhibit these women from utilizing the full force of their privileged upbringing.

Finally, the PSID (McGonagle et al., 2012; Brown et al., 2014) is the world's longest-running nationally representative household panel study. Its sample includes tracking children born to PSID households as they move out and establish their own households, providing the major data source for the assessment of intergenerational associations in the United States. The PSID includes an oversample of poor, African-American households and has been administered yearly since 1968 and bi-annually since 1997. Analyses of the influence of panel attrition on the study of intergenerational transmission of economic status attest to high representativeness (Fitzgerald, 2011). An inverse relationship between attrition probability and educational attainment, however, seems to downwardly bias estimates of intergenerational income elasticities with the PSID data (Schoeni & Wiemers, 2015). For this contribution, we use data from the most recent wave in 2013 supplemented by information from the two last waves for recent panel drop-outs.

[Table 1 about here]

Our overall analytic sample consists of 76,575 individuals (47,809 men and 28,766 women) aged 35 to 64 who lived in the United States when they were of school-age and who were not in education when interviewed. We divide our sample into six birth cohorts, covering cohorts born roughly before, during and after WWI (1908-1921), before and after the crash of 1929 (1922-1933), the phase of economic recession and WWII (1934-1945), post-WWII (1946-1957), during the period of Fordism in the late 1950s and 1960s (1958-1969), and during the 1970s (1970-1979). We typically label our cohort members by the years they turned 30 to help focus on the time period in which they completed their educational attainment and established their labor market careers. The composition of the cohorts with regard to some socio-demographic attributes is displayed in Table 1. Most importantly, we note that African-Americans are overrepresented whereas other racial and ethnic groups, importantly including Hispanics, are underrepresented in the most recent cohorts.

We base our measure of social class destinations on respondents' reports of their current occupations and our measure of social class origins on respondents' retrospective reports of their fathers' occupations during their own childhood. We recoded this occupational information into the EGP class scheme[6], collapsed into six social class categories: higher service class (I), lower service class (II), routine non-manual workers (IIIab for men, IIIa for women), self-employed and farmers (IVabc), skilled manual workers and supervisors (VI+V), and unskilled manual workers

[6] The surveys included here relied on different occupational coding schemes. The 1970 Census Occupational Classifications (COC) was used in OCG-II and early GSS waves, 1980 COC in later GSS waves and the SIPP, and 2000 COC in the most recent waves of the PSID. Changing occupational coding schemes have hindered prior research from assessing long-term social mobility. Besides the use of existing crosswalks from 2000-based to 1980-based EGP codes, we also draw on extensive work that devised a new crosswalk from 1970-based to 1980-based EGP codes (for deteils see Hertel / Groh-Samberg 2014) .Validation checks for these latter crosswalks based on three double-coded GSS waves are reported in Appendix Table A. 1. We also note that this crosswalk has been used successfully in prior research to describe class mobility in the U.S. (Hertel / Groh-Samberg 2014; Hertel 2015; Pfeffer / Hertel 2015).

(VIIab for men, VIIab+IIIb for women).[7] Respondents' educational attainment is measured as the highest degree attained in the following five categories: less than high school, high school, some college (including associate's degree), bachelor's degree and post-graduate degrees. For the assessment of relative mobility trends among women, we had to collapse the two lowest educational degrees, less than high school and high school, to counter the effect of sparse cells on the stability of our models.

We impute missing values on our main measures of education, destination, and origin using the Stata mi command (see Table 1), not least to adjust for the changing labor force participation of women and changes in the unemployment rate.[8] The inspection of imputed values indicates that individuals from low class backgrounds, low educated Americans and incumbents of lower classes are especially likely to be missing. The structure of missing values suggests that by ignoring observations with missing data, we might overestimate mobility in cells indicating (educational) immobility in the lowest social positions (Schoeni & Wiemers, 2015). The results reported here remain substantively the same when we restrict the analyses to complete observations (see Appendix, Figure A. 3). Further sensitivity analyses, reported in the Appendix, also add confidence that our findings are not only stable to a wide range of different approaches to treating missing values, but that they are also stable towards differences in the characteristics of the four surveys, different sample constructions, and different specifications of our social class measure (Table A. 6, Figure A. 2, and Figure A. 3).

[7] We lack information on the number of employees that would allow us to differentiate between the self-employed with (IVa) and without employees (IVb). The developers of the EGP scheme recommend collapsing low skilled manual workers with routine non-manual workers if analyses are performed separately for men and women (Erikson / Goldthorpe 1992).

[8] We did not rely on last job reported in the case of unemployment or inactivity at the time of the survey for three reasons: first, this information is not available in all surveys. Second, in some surveys where it is available, we do not know how far this measurement lies in the past, which potentially introduces severe bias by confounding cohort and life-course effects (especially with regard to women who stopped working relatively young, e.g. after marriage or giving birth) and undermines our sample restriction with regard to age. Third, episodes of unemployment are known to frequently precede downward occupational mobility (Gangl 2003; 2004), which indicates that using the last job systematically underestimates mobility. Instead, our imputations predict missing values based on the observed relationships between our key variables (origin, education, destination and cohort) and imposes that same relationship – which of course also derives from mobility inducing life events – to incomplete observations.

Structural Changes in the Labor Market and Education

As our brief historical overview above suggests, we expect dramatic changes in the two societal features that are at the heart of this assessment, the occupational and the educational structure.

[Figure 1 about here]

In terms of shifts in educational distribution, many empirical contributions have already described the rapid pace of educational expansion during much of the 20th century and its tapering off over the past three decades (Fischer & Hout, 2006; Goldin & Katz, 2008; Garfinkel et al., 2010). As Figure 1 demonstrates (see also Table 2, upper two panels), our own data capture these trends well. The share of 35 to 64 year old individuals with a college degree or more rose rapidly and linearly in the first four cohorts studied here (who turned 30 between 1938 and 1987) and at a similar pace for men (from 10.8 to 30.6 percent) and women (from 7.7 to 26.7 percent). Over the two most recent cohorts (who turned 30 between 1988 and 2009), the share of individuals with at least a post-secondary degree has remained stable for men but continued to increase for women to surpass the share of male degree holders (34.7 vs. 30.3 percent). These trends are mirrored at the lower level of the educational distribution, where high school dropout rates decreased sharply and linearly among men (from 52.3 to 7.9 percent) and women (from 44.4 to 7.5 percent) alike.[9] These trends, once again, underline the dramatic success in expanding education during most of the last century and the ebbing of that trend in recent decades.

[Table 2 about here]

Figure 2 (see also Table 2, bottom two panels) shows cohort changes in the class structure during the same period. Highly skilled white-collar positions (the "high service" class) expanded substantially in the first three cohorts of American men (from 17.8 to 24.5 percent) and in the first four cohorts of women (from 5.0 to 14.2 percent). Over the following cohorts, the service class slowly declined to 17.4 percent for men and 12.8 percent for women in the most recent cohort. On the other hand, the share of lower-grade professionals and managers ("low service" class) rose steadily across cohorts from 7.9 to 18.7 percent for men and from 12.8 to 28.3 percent for women in the youngest cohort.

[Figure 2 about here]

Trends in the share of unskilled workers reflect deindustrialization. The initial steep decline of unskilled manual positions, from 32.9 to 22.5 percent for men and 49.9 to 27.2 percent for women over the first four cohorts (but not beyond that), is offset by emerging positions in the low-wage personal services segment within the working classes (Kalleberg, 2000, 2006). The share of skilled manual positions, the stronghold of male employment (England, 2011), remained virtually

[9] Because female high school dropouts are becoming so few in more recent birth cohorts, we group them together with high school graduates in all following analysis unless noted otherwise. Especially in the loglinear cohort models, this should prevent any undue influence of the shrinking and increasingly selective group of female high school dropouts on results of cohort change in relative mobility (Xie / Killewald 2013).

unchanged, accounting for about 22 percent for men and less than 4 percent for women. Routine non-manual labor (around 8 percent) shows no pronounced cohort trends among men but declined among women from 23.5 in the oldest to 17.0 percent in the most recent cohort, a trend likely to be driven by substituting computers for routine office work (Autor et al., 2003; England & Boyer, 2009). Self-employed within and outside of agriculture accounted for about 11 percent of men in each cohort, whereas their share increased among women from 5.0 to 8.4 percent. This trend results from the decline of male-dominated farming and the more recent increase of less gender-segregated self-employment outside of agriculture (Arum & Müller, 2004; Arum, 2007).

4. Trends in Absolute Social Mobility

To provide a parsimonious description of the changing flows between class origins and destinations across our cohorts (6 destination classes by 6 origin classes by 6 cohorts = 216 data points), we describe trends in absolute class mobility at different levels of aggregation (see also Erikson & Goldthorpe, 1992, pp. 44-45; Breen, 2004a): We first investigate immobility and mobility, i.e. the main-diagonal and off-diagonal cells of the mobility table. We then further differentiate cases of mobility into vertical and non-vertical moves: vertical moves can occur between the (combined low and high) service class at the top, and the unskilled working class at the bottom, and a broad middle-class category that encompasses routine non-manuals, self-employed and skilled workers.[10] Intergenerational movement between these latter categories of the middle class, or between the low and the high service class, are counted as non-vertical moves.[11] Finally, we further distinguish vertical mobility by its direction and reach: short downward mobility goes from the service class to the middle class and from the middle class to the unskilled working class and vice versa in the case of short upward mobility. Long downward mobility goes from the service class to the unskilled working class and vice versa for long upward mobility (lower panel).

[Figure 3 about here]

Given the vast changes in the class structure documented in the last section, we should expect considerable intergenerational movement between class origins and destinations, i.e. high

[10] We do not place farmers in different vertical categories depending on whether origins or destinations are concerned, as suggested by Erikson and Goldthorpe (1992). Since our study covers such a long time window – our cohorts span nearly a century – it is not easy to identify the point at which farming origins or destinations cease to be structurally similar to unskilled working classes and become part of middle classes. Instead, we placed the self-employed in both origin and destination within the middle classes (Hout / Hauser 1992).

[11] This conceptualization corresponds to Erikson and Goldthorpe's (1992) own specification, based on their assessment of the comparability of distances between vertically ordered class positions. If, instead, we separately distinguished mobility between the low and high service classes, we would equate the social significance of such movement with that of other directional moves, such as mobility between the unskilled working class and the middle classes or mobility between the middle classes and the service class. For the sake of comparability to other contributions in this volume, however, we also provide results based on such alternative specification in the Appendix. Little changes with regards to overall mobility flows (compare Figures 3 to A. 4). For educational differentials in mobility flows, distinguishing within-service class flows yields similar trends but upward mobility continues to outpace immobility among the smaller group of college graduates (compare Figures 6 and A. 5).

individual class mobility. Figure 3 documents this to be the case (see also Table 3): across our entire sample, 71.1 percent of men and 78.8 percent of women experienced mobility. For men, this level of mobility is remarkably stable across all cohorts. Women, on the other hand, increasingly experienced immobility, up from initially 17.9 percent in the first cohort to 23.7 percent in the most recent cohort. Women's decreasing mobility rates may result in part from the decreasing gender segregation in the class structure (Charles & Grusky, 2004; England, 2010, 2011; Blau et al., 2013): Over time, women were able to gain more access to middle-class occupations that had been restricted to men – in other words, they were increasingly able to reproduce their father's class status.[12] Non-vertical mobility – i.e. intergenerational movement within the middle or the highest classes – decreased slightly among men and women from initially 16.4 and 17.3, respectively, to 15.8 percent for both by the last cohort. These trends result from decreasing outflow rates from farming origins into skilled working and non-manual routine positions, which are only partially replaced in later cohorts by increasing mobility within the service class. Vertical mobility, consequently, rose across cohorts among men from 53.9 to 56.1 percent but declined among women from 64.9 to 60.5 percent.

[Table 3 about here]

Absolute Mobility and Education

Here, we relate social mobility as experienced by individuals (absolute mobility) to their educational experiences. We begin by tracking class gaps in educational attainment, then education gaps in social class attainment, and finally highlight differences in mobility related to educational attainment.

Class Gaps in Educational Attainment

[Figure 4 about here]

Figure 4 illustrates differences in the shape of educational expansion for individuals from different social class backgrounds. It plots the share of individuals from each social class whose educational attainment does not go beyond a high school degree (upper panel) as well as individuals who attained a 4-year college degree or more (lower panel). The cohort trends first and foremost reveal that class gaps in education are large and have not decreased. This holds in spite of educational expansion, reflected in the overall decrease of men and women who attain at most a high school degree and an increase of men and women who attain at least a college degree. In fact, we find growing class gaps especially in the attainment of a college degree: the percentage point difference between the share of college graduates originating from high service class vs. the unskilled working classes increased for men from 28.9 to 38.6, and more rapidly for women from 17.0 to glaring 41.9

[12] Another way to illustrate this is by means of the index of dissimilarity (DI; see Breen 2004) to summarize the share of women who would have to change classes in order for their origin (=fathers') and destination distributions to be equal (DI=0). For women, the DI halved across the cohorts studied here, from 58.7 to 27.5 percent. While the DI for the comparison between the class distributions of men and their fathers is smaller, it also declined over cohorts, from 27.1 to 10.2 percent.

percentage points. These findings once again underline that the highest classes were most successful in taking advantage of the new educational opportunities created by educational expansion.

Education Gaps in Class Attainment

Class attainment is determined by a multitude of factors, but an important one among them is educational attainment (Blau & Duncan, 1967). Figure 5 displays cohort changes in the class position of men (upper panel) and women (lower panel) by their attained educational level (see online appendix Table A. 3 for full tables).

We observe that Americans who maximally obtained a high school degree have benefitted the least from the upgrading of the occupational structure. For the lowest educated Americans, the decrease in unskilled work was less pronounced than among the general population: among men with at most a high school degree it decreased from 38.9 to 35.9 percent (32.9 vs. 24.3 in the general population) and among women it decreased from 54.6 to 51.5 percent (49.9 to 30.0 percent in the general population). Reflecting the increasing importance of higher education, access to the service class declined among low educated men from initially 15.8 to 13.1 percent. This trend is particularly marked among male high-school drop-outs in our sample (not shown separately). None of the drop-outs born after 1970 gained access to the higher service class, while it was still a possibility – though small at 6.2 percent – for the earliest cohort. The trends are markedly different for low educated women: those with at most a high school degree were increasingly able to enter the (mostly lower) service classes, with their share increasing from 12.0 to 20.3 percent.

The occupational opportunities of Americans who access college but do not graduate with a bachelor's degree are also increasingly dire. While service-class positions declined (from 49.3 to 31.6 percent among men and 47.1 to 35.5 percent among women), the rate of unskilled working-class positions increased substantially (from 13.6 to 26.3 percent among men and from 17.7 to 27.5 percent among women).

[Figure 5 about here]

A bachelor's degree became increasingly important for access to the middle classes: the share of middle-class positions among BA holders increased for males (from 23.0 to 27.4 percent) and, more so, for females (from 20.6 to 29.3 percent). Yet, even among college graduates, the share of individuals who made it into the service class declined. The BA degree was a more reliable way to access the top of the class structure when college graduation rates were lower, a process customarily called credential inflation (Collins, 1979, 2011): while close to three quarters of college graduates in our first cohort entered the service class (above 72 percent for women and men), the same was true for fewer college graduates in our latest cohort (66.9 percent for men and 61.0 for

women). Instead, women who graduated with a Bachelor's degree increasingly even worked at unskilled working-class jobs (up from 4.8 to 9.8 percent).[13]

Finally, the class destination of post-graduate degree holders has remained quite stable across cohorts – that is, contrary to BA degrees, we do not find evidence (yet) for inflation in credentials at the very top of the educational distribution. Around 90 percent of men and above 80 percent of women with an advanced degree find their way into the service class. The slight increase of middle-class positions among postgraduates is mostly driven by graduates who become self-employed (not shown).

Education and Mobility Experiences

The documented changes in class gaps in education and in educational gaps in class attainment do not yet provide a direct answer to what many may consider the central question about changes in the role of education: namely, has education and, in particular, higher education become more important as a gateway to upward mobility? Figure 6 provides a direct and rather clear answer.

[Figure 6 about here]

Overall, upward mobility among college graduates has been decreasing while immobility has increased. In other words, college degrees have become a more important means to maintain one's social class status, i.e. a reproductive strategy (Torche, 2011). With the important exception of changes between the first and second cohort of males – where the importance of higher education for upward mobility increased – these trends are similar for both genders but more pronounced for males. For males, rates of immobility and upward mobility among college degree holders reached parity earlier than for women and then reversed, leaving the youngest cohort of male college graduates with considerably higher rates of immobility than upward mobility.

The initial increase in upward mobility solely among male college graduates turning 30 between 1953 and 1962 is likely to be driven by returning World War II and Korean War veterans. Around 75 and 60 percent of men born between 1920 and 1926 served in one of these wars and around 50 to 60 percent of veterans born between 1923 and 1928 benefitted from the educational provisions granted under the G.I. Bill (Bound & Turner, 2002; Turner & Bound, 2003). Benefits included tuition fees and a monthly allowance for occupational training, apprenticeships or university studies that were high enough to study even at the most prestigious institutions of higher education.

Overall, our assessment of education's role in absolute mobility trends leaves us with a substantially less optimistic view of changes in access to opportunity than one may have expected based on many positive aggregate trends: education has expanded significantly, important parts

[13] However, the continuous decline of class attainment among female BA holders is however not another instance in which increasing mobility is caused by women's failure to reproduce high class positions as it seems to be the case in Britain (Bukodi, Goldthorpe, Heather, and Waller forthcoming): long- and short-range downward mobility among female college graduates remained stable.

of the occupational structure have been upgraded, and overall upward mobility has increased. Still, class differentials in access to education are stable and absolute class returns to education have in important ways declined (e.g. in terms of a college degree guaranteeing access to the service class). What we observe is an instance of continuously maintained inequality in absolute terms. While the opportunity structure became more favorable for everyone, the privileged classes were most successful in benefitting from these advances. At the same time, women profited more strongly than men from the amelioration of the opportunity structure even though they still trail behind men when it comes to the mobility returns to their education.

5. Social Fluidity and Education

Analyses of changes in absolute mobility rates and changes in relative mobility rates, or social fluidity, address different questions. We now turn to the topic of social fluidity and, with that, an answer to the question of whether and how the United States has come closer or moved away from its ideal, the land of equal opportunity. We begin with an assessment of how social fluidity varies across educational status (the compositional effect) and how the role of education varies across different patterns of mobility. We then report two-way associations between origin, education, and destination to describe trends in each of the three legs of the "mobility triad". Uniting these findings in a final decomposition analysis, we describe the channels that account for the observed changes in social fluidity. We end with a closer look at the changing fluidity patterns of women and their determinants.

The compositional effect

Figure 7 displays the strength of the association between class origins and destinations for each of the five educational degrees. This OD association is now derived from uniform difference models (Xie 1992; Erikson & Goldthorpe 1992) to reflect the degree of social fluidity, i.e. social mobility levels that subtract structural mobility induced by changes in the overall occupational structure. We confirm the compositional effect found in prior research: intergenerational class associations tend to decrease with the level of attained education (Hout, 1988). In line with Torche (2011), we also find that the origin-destination association decreases up to a graduate degree but then increases slightly (and, in this case, insignificantly) among male postgraduates, whereas the intergenerational association declines gradually for women and with no difference between graduates and post-graduates (Torche, 2016).

[Figure 7 about here]

How important is education for class mobility?

Having described how class origins matter differently for class attainment across educational status, we now assess whether education also matters for relative mobility chances. To answer this question, we employ a method proposed by Breen, Karlson and Holm (Breen et al., 2013; Breen & Karlson, 2014) that allows us to estimate the mediating role of education for each origin-

destination combination, analogous to the assessment of mediation in linear regression models.[14] Table 4 reports the degree to which educational attainment mediates mobility from a given class origin (relative to a service-class origin) to a given class destination (relative to a service-class destination). For example, little more than one third (37 percent) of the total intergenerational association among men who originate in the routine non-manual class rather than the service class, and remain there rather than move into the service class, is mediated by education. This particularly low mediation effect and the fact that most effects presented in Table 4 are far below 100 percent underlines the importance of (higher) education for mobility strategies "from above", i.e. from and into the service classes (Goldthorpe, 2007, p. 171).

[Table 4 about here]

Nevertheless, education mediates more than half of the origin-destination association in almost all cells of the mobility table and significantly more in many, underlining education's primary importance for class mobility. Distinguishing between immobility (main diagonal) and mobility (off-diagonal) provides the following further insights: the role of education tends to be substantially lower for immobility than for mobility, suggesting that overall education is still an important positive contributor to a fluid society.[15] This finding that immobility is less strongly associated with educational attainment also points both towards the importance of other factors that inhibit class mobility and towards the fact that education is particularly important for class immobility in the reference group (service class I+II).

A comparison between men and women suggests that education tends to be more important for relative mobility chances among women. Especially cells pertaining to upward mobility chances (values below the main diagonal) are frequently above 100%, indicating that women need to acquire more (or more specific) education to outweigh gender disadvantage in terms of class attainment. Education is especially important for women from farming backgrounds to enter routine non-manual or self-employed positions.

[14] The challenge for mediation analysis in non-linear models, such as logistic regression, stems from the fact that coefficient estimates and their error variance are not separately identified because the scale of the predicted latent variable is unknown (Mood 2010). If new variables are added to an existing model, all coefficients are subject to rescaling, which complicates comparisons between the coefficients of nested models (or across samples). To account for the rescaling, the KHB decomposition method (Breen et al. 2013; Breen / Karlson 2014) substitutes the mediator variable (education) with the residuals of the mediator variable obtained in a regression of the mediator variables on the predictor variables of interest (origin classes). These residualized mediators can then be used to calculate total and indirect effects. While the coefficients of the models (total, direct and, their difference, the indirect effect) still cannot be compared across samples, their ratios can, since the common scale parameters cancel out.

[15] The role of education for immobility is particularly low for the petty bourgeoisie – the self-employed in (IVc) and outside of agriculture (IVab). Likely, immobility in these classes is instead more heavily driven by inherited capital, such as investment capital, land, machines, or the business/farm itself rather than by obtaining academic skills (Ishida et al. 1995). The exception to the pattern of lower mediation of immobility, are women from high grade routine non-manual origins for whom education plays a larger role in the reproduction of their class status.

Trends in Fluidity and the Mobility Triad

Having established the importance of education for social fluidity, we now turn back to the assessment of cohort trends. We estimate a series of log-linear and log-multiplicative models of the two-way association between origins and destinations (OD), origins and education (OE), and education and destinations (ED) (for details about these models, see Breen, 2010). The usual fit statistics are presented in Table 5, alongside UniDiff parameter estimates, which are also plotted in Figure 8.

[Figure 8 about here]

We begin by discussing the results for men. We find strong indications for a change in men's social fluidity across cohorts (OD): both the linear UniDiff and unconstrained UniDiff models are superior to the constant association model (see log-likelihood ratio test statistics [p vs. #] for models 1.2 and 1.3 in Table 5). For one additional parameter, the linear UniDiff model reduces deviance by 81.9 percent (203.2/248.1) compared to the constant association model. The linear decline in the OD association, i.e. increase in fluidity, estimated by this model is 5.7% for each cohort. Inspecting the UniDiff parameters that are not constrained to a linear trend (model 1.3) in Figure 8, however, shows that the increase in fluidity across cohorts was strong across the initial four cohorts but leveled off for men who turned 30 in the mid 1970s or later. We do not find evidence for a decline in fluidity among men born in the most recent cohort as reported by Beller (2009), Mitnik et al. (2016) and our own earlier analysis (Pfeffer & Hertel, 2015).[16] The overall trend of increased fluidity among men parallels findings from nine out of ten European countries over a similar time frame (Breen, 2004a), although the latter studied fluidity differences across periods rather than cohorts as we do.

In line with earlier research, we do not observe a substantial trend towards lower inequality of educational opportunity among men (OE). Neither the linear (2.2) nor the unconstrained UniDiff model (2.3) yield a significantly better fit than the constant association model (2.1). An inspection of the UniDiff parameters suggests that, at best, the trends in class inequality in educational attainment may be U-shaped: class differences in educational attainment were declining from an initially high level, remained stable between the second and the fifth cohort only to return to their initial level in the last cohort. This result – though suggestive, since we cannot reject a model of no trend – corroborates findings by Roksa et al. (2007, pp. 181-182) according to which class inequality in access to elite universities was higher in the pre-WWII cohort *as well as* cohorts

[16] Additional analyses reveal that this difference is mainly due to the inclusion of the PSID (see online Appendix, Figure A. 1, bottom right plot). This may be due to two features of these data: first, the PSID comprises a higher share of African Americans, who show more fluidity in this cohort (Hertel 2015). Also, Mitnik et al.'s finding that the recent decrease in fluidity is primarily driven by immobility in the highest classes suggests that the inclusion of African-Americans, who are more heavily concentrated in lower class positions, would counter the trend of decreasing fluidity. Second, a recent study by Schoeni and Wiemers (2015) indicates that panel attrition downwardly biases observed intergenerational income elasticities based on PSID data. If this effect of selective attrition also holds for intergenerational class associations, we may overestimate fluidity in the last two cohorts in which PSID data account for 42.6 and 72.4 percent of our analytic sample.

entering higher education in the 1980s compared to cohorts in-between. Possibly, the initial decline that we find was driven by educational provisions for returning veterans (Bound & Turner, 2002), whereas educational expansion and affirmative action programs following the civil right movements may have led to its subsequent stability on the lower level (Karen, 1991; Katznelson, 2005; Roksa et al., 2007). The final increase of the association between class origins and educational attainment coincides with the retrenchment of affirmative action in higher education, starting in the 1980s, and increasing tuition costs at times of widening income inequality (Roksa et al., 2007; Hout, 2012).

Finally, we observe that class returns to education (ED) for men fluctuate across cohorts without a clear trend. While the linear UniDiff model (3.2) fails to improve fit over the constant association model (3.1), the unconstrained UniDiff model (3.3) provides a moderately better fit. Those UniDiff parameter estimates suggest that there is little change over the first three cohorts, a unique reduction in the fourth cohort, and a subsequent increase in the returns to education.

[Table 5 about here]

Our findings for women are quite different. We find no evidence for a trend in increasing fluidity (OD). The linear (1.2) as well as the unconstrained (1.3) UniDiff models fail to improve model fit over the constant association model (1.1). Inspection of the UniDiff parameters suggests that mobility chances may have increased somewhat between the first and the second cohort but not since. Research from other countries has found both increasing and decreasing fluidity levels for women (Breen & Luijkx, 2004b), though these analyses used a period, rather than a cohort, approach. Nevertheless, the stability of fluidity among women is certainly a new enough finding for the U.S. context that merits further inspection, which we engage in below. Our results for women are also in line with findings from a recent period analysis of intergenerational associations in occupational status: studying trends across roughly five-year intervals between 1972 and 2010, Torche (2016, p. 247f.) found a substantial decline in women's intergenerational association in the mid-1980s, followed by a quarter century of overall stability.

Unlike for men, the relative association between class origin and educational attainment decreased considerably for women. Both the linear and the unconstrained UniDiff model (2.2 and 2.3, respectively) increase model fit significantly compared to the constant association model (2.1). The association between class origins and education declines by almost 4.4% per cohort; Figure 8 emphasizes that this change is almost linear. We note that this finding allows a considerably more positive conclusion about the development of educational opportunity among women than the picture of stable absolute class gaps in high school and college attainment established earlier (Figure 4). Part of the reason may be that our assessment of relative associations encompasses all educational categories, including "some college", which may be the main driver of the decrease. Indeed, this category is marked by much lower absolute class gaps (not shown above; with a maximum percentage point gap between classes of 12 percentage compared to a gap of 40-50 percentage points for high school and BA) and has expanded most rapidly (from 1.5% to 24.7%). That is, equalization of educational opportunity for women may have been accomplished mostly

through the rapid increase in college access that has also been documented in prior research (Diprete & Buchmann, 2006; Roksa et al., 2007, p. 173).

Finally, we also find that class returns to education declined significantly among women. Both versions of the UniDiff model (3.2 and 3.3) significantly outperform the constant association model (3.1). Contrary to men, however, we find a constant decline of class returns to education among women. This may suggest a kind of "perverse fluidity" (Goldthorpe & Mills, 2004, 2008) that could be driven by an increasing share of higher educated women experiencing downward mobility through entering part-time employment which is more frequently in working-class positions (Bukodi et al. 2017).

Channels of Changing Fluidity

Three distinct changes that we have documented above might drive the trends in social fluidity (for men) and lack thereof (for women): educational expansion, changes in class inequality in educational opportunity, and changes in class returns to education. Employing the decomposition method introduced by Breen (Breen, 2010), we investigate how much each of these channels contributes to the observed trends in social fluidity. Since, for women, the observed trends are flat, here the counterfactual models can be interpreted as indicating how fluidity would have changed if these channels were primarily driving them.

[Figure 9 about here]

Figure 9 shows the UniDiff parameter estimates for each cohort fitted to the actual observed mobility tables (O) as well as to counterfactual mobility tables. The additive *step-wise* inclusion allows for the influence of (1) the expansion-driven compositional effect, (2) changes in inequality of education, and (3) changes in returns to education. We follow this incremental approach by comparing how much each counterfactual mobility trend improves upon the prior counterfactual scenario (starting with a counterfactual baseline model B that restricts all relevant influences of education to be stable) and approaches the observed fluidity trend.[17] Table 6 additionally reports linear UniDiff parameter estimates and calculates the contribution of each counterfactual trend to the linear trend in fluidity estimated from the observed data.

The main results for American men are in line with our earlier analyses based on less than half of our current sample (Pfeffer & Hertel, 2015): a crucial driver of the increase in fluidity among men is the compositional effect (line 1). Other channels – namely trends in inequality in education (which, from above, we know were very muted) (line 2) and decreasing returns to education (line 3) – add only very limited *additional* explanatory power (i.e. they do not move the counterfactual lines much closer to the observed trend), except for the second cohort, for which the equalization

[17] The sequence of decomposition applied here follows the structure initially proposed by (Breen 2010) to be in line with other contributions in this volume. It differs from our earlier application of this approach that, in our view, facilitates a direct comparison of the relative strength of these three mechanisms (see Pfeffer and Hertel 2015, in particular Appendix A). The overall conclusions drawn from the two decompositions of mobility trends among men are similar between these two approaches.

of educational opportunity is the only mechanism that holds explanatory power beyond the compositional effect; yet another suggestion of the positive effects of the G.I. bill on white men (see above). In the linear UniDiff models, these three channels together account for roughly 70 percent of the linear increase in social fluidity among men. That is, changes related to education, in particular the expansion-driven compositional effect, are the main determinants of mobility trends. The remaining determinants of trends are those related to changes in the direct association between origins and destinations, outside of education. For instance, decreasing discrimination by social background in terms of hiring may account for an overall decrease in the residual association between origins and destinations once education is taken into account and, though only to a limited degree, to improving fluidity levels (Erikson & Jonsson, 1998; Jackson et al., 2005; Hällsten, 2013).

[Table 6 about here]

Our earlier analysis of women provided little evidence for changing levels of social fluidity. The counterfactual analysis sheds further light on how to interpret that finding: considering only expansion-induced changes through the compositional effect among women (line 1), social fluidity would have decreased substantially over the last century since higher educational attainment made women more likely to inherit higher class positions. At first sight, this finding is counter-intuitive in light of the greater fluidity among highly educated women (see Figure 7, right panel) whose share increased monotonically across consecutive cohorts. Our tentative interpretation is as follows: While the compositional effect does increase fluidity as education expands, in this particular instance it is outweighed by class differences in higher educational attainment (see bottom right plot in Figure 4). Because women from privileged origins profit more from expansion than all women and because education allows them to increasingly enter their origin position, educational expansion alone decreases fluidity for women. This effect exists in competition with the compositional effect and is also confounded by the cross-gender comparison of father-daughter mobility. To test for this, we decompose line 1 into fluidity trends resulting from educational expansion alone and those additionally accounted for by the compositional effect (not shown). The results provide some corroboration of our hypothesis: educational expansion alone drives fluidity down whereas allowing for the compositional effect mutes this fluidity decreasing effect. A similar finding of declining social fluidity has been reported by Featherman and Hauser (1976) and Hout (1984b) in analyses of trends in intergenerational mobility between 1962 and 1973 comparing black and white men. Hout specifically argued that public sector employment opportunities that became available in the wake of the Civil Rights movement enabled black men to profit from advantaged family origins, resulting in decreased social fluidity. In our cases of female fluidity trends, the other channels appear to have effectively counterbalanced this fluidity-reducing influence of educational expansion: beginning with the third cohort, both declining inequality of educational opportunity and class returns to education worked to increase fluidity (the counterfactual trend lines 2 and 3 are being pulled strongly towards higher fluidity). Together, these countervailing influences contributed to the stability of female fluidity levels.

We also observe considerably larger differences between observed and counterfactual fluidity levels among older cohorts of women (distance between the counterfactual and observed lines), implying that factors other than those related to education have been important determinants of female fluidity levels. A candidate explanation includes the idea that women's class attainment is constrained by occupational gender segregation, especially in the highest and lowest class positions, and that this type of gender segregation has withstood the radical transformation of women's educational attainment (England, 2011). Further fodder for this argument lies in the fact that we have observed a decrease of class returns of women's educational attainment across cohorts. Even in the two most recent cohorts, the association between their educational success and their class position has not increased but in fact continued to decrease.

6. Conclusion

In this contribution, we have studied trends in absolute and relative social mobility over the 20th century in the United States based on a new data collection made up of four national surveys. We have paid particularly close attention to the question of how these trends relate to changes in education.

Like others before us, we document massive changes in the occupational structure and the educational system of the United States. These changes are unsurprising given the large-scale transformations through industrialization and post-industrialization. But, in many ways, these aggregate trends paint a quite optimistic picture: the population became more educated and the occupational structure experienced upgrading that generally triggered upward mobility. Especially women benefitted consistently from the trend towards a post-industrial society, experiencing decreasing levels of downward mobility. It is doubtful whether such trend in occupational upgrading continues since we also document that the growth of high service class occupations and the decline of low-skilled positions has stagnated over the two most recent cohorts. The younger age of the most recent cohorts, however, precludes a final assessment of the latest intergenerational mobility trends due to possible future intra-generational (upward) mobility.

In contrast, our findings on the role of education in the mobility experienced by Americans (absolute mobility) provide little support for progress over the last century in the "great land of opportunity", a description with which the U.S. has been branded since its founding days. Even the radical increase of higher educational attainment during much of the 20th century has not closed class gaps in educational attainment. On the contrary, gaps in college graduation rates between the highest and lowest classes have increased among both men and women, supporting the view that educational expansion profited especially those families that had the economic and social resources to take advantage of growing educational opportunities. We also observe that absolute class returns to educational attainment have declined in particularly important dimensions of the class structure: while college attendance and graduation have become more important in order to access the middle class, even BA degrees have lost their power in ensuring access to the highest

classes and increasingly lead to even unskilled working-class positions. It is post-graduate degrees that, so far, have continued to maintain their function as the gatekeeper to higher class status. The upgrading of both the educational and class structure, finally, also resulted in an increase of immobility among college graduates at the expense of upward mobility. For both male and female college graduates, immobility is a much more frequent experience today than it was for cohorts born in the first half of the 20th century.

Our assessment of changes in social fluidity levels (relative mobility) and how they relate to changes in education reveals quite different stories for men and women. While class fluidity increased among men, it remained stable among women. Regarding the role of education in contributing to social fluidity, we find both gender commonalities and differences that help explain the diverging fluidity trends: for both men and women, a college degree is an important "equalizer" (Torche 2011) that reduces the direct link between social class origins and destinations (compositional effect). Moreover, education is of greater importance for women's upward mobility than for men's, i.e. women's access to a higher class position is more restricted to selection via educational credentials.

We find that the moderate increases in class fluidity among men are primarily driven by the compositional effect (see also Pfeffer & Hertel, 2015). That is, the weakening of intergenerational class associations for men was driven by the increasing share of college graduates but not by changes in class inequality in education, which remained stable, or changing returns to education, which were not marked by a consistent trend.

For women, on the other hand, educational trends alone provide an incomplete explanation for the stability of fluidity levels: everything else equal, educational expansion alone had the potential to decrease female fluidity – arguably because it elevated women's qualifications and enabled the privileged to gain access to occupations henceforth restricted to their fathers. The fluidity inducing effect of the compositional change proofed too weak to fully counter this effect. This trend, however, was effectively counterbalanced by decreasing levels of class inequality in educational attainment and decreasing class returns to education, contributing to the remarkable stability of intergenerational class transmission from fathers to daughters. Especially declining relative class returns to education, and hence the overall stability of women's relative mobility chances, might be driven in important parts by continued gender segregation in the labor market in spite of women's substantial gains in educational attainment (Charles & Grusky, 2004).

These new findings on gender-specific mobility trends and different determinants underline the need for further studies particularly focused on women. Bukodi et al. (2017) recently embarked on that journey to study the development of mobility chances among British women. They found that *increasing* social fluidity among British women is almost entirely driven by women from high-class origins failing to achieve class reproduction. They draw the conclusion that indiscriminate selection into lower class part-time work accounts for increasing fluidity. Given the contrary finding of stable fluidity among American women, we would propose concentrating on other factors, including demographic factors (family structure and marital status) to help explain women's mobility within

the American context. Finally, the shape and determinants of female mobility could be greatly enlightened by an explicit comparative approach dedicated to the analysis of female mobility that also takes into consideration the vast difference in welfare provisions and the particular impact they have on female workers and mothers (Esping-Andersen, 1990, 1993, 1999).

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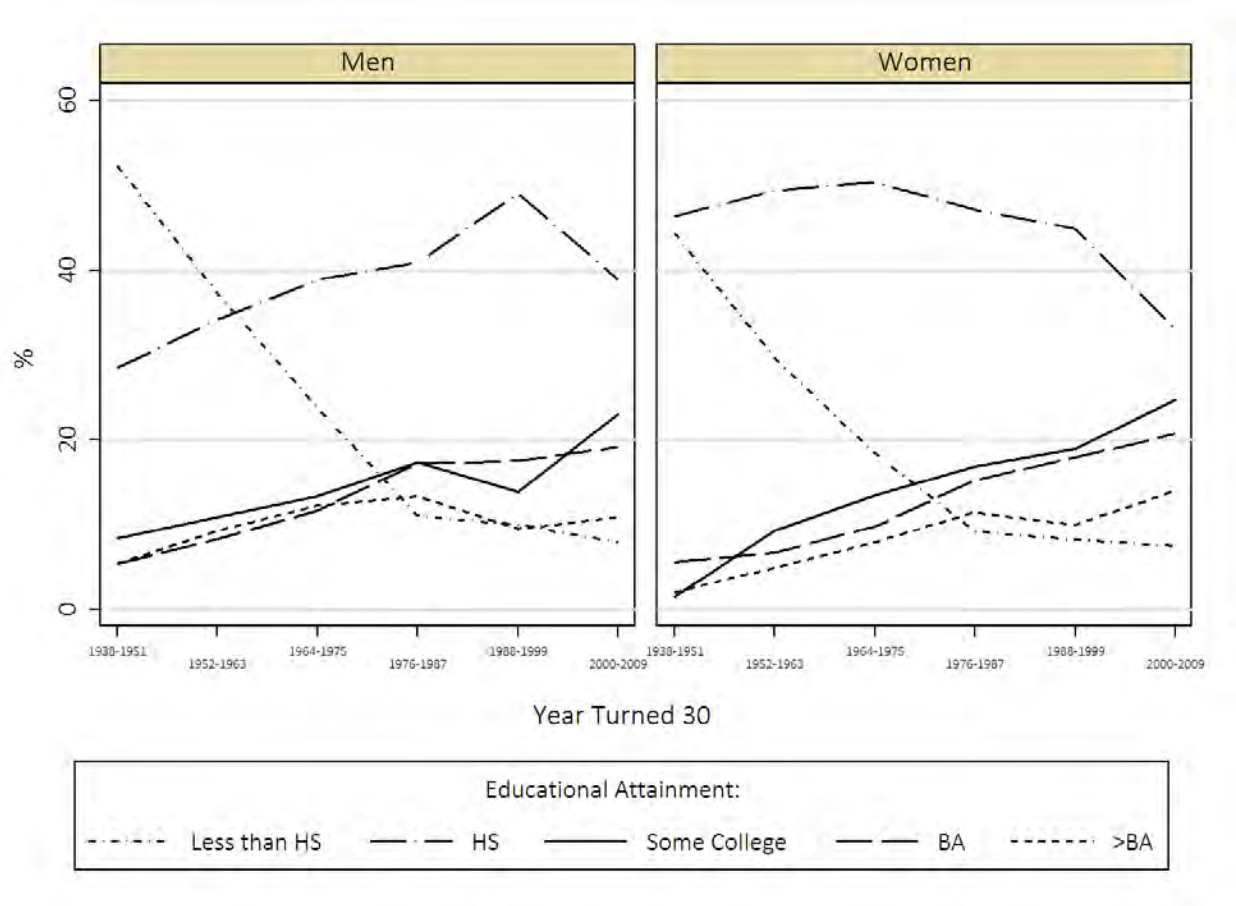
Table 1: Sample Characteristics by Birth Cohort

		Year turned 30						
		1938-1951	1952-1963	1964-1975	1976-1987	1988-1999	2000-2009	Total
Source	GSS	21.0%	22.7%	34.2%	48.9%	57.4%	27.6%	35.3%
	SIPP	0.9%	27.9%	43.4%	34.7%	0.0%	0.0%	25.3%
	OCG-II	78.2%	49.4%	22.2%	0.0%	0.0%	0.0%	27.3%
	PSID	0.0%	0.0%	0.2%	16.4%	42.6%	72.4%	12.1%
Demographics	Women	11.8%	25.0%	39.6%	51.9%	53.7%	52.8%	37.6%
	Race							
	White	86.2%	87.0%	87.1%	81.9%	68.9%	62.8%	82.6%
	Black	13.3%	12.2%	11.5%	15.3%	25.0%	27.0%	15.0%
	Other	0.5%	0.8%	1.4%	2.9%	6.2%	10.3%	2.4%
	Imputed	35.6%	30.2%	28.6%	27.2%	29.7%	30.9%	29.8%
	Observations	9,432	18,947	18,662	17,078	8,616	3,840	76,575

Note: Authors' calculations based on composite dataset (1972–2014); see text for details.

Figure 1: Changes in the Distribution of Education



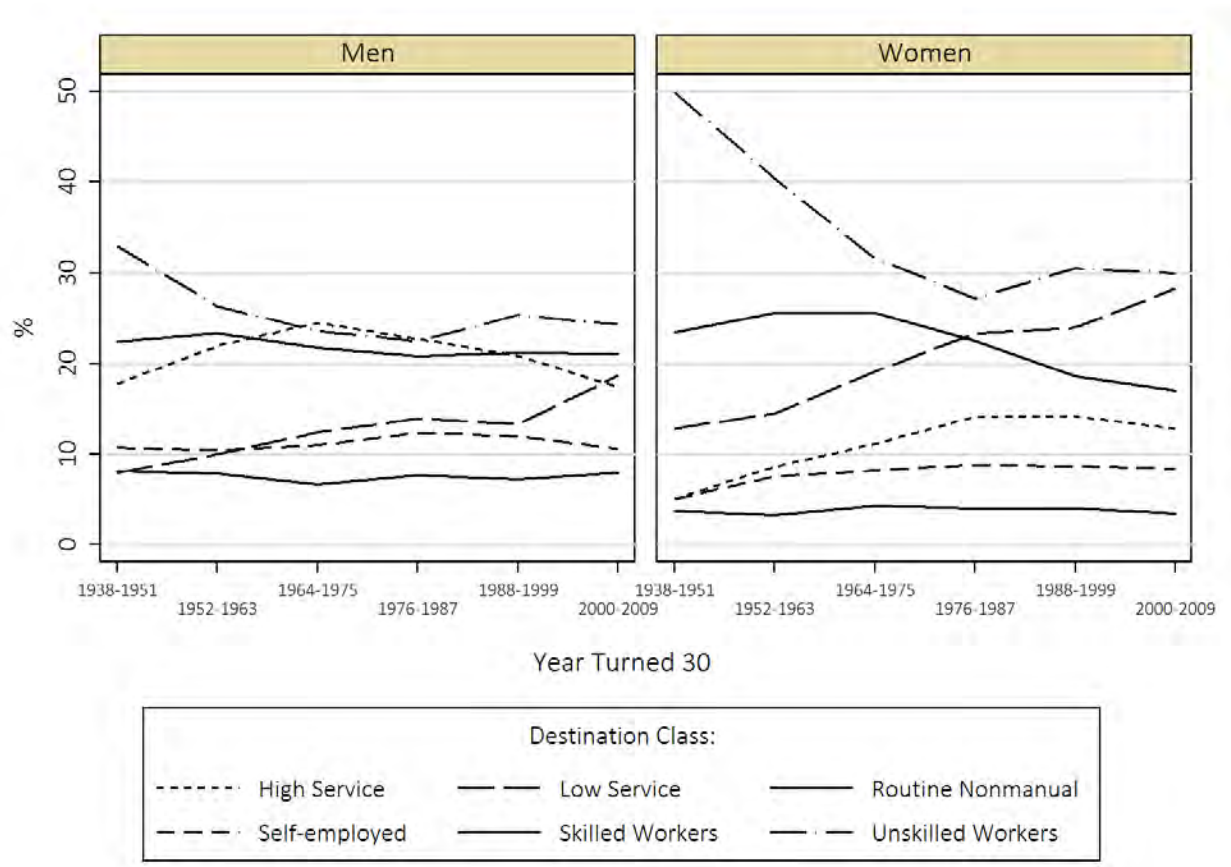
Note: Authors' calculations based on composite dataset (1972–2014).

Table 2: Cohort Trends in Education and Class Structure

		Year turned 30						
		1938-1951	1952-1963	1964-1975	1976-1987	1988-1999	2000-2009	Total
Highest Education								
Men	Less than HS	52.3%	37.3%	23.8%	11.1%	10.0%	7.9%	28.8%
	HS	28.5%	34.2%	38.9%	40.9%	49.1%	38.9%	36.9%
	Some college	8.4%	10.9%	13.4%	17.4%	13.9%	23.1%	12.9%
	BA	5.4%	8.3%	11.7%	17.3%	17.5%	19.2%	11.3%
	>BA	5.4%	9.3%	12.3%	13.3%	9.5%	10.9%	10.1%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Women	Less than HS	44.4%	29.7%	18.4%	9.2%	8.3%	7.5%	16.1%
	HS	46.4%	49.3%	50.4%	47.1%	44.9%	33.1%	46.9%
	Some college	1.5%	9.3%	13.5%	16.9%	18.9%	24.7%	15.1%
	BA	5.7%	6.7%	9.8%	15.2%	18.0%	20.7%	12.9%
	>BA	2.1%	4.9%	7.9%	11.5%	10.0%	14.0%	9.1%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Destination Class								
Men	High Service	17.8%	22.0%	24.5%	22.7%	20.9%	17.4%	21.7%
	Low Service	7.9%	10.0%	12.4%	13.9%	13.3%	18.7%	11.5%
	Routine NM	8.2%	7.9%	6.7%	7.7%	7.2%	7.9%	7.6%
	Self-employed	10.7%	10.5%	11.0%	12.4%	12.0%	10.6%	11.1%
	Skilled Workers	22.4%	23.3%	21.8%	20.8%	21.2%	21.1%	22.1%
	Unskilled Workers	32.9%	26.3%	23.6%	22.5%	25.4%	24.3%	26.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Women	High Service	5.0%	8.6%	11.1%	14.2%	14.2%	12.8%	12.0%
	Low Service	12.8%	14.5%	19.1%	23.3%	24.0%	28.3%	20.8%
	Routine NM	23.5%	25.6%	25.6%	22.5%	18.6%	17.0%	22.8%
	Self-employed	5.0%	7.6%	8.2%	8.8%	8.7%	8.4%	8.3%
	Skilled Workers	3.8%	3.3%	4.3%	4.1%	4.0%	3.5%	3.9%
	Unskilled Workers	49.9%	40.4%	31.6%	27.2%	30.5%	30.0%	32.1%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

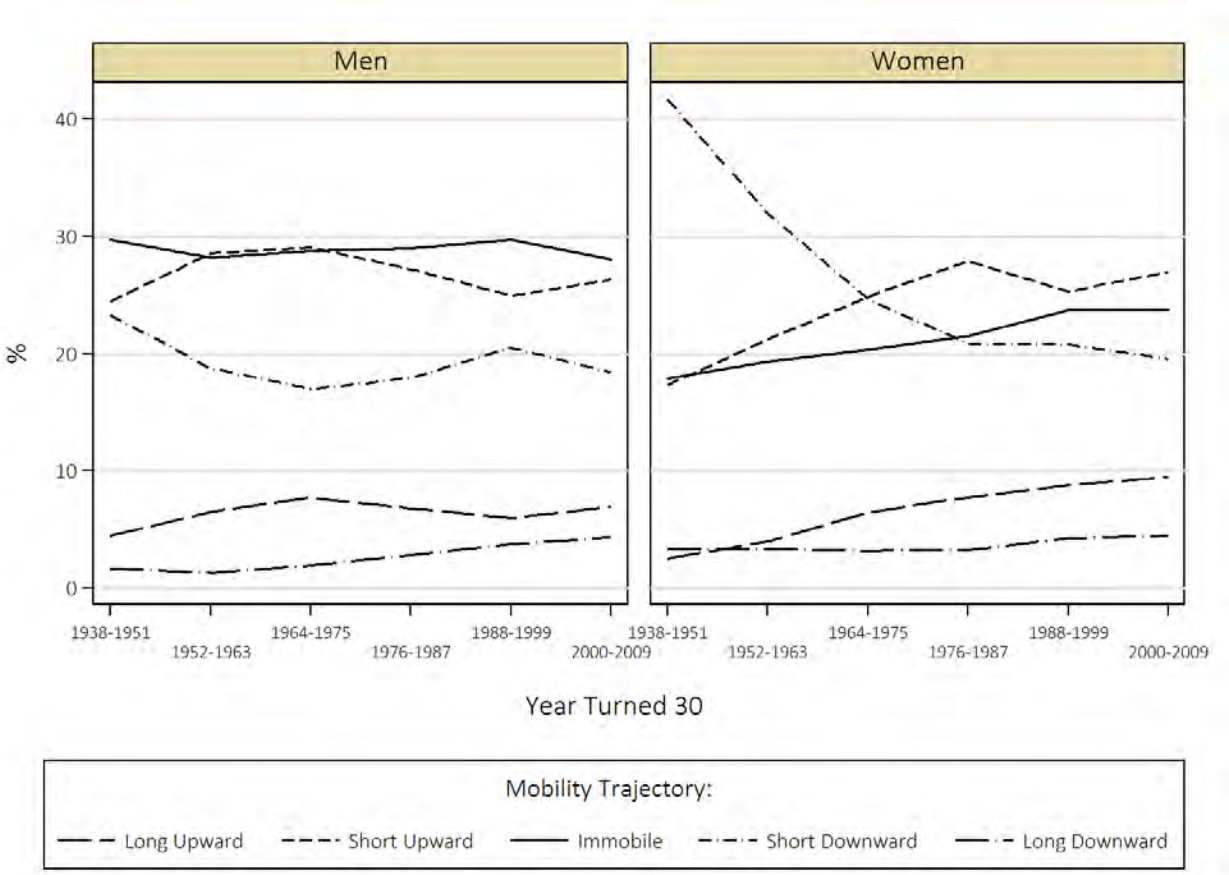
Note: Authors' calculations based on composite dataset (1972–2014).

Figure 2: Changes in the Occupational Structure



Note: Authors' calculations based on composite dataset (1972–2014).

Figure 3: Trends in vertical absolute mobility and immobility across cohorts



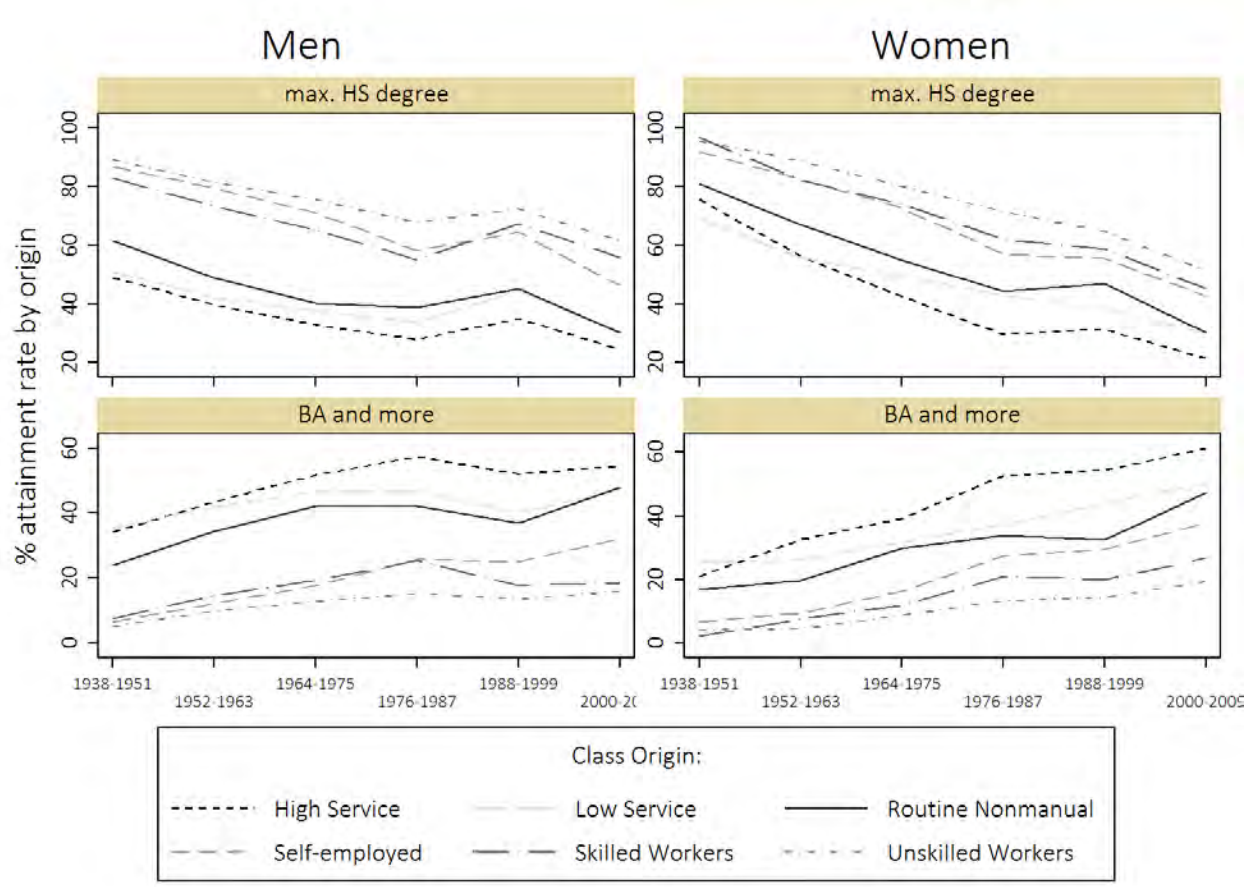
Note: Authors' calculations based on composite dataset (1972–2014). Mobility flows sum up by cohort to 100 minus the share of non-vertically mobile, which are mostly stable across cohorts (see Table 3).

Table 3: Absolute mobility rates

			Year turned 30						
			1938-1951	1952-1963	1964-1975	1976-1987	1988-1999	2000-2009	Total
Men		Immobility	29.8%	28.2%	28.8%	29.0%	29.7%	28.1%	28.9%
		Total Mobility	70.3%	71.8%	71.2%	71.0%	70.3%	71.9%	71.1%
	with	Non-vertical	16.4%	16.6%	15.5%	16.2%	15.1%	15.8%	16.1%
	with	Vertical	53.9%	55.2%	55.7%	54.8%	55.2%	56.1%	55.1%
		Long Up	4.5%	6.5%	7.7%	6.8%	6.0%	7.0%	6.5%
	with	Short Up	24.5%	28.6%	29.1%	27.2%	24.9%	26.3%	27.4%
	with	Long Down	1.7%	1.3%	1.9%	2.8%	3.7%	4.4%	2.1%
		Short Down	23.3%	18.8%	17.0%	17.9%	20.5%	18.4%	19.1%
Women		Immobility	17.9%	19.3%	20.3%	21.5%	23.8%	23.7%	21.2%
		Total Mobility	82.1%	80.7%	79.7%	78.5%	76.2%	76.3%	78.8%
	with	Non-vertical	17.3%	20.1%	20.5%	18.7%	17.1%	15.8%	18.9%
	with	Vertical	64.9%	60.5%	59.2%	59.8%	59.1%	60.5%	59.9%
		Long Up	2.5%	4.0%	6.5%	7.8%	8.8%	9.5%	6.9%
	with	Short Up	17.3%	21.2%	24.9%	27.9%	25.3%	27.0%	25.1%
	with	Long Down	3.3%	3.4%	3.2%	3.3%	4.2%	4.5%	3.5%
		Short Down	41.7%	32.0%	24.7%	20.9%	20.8%	19.6%	24.4%

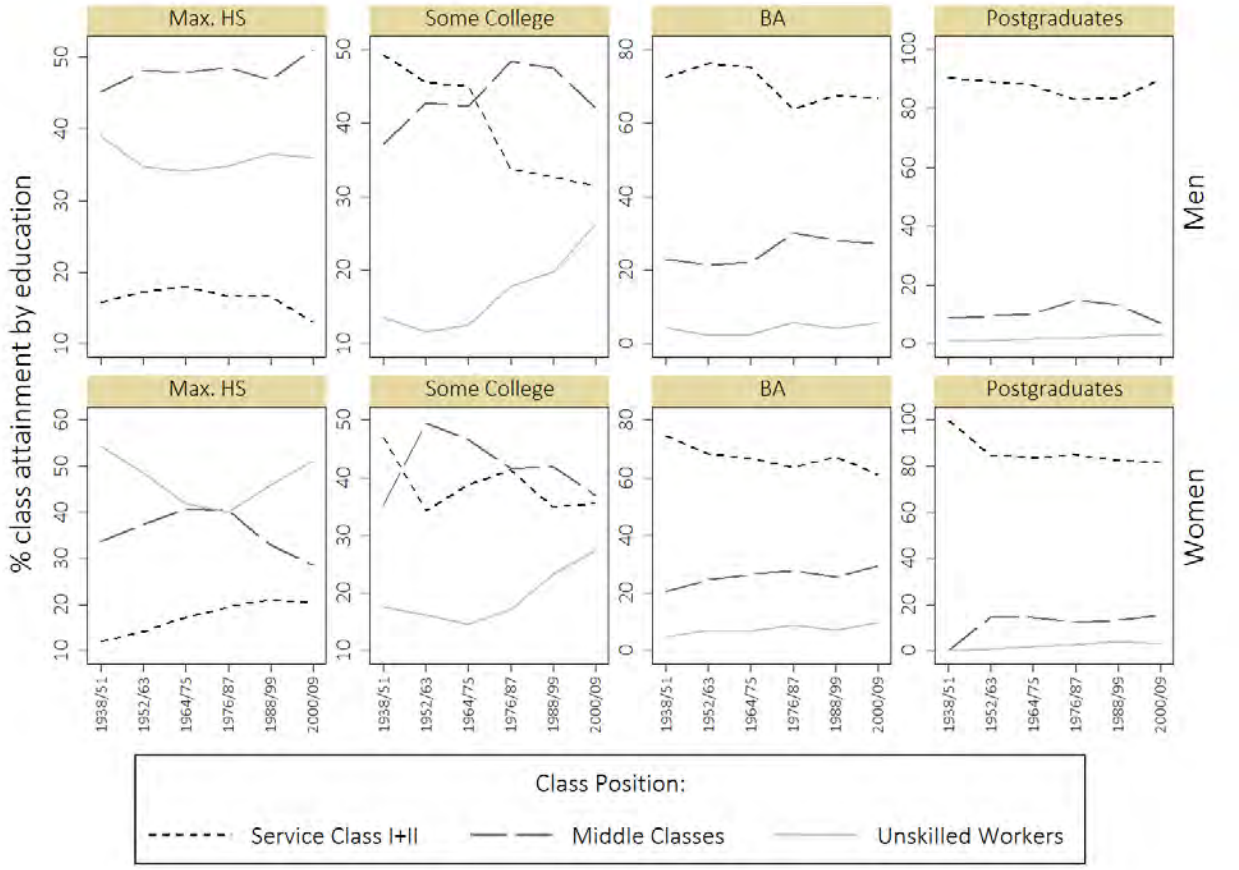
Note: Authors' calculations based on composite dataset (1972–2014). Up- and downward mobility add up to vertical mobility. Vertical and non-vertical mobility add up to total mobility. Any differences are due to rounding.

Figure 4: Trends in (absolute) class gaps in education



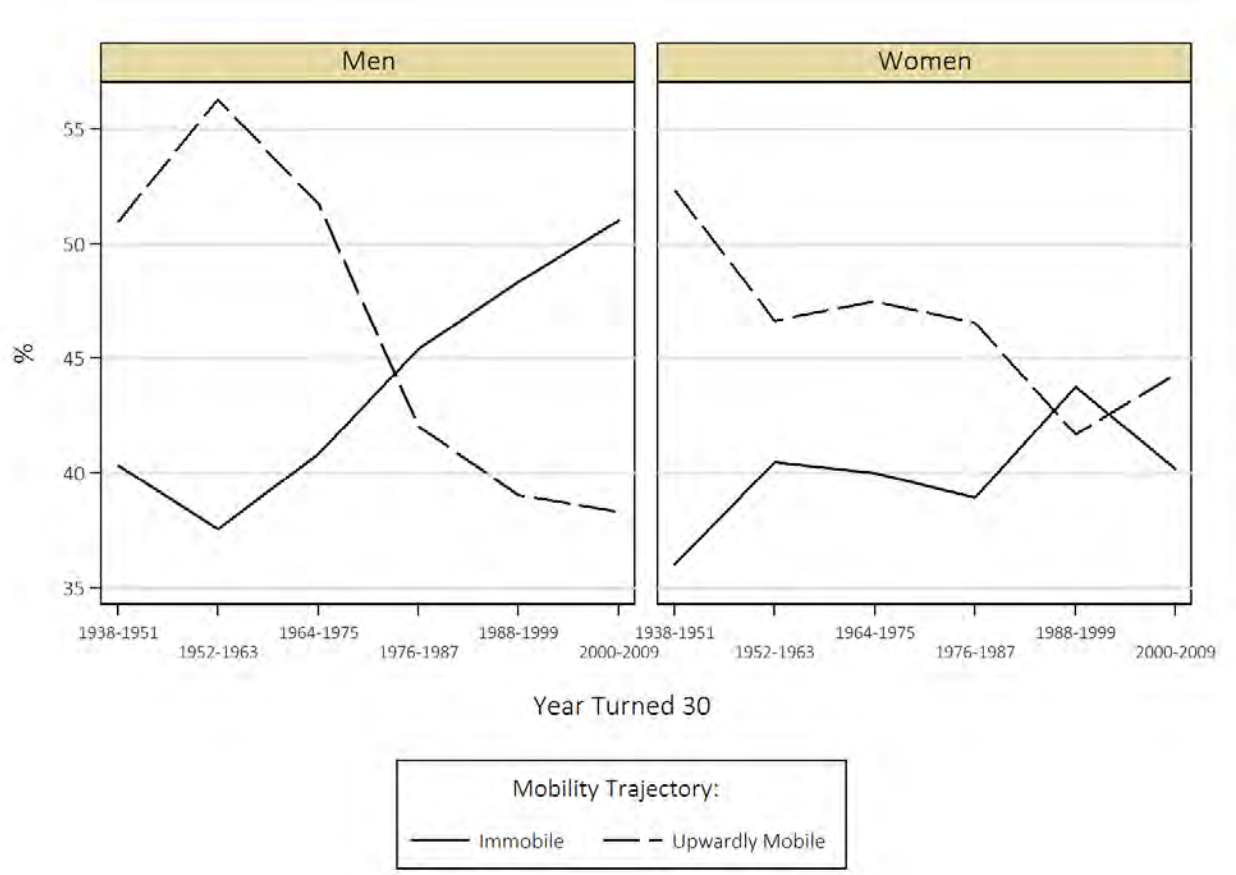
Note: Authors' calculations based on composite dataset (1972–2014). Corresponding numbers are shown in Table A.2 in the appendix.

Figure 5: Absolute class attainment by educational attainment



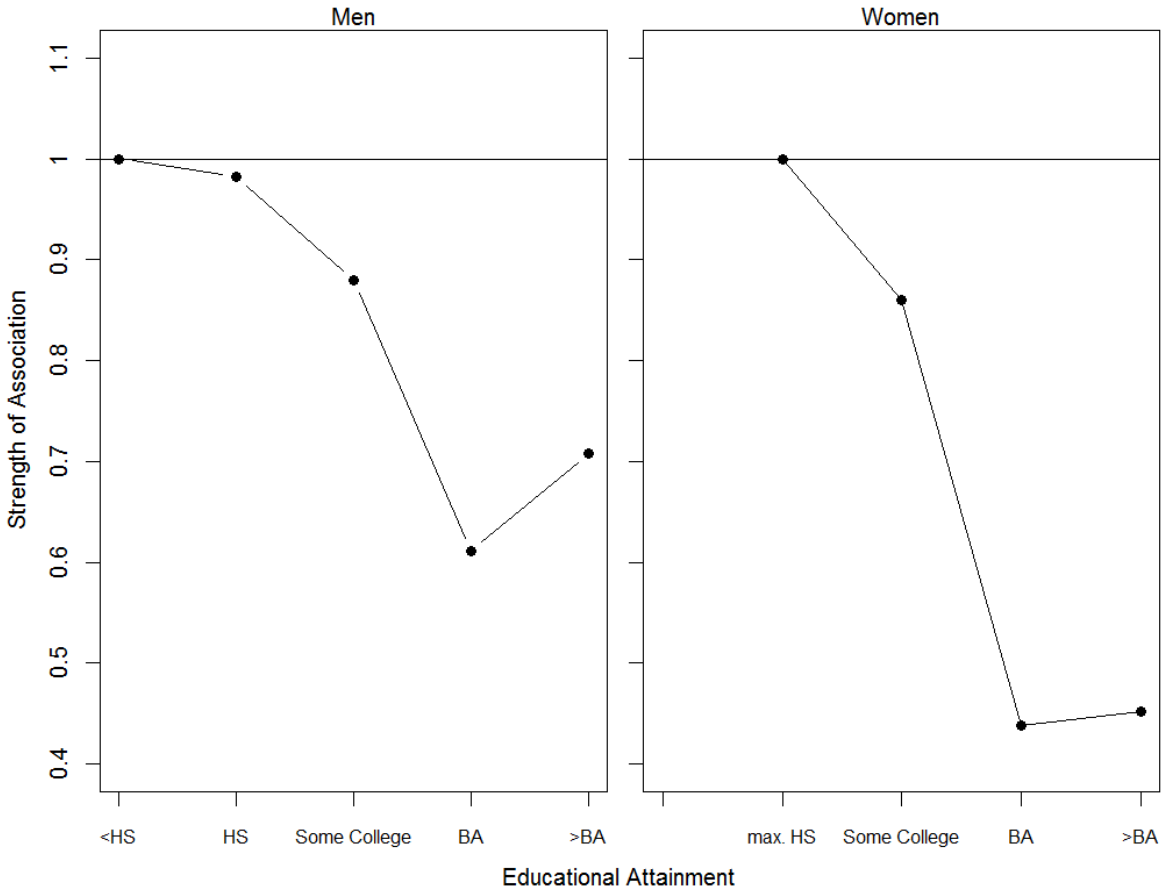
Note: Authors' calculations based on composite dataset (1972–2014). Middle classes comprise routine non-manuals, self-employed, farmers and skilled workers. Service classes comprise low and high positions in the salariat. All percentages are reported in Table A. 3 in the online appendix.

Figure 6: Absolute mobility trends among university graduates



Note: Authors' calculations based on composite dataset (1972–2014). Mobility rates depicted are those of university graduates only. Downward mobility not shown (residual category).

Figure 7: Strength of relative association between origin and destination by educational degree



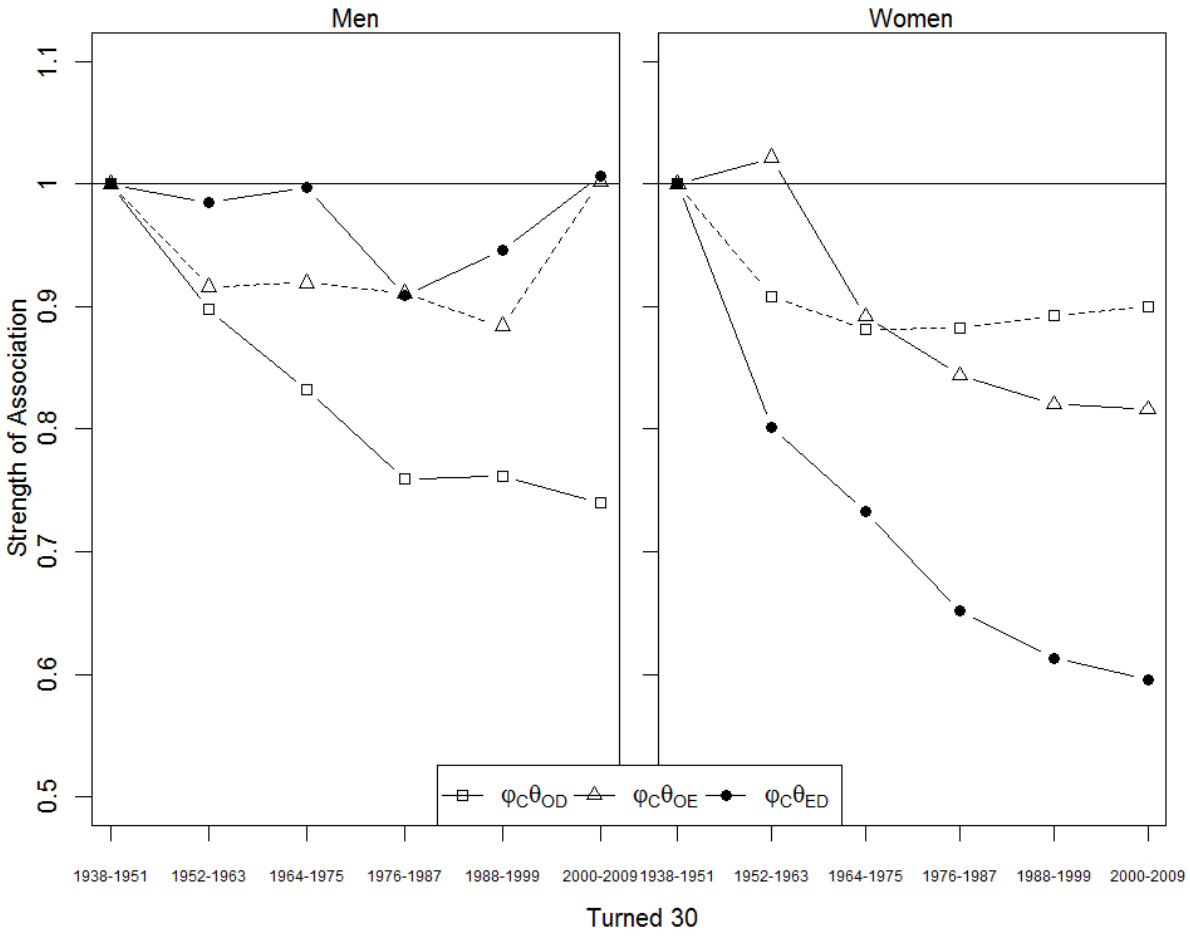
Note: Authors' calculations based on composite dataset (1972–2014); N = 47,809 men and 28,766 women.

Table 4: The Role of Education as Mediator of Social Fluidity

		Destination Class (ref. SC I+II)				
	Origin Class (ref. SC I+II)	IIIab	IVab	IVc	V/VI	VIIab
Men	Routine Non-Manual (IIIa)	36.7%	n.s.	n.s.	93.1%	89.5%
	Self-Employed (IVab)	77.5%	44.4%	49.3%	71.0%	79.2%
	Farmers (IVc)	93.9%	76.6%	25.5%	73.9%	68.8%
	Skilled Workers (V/VI)	74.9%	88.3%	72.5%	60.9%	68.8%
	Unskilled Workers (VIIab)	67.9%	84.4%	54.3%	69.6%	61.6%
	Origin Class (ref. SC I+II)	IIIa	IVab	IVc	V/VI	VIIab+IIIb
Women	Routine Non-Manual (IIIa)	107.4%	n.s.	13.7%	87.6%	76.1%
	Self-Employed (IVab)	81.3%	49.0%	65.0%	68.1%	77.0%
	Farmers (IVc)	113.2%	122.4%	33.4%	76.5%	69.6%
	Skilled Workers (V/VI)	92.5%	133.6%	n.s.	65.6%	73.6%
	Unskilled Workers (VIIab+IIIb)	89.2%	115.4%	82.2%	67.6%	66.5%

Note: Authors' calculations based on composite dataset (1972–2014); N = 47,809 men and 28,766 women. n.s. indicates that either there is no statistically significant relation between educational attainment and class attainment or that there is no correlation between class origins and educational attainment (Kohler et al., 2011, p. 424).

Figure 8. Relative trends in two-way associations between origin, destination, and education



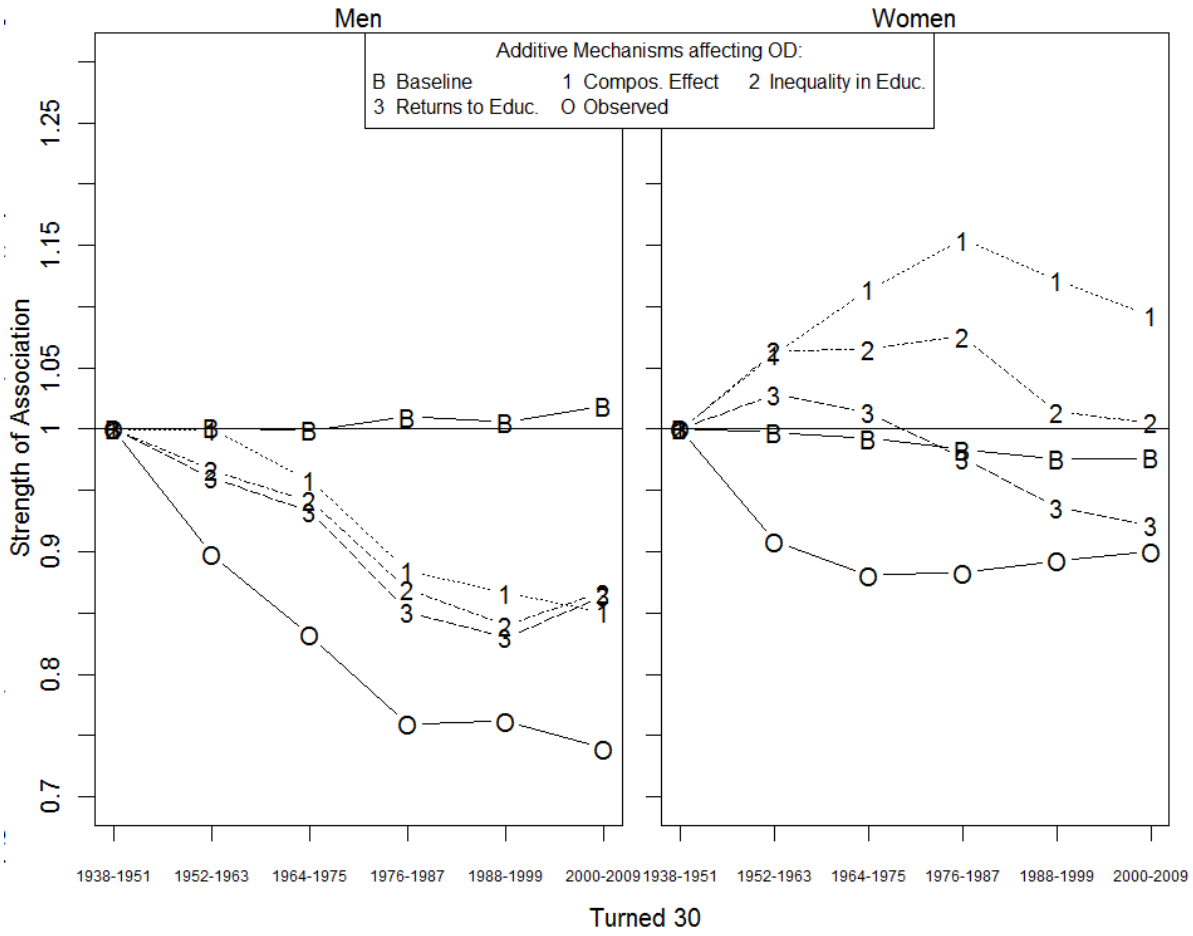
Note: Authors' calculations based on composite dataset (1972–2014); N = 47,809 men and 28,766 women. Dashed lines indicate that the UniDiff model (#.3) does not significantly increase model fit over the constant fluidity model ($p > 0.05$).

Table 5: Fit Statistics for Observed Trends in Mobility Components

		G^2	df	p	Δ	BIC	p vs. #.1	p vs. #.2
Men	ODC (Trends in Social Mobility)							
	1.1 Constant	248.1	125	0.0000	0.022	-1,099		
	1.2 Linear UniDiFF	203.2	124	0.0000	0.021	-1,133	0.0000	
	1.3 UniDiFF	198.0	120	0.0000	0.021	-1,095	0.0000	0.2674
	OEC (Trends in Educational Inequality)							
	2.1 Constant	166.9	100	0.0000	0.019	-911		
	2.2 Linear UniDiFF	165.2	99	0.0000	0.019	-902	0.1923	
	2.3 UniDiFF	158.5	95	0.0001	0.019	-865	0.1355	0.1526
	EDC (Trends in Educational Returns)							
	3.1 Constant	233.3	100	0.0000	0.022	-844		
	3.2 Linear UniDiFF	230.2	99	0.0000	0.021	-837	0.0783	
	3.3 UniDiFF	220.2	95	0.0000	0.020	-803	0.0225	0.0404
Women	ODC (Trends in Social Mobility)							
	1.1 Constant	201.5	125	0.0000	0.028	-1,082		
	1.2 Linear UniDiFF	201.4	124	0.0000	0.028	-1,072	0.7518	
	1.3 UniDiFF	200.6	120	0.0000	0.028	-1,031	0.9702	0.9385
	OEC (Trends in Educational Inequality)							
	2.1 Constant	136.1	75	0.0000	0.021	-634		
	2.2 Linear UniDiFF	127.0	74	0.0001	0.020	-633	0.0026	
	2.3 UniDiFF	124.3	70	0.0001	0.020	-594	0.0376	0.6092
	EDC (Trends in Educational Returns)							
	3.1 Constant	241.4	75	0	0.027	-528.6		
	3.2 Linear UniDiFF	188.5	74	0	0.023	-571.3	0.0000	
	3.3 UniDiFF	181.7	70	0	0.023	-537	0.0000	0.1468
	UniDiff Parameters	**Linear**	**C = 1**	**C = 2**	**C = 3**	**C = 4**	**C = 5**	**C = 6**
Men	OD (1.2 & 1.3)	-0.057	1	0.898	0.832	0.760	0.762	0.740
	OE (2.2 & 2.3)	-0.013	1	0.916	0.919	0.911	0.884	1.002
	ED (3.2 & 3.3)	-0.013	1	0.985	0.997	0.909	0.946	1.007
Women	OD (1.2 & 1.3)	-0.007	1	0.908	0.881	0.883	0.893	0.900
	OE (2.2 & 2.3)	-0.044	1	1.022	0.892	0.844	0.820	0.816
	ED (3.2 & 3.3)	-0.064	1	0.801	0.733	0.651	0.613	0.596

Note: Authors' calculations based on composite dataset (1972–2014); N = 47,809 men and 28,766 women.

Figure 9: Mechanisms behind social fluidity trends



Note: Authors' calculations based on composite dataset (1972–2014); N = 47,809 men and 27,653 women.

Table 6: Incremental Linear Change in Social Fluidity for each channel

	Men		Women	
	linear Effect	% explained	linear Effect	% explained
Counterfactuals account for:				
1. Compositional Effect	-0.032	55.3%	0.018	-241.2%
2. + Chang. Inequality in Education	-0.034	59.5%	-0.009	128.4%
3. + Chang. Returns to Education	-0.040	69.8%	-0.025	339.7%
Observed Change in Fluidity (O)	-0.057	100.0%	-0.007	100.0%

Note: Authors' calculations based on composite dataset (1972–2014); N = 47,809 men and 27,653 women.

7. Appendix

As outlined in the main part of the text, the census occupational coding (COC) scheme we rely on here differs across the four surveys included and across the long period we study. The most consequential change was the transition from COC1970 to COC1980, which in fact prevented other researchers from creating EGP classes for data collected before the 1980s (Morgan & McKerrow, 2004; Morgan & Kim, 2006; Morgan & Tang, 2007). To test for the effect of coding scheme changes on social fluidity, we exploit the fact that three consecutive GSS waves have been double-coded into both 1970 and 1980 COC. We employ a series of loglinear models to test whether or not the coding differences between the COC1970s and COC1980s schemes may be responsible for changes in social fluidity across cohorts. Table A. 1 reports fit statistics for the following models: Models 1 accounts only for one- and two-way associations between coding scheme (S), origin (O), destination (D), and cohort (C). Model 2 specifies uniform change of the OD association across cohorts. Model 3 fits the full three-way interaction of origins, destinations and scheme. Model 4 fits the three-way interaction with cohort instead of scheme. And Model 5 fits both three-way interactions.

Table A. 1: Comparison of Coding Schemes for COC1970s and COC1980s

							p	
#	Parameters	G^2	df	p	Δ	BIC	vs. #1	vs. #4
M1	SO+SD+CO+CD	603.2	233	0.0000	0.168	-1,269		
M2	M1+OD u C	129.6	205	1.0000	0.066	-1,518	0.0000	
M3	M1+SOD	122.8	183	0.9998	0.064	-1,348	0.0000	
M4	M1+COD	50.4	133	1.0000	0.043	-1,018	0.0000	
M5	M4+SOD	41.0	108	1.0000	0.041	-1,348	0.0000	0.9982
W1	SO+SD+CO+CD	517.0	233	0.0000	0.140	-1,399		
W2	W1+OD u C	198.6	205	0.6121	0.075	-1,487	0.0000	
W3	W1+SOD	195.3	183	0.2537	0.074	-1,310	0.0000	
W4	W1+COD	65.6	133	1.0000	0.038	-1,028	0.0000	
W5	W4+SOD	52.1	108	1.0000	0.034	-1,310	0.0000	0.9853

Note: Authors' calculations. N = 3,089 coding instance for men and N= 3,727 coding instances for women. A reduced data set that randomly chooses one scheme for each observation yields the same substantial results but provides of course less power. Based on the three double-coded GSS waves 1988-1990.

According to the deviance G^2 and the DI (Δ), models M4 and W4 are they best fitting models. They account for cohort change (C) but no additional three-way association between origins (O). destinations (D), and coding schemes (S). Additionally allowing for the coding scheme to be associated with mobility patterns (M5 and W5) does not improve statistical fit; that is, accounting for the switch in coding schemes does not appreciably improve our understanding of mobility patterns.

Table A. 2 Trends in (absolute) class gaps in education

Men	High Service			Low Service			Non-Manual			Self-employed			Skilled Workers			Unskilled Workers		
	max. HS	SC	BA+	max. HS	SC	BA+	max. HS	SC	BA+	max. HS	SC	BA+	max. HS	SC	BA+	max. HS	SC	BA+
1913-1951	49.0	16.8	34.1	51.1	13.5	35.4	61.7	14.4	24.0	86.9	6.5	6.6	82.8	9.6	7.6	89.3	5.5	5.2
1952-1963	39.8	16.7	43.5	42.1	16.0	41.9	48.8	16.7	34.5	79.4	8.4	12.1	73.4	12.0	14.6	81.5	8.6	9.9
1964-1975	33.0	15.2	51.8	37.7	15.7	46.5	40.3	17.6	42.2	71.1	11.2	17.7	65.3	15.4	19.3	75.6	11.6	12.8
1976-1987	27.9	14.6	57.5	33.7	19.5	46.8	38.8	19.1	42.1	58.2	16.0	25.9	55.0	19.5	25.4	67.8	17.1	15.1
1988-1999	35.1	12.7	52.2	44.5	15.3	40.2	45.1	18.0	36.9	64.4	10.5	25.1	67.4	14.9	17.8	72.5	14.0	13.5
2000-2012	24.6	20.9	54.5	30.0	23.0	47.1	30.2	21.9	47.9	46.3	21.7	32.0	55.8	25.9	18.3	61.5	22.5	15.9
Women	High Service			Low Service			Non-Manual			Self-employed			Skilled Workers			Unskilled Workers		
	max. HS	SC	BA+	max. HS	SC	BA+	max. HS	SC	BA+	max. HS	SC	BA+	max. HS	SC	BA+	max. HS	SC	BA+
1913-1951	75.6	3.4	21.0	69.2	5.1	25.6	81.0	2.4	16.7	91.9	1.4	6.7	96.7	1.2	2.1	95.6	0.4	4.0
1952-1963	56.4	11.2	32.5	55.8	17.9	26.3	67.0	13.5	19.5	82.5	8.0	9.4	82.2	10.2	7.5	88.8	6.6	4.5
1964-1975	42.5	18.3	39.2	49.5	18.8	31.7	54.9	15.3	29.8	72.7	11.2	16.2	73.9	14.2	11.9	80.1	11.2	8.8
1976-1987	29.7	17.7	52.7	42.9	19.8	37.3	44.3	21.9	33.9	57.0	15.5	27.5	62.0	17.1	20.9	71.5	15.3	13.2
1988-1999	31.4	14.3	54.4	38.4	17.6	44.0	47.0	20.7	32.3	55.4	15.2	29.4	58.8	21.2	20.0	64.7	21.1	14.2
2000-2012	21.5	17.3	61.2	30.0	19.8	50.2	30.1	22.6	47.4	42.7	19.6	37.8	45.1	28.2	26.8	51.4	29.3	19.4

Note: Authors' calculations based on composite dataset (1972–2014). Max. HS includes high school graduates and dropouts, SC denotes some college, BA+ includes graduates and postgraduates. Percentages add up to 100 within each origin category. N = 47,809 men and N = 28,766 women.

Table A. 3: Class attainment by obtained educational degree

Men	Max. HS			Some College			BA			Postgraduates		
	Service class I+II	Middle Classes	Unskilled Workers	Service class I+II	Middle Classes	Unskilled Workers	Service class I+II	Middle Classes	Unskilled Workers	Service class I+II	Middle Classes	Unskilled Workers
1913-1951	15.83	45.18	38.99	49.29	37.14	13.57	72.54	22.99	4.46	90.42	8.69	0.89
1952-1963	17.27	48.09	34.64	45.56	42.77	11.67	76.20	21.43	2.36	89.18	9.53	1.29
1964-1975	18.03	47.86	34.11	45.06	42.34	12.61	75.17	22.10	2.73	87.91	10.35	1.74
1976-1987	16.65	48.52	34.82	33.78	48.39	17.83	63.94	30.28	5.77	83.03	15.05	1.92
1988-1999	16.69	46.75	36.56	32.67	47.47	19.86	67.67	28.18	4.15	83.64	13.46	2.90
2000-2012	13.07	51.00	35.92	31.58	42.11	26.32	66.86	27.38	5.76	89.9	7.07	3.03
Women	Max. HS			Some College			BA			Postgraduates		
	Service class I+II	Middle Classes	Unskilled Workers	Service class I+II	Middle Classes	Unskilled Workers	Service class I+II	Middle Classes	Unskilled Workers	Service class I+II	Middle Classes	Unskilled Workers
1913-1951	11.98	33.66	54.36	47.06	35.29	17.65	74.60	20.63	4.76	100	0.00	0.00
1952-1963	14.10	37.31	48.58	34.32	49.55	16.14	68.34	24.45	7.21	84.62	14.53	0.85
1964-1975	17.22	40.82	41.96	38.82	46.64	14.54	66.76	26.48	6.76	83.82	14.31	1.87
1976-1987	19.52	40.32	40.16	41.29	41.56	17.14	63.70	27.56	8.74	85.07	12.28	2.65
1988-1999	21.10	32.89	46.02	34.93	41.89	23.17	67.39	25.63	6.98	82.68	13.20	4.11
2000-2012	20.29	28.55	51.15	35.53	36.93	27.54	60.95	29.29	9.76	81.69	15.49	2.82

Note: Authors' calculations based on composite dataset (1972–2014). Middle Classes comprise routine non-manuals, self-employed, farmers and skilled workers. Service class comprises low and high positions in the salariat. Percentages add up to 100 within each educational degree. N = 47,809 men and N = 28,766 women.

Table A. 4: Fit Statistics of Loglinear Models fitted to Counterfactual Tables - Men

						p	
	G^2	df	p	Δ	BIC	vs. #.1	vs. #.2
No Change							
1.1 Constant	0.5	125	1.0000	0.001	-1,346		
1.2 Linear UniDiFF	0.3	124	1.0000	0.001	-1,336	0.6547	
1.3 UniDiFF	0.3	120	1.0000	0.001	-1,293	0.9991	1.0000
Educational Expansion							
2.1 Constant	10.2	125	1.0000	0.005	-1,337		
2.2 Linear UniDiFF	5.5	124	1.0000	0.004	-1,331	0.0302	
2.3 UniDiFF	4.9	120	1.0000	0.004	-1,288	0.3804	0.9631
Compos. Effect							
3.1 Constant	25.7	125	1.0000	0.008	-1,321		
3.2 Linear UniDiFF	15.1	124	1.0000	0.006	-1,321	0.0011	
3.3 UniDiFF	14.0	120	1.0000	0.006	-1,279	0.0391	0.8943
Chang. Inequality in Education							
4.1 Constant	63.7	125	1.0000	0.012	-1,283		
4.2 Linear UniDiFF	51.3	124	1.0000	0.011	-1,285	0.0004	
4.3 UniDiFF	50.5	120	1.0000	0.011	-1,243	0.0216	0.9385
Chang. Returns to Education							
5.1 Constant	87.1	125	0.9960	0.014	-1,260		
5.2 Linear UniDiFF	68.3	124	1.0000	0.013	-1,268	0.0000	
5.3 UniDiFF	66.2	120	1.0000	0.012	-1,227	0.0009	0.7174
Observed							
6.1 Constant	248.1	125	0.0000	0.022	-1,099		
6.2 Linear UniDiFF	203.2	124	0.0000	0.021	-1,133	0.0000	
6.3 UniDiFF	198.0	120	0.0000	0.021	-1,095	0.0000	0.2674
UniDiff Parameters	Linear	C = 1	C = 2	C = 3	C = 4	C = 5	C = 6
1.2 & 1.3	0.0037	1	1.0054	1.0091	1.0155	1.0105	1.0198
2.2 & 2.3	-0.0179	1	1.0015	0.9822	0.9496	0.9306	0.9247
3.2 & 3.3	-0.0316	1	0.9984	0.9612	0.9009	0.8804	0.8667
4.2 & 4.3	-0.0340	1	0.9574	0.9406	0.8809	0.8420	0.8574
5.2 & 5.3	-0.0399	1	0.9613	0.9347	0.8472	0.8286	0.8476
6.2 & 6.3	-0.0571	1	0.8977	0.8319	0.7596	0.7618	0.7396

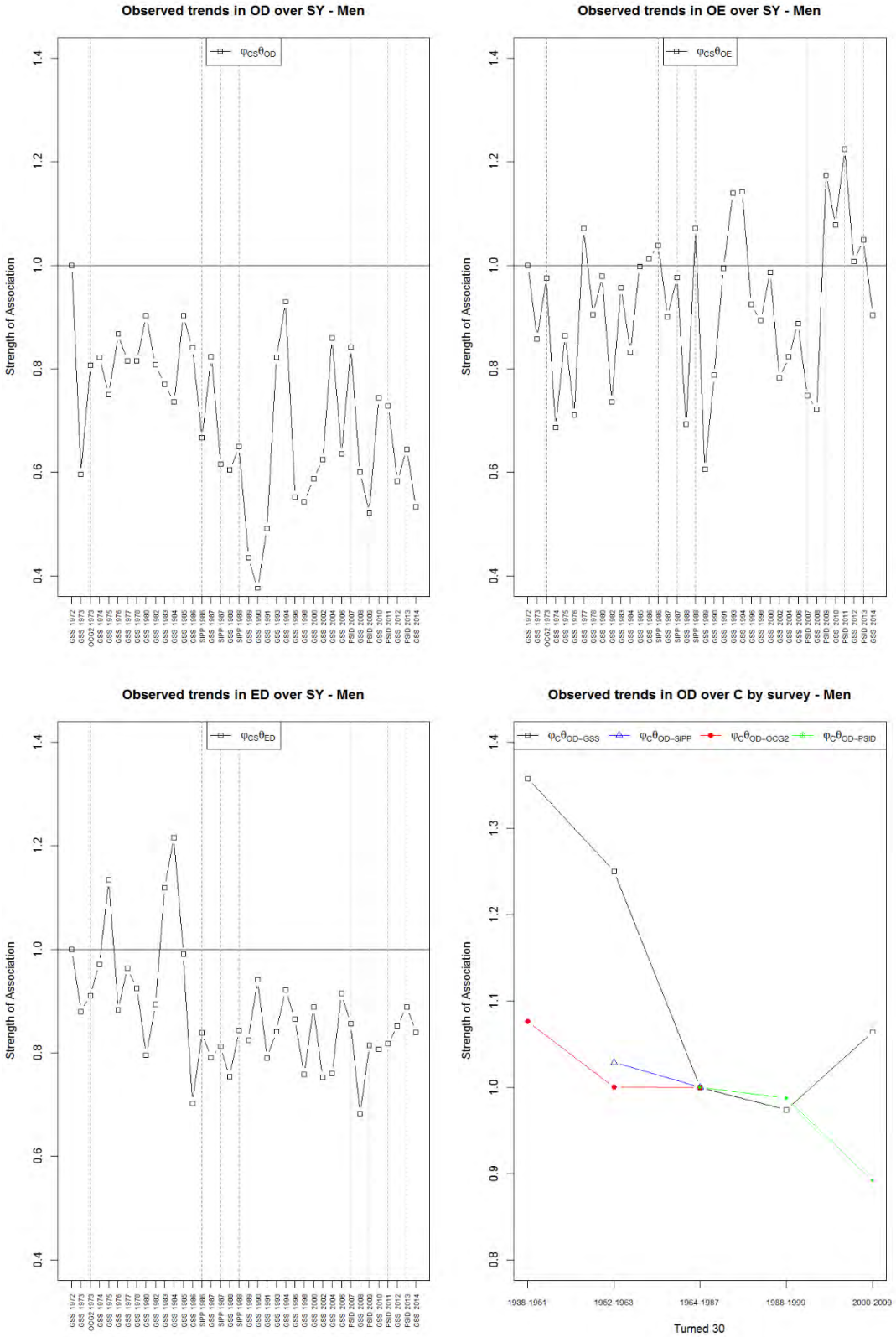
Note: Authors' calculations based on composite dataset (1972–2014); N = 47,809 men.

Table A. 5: Fit Statistics of Loglinear Models fitted to Counterfactual Tables - Women

						p	
	G^2	df	p	Δ	BIC	vs. #.1	vs. #.2
No Change							
1.1 Constant	0.8	125	1.0000	0.001	-1,283		
1.2 Linear UniDiFF	0.7	124	1.0000	0.001	-1,272	0.7518	
1.3 UniDiFF	0.7	120	1.0000	0.001	-1,231	0.9998	1.0000
Educational Expansion							
2.1 Constant	3.3	125	1.0000	0.003	-1,280		
2.2 Linear UniDiFF	1.6	124	1.0000	0.002	-1,272	0.1923	
2.3 UniDiFF	0.9	120	1.0000	0.002	-1,231	0.7915	0.9513
Compos. Effect							
3.1 Constant	5.2	125	1.0000	0.004	-1,278		
3.2 Linear UniDiFF	4.6	124	1.0000	0.004	-1,269	0.4386	
3.3 UniDiFF	4.0	120	1.0000	0.004	-1,228	0.9449	0.9631
Chang. Inequality in Education							
4.1 Constant	15.9	125	1.0000	0.008	-1,268		
4.2 Linear UniDiFF	15.7	124	1.0000	0.008	-1,257	0.6547	
4.3 UniDiFF	15.2	120	1.0000	0.008	-1,217	0.9830	0.9735
Chang. Returns to Education							
5.1 Constant	35.4	125	1.0000	0.012	-1,248		
5.2 Linear UniDiFF	33.6	124	1.0000	0.012	-1,240	0.1797	
5.3 UniDiFF	33.3	120	1.0000	0.012	-1,199	0.8351	0.9898
Observed							
6.1 Constant	201.5	125	0.0000	0.028	-1,082		
6.2 Linear UniDiFF	201.4	124	0.0000	0.028	-1,072	0.7518	
6.3 UniDiFF	200.6	120	0.0000	0.028	-1,031	0.9702	0.9385
UniDiff Parameters	Linear	C = 1	C = 2	C = 3	C = 4	C = 5	C = 6
1.2 & 1.3	-0.0057	1	0.9937	0.9938	0.9845	0.9779	0.9730
2.2 & 2.3	0.0234	1	1.0383	1.0833	1.1209	1.1066	1.1203
3.2 & 3.3	0.0176	1	1.0474	1.0906	1.1262	1.0974	1.1009
4.2 & 4.3	-0.0094	1	1.0561	1.0475	1.0505	0.9984	1.0094
5.2 & 5.3	-0.0248	1	1.0322	1.0166	0.9785	0.9345	0.9278
6.2 & 6.3	-0.0073	1	0.9079	0.8811	0.8829	0.8926	0.8997

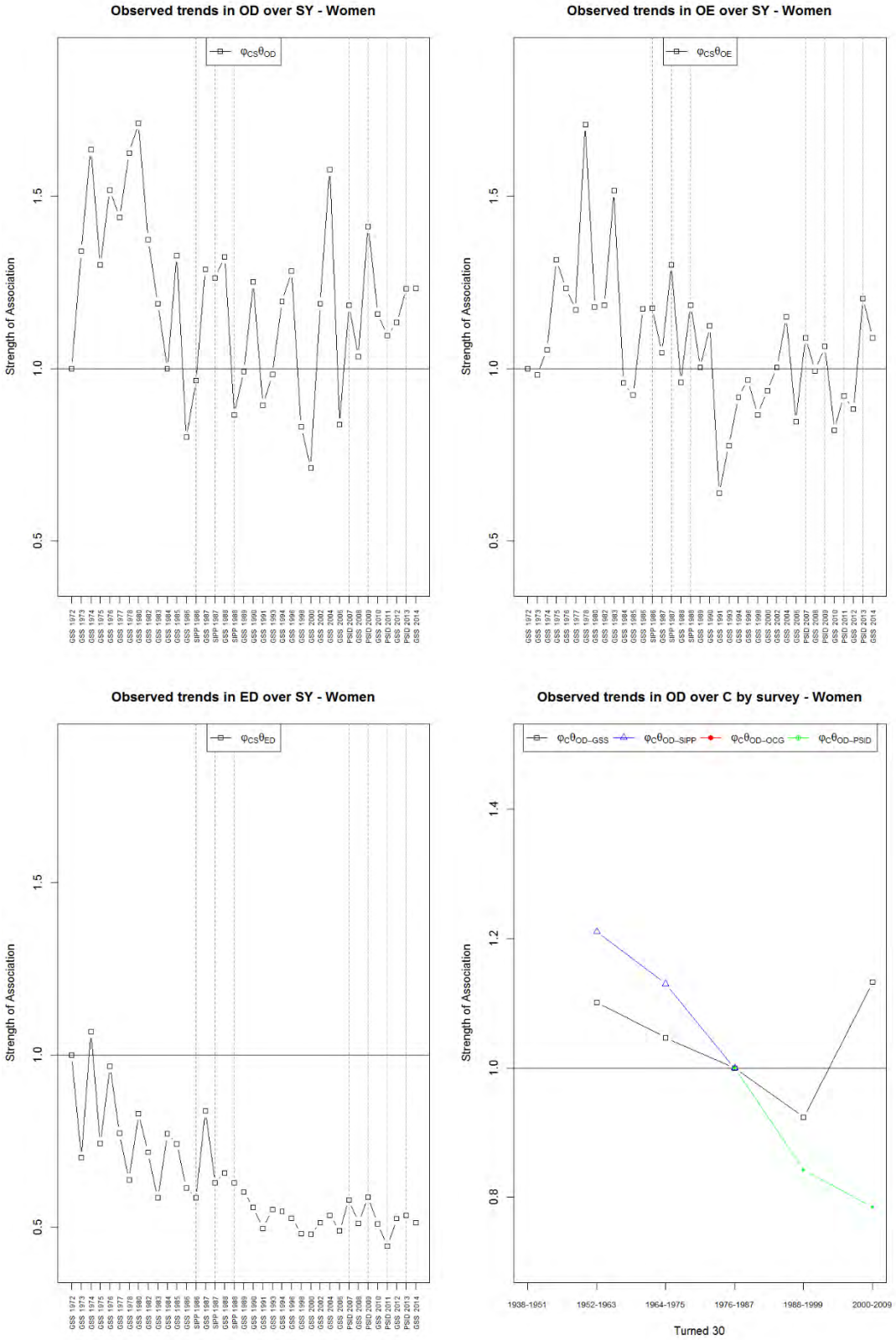
Note: Authors' calculations based on composite dataset (1972–2014); N = 28,766 women.

Figure A. 1: Differences in the two-way interaction across survey and survey years for men



Note: Authors' calculations based on composite dataset (1972–2014); N = 47,809 men. Dashed lines mark UniDiff parameters based on other data sets than the GSS.

Figure A. 2: Differences in the two-way interaction across survey and survey years for women



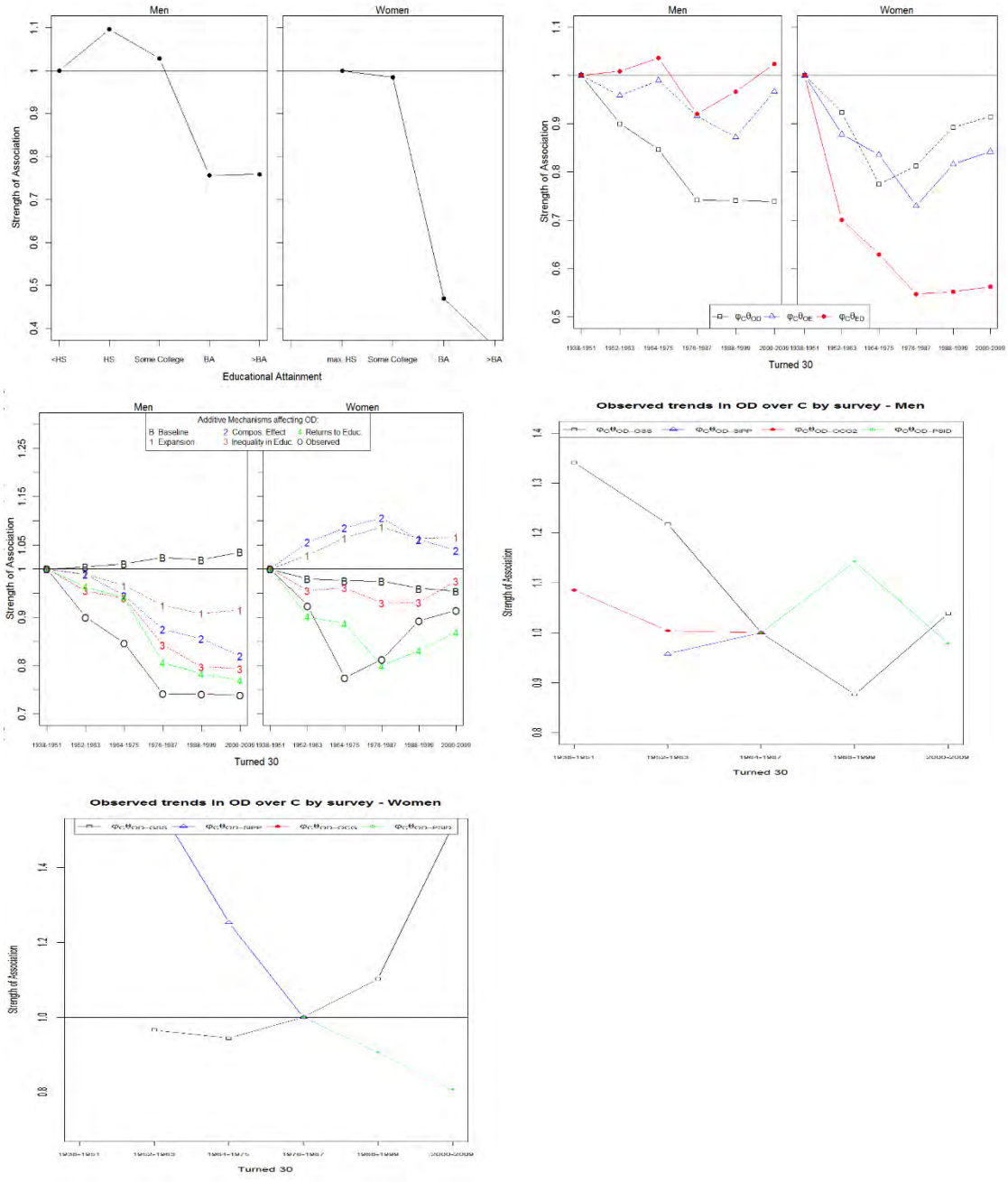
Note: Authors' calculations based on composite dataset (1972–2014); N = 27,653 women. Dashed lines mark UniDiff parameters based on other data sets than the GSS.

Table A. 6: Fit statistics for Surveys year change in the two-way associations

							p	
		G^2	df	p	DI	BIC	vs. #.1	vs. #.2
Men	ODSY - Men (Trends in Social Mobility)							
	1.1 Constant	1116.3	925	0.0000	0.043	-8,851		
	1.2 Linear UniDiFF	1068.1	924	0.0007	0.039	-8,888	0.0000	
	1.3 UniDiFF	1000.4	888	0.0050	0.038	-8,568	0.0000	0.0011
	OESY - Men (Trends in Social Mobility)							
	2.1 Constant	893.7	740	0.0001	0.037	-7,080		
	2.2 Linear UniDiFF	893.5	739	0.0001	0.037	-7,069	0.6547	
	2.3 UniDiFF	844.7	703	0.0002	0.035	-6,730	0.0896	0.0755
	EDSY - Men (Trends in Social Mobility)							
	3.1 Constant	960.2	740	0.0000	0.034	-7,013		
	3.2 Linear UniDiFF	950.2	739	0.0000	0.033	-7,013	0.0016	
	3.3 UniDiFF	904.5	703	0.0000	0.032	-6,670	0.0248	0.1290
Women	ODSY - Women (Trends in Social Mobility)							
	1.1 Constant	1004.9	900	0.0082	0.057	-8,235		
	1.2 Linear UniDiFF	1004.7	899	0.0078	0.057	-8,225	0.6547	
	1.3 UniDiFF	943.4	864	0.0306	0.054	-7,927	0.0051	0.0039
	OESY - Women (Trends in Social Mobility)							
	2.1 Constant	577.8	540	0.1259	0.038	-4,966		
	2.2 Linear UniDiFF	573.2	539	0.1490	0.038	-4,961	0.0320	
	2.3 UniDiFF	515.4	504	0.3532	0.033	-4,659	0.0041	0.0090
	EDSY - Women (Trends in Social Mobility)							
	3.1 Constant	758.3	540	0.00000	0.043	-4785.9		
	3.2 Linear UniDiFF	700.5	539	0.00000	0.04	-4833.4	0.0000	
	3.3 UniDiFF	651.5	504	0.00001	0.038	-4523	0.0000	0.0584
	UniDiff Parameters	**Linear**						
Men	OD (1.2 & 1.3)	-0.007						
	OE (2.2 & 2.3)	0.001						
	ED (3.2 & 3.3)	-0.003						
Women	OD (1.2 & 1.3)	-0.001						
	OE (2.2 & 2.3)	-0.004						
	ED (3.2 & 3.3)	-0.009						

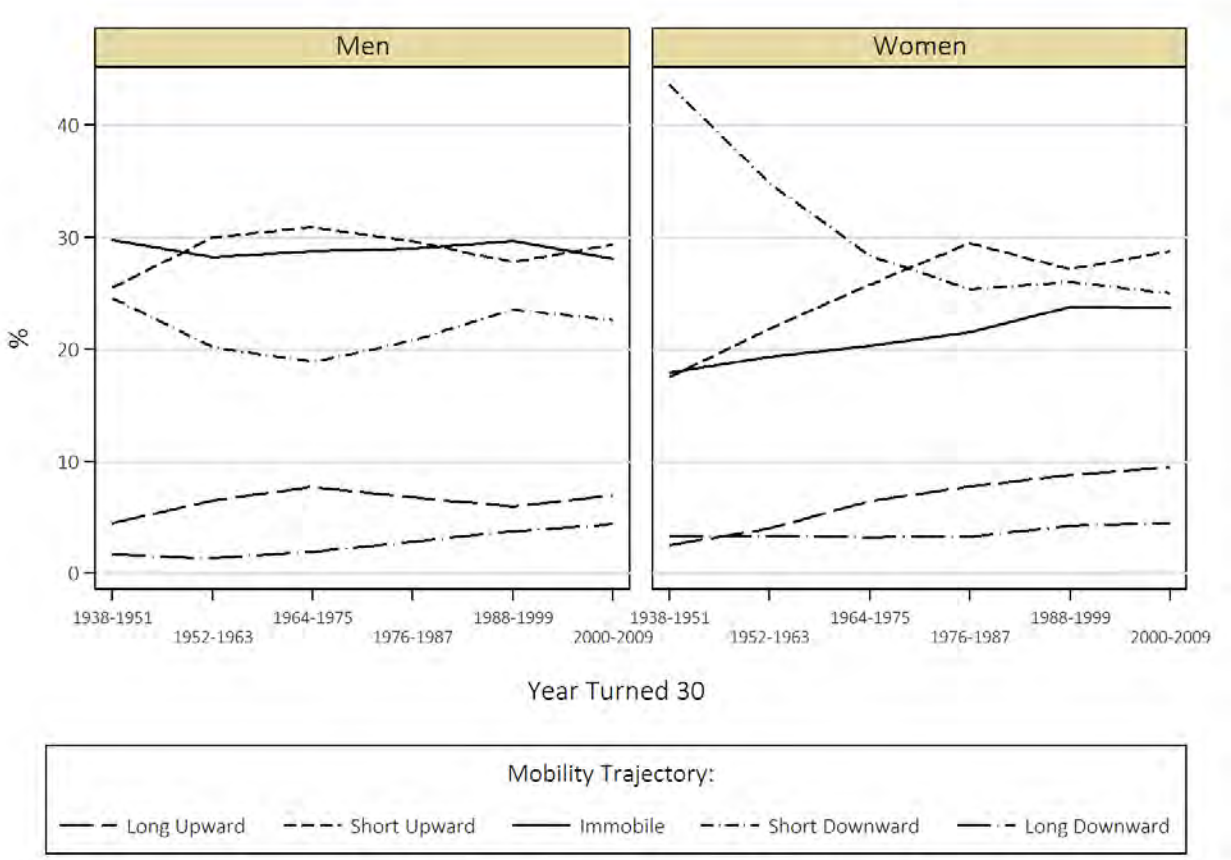
Note: Authors' calculations based on composite dataset (1972–2014); N = 47,809 men and N = 28,766 women. UniDiff parameters plotted in Figure A. 1 and Figure A. 2.

Figure A. 3: Compositional effect, Trends and Simulation based solely on completed observations



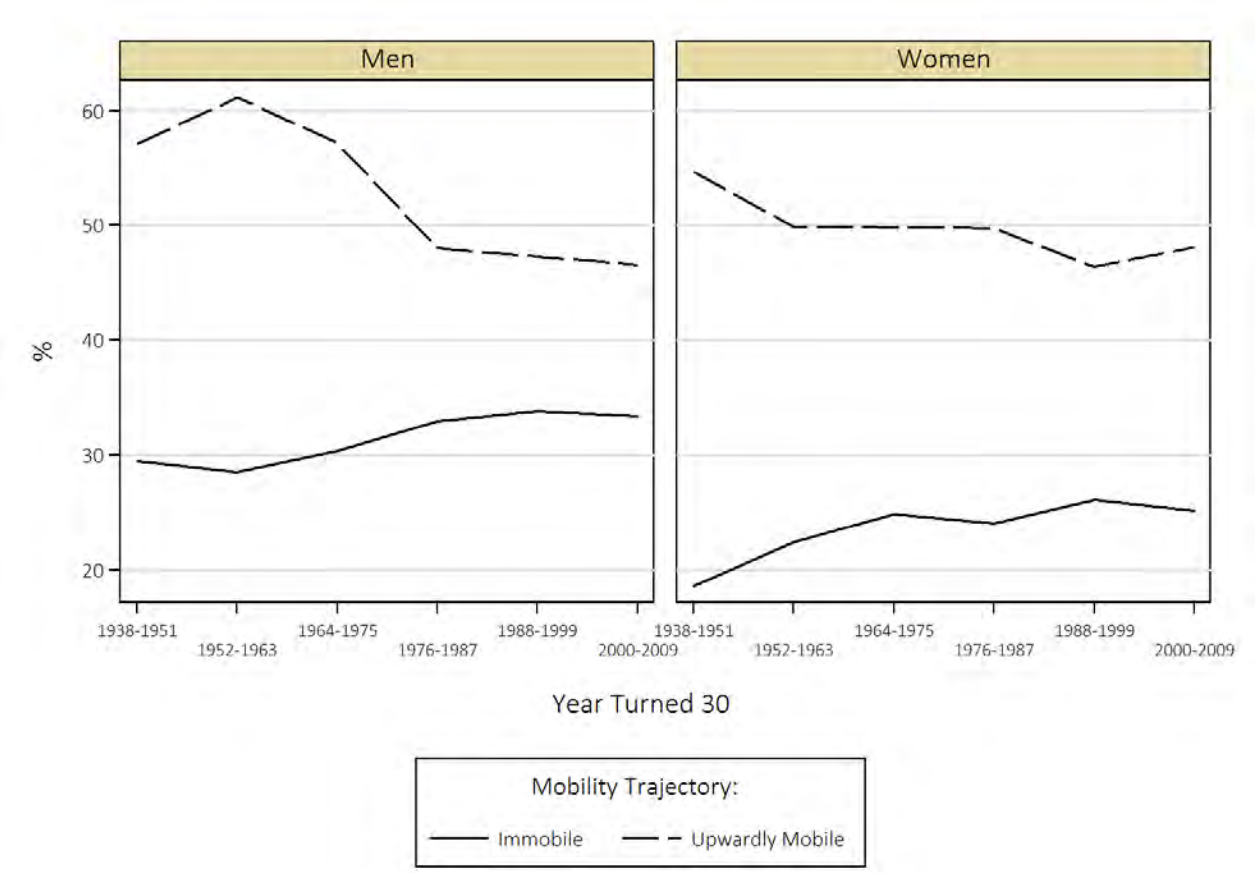
Note: Authors' calculations based on composite dataset (1972–2014) excluding observations with missing data on origins, destinations or education; N = 34,555 men and N = 17,675 women.

Figure A. 1: Trends in vertical absolute mobility and immobility across cohorts
Based alternative specification that distinguished mobility between low and high service classes



Note: Authors' calculations based on composite dataset (1972–2014). Mobility flows sum up by cohort to 100 minus the share of non-vertically mobile, which are mostly stable across cohorts. Different from Figure 3, short upward and downward mobility includes here mobility within the service class. Percentages available upon request from the authors.

Figure A. 2: Absolute mobility trends among university graduates
Based alternative specification that distinguished mobility between low and high service classes



Note: Authors' calculations based on composite dataset (1972–2014). Mobility rates depicted are those of university graduates only. Downward mobility not shown (residual category). Different from Figure 6, short upward and downward mobility includes here mobility within the service class. Percentages available upon request from the authors.

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