Early Tracking and Social Inequality in Educational Attainment: Educational Reforms in 21 European Countries

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This article studies socioeconomic inequalities in educational attainment in 21 European countries for cohorts born between 1925 and 1989, and asks the question whether reforms to track students later in the school career have reduced inequalities. Country fixed effects models show that inequalities by parental occupational class were reduced after policies were implemented that separated children for different school careers at a later age (i.e., postponed between-school tracking). The association between parents' education and children's attainment is hardly affected by reforms to later tracking. The results remained after taking into account the political climate preceding reforms, and were also highly robust to the selection of countries. A reduction of inequality was achieved through a loss of attainment by the children of advantaged backgrounds. Political implications and the relevance of these findings for American debates are discussed.

American scholars have extensively examined the hypothesis that tracking in schools magnifies educational inequality by socioeconomic or ethnic/racial background (e.g., Gamoran and Mare 1989; Lucas 1999; Oakes 1985/2005). The kind of differentiation that is typically studied is differentiation within American high schools. Although full-curriculum tracking in American schools has been replaced by other forms of ability grouping by subject, Oakes (1985/2005: 214) concludes that "tracking remains firmly entrenched in American schools."

While this may be true, American schools have always been much less differentiated than schools in many European societies. In Germany, Austria and Switzerland, for instance, children enter a fully differentiated curriculum, in separate schools, in fifth grade (around the age of 10). In the Netherlands, children enter either prevocational or academically oriented schools after sixth grade

around the age of 12. By contrast, in other European societies, the comprehensive system has been even more strongly embraced than in the United States. These country differences are reflected in the level of between-school variance in student achievement at age 15, where the variance between schools is comparatively high in the German-speaking countries, comparatively low in Finland, Sweden, Denmark, and Norway, with the United States taking an intermediate position (Vandenberge 2006). Recent comparative work showed that the variability between schools is to a large extent explained by between-school differences in "opportunities to learn" in tracked educational systems, meaning that educational processes complement family processes in explaining why tracking matters for inequality by socioeconomic background (Schmidt et al. 2015).

A number of societies, including Sweden, Finland, England, Scotland and France, have reformed their systems between the 1950s and 1980s, from an early-tracking to a comprehensive unstratified system. In some Central and Eastern European countries, by contrast, between-school tracking has been pulled forward after the fall of communism, possibly to abandon the previous equal opportunities ideology reflected in common education to all children. From these European reforms we may learn about the distributional consequences of tracking between schools. Such lessons are important for the United States, as, intended or unintended, contemporary policies may increase segregation between schools in ways similar to the early tracking systems in Europe. For instance, a possible rise in public spending on improving school choice may spur racial segregation (cf. Bifulco and Ladd 2007). Also, current debates in the United States about the advantages and disadvantages of a transition from middle to high school (e.g., Pharris-Ciurej et al. 2012; Weiss and Bearman 2007) may learn from European research on differences in the timing of between-school sorting based on learning abilities.

In this article I focus on reforms with regard to the tracking age in Europe. Using microlevel data on 21 European countries, of which 14 have experienced reforms with regard to the age at which students are first selected into fully separate school curricula, I use a pre- and postreform design on 21 countries, similar to Dee and Jacob's (2008, 2011) approach to evaluate the effects of school accountability policies across US states. I examine whether the socioeconomic

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gradient in educational attainment is tilted after tracking age reforms were implemented. In addition, it is examined whether reforms to later tracking are related to the overall likelihood to complete high school and to complete college. With this focus on both socioeconomic status (SES)-based inequalities and overall "average" outcomes, the analysis sheds light on a possible trade-off between equality and efficiency. Such a trade-off has been suggested to exist when higher average outcomes (e.g., a larger share of a cohort completing college) are more likely to be achieved when larger inequalities are permitted, or, reversely, more equality is more likely to be achieved if a society is willing to give in with regard to the average performance (Hanushek and Wössmann 2006; Micklewright and Schnepf 2007).

We furthermore examine to what extent the egalitarian political climate during the respondents' youth mitigated the relationship between tracking age and inequality. Although there will obviously be other factors associated to inequalities that are not examined, an important argument against the interpretation of tracking age reform effects is that those reforms are endogenous to reducing inequalities, inspired by the wider societal and political climate. If the effects of tracking age reforms uphold, we achieve stronger evidence of the importance of the educational institutional structure.

Earlier Research on Between-School Tracking and Inequalities

Comparative Research

Most existing comparative research on between-school tracking focuses on student test scores on various sorts of academic achievement (in particular mathematics and literacy). This is likely caused by the increased availability of international student assessments, such as the Programme for International Student Achievement taken at age 15, the Trends in Mathematics and Science Study taken in grades 4 and 8, and more recently the Programme for the International Assessment of Adult Competencies taken in adulthood. Most of these studies show that socioeconomic disparities in students' academic achievement are larger in systems that track students early in the school career between schools in comparison to comprehensive education systems or within-school tracking systems (Blossfeld et al. 2016; Brunello and Checchi 2007; Burger 2016; Chmielewski 2014; Heisig and Solga 2015; for a review see Van de Werfhorst and Mijs 2010). Also gaps by immigration background tend to be larger in societies with earlier tracking, as early tracking systems give too little time to children of immigrants to show their full academic potential (Crul and Vermeulen 2003; Van de Werfhorst and Heath 2018). However, some research shows that the immigration background gap is not correlated to the age of tracking, or

only when severe marginalization occurs with tracking (Borgna and Contini 2014; Cobb-Clark et al. 2012).

Importantly, in between-school tracking systems like in Germany, the Netherlands and Austria, segregation by socioeconomic background is larger than in within-school tracking systems, even if the track differences in academic achievement are similar across tracking systems (Chmielewski 2014). Hence, most comparative research focuses on between-school tracking, and particularly on the age at which this happens in different educational systems.

Comparing primary school children (pretracking) and secondary school children (posttracking in early tracking countries, but still comprehensive in other countries), Hanushek and Wössmann (2006) show that the dispersion in academic achievement goes up more in early tracking systems, whereas the average performance is lower. Inequalities in the form of larger dispersions correlate negatively with the average performance at the country level (Brown et al. 2007), indicating that there is no trade-off between equality and efficiency in student achievement. On the contrary, dispersions tend to be smaller in societies with higher average achievements. Not only dispersions, but also socioeconomic gradients in academic achievement rose faster across the early life course phase in tracked relative to comprehensive systems (Dämmrich and Triventi 2018; Lavrijsen and Nicaise 2015).

Recent cross-sectional comparative research has moved beyond the study of academic achievement around the age of 15, and has examined further educational attainment in early tracking and comprehensive systems. Socioeconomic and ethnic inequalities appeared to be larger in early tracking systems relative to comprehensive systems (Griga and Hadjar 2014; Österman 2018; Pfeffer 2008). Thus, the institutional effects may not only affect achievement differences in high school but also extend to later stages of the educational career. It should be noted that the effect sizes of tracking are such that inequalities are not erased in comprehensive systems; at most, later tracking reduces inequalities to some extent.

Within-Country Studies

The importance of tracking for inequality of opportunities has also been studied by examining educational reforms within societies. A number of societies have reformed their educational system with regard to the age at which children are tracked, especially in the 1960s and 1970s. The "comprehensive reform" that was part and parcel of educational policy debates in these decades was aimed at reducing selection in the earlier stages of education (Leschinsky and Mayer 1990). For Scotland it has been demonstrated that a reform to later tracking reduced levels of inequality, although the tracking-age reforms were part of a

broader set of policies (Gamoran 1996). Other studies on the reform towards comprehensive education in England and Wales showed, however, that class inequality in educational attainment did not decline (Halsey et al. 1980). Also, the attainment of higher social class positions has not become more equalized between working class and middle class children in comprehensive schools relative to the parallel selective systems in England, at least among the first cohorts affected by the comprehensive reform (Boliver and Swift 2011). However, Gorard and Siddiqui (2018) showed for England more between-school segregation on social background over and above ability segregation, and lower school performance among the disadvantaged students in the lower stream, in geographical areas with selective schools relative to the areas with comprehensive education. The reform to the comprehensive English system has, however, also reduced performance of high ability students, with little effect on middle and low ability students (Galindo-Rueda and Vignoles 2004).

Difference-in-difference designs show that comprehensive reforms have led to a reduction of socioeconomic inequalities in academic achievement in a number of other societies (Poland: Le Donné 2014; Sweden: Meghir and Palme 2005; Finland: Pekkarinen et al. 2009).

Less concerned with educational policy reforms, but informative about the process through which early tracking leads to larger inequalities, studies have demonstrated how socioeconomic inequality is emerging across the school career. American scholars have consistently highlighted inequalities by socioeconomic background both in the enrollment into tracks, and through that, in further educational careers (Alexander et al. 1978; Dauber et al. 1996; Oakes 1985/2005). Among the main drivers of SES-based inequalities in track placement were social differences in academic achievement and in subjective processes surrounding students (e.g., encouragement, aspirations, parental expectations). Track placement has an effect on further academic achievement even after holding constant nonrandom assignment to tracks on measured and unmeasured characteristics (Gamoran and Mare 1989), although tracking effects depend on tracking practices in schools (Hallinan 1994). Later studies emphasized the importance of teacher bias in the recommendation for track enrolments (Timmermans et al. 2015), and more generally stressed the relevance of instructional, social and institutional effects of tracking practices on student outcomes (Lucas 1999).

In Hungary, early tracking leads to improvements of the academic performance of higher SES groups, and harms the performance of those left in the lower tracks (Horn 2013). German data show that the rising inequalities across the tracking stages result partly from differential learning environments, implying that better learning environments are offered in the academic track (Maaz et al. 2008). Comparative research confirms the strong correlations between early tracking, academic segregation and school differences in "opportunities to learn"

(Schmidt et al. 2015). Besides school factors such as instruction and learning environment, family resources may also matter differently in early tracking relative to late tracking systems. Children of different socioeconomic backgrounds vary in their ability to foresee the future educational career (Breen et al. 2014; Lucas 2001). Children of disadvantaged backgrounds are more myopic and less forward-looking, and this is particularly likely to be harmful in early selecting systems as a longer educational future needs to be foreseen to make well-informed educational decisions.

Schindler (2016) and Dronkers and Van de Werfhorst (2016) used longitudinal data for Germany and the Netherlands, respectively, to study inequality at the transition to secondary school and later stages in education, for cohorts born since the 1930s/40s. Both studies conclude that inequality in final educational attainment is increasingly dependent on what is happening *after* the initial stage of track placement. Thus, whereas the track placement is, across cohorts, increasingly meritocratic based on test scores, SES inequalities on top of performance seem to be partially "restored" at later stages (which could happen, for instance, through shadow education, or improving educational aspirations). Given the importance of educational qualifications for further chances in life, we need to study the relationship between tracking policies and inequality of final educational attainment.

The Current Study: A Comparative Reform Design

This article combines elements of the comparative and the within-country designs. I study socioeconomic inequality in educational attainment across time, exploiting reforms in the tracking age in various European countries.[1] The hypothesis that later tracking is associated with larger socioeconomic inequalities can be tested by comparing inequality before and after reforms with trends observed in countries that have not implemented tracking age reforms. Such a design has clear advantages over both comparative cross-sectional studies of educational systems and the single-country longitudinal reform studies.

With cross-sectional country comparisons, a weakness is that countries differ in many ways more than with regard to the tracking age. Historical or cultural differences between societies are not taken into account, and with a limited set of countries only a few control variables at the country level can typically be included. With a comparative reform perspective, tracking age varies both between and within societies, so the researcher can hold constant for stable between-country differences (e.g., related to history, broader culture, or political economy), and can include more contextual control variables that filter out other cultural and institutional factors that also vary between and within countries.

An advantage over single-country reform studies is that pre-and postreform comparisons may capture overall trends in socioeconomic inequality. For instance, if inequality is declining for other reasons than the reform (e.g., because of an increasing meritocratization as part of a broader modernization process), one may falsely attribute the decline to the postponement of tracking. In a comparative reform study, country-specific inequality trends can be included in the model, as a baseline trend on top of which the reform effects are identified.

An additional contribution to existing scholarship is that this article explicitly studies multiple indicators of socioeconomic background: the educational level and the occupational class of parents. Many studies on children's educational outcomes have a general interest in the effects of SES, independent of how it is measured (e.g., parents' education, occupation or sometimes the number of books in the home environment). Sociological scholarship emphasizes, however, that various indicators of the family background signify different sorts of resources available in the family. In a multivariate framework in which both parents' education and occupation are included, there are various reasons to expect that the impact of occupational position of parents during the child's youth is more easily affected by policies than education of parents. First, family strategies may be strongly based on the avoidance of downward educational mobility, and well-educated parents may navigate their children through the institutional landscape relatively independent of how education is organized. Second, parental education effects may partly reflect genetic endowments or other early-life advantages of which the effects on later school careers are relatively independent of the educational institutional structure. Third, to the extent that track recommendations by teachers are biased towards advantaged families (Barg 2013; Timmermans et al. 2015), it is likely that these biases are based on parental characteristics visible to school professionals during the children's schooling, which holds more clearly for contemporary parental occupation than parental education completed in the past. A study that examined tracking age reforms in relation to grade 8 mathematics achievement on a limited set of countries also found clearer associations of policy reforms with the slope of parental occupation than of parental education (Van de Werfhorst 2018).

Research Design

Data and Variables

I study the level of socioeconomic inequality in educational attainment with the European Social Surveys (ESS) rounds one through seven, collected between

2002 and 2014 (European Social Survey Cumulative File 1–7 (2016) complemented with the data from Latvia, which were not yet part of the cumulative file at the time of analysis). The ESS works with representative samples of the population aged 15 and older who report about their own educational attainment and their parents' SES characteristics. I study the association between parents' and children's educational attainment for respondents (=children) born between 1925 and 1989. Children's educational attainment is examined in different ways: the *completion of upper secondary education* (a level that gives access to tertiary education), the completion of a *college degree* conditional on the completion of upper secondary education, and the *years of education* completed (capped at 25). The analysis of the completion of upper secondary education and the conditional likelihood to complete college follows the educational transition approach of Mare (1980), complemented with adequate modeling techniques to account for unobserved heterogeneity (inspired by Holm and Jaeger 2011; see next section for more details). The ESS reports separately about the qualification level obtained (used for the completion of upper secondary education and a college degree) and the number of years the respondent went to school (used for years of education).

It is important to consider where our study, with SES gradients in the likelihood to attain given educational transitions and in final level of attainment, stands in relation to the concept of inequality of opportunity (IEO). Following Boudon (1974), IEO refers to socioeconomic inequalities in educational attainment, which would mean the present article studies IEO. Jackson (2013) sees IEO as being concerned with inequalities at given educational transitions, not in terms of all SES-based inequalities in education. A similar approach is taken by Buis (2010), who sees the latter as a study of (social) inequalities of educational outcomes rather than opportunity. Following that logic, I study both inequality of opportunity (at transitions) and inequality of outcomes. Others have distinguished IEO from equality of outcomes mainly by reserving the latter for univariate distributions (inequality of educational outcomes referring to a distribution with a large dispersion in achievement or attainment indicators) (Meschi and Scervini 2014; Van de Werfhorst 2014). In any case, inequality of educational opportunity can refer to both primary and secondary effects of social origin (Jackson 2013), with primary (or indirect) effects constituted by social differences in academic achievement and secondary (or direct) effects by social differences that may exist on top of differences in academic achievement. As our data do not have information on academic achievement, I study the total SES effects.

The individual-level data are merged with various other data sources for contextual data (at the level of country*birth year). Most importantly, the ESS is merged with a historical database of educational policy reforms that were

implemented in 21 European countries between the 1930s and 2000 (Braga et al. 2013; Checchi and Van de Werfhorst 2018). *Reforms in tracking age* are documented, meaning tracking between school types, typically in different schools for multiple years leading to distinct qualification levels. In the classification of LeTendre et al. (2003) and Chmielewski (2014) such systems are referred to as between-school tracking systems. Given that we know when reforms have been implemented, we can identify rather adequately the educational system the ESS respondents have gone through in their youth (although sometimes reforms have been implemented gradually across regions, and we have to assume that children went through the school system at nominal age). Besides tracking age reforms, reforms in the *minimum school leaving age* are also documented, which enables us to hold constant for this reform that sometimes (but not always) came together with tracking age reforms. It should be noted that, for ease of interpretation of the regression models, 10 is subtracted from tracking age and minimum school leaving age. Figure 1 shows the tracking age variable, by year of birth and country.

Other contextual data are included to capture the political (in)egalitarian climate during the child's youth, enabling us to hold constant for this in our identification of tracking age effects on inequality. The political climate is captured with three different variables, which we connect to the ESS data in the year when the respondents were nine years old. We first use the Manifesto Project Database (MPD), which codes the standpoints of political parties running for national elections in many countries since the 1940s, on various issues (Volkens et al. 2017). From the MPD we take the *parties' standpoints on equality* (coded as proequality). We only examine parties in government (taken from the Party Government Dataset; Seki and Williams 2014), taking account of each party's relative share in government to trace the political decision-making potential on equality issues. Second, also from the Party Government Dataset, the *proportion of social democratic seats in government* is taken. The third variable to identify the political climate is the factual level of *income redistribution* that took place in a country in a particular time period. Based on the Standardized World Income Inequality Database (Solt 2009), the Gini coefficient of gross household incomes and net household incomes are subtracted so that a high score indicates more redistribution.

An advantage of the design is that we can study educational attainment for many cohorts (given that respondents can report about their educational attainment in a reliable and valid way, even if education was finished a long time ago). A downside is, however, that we do not have information about the school to which the respondent went. Hence, we cannot investigate whether tracking affects inequalities through the differences in opportunities to learn between tracks, as exemplified by differences in offered courses between educational
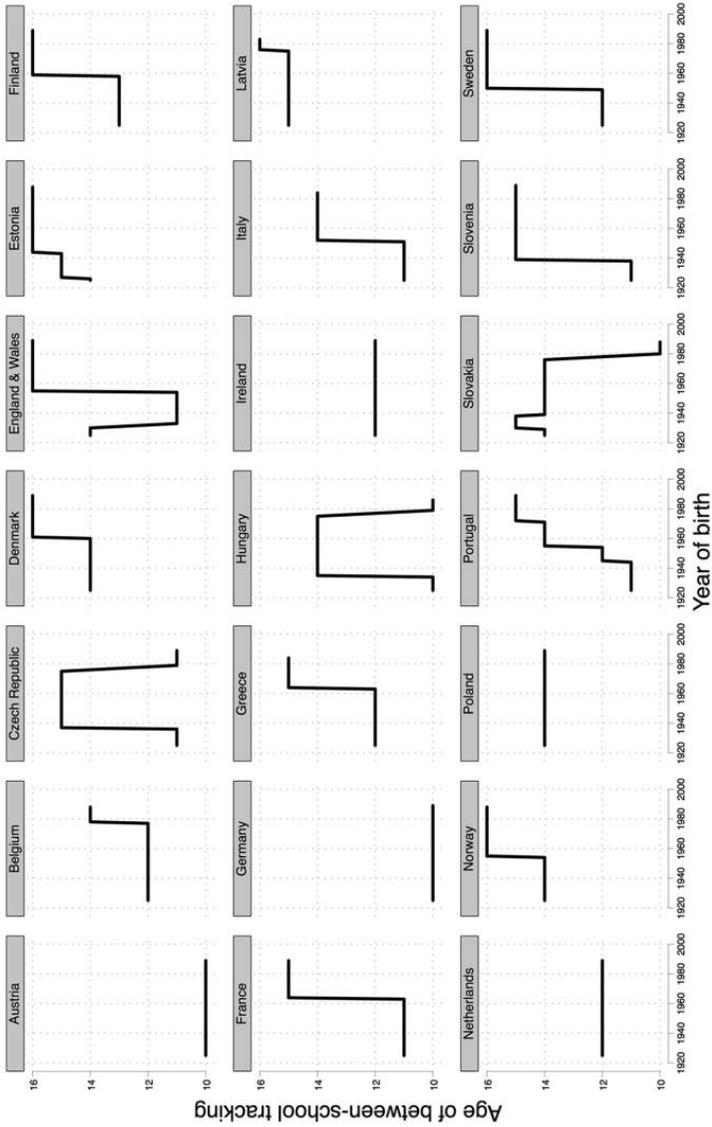
Fig. 1.—Tracking age reforms by year of birth

tracks in a society (Schmidt et al. 2015), or through differences in school quality, or teacher quality, or other detailed mechanisms from which our macrolevel analysis aggregates.

As indicators of socioeconomic background, I use parents' education and occupational class during the respondent's youth. Parents' education is measured in four levels: incomplete secondary, lower secondary, upper secondary, and tertiary. This variable is entered in the models on a linear scale, although we did a robustness check with a categorical approach leading to the same substantive conclusions. Parents' occupational class (referring to when the respondent was 14 years old) is operationalized in six groups: (1) routine manual and service work, (2) semiroutine manual and service work, (3) technical and craft occupations, (4) clerical and intermediate occupations and middle management, (5) senior managers and administrators, and (6) traditional and modern professional occupations. This variable is entered as a categorical variable in the regression models. Note that the data do not have information on parental income or wealth. Arguably parental occupational class and education are the most important SES indicators as predictors of children's educational attainment (Bukodi et al. 2014). In the appendix, a correlation matrix is provided of the SES indicators and the three dependent variables.

Both variables are available for both parents. I used a dominance approach to take the highest of either of the father's or mother's education and occupation. The dominance approach optimizes the number of observations, as all respondents can be included for whom the information of at least one parent is available. One may question whether the dominance approach is appropriate for determining the highest parental occupation, given that it is not measured on a strictly hierarchical scale. This is particularly a concern for technicians and crafts workers, whose position may be hard to determine on a hierarchical scale relative to clerical workers, and for professionals and senior managers. Nevertheless, "white-collar" and professional occupations are considered as more inclined to education than, respectively, "blue-collar" and senior managers; hence the clerical and intermediate management positions and professionals are given a higher score to determine which of the parents is taken as a source of information on parental occupation. In the regression models, parents' occupational class is entered in categories.[2]

Our models control for sex (male = 1, female = 0) and year of birth (centered around 0 at the mean birth year of 1956). Table 1 shows descriptive statistics for all the variables.

Table 2 shows two sets of descriptions of the contextual variables (with unit of analysis country*birth year). Panel A shows the correlations of the contextual variables (tracking age, minimum school leaving age, and the three political climate variables). Tracking age is positively correlated to minimum school

TABLE 1

Descriptive Statistics

	Observations	Mean	SD	Min	Max
Contextual variables:					
Tracking age[a]	186,405	13.21	2.03	10	16
Minimum school leaving age[a]	185,579	14.87	1.66	10	18
Proequality political ideology in government	106,033	4.80	3.34	0	19
Social democratic seats in government	110,125	.37	.35	0	1
Income redistribution	80,711	15.68	3.71	4.28	26.44
Individual-level variables:					
Gender (male = 1)	186,405	.46	.50	0	1
Parents' education	186,405	2.39	1.10	1	4
Year of birth	186,405	1,957.17	15.26	1,925	1,989
Completion of upper secondary education	186,209	.73	.44	0	1
Completion of bachelor's degree (conditional on having completed upper secondary education)	136,614	.39	.49	0	1
Years of education	185,020	13.44	5.08	4	25

	Frequency	Percent
Parents' occupation:		
Routine working class	35,251	18.91
Semi/routine working class	26,342	14.13
Technicians/crafts	38,898	20.87
Intermediate/middle management	39,772	21.34
Senior management/ administration	8,479	4.55
Professionals	22,697	12.18
Missing	14,966	8.03
Total	186,405	100

[a] For ease of interpretation, we used tracking age and minimum school leaving age minus 10 in the regression models.

leaving age ($r = 0.3$). A proequality ideology is also positively correlated to tracking age, so that country-cohorts with a more proequality polity have, on average, later tracking ages ($r = 0.19$). The same holds for the share of social democratic seats in the government during youth ($r = 0.23$). Factual income redistribution is not correlated to tracking age, whereas it is correlated in the expected direction with the political ideology and the share of social democratic seats in government.

TABLE 2

Contextual Variables: Correlations and Variance Components

Panel A: Pairwise Correlations	Tracking Age	Minimum School Leaving Age	Equality Ideology in Government	Social Democratic Seats in Government
Minimum school leaving age:				
r	.296			
SE	.000			
$\mathcal{N}$	1,336			
Equality ideology in government:				
r	.189	.092		
SE	.000	.015		
$\mathcal{N}$	693	692		
Social democratic seats in government:				
r	.228	−.002	.332	
SE	.000	.961	.000	
$\mathcal{N}$	723	722	693	
Income redistribution:				
r	−.004	.338	.182	.057
SE	.921	.000	.000	.187
$\mathcal{N}$	538	537	506	536

Panel B: Between- and Within-Country Variances in Contextual Variables	$\mathcal{N}/n$	Between Country Variance	Within Country Variance	Total Variance	ICC (%)
Tracking age	1,342/21	2.185	1.797	3.981	54.875
Minimum school leaving age	1,336/21	.723	2.062	2.786	25.968
Equality ideology in government	693/20	4.969	6.620	11.589	42.878
Social democratic seats in government	723/20	.066	.064	.130	50.728
Income redistribution	538/20	7.002	8.556	15.558	45.004

NOTE.—Based on the country*year of birth dataset. SE refers to standard error, $\mathcal{N}$ refers to country-birth years, *n* refers to countries.

Panel B shows a variance decomposition of the contextual variables, separating between-country and within-country variances. These results clearly indicate that there are substantial differences within and between countries, on all of the contextual variables. The between-country variance captures between 26 and 55% of the total variance (intraclass correlation, ICC); the remainder of the total variance is within countries. This means that there is quite some variation in the contextual variables within countries, which is necessary for the country fixed effects model.

Analytical Approach

With the variation across countries and across cohorts within countries, the data are suitable to use a country fixed effects model. Inspired by difference-in-difference approaches by Hanushek and Wössmann (2006), Meghir and Palme (2005), and Pekkarinen et al. (2009), I estimate a country fixed effects model on 21 European countries to test whether inequality in educational attainment by socioeconomic background has gone down more steeply in societies that have reformed their educational system to later tracking ages, relative to countries that have not reformed their educational system.

The following equation summarizes the baseline model. It estimates educational outcome EDU_{ijk} of individual i in birth year j in country k to be a function of main effects (β coefficients) of year of birth, parents' education PEDUC and parents' occupation POCC (inserted as dummy variables) and the interaction effects between SES indicators and year of birth, complemented with fixed effects in the form of country dummies $\xi_{k6}CD$. Moreover, the model inserts the three-way interaction between country dummies, year of birth and SES indicators (ξ_{3k} and ξ_{4k}), plus the underlying two-way interactions. Thus, the model identifies a country-specific level and trend in inequality by parents' education and occupation. With this strategy, we offer an even more conservative test of policy effects than recommended by a recent study by Giesselmann and Schmidt-Catran (2018), who explain that one needs country-specific slopes of individual-level variables if one wishes to detect cross-level interaction effects in repeated cross-sectional data. Although that strategy allows the researcher to interpret contextual effects as within-country effects, our three-way interaction additionally neutralizes potential other explanations for country-specific trends in social inequality in education.

The main parameters of interest are the δ-parameters, which identify the association between tracking age (measured at the country*birth year level) and the gradients in educational outcomes by parental education and occupation, and the main effect of tracking age reforms. These effects are thus identified on top of the country-specific time trend in SES-based inequalities.

$$
\begin{aligned}
EDU_{ijk} = {} & \alpha + \beta_0 Birthyear_{jk} + \beta_1 PEDUC_{ijk} + \beta_2 POCC_{ijk} + \beta_3 PEDUC_{ijk} \\
& * Birthyear_{jk} + \beta_4 POCC_{ijk} * Birthyear_{jk} + \delta_1 TrackingAge_{jk} \\
& + \delta TrackingAge_{jk} * PEDUC_{ijk} + \delta_3 TrackingAge_{jk} \\
& * POCC_{ijk} + \xi_{k1} CD * PEDUC_{ijk} + \xi_{k2} CD * POCC_{ijk} + \xi_{k3} CD \\
& * PEDUC_{ijk} * Birthyear_{jk} + \xi_{k4} CD * POCC_{ijk} * Birthyear_{jk} \\
& + \xi_{k5} CD * Birthyear_{jk} + \xi_{k6} CD + \varepsilon_{ijk}
\end{aligned}
$$

I build on this baseline model in various ways. For the model predicting the attainment of a college degree conditional on the completion of upper secondary

education, we need to take account of the selection on the completion of upper secondary education in order to avoid unbiased estimates. The model follows the approach by Holm and Jaeger (2011) who use a Heckman probit model that combines a selection equation into completion of upper secondary education (which defines whether or not students face the transition to higher education). As a variable uniquely entered in the selection equation, I use policy reforms on minimum school leaving age, as this is likely predicting the completion of upper secondary education. Moreover, as such a policy affects the likelihood to complete upper secondary education disproportionately for disadvantaged students, and likely so across time, the three-way interaction between minimum school leaving age, parents' education and year of birth is inserted in the selection equation. The rho is 0.41, which points to strongly correlated errors in the selection equation and the equation predicting obtaining a college degree (which is not surprising given that our data has no information on academic performance, motivation and other relevant factors for educational attainment at various levels). Because the interaction between minimum school leaving age reforms and parents' education is included in the selection equation, the interaction term between parents' education and tracking age is omitted from the main equation.

The second way to build on the baseline model is by adding control variables at the contextual level identifying the political climate at age 9, including their interactions with the two SES indicators. In other words, if we detect tracking age to modify the SES slopes predicting educational attainment, it is not because tracking age reflects the broader (measured) egalitarian political ideology that may have led to tracking age reforms. Because political climate can have independent effects on (inequality in) the level of attainment, it is not possible to treat the political climate variables as instruments for tracking age reforms.

Third, we add to the baseline model policy reforms on minimum school leaving age, including its interaction with SES indicators. With this analysis we avoid the interpretation of tracking age effects as effects of an extension of compulsory education, which has also been shown to reduce socioeconomic inequalities in education (Betthäuser 2017).

Fourth, we estimate the baseline model on a subset of countries to test whether the results are driven by tracking age reforms in Scandinavia, or by the reforms towards earlier tracking in some former communist countries after the fall of communism, and whether the baseline results are confirmed if we only include countries with reforms to later tracking.

Fifth, the difference-in-difference design of the baseline model is extended by restricting the cohorts studied between 5- and 10-year bands around the reform. This analysis is only done for postwar cohorts (1946–1989) in countries with an upward reform of the tracking age, and around one crucial reform in these countries. With short bandwidths overall trends are very small, making it

unlikely that broad between-cohort differences in inequalities confound the reform effects.

Results

In table 3 the results are shown of a set of fixed effects regression models. The results of baseline models are shown for the three dependent variables (completion of upper secondary education, completion of a college degree conditional on upper secondary completion, and years of schooling). As models 1 to 3 show, parents' education is strongly related to children's educational attainment, not surprisingly. For every level of parental education, children's likelihood to complete upper secondary education increases with 16 percentage points, their probability to attain a college degree rises and their educational attainment goes up by 1.3 years. Also parents' occupation is strongly correlated to educational attainment, in a nonlinear way (on top of parental education). Advantages are particularly found among children of senior managers/ administrators and professionals, but also the intermediary classes have typically higher levels of attainment and higher likelihoods to obtain secondary and tertiary qualification levels than children from working class backgrounds. Interestingly, children of the intermediate occupations and middle management are similar to the senior managers and professionals with regard to the likelihood to finish upper secondary education but lag behind these groups with regard to the likelihood to complete college.

The main effect for tracking age is not significant (referring to a reform correlate given that country fixed effects are included). Given that the interaction terms between tracking age and SES variables are included in the model, this refers to low-educated parents and parents of the unskilled working class.[3] The interaction terms show that there is not a reform effect on the slope of parental education. The effect of parents' occupational class is, however, reduced with reforms to later tracking. The positive main effect of coming from a family with a senior management function (relative to a routine working class background) is 0.041 for the completion of an upper secondary qualification. This effect refers to an educational system that tracks at age 10 (as tracking age was coded as 0 for this situation). The advantage of coming from a background of managers is reduced with 0.015 for every later year of tracking. For the class background of professionals, the positive effect is reduced even more, although it should be noted that parental education is also in the model, which likely explains a large part of the advantage of children of professionals.[4]

With regard to the completion of a college degree (model 2) the advantage of coming from the managing class is also reduced with later tracking, but much more modest than with regard to upper secondary education (main effect

TABLE 3

Fixed Effects Models of Educational Transitions and Attainment

	Upper Secondary (Linear Probability Model) (1)	Degree (Heckman Probit) (2)	Years of Education (Linear Model) (3)	Controlled for Egalitarian Political Climate (Years of Education) (4)	Controlled for Minimum School Leaving Age Reforms (Years of Education) (5)
Male	.034**	−.071	.221	−.215	.217
	(3.55)	(−1.05)	(1.42)	(−.99)	(1.41)
Tracking age	−.002	−.004	.054	.059	.051
	(−.19)	(−.26)	(.69)	(.67)	(.64)
Parents' education	.162***	.372***	1.315***	1.783***	1.162***
	(976.64)	(27.33)	(463.64)	(5.69)	(14.14)
Parents' education × tracking age	.003		−.007	.087***	−.009
	(1.55)		(−.24)	(4.51)	(−.32)
Parents' occupational class (relative to routine working class):					
Semi-/routine working class	−.001***	.016***	.065***	.104	.196
	(−14.38)	(9.36)	(63.78)	(.15)	(1.23)
Technicians/crafts	−.004***	−.052***	−.045***	−.191	−.361*
	(−34.72)	(−17.56)	(−25.41)	(−.42)	(−2.27)
Intermediate/middle management	.057***	.309***	.808***	1.224*	.687***
	(3605.00)	(116.38)	(8081.37)	(2.20)	(5.24)
Senior management/administration	.041***	.706***	2.412***	2.223*	2.752***
	(141.37)	(80.18)	(482.06)	(2.33)	(10.46)
Professionals	.018***	.697***	3.072***	3.168**	3.547***
	(29.15)	(80.24)	(307.37)	(3.20)	(18.17)

TABLE 3 (*Continued*)

	Upper Secondary (Linear Probability Model) (1)	Degree (Heckman Probit) (2)	Years of Education (Linear Model) (3)	Controlled for Egalitarian Political Climate (Years of Education) (4)	Controlled for Minimum School Leaving Age Reforms (Years of Education) (5)
Parents' occupational class × tracking age:					
Semiroutine wc × tracking age	.005	−.004	.001	−.135	.008
	(1.20)	(−.34)	(.07)	(−1.92)	(.42)
Techn/craft × tracking age	−.003	−.031*	−.108*	−.184*	−.126**
	(−.57)	(−2.19)	(−2.62)	(−2.21)	(−2.95)
Intermediate/middle mgt × tracking age	−.004	−.006	−.039	−.115	−.051
	(−.84)	(−.36)	(−1.04)	(−1.29)	(−1.24)
Senior mgt/admin × tracking age	−.015*	−.046*	−.282**	−.622***	−.281**
	(−2.45)	(−2.56)	(−3.56)	(−9.22)	(−3.63)
Prof × tracking age	−.017**	−.011	−.121**	−.217*	−.115*
	(−3.13)	(−.51)	(−2.99)	(−2.18)	(−2.54)
Year of birth	.015***	.021***	.047***	.019	.047***
	(1,075.18)	(12.63)	(187.83)	(1.47)	(32.86)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Country × year of birth	Yes	Yes	Yes	Yes	Yes
Country × parents' education	Yes	Yes	Yes	Yes	Yes
Parents' education × year of birth	Yes	Yes	Yes	Yes	Yes
Country × parents' education × year of birth	Yes	Yes	Yes	Yes	Yes
Country × parents' occupational class	Yes	Yes	Yes	Yes	Yes
Parents' occupational class × year of birth	Yes	Yes	Yes	Yes	Yes

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	(1)	(2)	(3)	(4)	(5)
Country × parents' occupational class × year of birth	Yes	Yes	Yes	Yes	Yes
Equality ideology in government				Yes	
Parents' education × equality ideology in government				Yes	
Parents' occupational class × equality ideology in government				Yes	
Social democratic seats in government				Yes	
Parents' education × social democratic seats				Yes	
Parents' occupational class × social democratic seats in government				Yes	
Income redistribution				Yes	
Parents' education × income redistribution				Yes	
Parents' occupational class × income redistribution				Yes	
Minimum school leaving age					Yes
Parents' occupational class × minimum school leaving age					Yes
Parents education × minimum school leaving age					Yes
Constant	.329***	−2.394***	8.762***	8.180***	8.836***
	(69.48)	(−33.95)	(114.84)	(11.71)	(35.51)
Observations	171,272	176,595	170,342	70,479	169,587
Adjusted R^2	.331		.320	.202	.320

NOTE.—t statistics in parentheses.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

of 0.706 and interaction effect of -0.046 per year of later tracking). The advantage of children of professionals in the likelihood to complete upper secondary education is reduced with later tracking, but not in the likelihood to complete college. Completed years of education (model 3) also becomes less dependent on the class background of children if systems reformed to later tracking. Children of senior managers and professionals attain around 2.5 to 3 more years of education than children of routine working-class backgrounds in systems that track at age 10, but this advantage is reduced by 0.28 (managers) and 0.12 (professionals) for each year that the system tracks later after reforms.

Models 4 and 5 include additional contextual variables, including their interaction with parents' education and occupational class (only for years of education). Model 4 adds the variables illustrating the political climate during youth. This model shows that the results with regard to parental occupation remain intact: we see larger inequalities by parental occupation in early-selecting systems. The interaction effect is stronger relative to the main effect in this model than in model 3, so holding constant for the inequality-modifying effect of the political climate makes for stronger effects of tracking age reforms. What is different in model 4 relative to model 3 is that the interaction term between tracking age reforms and parents' education turns significantly positive. So, controlled for the inequality-modifying effects of the political climate, and on top of the inequality-reducing effect of tracking age reforms in terms of parents' occupation, we find that inequality by parental education *rises* after reforms to later tracking.

Model 5 takes into account policy changes with regard to minimum school leaving age, and the results of this model are very similar to model 3. So, the tracking age effects in model 3 are not driven by compulsory school leaving age reforms.

Figure 2 shows the predicted outcomes for the three dependent variables by means of marginal effects plots (following models 1–3 of table 3). These graphs are clearer than the table about the impact of reforms for specific social groups. For all three outcomes, the managing class sees its children's educational attainment fall with later tracking. For some outcomes (secondary completion and total years of schooling), also children of professionals see their attainment decline. Other groups experience a rising likelihood of completing upper secondary education (the entry ticket to college), in particular the semiroutine working class. So the declining inequality after reforms to later tracking is found both because disadvantaged groups see their position improve and the advantaged classes see their position deteriorate. With regard to obtaining a college degree, the pattern is different. We only see that the children of managers decline their likelihood to get a college degree, while other groups are largely unaffected. Both higher classes (managers and professionals) experience declining educational attainments in years of schooling.
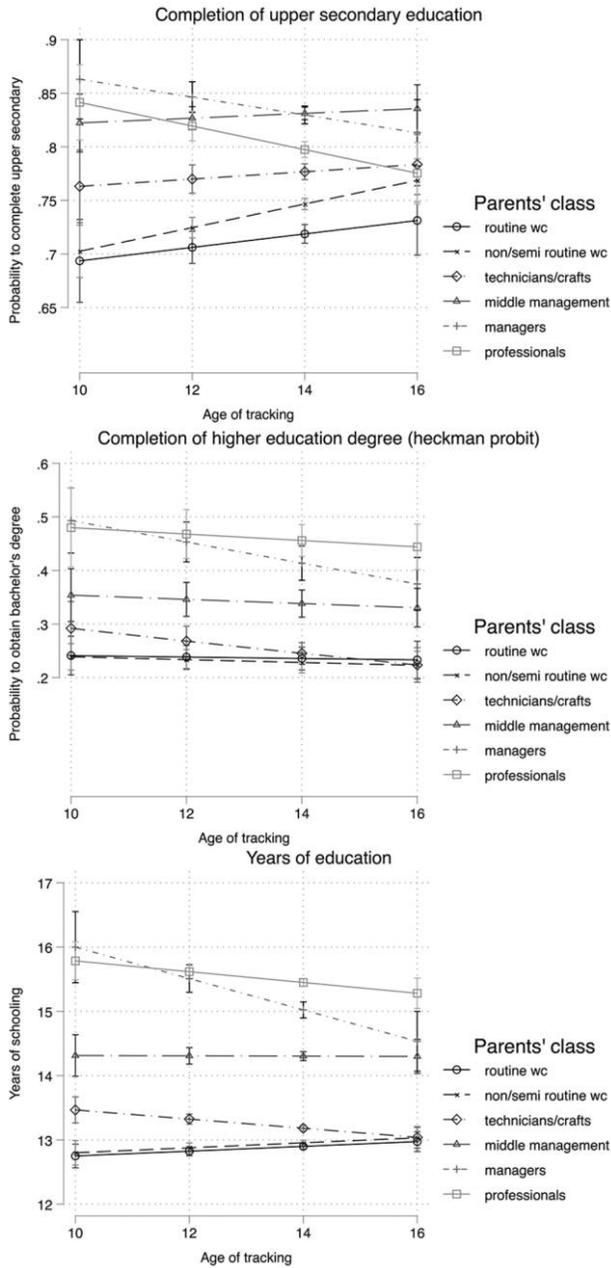
FIG. 2.—Predicted educational attainment outcomes based on models 1, 2, and 3 of table 2.

To further illustrate the effect of tracking age reforms for different subgroups, table 4 shows separate regressions by parental occupational group (in three groups: routine and semiroutine working class; technicians/craftsmen and middle management; and managers and professionals, predicting years of education). The effect of tracking age is small and not statistically significant for students of the working classes and intermediate classes. For the children of senior managers and professionals, however, the effect is −0.126 school years for every year that the system tracks later.

As robustness checks, model 3 was run on three subsets of countries. First, the model was run on countries excluding the Central and Eastern European countries that have reformed towards earlier tracking after the end of the Soviet era (Czech Republic, Hungary, Slovakia). Second, we focused only on countries that have reformed their tracking age upwards, so excluding unreformed countries too. Third, we excluded Scandinavian countries (Norway, Sweden, Denmark, Finland), to test whether the equalizing effect of later tracking as described previously is because of the egalitarian culture in these countries.

TABLE 4

Separate Models by Parents' Occupational Group

	Working Classes (Years) (1)	Intermediate Classes (Years) (2)	Managers and Professionals (Years) (3)
Male	.196	.229	.248
	(1.33)	(1.34)	(1.30)
Tracking age	.045	−.037	−.126**
	(1.40)	(−.99)	(−3.37)
Parents' education	1.001***	1.260***	1.878***
	(11.34)	(13.54)	(19.32)
Year of birth	.053***	.040***	.037***
	(81.56)	(54.63)	(50.59)
Country fixed effects	Yes	Yes	Yes
Country × Year of birth	Yes	Yes	Yes
Constant	9.483***	9.262***	9.660***
	(43.70)	(32.11)	(25.14)
Observations	61,150	78,192	31,000
Adjusted R^2	.263	.208	.142

NOTE.—t statistics in parentheses.
** $p < .01$.
*** $p < .001$.

As can be seen in Figure 3, all these robustness checks confirm that the advantage of children of senior managers and administrators declined after reforms to later tracking. The patterns for the other classes are very modest.

As a final analysis, the data window was limited to rather small bandwidths around the reform (5 years before and after, and 10 years before and after). We only focused on postwar birth cohorts (born between 1946–1989), and picked out one core tracking age reform for each of the fourteen countries where this was the case (Belgium, reform at birth cohort 1978; Czech Republic 1978; Denmark 1961; England and Wales 1955; Finland 1959; France 1964; Hungary 1976; Italy 1952; Latvia 1976; Norway 1955; Portugal 1955; Slovakia 1977; Sweden 1950). While even smaller bandwidths may be desired to investigate policy reform effects, typically the comprehensive reform took some years to be fully implemented. Given that we study rather short bandwidths, we add a general time trend in the socioeconomic gradients in educational attainment, but not a country-specific one. Table 5 shows the results of the bandwidth analysis. The results confirm that the inequalities by parental occupational group decline after the reform, particularly at the top of the occupational hierarchy. The size of the effects is, however, not very high; the gap between senior managers and the routine working class shrinks with 2.6 percentage points per year of tracking. For obtaining a college degree and years of education, there are more significant interaction effects, with very similar effect sizes of the interaction terms relative to the main effect.

Conclusion and Discussion

This article studied the question whether educational policy reforms to postpone the moment of tracking into different school types reduced socioeconomic gradients in educational attainment. Cross-sectional comparative research has often demonstrated that inequalities in achievement and attainment are larger in societies in which children are tracked between schools relatively early, and longitudinal single-country studies have studied the impact of reforms on inequalities as well. This article combined the two approaches and examined whether reforms to later tracking have reduced the socioeconomic gradients in educational attainment using data on 21 European countries, of which 14 had reforms in the tracking age at least once across the birth cohorts 1925–1989.

The results clearly showed that inequalities by class background reduced with reforms to later tracking. The strongest impact of the reform was that it reduced the advantage of children of senior managers and administrators. Nevertheless, the advantage of professionals was also reduced with later tracking, and the educational opportunities of the skilled working class increased. The results persisted after holding constant of the inequality-modifying effect of the
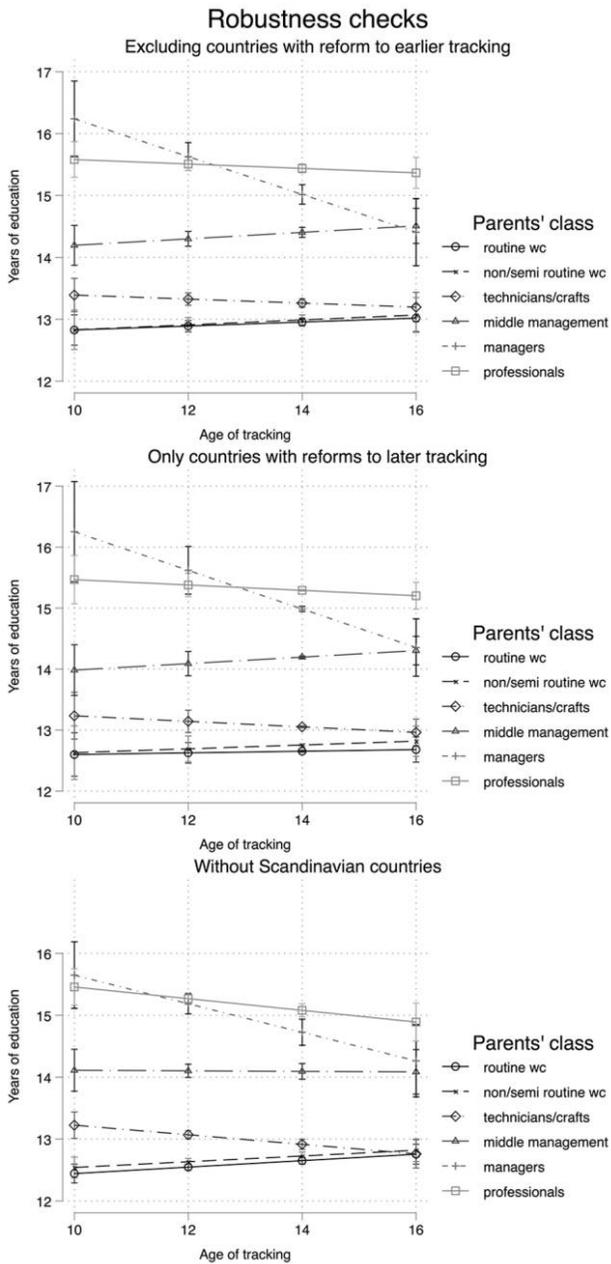
FIG. 3.—Robustness of findings for subsets of countries

political climate, after running models on subsets of countries, and after the selection of short bandwidths of cohorts around the reforms. Like in an earlier study, the influence of parental education was much less susceptible to policy reforms (Van de Werfhorst 2018). In most analyses there is no statistical association between tracking age reforms and the slope of parents' education predicting educational attainment, and in one analysis (controlling for the political climate) the interaction effect was even positive (implying larger gaps by parents' education in later selecting systems). This finding indicates that given a more egalitarian particular political climate, later tracking may in fact increase inequalities. However, given the total package of results, I would conclude that tracking age reforms do little to inequalities by parents' education.

Given that the impact of parents' education and the occupational class of professionals were not as strongly affected by reforms to later tracking than the impact of the social class of senior managers and administrators, it seems that groups that are strongly connected to the schooling system are not much affected (i.e., higher educated parents and parents with an occupation in the professions). Possibly these groups find strategies to keep their children ahead in the educational system irrespective of the age at which children are tracked. The occupational class of senior managers and administrators have a particular advantage when their children are educated in an early-selecting system, but lose some of their advantage in later selecting systems.

The reduction of SES-based inequalities with later tracking—and the smaller effects among social groups strongly attached to education—is in line with sociological theories on institutions and educational decision-making. The life course hypothesis states that children become more independent from their parents in making educational decisions at later ages (Blossfeld and Shavit 1993). While the life course hypothesis is usually tested by comparing SES gradients across educational transitions in the "Mare model" (Mare 1980), the transition approach suffers from increased homogeneity of the sample across transitions, making it hard to test the life course hypothesis against this statistical explanation (Holm and Jaeger 2011). Comparing educational systems with regard to tracking age offers an additional way to test the life course hypothesis, and our results are in line with it. Relatedly, Lucas (2001) has argued that there are structural differences in students' ability to oversee the educational future (which he calls myopia). If disadvantaged children have more difficulty to oversee the educational future, they would be disproportionately harmed in a system that tracks early (as a longer future school career must be overseen to make rational educational decisions).

Also in line with the life course hypothesis is the argument that disadvantaged children cannot show their learning potential in early selecting systems because they have been in school too short a time (Crul and Vermeulen 2003). So not only does the relationship between parents and children vary across the life course, but

TABLE 5

Models with Limited Bandwidths of Cohorts around Reforms

	BANDWIDTH 5 + 5 YEARS			BANDWIDTH 10 + 10 YEARS		
	Upper Secondary (1)	Degree Heckman Probit (2)	Years of Education (3)	Upper Secondary (4)	Degree Heckman Probit (5)	Years of Education (6)
Male	.003 (.25)	−.148** (−2.88)	−.132 (−.61)	.004 (.30)	−.157** (−3.04)	−.189 (−.89)
Parents' education	.080*** (7.50)	.326*** (9.73)	1.170*** (10.78)	.086*** (8.37)	.336*** (12.44)	1.176*** (14.84)
Tracking age	.013 (2.05)	.055** (2.69)	.152* (2.82)	.020* (2.91)	.013 (.81)	.152** (3.10)
Parents' occupational class (relative to routine working class):						
Semi-/routine working class	.250* (2.42)	.608 (1.46)	1.986* (2.20)	.219 (1.69)	.070 (.25)	1.542 (2.14)
Technicians/crafts	.280* (2.50)	1.011* (2.50)	3.013* (2.38)	.265* (2.70)	.529 (1.66)	2.917* (2.98)
Intermediate/middle management	.359* (2.44)	1.062* (2.57)	3.886** (3.56)	.410* (2.89)	.729* (2.05)	4.430** (3.25)
Senior management/administration	.479** (3.31)	2.103** (3.20)	10.899*** (6.11)	.539** (3.94)	1.519*** (3.62)	8.640*** (6.20)
Professionals	.388* (2.27)	2.110*** (4.82)	6.886** (4.00)	.419* (2.95)	1.650*** (3.60)	7.166*** (5.55)

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Parents' occupational class × tracking age:						
Semiroutine wc × tracking age	−.015	−.043	−.130	−.014	−.007	−.101
	(−2.04)	(−1.52)	(−2.06)	(−1.54)	(−.35)	(−2.08)
Techn/craft × tracking age	−.015	−.067*	−.187*	−.016*	−.035	−.186*
	(−1.99)	(−2.47)	(−2.21)	(−2.28)	(−1.61)	(−2.85)
Intermediate/middle mgt* tracking age	−.017	−.053	−.169*	−.022*	−.032	−.215*
	(−1.69)	(−1.95)	(−2.28)	(−2.26)	(−1.37)	(−2.40)
Senior mgt/admin × tracking age	−.026*	−.113*	−.620***	−.031**	−.072*	−.450***
	(−2.61)	(−2.45)	(−5.02)	(−3.38)	(−2.44)	(−4.53)
Prof × tracking age	−.019	−.102***	−.279*	−.024*	−.073*	−.315**
	(−1.67)	(−3.73)	(−2.29)	(−2.42)	(−2.45)	(−3.40)
Time to/since reform	.004	.013	.051	.007**	.020*	.101***
	(.77)	(1.30)	(1.02)	(3.34)	(2.44)	(4.40)
Parents' education × time to/since reform	Yes	Yes	Yes	Yes	Yes	Yes
Parents' occupational class × time to/since reform	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	.377**	−1.981***	8.656***	.296*	−1.364***	8.989***
	(3.69)	(−6.54)	(10.45)	(2.93)	(−6.44)	(12.08)
Observations	18,620	19,048	18,535	37,456	38,107	37,281
Adjusted R^2	.285	.274	.274	.287	.286	.286

NOTE.—t statistics in parentheses.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

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also the relationship between students and teachers/schools is dependent on the age at which students are sorted in different school trajectories. Moreover, with regard to the student-school processes, it is plausible that contemporary occupational class matters more than the educational attainment of parents, as we found. Teachers are socioeconomically biased in the track recommendations they give (Barg 2013; Timmermans et al. 2018), and it is plausible that this bias is more strongly grounded in known characteristics of parents, such as their occupation, rather than the educational level they likely have attained earlier.

If there are policy implications to be drawn from this study, it is plausible that postponing the moment of selection reduces socioeconomic gradients but will not erase them. However, the reduction of inequality was achieved by reducing the educational opportunities of "elites," particularly the children of senior managers and administrators, and improving the opportunities of the working classes. So the results demonstrated that it is not just "pulling up" the disadvantaged students but also giving up advantages by elites that creates a more equitable educational system. One may question whether reforms to later tracking are achievable if they limit the opportunities of the advantaged students (cf. Montt 2016). A major challenge seems to be how (political) elites support equitable reforms if their children would suffer from it.

What can American scholarship learn from these findings? It is important for American education scholars to be aware that tracking happens much more rigidly in some European countries than in the United States. This is reflected in larger between-school variances in educational achievement in these European countries than in the United States. (Vandenberge 2006). This does not mean that there is no segregation between schools in the US, and we know that there is tracking within schools in the American context. Between-school differences are smaller in Scandinavian countries than they are in the United States, but both have similar formal education systems with later between-school tracking. So between-school segregation (be it through residential segregation or otherwise) partly creates socioeconomic gradients in educational opportunities in similar ways as between-school tracking systems do (or did) in Europe. From the current study, we can learn that keeping children with varying learning potentials together for longer in the same school environments may reduce socioeconomic inequalities in educational attainment. To the extent that between-school segregation creates the same inequalities in the US as between-school tracking systems do in Europe, this lesson is useful for the understanding of equality of opportunity in the United States. Reducing segregation is likely to promote equality of opportunity (Reardon and Owens 2014).

Relatedly, the life course hypothesis, which is used to interpret the main finding, is of general interest to anyone studying educational inequality. Although existing research has examined this hypothesis mostly by comparing educational processes at different ages, an alternative approach to testing this

hypothesis is to look at the institutional context. What happens in contexts where families are forced to make decisions at an earlier age? From the current article, a more general hypothesis can be formulated that systems that impose earlier moments of decision-making may create larger inequalities. From that perspective it is interesting to study the transition from middle to high school in the United States. Although the comparison of eighth grade and ninth grade outcomes showed no difference between students making a transition from a middle school to a different high school and students continuing in the same school (Weiss and Bearman 2007), it is, ceteris paribus, possible that socioeconomic sorting in high schools is weaker if there is a transition compared with when there is no transition and the sorting already takes place in the middle school years.

A certain level of inequality of educational opportunity is widespread, but it is not the case that socioeconomic inequality or patterns of social mobility are the same in the whole Western world. Institutions matter. Although stratification research often focuses on social policies reducing educational inequalities by reducing inequality in parental resources such as household income (e.g., Breen and Jonsson 2007), it is important to know that educational institutions matter as well.

Appendix

TABLE A1

Correlation Matrix of Parents' Education, Parents' Occupation (in Dummy Variables and Linearly), and Educational Outcome Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Routine working class	1.00	...									
2. Semi-/routine working class	−.22	1.00	...								
3. Technicians/crafts	−.28	−.23	1.00	...							
4. Intermediate/middle management	−.28	−.23	−.30	1.00	...						
5. Senior management/administration	−.12	−.10	−.12	−.13	1.00	...					
6. Professionals	−.20	−.17	−.21	−.21	−.09	1.00	...				
7. Parents' occupational class linear	−.69	−.31	−.06	.29	.26	.69	1.00	...			
8. Parents' education	−.33	−.18	−.06	.13	.18	.39	.54	1.00	...		
9. Upper secondary	−.20	−.10	−.02	.13	.09	.15	.27	.46	1.00	...	
10. Degree (conditional on having completed upper secondary)	−.13	−.12	−.10	.05	.12	.23	.29	.22	...	1.00	...
11. Years of education	−.20	−.14	−.09	.12	.14	.27	.37	.45	.55	.63	1.00

NOTE.—All correlations are significant at $p < .001$.

Notes

1. This article concentrates on socioeconomic inequalities and not ethnic inequalities, which are also prevalent in many European societies. However, in the postwar cohorts we study, the share of ethnic minorities in Europe was very modest, as the major migration flows happened after many of the tracking age reforms. For research on ethnic inequalities in relation to the tracking age see Ruhose and Schwerdt (2016) and Van de Werfhorst and Heath (2018).

2. In robustness checks we demonstrated that the impact of father's characteristics seems more strongly affected by educational policy reforms than of mother's characteristics.

3. A model without interaction terms confirms that the overall effect of tracking age reforms is not statistically significantly different from zero.

4. I also estimated models separately with parents' education and occupational class. These models largely confirmed the main results: no significant interaction effect between tracking age and parents' education, and a reduced slope of parents' occupational class with later tracking.

References

Alexander, Karl L., Martha Cook, and Edward L. McDill. 1978. "Curriculum Tracking and Educational Stratification: Some Further Evidence." *American Sociological Review* 43 (1): 47–66.

Barg, Katherin. 2013. "The Influence of Students' Social Background and Parental Involvement on Teachers' School Track Choices: Reasons and Consequences." *European Sociological Review* 29 (3): 565–79.

Betthäuser, Bastian. 2017. "Fostering Equality of Opportunity? Compulsory Schooling Reform and Social Mobility in Germany." *European Sociological Review* 33 (5): 633–44.

Bifulco, Robert, and Helen F. Ladd. 2007. "School Choice, Racial Segregation, and Test-Score Gaps: Evidence from North Carolina's Charter School Program." *Journal of Policy Analysis and Management* 26 (1): 31–56.

Blossfeld, Hans-Peter, Sandra Buchholz, Jan Skopek, and Moris Triventi. 2016. *Models of Secondary Education and Social Inequality: An International Comparison*. Cheltenham, UK: Edward Elgar.

Blossfeld, Hans-Peter, and Yossi Shavit. 1993. "Persisting Barriers. Changes in Educational Opportunities in Thirteen Countries." In *Persistent Inequality: A Comparative Study of Educational Attainment in Thirteen Countries*, ed. Y. Shavit and H. P. Blossfeld. Boulder, CO: Westview.

Boliver, Vikki, and Adam Swift. 2011. "Do Comprehensive Schools Reduce Social Mobility? 1." *British Journal of Sociology* 62 (1): 89–110.

Borgna, Camilla, and Dalit Contini. 2014. "Migrant Achievement Penalties in Western Europe: Do Educational Systems Matter?" *European Sociological Review* 30 (5): 670–83.

Boudon, Raymond. 1974. *Education, Opportunity, and Social Inequality*. New York: Wiley.

Braga, Michela, Daniele Checchi, and Elena Meschi. 2013. "Educational Policies in a Long-Run Perspective." *Economic Policy* 28 (73): 45–100.

Breen, Richard, and Jan O. Jonsson. 2007. "Explaining Change in Social Fluidity: Educational Equalization and Educational Expansion in Twentieth-Century Sweden." *American Journal of Sociology* 112 (6): 1775–1810.

Breen, Richard, Herman G. van de Werfhorst, and Mads Meier Jaeger. 2014. "Deciding under Doubt: A Theory of Risk Aversion, Time Discounting Preferences, and Educational Decision-Making." *European Sociological Review* 30 (2): 258–70.

Brown, Giorgina, John Micklewright, Sylke V. Schnepf, and Robert Waldmann. 2007. "International Surveys of Educational Achievement: How Robust Are the Findings?" *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 170 (3): 623–46.

Brunello, Giorgio, and Daniele Checchi. 2007. "Does School Tracking Affect Equality of Opportunity? New International Evidence." *Economic Policy* 22 (52): 781–861.

Buis, Maarten L. 2010. "Inequality of Educational Outcome and Inequality of Educational Opportunity in the Netherlands during the 20th Century." PhD diss., VU University Amsterdam.

Bukodi, Erzsébet, Robert Erikson, and John H. Goldthorpe. 2014. "The Effects of Social Origins and Cognitive Ability on Educational Attainment Evidence from Britain and Sweden." *Acta Sociologica* 57 (4): 293–310.

Burger, Kaspar. 2016. "Intergenerational Transmission of Education in Europe: Do More Comprehensive Education Systems Reduce Social Gradients in Student Achievement?" *Research in Social Stratification and Mobility* 44:54–67.

Checchi, Daniele, and Herman G. van De Werfhorst. 2018. "Policies, Skills and Earnings: How Educational Inequality Affects Earnings Inequality." *Socio-Economic Review* 16 (1): 137–60.

Chmielewski, Anna K. 2014. "An International Comparison of Achievement Inequality in Within- and Between-School Tracking Systems." *American Journal of Education* 120 (3): 293–324.

Cobb-Clark, Deborah A., Mathias Sinning, and Steven Stillman. 2012. "Migrant Youths' Educational Achievement: The Role of Institutions." *The ANNALS of the American Academy of Political and Social Science* 643 (1): 18–45.

Crul, Maurice, and Hans Vermeulen. 2003. "The Second Generation in Europe." *International Migration Review* 37 (4): 965–86.

Dämmrich, Johanna, and Moris Triventi. 2018. "The Dynamics of Social Inequalities in Cognitive-Related Competencies along the Early Life Course—a Comparative Study." *International Journal of Educational Research* 88:73–84.

Dauber, Susan L., Karl L. Alexander, and Doris R. Entwisle. 1996. "Tracking and Transitions through the Middle Grades: Channeling Educational Trajectories." *Sociology of Education* 69 (4): 290–307.

Dee, Thomas S., and Brian A. Jacob. 2008. "Do High School Exit Exams Influence Educational Attainment or Labor Market Performance?" In *Standards-Based Reform and the Poverty Gap: Lessons for "No Child Left Behind,"* ed. Adam Gamoran. Washington, DC: Brookings Institution Press.

Dee, Thomas S., and Brian Jacob. 2011. "The Impact of No Child Left Behind on Student Achievement." *Journal of Policy Analysis and Management* 30 (3): 418–46.

Dronkers, Jaap, and Herman van de Werfhorst. 2016. "Meritocratisering in school-loopbanen in Nederland." In *Meritocratie. Op weg naar een nieuwe klassensamenleving?* ed. Paul De Beer and Maisha Van Pinxteren. Amsterdam: Amsterdam University Press.

European Social Survey Cumulative File, ESS 1–7. 2016. Data file edition 1.0. NSD— Norwegian Centre for Research Data, Norway—Data Archive and distributor of ESS data for ESS ERIC. doi:10.21338/NSD-ESS-CUMULATIVE.

Galindo-Rueda, Fernando, and Anna Vignoles. 2004. "The Heterogeneous Effect of Selection in Secondary Schools: Understanding the Changing Role of Ability." SSRN Scholarly Paper ID 575089. Rochester, NY: Social Science Research Network.

Gamoran, Adam. 1996. "Curriculum Standardization and Equality of Opportunity in Scottish Secondary Education: 1984–90." *Sociology of Education* 69 (1): 1–21.

Gamoran, Adam, and Robert D. Mare. 1989. "Secondary School Tracking and Educational Inequality: Compensation, Reinforcement, or Neutrality?" *American Journal of Sociology* 94 (5): 1146–83.

Giesselmann, Marco, and Alexander W. Schmidt-Catran. 2018. "Getting the within Estimator of Cross-Level Interactions in Multilevel Models with Pooled Cross-Sections: Why Country Dummies (Sometimes) Do Not Do the Job." *Sociological Methodology.* doi/10.1177/0081175018809150.

Gorard, Stephen, and Nadia Siddiqui. 2018. "Grammar Schools in England: A New Analysis of Social Segregation and Academic Outcomes." *British Journal of Sociology of Education* 39 (7): 909–24.

Griga, Dorit, and Andreas Hadjar. 2014. "Migrant Background and Higher Education Participation in Europe: The Effect of the Educational Systems." *European Sociological Review* 30 (3): 275–86.

Hallinan, Maureen T. 1994. "School Differences in Tracking Effects on Achievement." *Social Forces* 72 (3): 799–820.

Halsey, A. H., Anthony F. Heath, and John M. Ridge. 1980. *Origins and Destinations: Family, Class, and Education in Modern Britain.* Oxford: Clarendon.

Hanushek, Eric A., and Ludger Wössmann. 2006. "Does Educational Tracking Affect Performance and Inequality? Differences-in-Differences Evidence across Countries." *Economic Journal* 116 (510): C63–76.

Heisig, Jan Paul, and Heike Solga. 2015. "Secondary Education Systems and the General Skills of Less- and Intermediate-Educated Adults: A Comparison of 18 Countries." *Sociology of Education* 88 (3): 202–25.

Holm, Anders, and Mads Meier Jaeger. 2011. "Dealing with Selection Bias in Educational Transition Models: The Bivariate Probit Selection Model." *Research in Social Stratification and Mobility* 29 (3): 311–22.

Horn, Dániel. 2013. "Diverging Performances: The Detrimental Effects of Early Educational Selection on Equality of Opportunity in Hungary." *Research in Social Stratification and Mobility* 32:25–43.

Jackson, Michelle. 2013. "How Is Inequality of Opportunity Generated? The Case for Primary and Secondary Effects." In *Determined to Succeed? Performance versus Choice in Educational Attainment*, ed. Michelle Jackson. Palo Alto: Stanford University Press.

Lavrijsen, Jeroen, and Ides Nicaise. 2015. "New Empirical Evidence on the Effect of Educational Tracking on Social Inequalities in Reading Achievement." *European Educational Research Journal* 14 (3–4): 206–21.

Le Donné, Noémie. 2014. "La réforme de 1999 du système éducatif polonais Effets sur les inégalités sociales de compétences scolaires." *Revue française de sociologie* 55 (1): 127–62.

Leschinsky, Achim, and Karl Ulrich Mayer, eds. 1990. *The Comprehensive School Experiment Revisited: Evidence from Western Europe.* Frankfurt: Peter Lang.

LeTendre, Gerald K., Barbara K. Hofer, and Hidetada Shimizu. 2003. "What Is Tracking? Cultural Expectations in the United States, Germany, and Japan." *American Educational Research Journal* 40 (1): 43–89.

Lucas, Samuel R. 1999. *Tracking Inequality. Stratification and Mobility in American High Schools.* New York: Teachers College Press.

Lucas, Samuel R. 2001. "Effectively Maintained Inequality: Education Transitions, Track Mobility, and Social Background Effects." *American Journal of Sociology* 106 (6): 1642–90.

Maaz, Kai, Ulrich Trautwein, Oliver Lüdtke, and Jürgen Baumert. 2008. "Educational Transitions and Differential Learning Environments: How Explicit Between-School Tracking Contributes to Social Inequality in Educational Outcomes." *Child Development Perspectives* 2 (2): 99–106.

Mare, Robert D. 1980. "Social Background and School Continuation Decisions." *Journal of the American Statistical Association* 75 (June): 295–305.

Meghir, Costas, and Mårten Palme. 2005. "Educational Reform, Ability, and Family Background." *American Economic Review* 95 (1): 414–24.

Meschi, Elena, and Francesco Scervini. 2014. "Expansion of Schooling and Educational Inequality in Europe: The Educational Kuznets Curve Revisited." *Oxford Economic Papers* 66 (3): 660–80.

Micklewright, John, and Sylke V. Schnepf. 2007. "Inequality of Learning in Industrialized Countries." In *Inequality and Poverty Re-examined*, eds. Stephen P. Jenkins and John Micklewright. Oxford: Oxford University Press.

Montt, Guillermo. 2016. "Are Socioeconomically Integrated Schools Equally Effective for Advantaged and Disadvantaged Students?" *Comparative Education Review* 60 (4): 808–32.

Oakes, Jeannie. (1985) 2005. *Keeping Track: How Schools Structure Inequality.* New Haven, CT: Yale University Press.

Österman, Marcus. 2018. "Varieties of Education and Inequality: How the Institutions of Education and Political Economy Condition Inequality." *Socio-Economic Review* 16 (1): 113–35.

Pekkarinen, Tuomas, Roope Uusitalo, and Sari Pekkala Kerr. 2009. "School Tracking and Development of Cognitive Skills." *SSRN ELibrary.*

Pfeffer, Fabian T. 2008. "Persistent Inequality in Educational Attainment and Its Institutional Context." *European Sociological Review* 24 (5): 543–65.

Pharris-Ciurej, Nikolas, Charles Hirschman, and Joseph Willhoft. 2012. "The 9th Grade Shock and the High School Dropout Crisis." *Social Science Research* 41 (3): 709–30.

Reardon, Sean F., and Ann Owens. 2014. "60 Years After Brown: Trends and Consequences of School Segregation." *Annual Review of Sociology* 40 (1): 199–218.

Ruhose, Jens, and Guido Schwerdt. 2016. "Does Early Educational Tracking Increase Migrant-Native Achievement Gaps? Differences-in-Differences Evidence across Countries." *Economics of Education Review* 52:134–54.

Schindler, Steffen. 2016. "School Tracking, Educational Mobility and Inequality in German Secondary Education: Developments across Cohorts." *European Societies* 19 (1): 28–48.

Schmidt, William H., Nathan A. Burroughs, Pablo Zoido, and Richard T. Houang. 2015. "The Role of Schooling in Perpetuating Educational Inequality: An International Perspective." *Educational Researcher* 44 (7): 371–86.

Seki, Katsunori, and Laron K. Williams. 2014. "Updating the Party Government Data Set." *Electoral Studies* 34:270–79.

Solt, Frederick. 2009. "Standardizing the World Income Inequality Database." *Social Science Quarterly* 90 (2): 231–42.

Timmermans, Anneke C., H. de Boer, H. T. A. Amsing, and M. P. C. van der Werf. 2018. "Track Recommendation Bias: Gender, Migration Background and SES Bias over a 20-Year Period in the Dutch Context." *British Educational Research Journal* 44 (5): 847–74.

Timmermans, Anneke C., Hans Kuyper, and Greetje van der Werf. 2015. "Accurate, Inaccurate, or Biased Teacher Expectations: Do Dutch Teachers Differ in Their Expectations at the End of Primary Education?" *British Journal of Educational Psychology* 85 (4): 459–78.

Vandenberge, Vincent. 2006. "Achievement Effectiveness and Equity: The Role of Tracking, Grade Repetition and Inter-School Segregation." *Applied Economics Letters* 13 (11): 685–93.

van de Werfhorst, Herman G. 2014. "Changing Societies and Four Tasks of Schooling: Challenges for Strongly Differentiated Educational Systems." *International Review of Education*, 1–22.

van de Werfhorst, Herman G. 2018. "Early Tracking and Socioeconomic Inequality in Academic Achievement: Studying Reforms in Nine Countries." *Research in Social Stratification and Mobility* 58:22–32.

van de Werfhorst, Herman G., and Anthony Heath. 2018. "Selectivity of Migration and the Educational Disadvantages of Second-Generation Immigrants in Ten Host Societies." *European Journal of Population*, 1–32.

van de Werfhorst, Herman G., and Jonathan J. B. Mijs. 2010. "Achievement Inequality and the Institutional Structure of Educational Systems: A Comparative Perspective." *Annual Review of Sociology* 36:407–28.

Volkens, A., Lehmann, P., Matthieß, T., Merz, N., Regel, S., and Weßels, B. 2017. *The Manifesto Data Collection. Manifesto Project (MRG/CMP/MARPOR) Version 2017a*, Berlin: Wissenschaftszentrum Berlin für Sozialforschung (WZB).

Weiss, Christopher C., and Peter S. Bearman. 2007. "Fresh Starts: Reinvestigating the Effects of the Transition to High School on Student Outcomes." *American Journal of Education* 113 (3): 395–421.