EMI in Germany - Qualitative Differentiation in a Tracked Education System

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Abstract

This article discusses effectively maintained inequality considering two different examples from the Germany education system: secondary school attainment and enrolment in highly ranked universities among freshmen. In our analyses of secondary school attainment we investigate whether considering differentiation in upper secondary education leads to other conclusions than restricting the analyses to the conventional distinction between the traditional degree levels. In our analyses of university choice we investigate whether the introduction of university ranking lists has created a new qualitative dimension of inequality in the German higher education system.

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Introduction

By international comparison, Germany appears among the countries with rather pronounced inequalities in educational attainment by parental social status and class (Breen et al., 2009; Müller and Karle, 1993). Its educational system is characterized by early selecting and stratified secondary schooling (Jackson and Jonsson, 2013). We analyze the role of qualitative and quantitative dimensions of educational inequality in order to test "effectively maintained inequality" (EMI) with regard to inequality by social class background. Thereby, we assess whether and to what extent the concepts and tools suggested by the EMI literature contribute to an understanding of educational inequality in the context of a highly differentiated and "tracked" education system. We concentrate on two different examples of educational sequences, where we should expect processes of EMI to be at work. First, we consider inequality in educational attainment in the stratified secondary educational system. Secondary education can be considered as the key passage in the process of intergenerational transmission of social positions in Germany. Second, we discuss a more recent development. Although the German higher education system used to be characterized by a high degree of standardization across institutions, attempts have been made to establish more elements of qualitative differentiation. We analyze whether the ranking position of universities has developed into a qualitative dimension of social inequality in the choice of institutions among university freshmen.

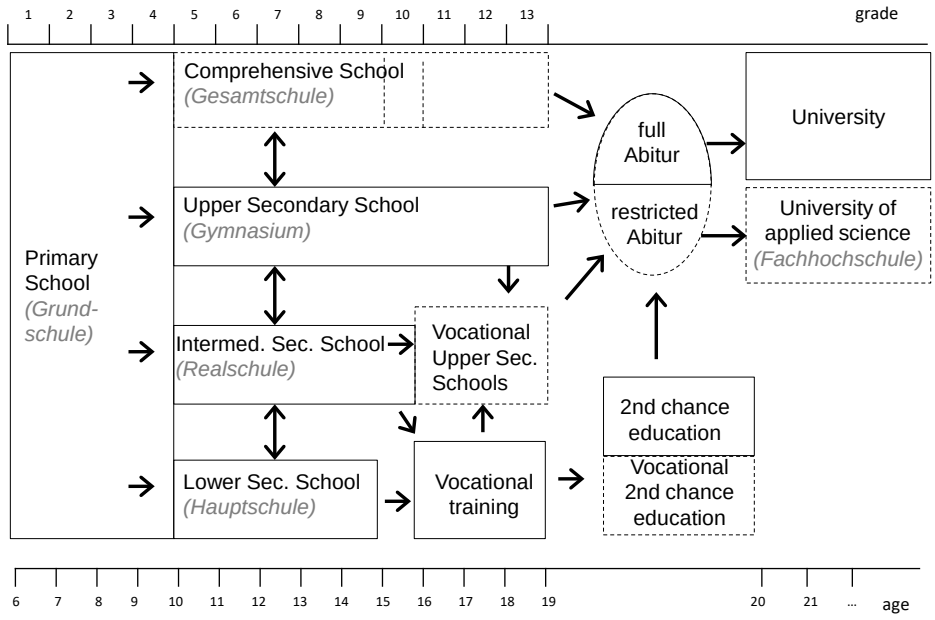
Institutional context

We aim at testing EMI drawing on Germany as a country case. Describing the German society more broadly, its welfare state is a prime example of a conservative welfare system (Esping-Andersen, 1990). The labor market is strongly segregated by occupations, which the educational system provides specific knowledge for. The German education-work-nexus has been characterized as an occupational labor market (Marsden, 1999) or a coordinated market economy (Hall and Soskice, 2001). This characterization reflects that vocational education and training programs are influenced by corporatist processes which involve the state as well as employer associations and trade unions.

Education in Germany is overwhelmingly public, in spite of a growing popularity of private schools on all educational levels. Although education is a domain governed by the federal states, it is highly standardized on the federal level. Degrees and certificates are equivalent across states. As to institutions of general education, the most remarkable feature of the German

system is early selection into distinct educational tracks.[1] After elementary school (grade 4 or 6, age 10-12), students are assigned to different secondary school types. The assignment is highly influenced by previous performance in elementary school and selects students into three main tiers of secondary schooling. The *Hauptschule* is practically oriented and has the least demanding curriculum. It ends after grade 9 with the lower secondary degree and nowadays often leads into blue-collar or unskilled jobs. The *Realschule* is somewhat more demanding and supposed to prepare students for non-academic training positions in the trade, services and administration sectors. It concludes after grade 10 with the intermediate secondary degree. The *Gymnasium* is the academically most demanding school type and prepares students for academic education. After grade 12 or 13 students can earn an upper secondary degree, which is the prerequisite for access to higher education. Besides these three institutions, some federal states have introduced comprehensive schools, where students are not separated according to aptitude but where all three degrees can be obtained within one institution.

Figure 1: The German education system



Besides this basic structure in secondary education, which often serves to describe the German school system as highly stratified and selective, various reforms have been undertaken since the 1970s that were intended to make initial tracking decisions after elementary education less deterministic for the final educational attainment. In many cases, the Hauptschule started to

[1] Since much literature on tracking is concerned with separate programs within schools, it should be stressed that tracking in the German context refers to a separation of students into different institutions. The different school types are usually independent organizations which are often located in different places.

offer an additional 10th grade to enable their top students to obtain an intermediate secondary degree. Graduates from the Hauptschule can also obtain an intermediate secondary degree through various vocational training programs. For students with an intermediate secondary degree, options for earning an upper secondary degree were extended as well. First, conditional on performance-related requirements, entry into the upper grades of the Gymnasium was facilitated. Second, vocational upper secondary schools were established, where students with an intermediate degree can obtain the upper secondary degree in two-to-three year programs. Third, the two-to-three year programs of second-chance upper secondary education for students who left the educational system for work or completed vocational training programs were extended and amended by programs which integrate vocational training with general education. Another innovation of the 1970s was the differentiation of the upper secondary degree, which was a consequence of reforms in higher education. Universities of applied sciences (Fachhochschulen) have been established as vocationally oriented institutions of higher education aside the traditional universities. While the upper secondary degree (Abitur) remains the access certificate for universities, a restricted upper secondary degree (*Fachhochschulreife*) was introduced as entrance requirement for universities of applied science. It can be obtained by leaving the traditional Gymnasium without examination one year before the Abitur exams or through a regular exam after two-year programs at vocational upper secondary schools.

The German higher education system is a binary type system (Arum et al., 2007). Whereas the universities are traditionally academically oriented, the universities of applied sciences are much closer to applied and vocationally oriented education. Although traditional universities are considered more prestigious than the universities of applied sciences, there has never been a clear prestige hierarchy within institutional types. Only recently (since the 1990s) several periodicals started to evaluate universities within specific fields of study. The results are published on a regular basis in nation-wide print-media as a guideline for upper secondary graduates when choosing a university. It was first published in 1998 in the periodical "Stern" and in a magazine for consumer product quality assessment ("Stiftung Warentest").[2] This ranking reached a broader public and continues to appear for varying fields of study annually. Other newspapers and periodicals followed and published their own rankings, in particular for the field of business and economics (cf. Table A1 in the appendix). To date, we know that there are a number of qualitative differences within higher education in Germany, such as regarding fields of study (Reimer and Pollak, 2010) or the individual sequencing and combining vocational and higher education (Jacob et al., 2013; Weiss and Steininger, 2013). For EMI, the

[2] www.che-ranking.de/methodenwiki/index.php/FAQ

question arises whether the new opportunity for qualitative differentiation is used by privileged groups and leads to new inequalities.

EMI in the German educational system

A system as described above poses challenges for testing EMI. Since we are going to apply the formal test of EMI as introduced by Lucas and Byrne (cite introductory paper), it might be appropriate to discuss some specific issues first that arise in the German educational system. As we shall see, these issues might influence the outcome of the EMI test and render results that are in opposition to a conventional understanding of inequality.

The theory of EMI "posits that socioeconomically advantaged actors secure for themselves and their children some degree of advantage wherever advantages are commonly possible" (Lucas, 2001: 1652). Accordingly, advantages can be achieved via quantitative or qualitative distinction or a combination of both. With regard to educational options or outcomes, the quantitative dimension is represented by educational levels, while the qualitative dimension can cover various dimensions of differentiation within educational levels, such as field of study or institutional prestige. In order to evaluate whether EMI prevails, Lucas (2009: 485) suggests to predict the outcome of interest – which is supposed to be categorical – for theoretically focal persons. In our case, these are persons who have similar characteristics but differ with respect to social background. If the prediction of the modal category in the outcome differs according to social origin, this would indicate the presence of EMI.

One important issue to consider with regard to the scope conditions is the number and delimitation of categories of the dependent variable. Whether or not the modal category of the outcome differs according to socioeconomic background can be influenced by collapsing and splitting categories as well as by shifting boundaries between them. As can be taken from Figure 1, German secondary education is quite fragmented and can be further differentiated both in quantitative and qualitative terms. The particular way in which this is done is a matter of choice. For example, consider the different degree levels that can be attained in German secondary education: lower, intermediate and upper secondary degrees. This might be associated with EMI when the intermediate degree is the modal category for one group and the upper secondary degree is the modal category for another group. Now imagine we consider restricted and full upper secondary degrees as different educational levels. It could be the case that this mere differentiation of categories might turn the intermediate degree into the modal category for both groups, even if inequalities are by and large maintained throughout the entire system.

Another challenge to testing EMI in Germany is that the distinction between quantitative and qualitative differentiation is less clear than for the unitary US high school system. Lucas (2001) offers the concept of collinearity as a possible solution: If a qualitative differentiation (type of educational program) is collinear with a quantitative differentiation (level of educational outcome), then it is fair to consider the qualitative dimension as quantitative. This applies to secondary school systems that pursue between-school tracking, where the choice of tracks already predetermines which educational level can be attained. As we shall see, a solution is less obvious if tracks and education outcomes are not collinear but only correlated. Qualitative differentiation is then likely to take place within sub-systems, which alter the sizes of categories and hence technically impact findings on EMI for the overall system.

Given the strong segmentation of the German educational system we picked two examples for which recent developments may suggest the prevalence of an EMI-pattern. First, we consider educational attainment in the tracked secondary school system, representing a stable component of the German educational system, which, however, became more differentiated during the past decades. Our analysis addresses the question whether a more differentiated conception of educational outcomes and pathways uncovers new dimensions of inequality in addition to the common distinction of educational levels.

Our second analysis turns to a recent development in higher education. It is a well-established finding that access to higher education is socially selective (Mayer et al., 2007), representing a quantitative dimension of inequality. We direct attention to qualitative differentiation within higher education by analyzing whether the rise of university ranking lists is reflected in socially selective enrolment in higher education institutions of varying reputation.

About the first of our two questions, there exists an extensive literature on social inequality in German secondary education. The findings indicate pronounced inequalities both in track allocation at the beginning of secondary schooling (e.g. Neugebauer et al., 2013) and with respect to degree attainment at the end of secondary education (Klein et al., 2009; Mayer et al., 2007).Many previous studies considered inequalities at the transition as collinear with inequalities in attainment (cf. Blossfeld, 1993). This was justified with rather low levels of track mobility after track placement. However, empirical evidence has shown that mobility between tracks matters (Hillmert and Jacob, 2010; Jacob and Tieben, 2009). Structural changes in secondary education as described above furthermore suggest that mobility between tracks and institutions increased, which means that tracks and degrees are no longer collinear, but only correlated. Furthermore, the differentiation of educational pathways created new qualitative (and quantitative) differences within the traditional three levels of (lower, intermediate and

upper) secondary education. The most obvious changes relate to differentiation within upper secondary education. First, a new hierarchical (quantitative) distinction appears among upper secondary degrees: restricted vs. full. Second, a new qualitative distinction appears as well: traditional general-education-type schools (Gymnasium) vs. vocational institutions or second chance education.

In order to make sense of socially selective distributions over these educational options, we need an idea of why some of them can be considered more advantageous than others. Obviously, a full upper secondary degree is worth more than a restricted upper secondary degree as it provides access to all post-secondary educational institutions, while the latter excludes the universities as an option. Apart from that, it signals more (years of) education than the restricted degree. In contrast, it is less obvious why an upper secondary degree obtained at the Gymnasium shall be more advantageous than an equivalent degree obtained at a vocational school. First, the Gymnasium certainly is the more prestigious school, which signals traditional humanistic values of general education, while vocational schools adhere to a narrower vocational curriculum. Second, there is evidence that students at vocational upper secondary schools obtain fewer competencies on key subjects than students at the Gymnasium (Köller and Trautwein, 2004; Watermann et al., 2004). We shall expect then that socioeconomically advantaged students not only reach the upper secondary level more often than students of disadvantaged background, but also obtain their degrees more often at the Gymnasium and have better chances to earn a full degree instead of a restricted one.

For our second analysis on higher education enrolment we cannot refer to previous studies to find out whether there are consequences for social inequality. To date, we do not know of any empirical study that evaluates the labor market benefits of studying in a highly ranked institution. However, for EMI it should be enough if a certain choice is perceived as advantageous. In this sense, introduction of institutional hierarchies within fields of study clearly creates a dimension of qualitative differentiation and can be seen as a viable test case for EMI.

Data, variables and models

Data

For our analyses of secondary educational attainment, we draw on data collected by the Federal Institute for Vocational Education and Training (BIBB), the BIBB Transition Survey 2006 (Friedrich et al., 2010). This random sample of households with persons born between 1982 and 1988 was collected in 2006. The dataset contains indicators of social origin and detailed

longitudinal information on educational careers of 7,230 individuals. We exclude all respondents younger than the age of 20 in order to avoid cases with incomplete secondary education. After listwise deletion of cases with missing values, the remaining working sample comprises 3.332 individuals.

In order to describe inequality in university choice we analyze four waves of a survey of freshmen, provided by the German Centre for Research on Higher Education and Science Studies (DZHW). They were conducted in the years 1993, 1996, 2000 and 2005 as self-administered postal surveys. From these surveys we extracted all students enrolled in business- or economics programs. We chose to concentrate on these fields, since these are the fields of study where we expect university rankings to be most relevant both for the choice of institution and as a labor market signal. We can use a sample of 2816 cases. Through a university identifier variable we were able to add the ranking scores from the CHE-Ranking to the dataset.

Variables

The central independent variable, social origin, is defined as the highest occupational class out of both parents according to the EGP-scheme (Erikson et al., 1979). In order to simplify the calculation of predicted probabilities and due to limited sample sizes we group the class origin variable into three categories: salariat classes (EGP I+II), intermediate classes (EGP IIIa+IV+V) and the working classes (EGP IIIb+VI+VII).

For secondary schooling, our dependent variable is the highest secondary degree ever attained. In order to investigate EMI processes, we use two different versions of that variable. An undifferentiated version with four categories: no, lower, intermediate and upper secondary degree, and a differentiated version with six categories: no, lower, intermediate, restricted upper secondary, full upper secondary obtained at vocational schools, and full upper secondary degree obtained at the Gymnasium. In our models we include a set of dichotomous control variables: Gender, migration background (at least one parent born abroad), East- or West Germany. The dataset lacks a measure of ability or competences. Instead, we control for the type of first secondary school, which is assigned partly based on school marks. We distinguish the four school types shown in Figure 1.

In the analyses of university choice we consider three different outcome-variables which were used as separate dimensions to rank institutions: First, the students/staff ratio, which is supposed to be an indicator for the quality of supervision; second, the rating of students who were asked to evaluate the quality of their university in a survey; third, the rating as top university by professors working in the field, by high yields from third party money or their publication

record – while all of the three usually coincide. As control variables, we include the grade point average (GPA) of the last school leaving exam. The GPA is centered to the mean within federal states. The original German scale (from 1.0=excellent to 6.0=unsatisfactory) is reversed, i.e. higher numbers indicate a better GPA. We also control for sex and residence in East or West Germany, for the school track in which the student achieved qualification to enter higher education and whether this qualification is the restricted upper secondary degree. It is important to note that there are even highly ranked universities of applied sciences, although they are traditionally regarded as lower tier. We include into the model whether the student visits a university of applied science or a full university and whether the program is closer to economics or to business administration. As we are interested in the choice of highly ranked programs, we have to make sure that social origin effects do not only emerge from other motives which correlate with the ranking. Therefore, we include three variables from an item-battery about the motives for choosing the institution of the present enrolment. These ask whether the choice was motivated by good infrastructure of the institution, by cheap living conditions, and by restrictions due to rejections at other universities. The items are measured on a scale from 1 (very important) to 5 (unimportant). Since it is also possible that students even have to change the field of study because they cannot meet the requirements for the numerus clauses in the entire field of their first choice, we added two additional measures: the question whether they are enrolled in their most preferred field (categories: yes/no) and whether their present institution was their first preference (categories: yes, no, hadn´t any preference).

Statistical Models

In the analyses of secondary school attainment, we employ multinomial logistic regressions. As we expect the coefficients of the initially attended secondary school track to be different for students of differing social origins, we model interactions between these two independent variables. Given the problems associated to using interaction terms in non-linear models (Ai and Norton, 2003), we include a set of dummy variables indicating combinations of these two variables.

In the analyses of university choice, we employ ordered and binary logistic regressions. The ordered models refer to the ranking results for student rating and the student/staff ration, the binary models are used to analyze whether the school was a top “scientific top-institution” according to faculty-ratings, third party money or publication record. For comparisons over the different years we estimate linear probability models.

In order to conduct the formal test of EMI we derive predicted probabilities of the outcomes for focal persons. This means that we condition the predictions on predefined combinations of values on the independent variables but let the variable indicating social origin vary. If the predicted modal categories of the dependent variable differ across social origin, this would indicate EMI.

Results

EMI in secondary education

Table 1 displays a cross-tabulation between social origin and highest secondary degree. The upper secondary degree category displays both the undifferentiated attainment rates and the differentiated categories. Considering the undifferentiated version first, as one would expect, there is a clear association between social origin and attainment. Salariat classes are overrepresented and working classes are underrepresented in the upper secondary degree category, while it is the other way around in the lower secondary degree category. Applying the EMI evaluation criteria to this table reveals that the upper secondary degree is the modal category for the salariat and intermediate classes, while the intermediate degree is the modal category for the working classes. These results indicate some equalization over the years of expansion in upper secondary education. Analyses of older data have already revealed similar results for the salariat, but even lower attainment rates for the other classes of origin. Using data from the German Life History Study (Mayer, 2006), Weiss (2013) reports that 65.3 per cent of children from salariat-origins attain an upper secondary degree, and only 38.3 per cent of the intermediate and 20.2 per cent of the working class children respectively. In addition, we replicated tables 1 and 2 using data from the National Educational Panel Study (NEPS) (Blossfeld et al., 2011) for the birth cohorts 1977-1988. For table 1 we found very similar results, except for a somewhat higher share of intermediate class children in the restricted degrees, and a lower share of this group in full Gymnasium degrees (restricted: 9.3 per cent; full voc: 5.7 per cent; full Gymn.: 29.6; N: 1785)[3]. Hence, we would conclude that in total we observe EMI in German secondary education.

Table 1: Secondary attainment rates, by social origin

EGP class of origin	highest secondary degree type							N
	none	lower	intermediate	upper	upper secondary differentiated			
					restricted	full voc.	full Gymn.	
Salariat	1.4	5.9	21.3	71.4	8.7	5.6	57.1	1,114

[3] Full results of these analyses are available from the authors upon request from the authors.

Intermediate	2.5	12.3	31.7	53.5	7.6	5.2	40.7	641
Working	2.9	23.3	38.1	35.7	8.7	4.8	22.3	1,577
Total	2.3	15.4	31.2	51.1	8.5	5.1	37.5	3,332

Source: BIBB Transition Survey 2006, own calculations.

By considering the differentiated version of the upper secondary degree instead of the undifferentiated category, the full upper secondary degree obtained at the Gymnasium turns out to be the modal category for salariat and intermediate classes, while the intermediate degree remains the modal category for the working classes.

In the following analyses (Table 2), we repeat the same exercise for focal persons. This means that we present predicted probabilities from a multinomial logistic regression model (cf. Table A2 in the appendix) for persons that only differ according to social origin. Throughout the various focal persons that we display in the table, we condition the predictions on Western Germans without migration background. The upper panel of the table contains the predicted values for males, the lower panel the values for females, respectively. As a further variation, we condition the predictions on the different school types that have been attended right after the transition into secondary education. The school type is indicated in the first column of the table[4].

[4] We also replicated table 2 using the NEPS data. However, the breakdown into subcategories resulted in very small number of cases for many categories. Still, we could broadly confirm the overall picture. In particular, we can replicate the larger categories, while there are more (but unreliable) deviations in some of the rare combinations.

Table 2: Predicted secondary attainment rates for focal persons

MALE		highest secondary degree type						
first sec. school		none	lower	intermed.	upper	upper secondary differentiated		
						restricted	full voc.	full Gymn.
lower secondary	Salariat	4.1	45.6	31.1	19.3	13.2	2.6	3.5
	Intermediate	5.9	63.1	26.2	4.8	3.5	0.0	1.3
	Working	3.4	66.2	23.1	7.3	4.0	2.2	1.1
intermed. secondary	Salariat	1.3	8.2	47.7	42.7	17.5	15.5	9.7
	Intermediate	0.0	5.4	60.0	34.7	15.3	12.2	7.2
	Working	1.6	11.9	60.9	25.6	12.5	8.9	4.2
upper secondary	Salariat	1.5	1.1	11.3	86.2	7.2	3.1	75.9
	Intermediate	4.3	1.1	15.7	79.0	5.1	3.0	70.9
	Working	4.0	1.9	21.7	72.3	9.7	2.3	60.3
compreh.	Salariat	1.3	7.8	36.5	54.5	10.9	9.0	34.6
	Intermediate	2.1	24.7	30.3	42.9	12.4	3.9	26.6
	Working	4.1	32.5	29.1	34.4	13.8	4.4	16.2

FEMALE		highest secondary degree type						
first sec. school		none	lower	intermed.	upper	upper secondary differentiated		
						restricted	full voc.	full Gymn.
lower secondary	Salariat	3.0	33.6	37.5	25.9	15.2	3.8	6.9
	Intermediate	4.8	52.3	35.5	7.4	4.6	0.0	2.8
	Working	2.8	54.8	31.3	11.1	5.2	3.6	2.3
intermed. secondary	Salariat	0.8	4.8	45.6	48.9	15.9	17.9	15.1
	Intermediate	0.0	3.2	57.6	39.3	14.0	14.2	11.1
	Working	1.0	7.4	61.8	29.9	12.1	10.9	6.9
upper secondary	Salariat	0.6	0.4	7.7	88.0	4.7	2.6	84.0
	Intermediate	1.8	0.5	11.0	86.7	3.4	2.6	80.7
	Working	1.8	0.9	16.1	81.4	6.9	2.1	72.4
compreh.	Salariat	0.7	4.0	30.6	64.8	8.7	9.1	47.0
	Intermediate	1.2	14.2	28.5	56.1	11.1	4.4	40.6
	Working	2.6	20.7	30.3	46.6	13.7	5.6	27.3

Source: BIBB Transition Survey 2006, own calculations.

The first section of the table contains predicted probabilities of final secondary school attainment for male students in West Germany without migration background who have started secondary education in a lower secondary school (Hauptschule). Although there is quite some variation in the attainment rates across social origin, the lower secondary degree is the modal category for all three socioeconomic groups. Hence, for this focal group, we do not find EMI according to the EMI evaluation criterion. The same picture emerges in the next section of the table: For students initially attending intermediate school the intermediate secondary degree is the modal category in secondary attainment irrespective of social origin – although the distributions over degrees do vary. For male students who started in upper secondary school (Gymnasium), the modal category of secondary attainment is the upper secondary degree, with predicted probabilities between 72 and 86 percent, depending on social origin. By considering

the differentiated instead of the undifferentiated version of the upper secondary degree, the full degree obtained at the Gymnasium appears at the modal category, with predicted probabilities between 60 and 76 percent. Again, despite some variation in the attainment rates, the evaluation criterion does not indicate EMI in its strong form, neither in the undifferentiated nor in the differentiated version. Finally, for male students who initially attended a comprehensive school, the pattern is quite similar as for those who started in the Gymnasium, except that predicted probabilities of upper secondary degrees are somewhat lower.

Conditioning the predictions on female students in the lower panel of the table yields quite similar patterns – with two exceptions. First, for those who started secondary education at an intermediate secondary school (Realschule), the modal category of secondary attainment varies across social origin in the undifferentiated version. While for salariat class girls the modal category is the upper secondary degree, it is the intermediate degree for intermediate and working class girls. Applying the differentiated version of the upper secondary degree would, however, shift the modal category to the intermediate degree for salariat class girls as well. Second, for those girls who initially attended a comprehensive school, the undifferentiated version of the dependent variable indicates the upper secondary degree as modal category. By applying the differentiated version, the modal category would shift to the full degree obtained at the Gymnasium for salariat or intermediate class girls and to the intermediate degree for working class girls. Hence, the test based on the differentiated version would suggest EMI to be at work, while the undifferentiated version would not.

In a final analysis of secondary school attainment, we condition our sample on a specific group of students: We only consider students that have graduated with an intermediate degree from the intermediate school (Realschule). The Realschule does not provide any upper secondary degree by herself. But graduates with a certain grade point average are entitled to continue their education career in schools with an upper secondary track. As the dataset includes grade point averages for each secondary degree that has been attained, this enables us to partial out potential EMI processes in educational decisions by holding performance constant.

Table 3: Predicted probabilities of highest secondary attainment, Realschule-graduates only

		highest secondary degree type				
		intermediate	upper	upper secondary differentiated		
				restricted	full vocational	full Gymnasium
Male	Salariat	40.1	59.9	22.1	22.1	15.7
	Intermediate	51.2	48.8	14.5	21.8	12.5
	Working	59.2	41.8	14.9	17.0	8.9
Female	Salariat	43.1	56.9	21.4	23.2	12.3
	Intermediate	50.3	49.7	18.5	18.3	13.0
	Working	60.7	39.3	17.3	15.9	6.1

Source: BIBB Transition Survey 2006, own calculations, predicted probabilities held constant on a GPA of 2.0 (good)

Table 3 depicts predicted probabilities from a multinomial logistic regression identical to the one above, but conditioned on the subsample of intermediate school graduates and in addition controlling for grade point average of the school leaving certificate (cf. Table A3 in the appendix). The predictions are conditioned on Western German students without migration background with a grade point average of 2.0 on the German grading scale, which implies that they are formally entitled to continue their educational career in upper secondary education. If we consider the undifferentiated version of the dependent variable in the prediction for male students, the upper secondary degree is the modal category in final secondary attainment for students with salariat class background, while the intermediate degree is the modal category for the other two classes. Since performance is held constant, this reflects differences in choice. Applying the differentiated version of the upper secondary degree turns the intermediate degree into the modal category for all classes – even though the shares in the different degree categories differ across social background. The results are essentially the same for female students.

To sum up, our analyses of secondary educational attainment have shown that when we apply the modus-based evaluation criteria of EMI, we find a disadvantage of working class students in the total population (Table 1). If we consider focal persons instead, we do not find a single instance of EMI among the male students. Only within the subsample of graduates from the Realschule, we do find an indication of choice-based EMI. Among the female students, it depends on the degree of differentiation of the dependent variable whether EMI appears in two out of four focal group constellations that we have considered. If, in contrast to the modus-based evaluation criterion, we would pursue a conventional consideration of unequal distributions of predicted probabilities, we would however find social inequality in secondary school attainment in all instances.

Qualitative differentiation in attendance of highly ranked universities

As described above, we refer to three dimensions of the CHE-ranking. The main results are presented in Table 4 and are based on the waves 2000 and 2005, i.e. those waves in which rankings already existed. In the first two columns we see that we cannot reject the null-hypothesis and have to assume that social origin is not related with entering universities that are highly ranked in the students/staff-ratio and the students rating. However, the models on the most exclusive indicators (scientific standing according to professor-rating, third party money or publication record) in the third column show that students from working classes are significantly less often enrolled in these top institutions. We assume that this indicator measures at least vaguely the academic excellence of the institution or its standing among recruiters[5]. The student/staff-ratio can result from low capacity utilization rather than excellent supervision. Student's ratings can be biased as well, since students have an interest to give their institution a good rating. And even if they are honest, most of them have not seen many other institutions that they can use for comparison.

[5] The high consistency of this dimemsion with a ranking published by the "Wirtschaftswoche" relying on a survey among recruiters suggests that the measure is related to labor market outcomes as well (see Wirtschaftswoche, September 2 1999: "Die Favoriten der Unternehmen. Die Qualität der Fakultäten in der Einschätzung von Personalverantwortlichen." Issue 36/99.

Table 4: (Ordered) logit models on ranking results, economics and business freshmen 2000 and 2005

Logit model coefficients	Student/staff-ratio (ordered logit)	Students rating (ordered logit)	Top-university (binary logit)
Class of Origin			
Salariat	*Ref.*	*Ref.*	*Ref.*
Intermediate	0.01	0.08	-0.64**
Working	0.29+	0.30+	-0.53*
Sex: male	-0.11	-0.08	-0.08
School leaving exam (Hochschulreife)			
Years passed since graduation	0.11*	0.12*	0,02
Grade point average	0.00	-0.2	0.01
Fachhochschulreife (limited entrance to higher education, ref.: Abitur)	0.03	0.14	-0.18
Not graduated from general Gymnasium	0.22	0.28*	0.08
Reason for choosing this university			
good infrastructure	0.21**	0.25*	0.02
low price living conditions	-0.00	-0.11*	0.05
numerus clausus	-0.07	-0.09+	0.04
Study-intentions matches with studies	-0.01	-0.08	0.23
Preferred university			
no preference	*Ref.*	*Ref.*	*Ref.*
Yes	-0.27	-0.18	0.43
No	-0.31	-0.28	0.32
Business administration (Ref.: Economics)	0.68**	0.56**	-0.62*
Studies at university (Ref.: Fachhochschule)	-1.08*	-0.34	1.39
N	1885	1885	1885
Cut points			
cut 1	-1.80	-0.76	
cut 2	0.52	0.38	
Pseudo R^2	0.08	0.06	0.23

Source: "HIS/DZHW-Studienanfängerbefragung" 2000 and 2005, own calculations
Federal state of university entrance qualification kept constant, standard errors clustered by university.
+ p<.10; * p<.05; ** p<.01

Hence, it seems that the salariat class students distinct themselves by using the most reliable information from the rankings. Therefore, and due to restriction in space, we will limit all further analyses to this indicator. What could clearly be questioned is whether the choice of these universities is indeed a product of the rankings, or if higher class kids have always had enough information about university quality and would have ended up in these institutions anyhow. If this is the case, more transparency on university quality could even help the lower classes offspring to choose institutions of higher prestige. Therefore, we compare the effects of the first ranking issued in 1998 over time. In order to arrive there, we assign the ranking result from 1998 to each institution and then run the same model as above year by year (Table 5).

Table 5: linear probability models on entering a university with top-rating in 1998, comparison over time (covariates identical with Table 4)

Class of Origin	1993	1996	2000	2005

Salariat	*Ref.*	*Ref.*	*Ref.*	*Ref.*
Intermediate	0.03	-0.03	-0.08**	-0.06**
Working	0.00	-0.05	-0.08**	-0.10**

Source: "HIS/DZHW-Studienanfängerbefragung" 1993, 1996, 2000 and 2005, own calculations

Indeed, the results show a clear pattern. In 1993 we do not find class effects on the probability of studying at a top institution. There are already small effects in 1996, which is a sign that the introduction could be only one factor within a broader debate on university quality that lead to new stratification between institutions. After the introduction of rankings in 1998, class effects clearly intensify and are statistically significant. In 2000, the average difference between the lower or intermediate classes and the upper classes arrives at 8 percentage points, keeping all other model variables constant. The result remains stable and is by and large confirmed for the 2005 cohort. In order to illustrate the scope of these effects further and test EMI, we predict the probabilities of entering a top institution for a focal person and let the values vary by class of origin, as shown in Table 6.

Table 6: Predicted probabilities of entering a top-rated HE institution

Class of Origin	1993	1996	2000	2005
Salariat	0.46	0.52	0.46	0.56
Intermediate	0.52	0.43	0.30	0.36
Working	0.47	0.33	0.31	0.17

Source: "HIS/DZHW-Studienanfängerbefragung" 1993, 1996, 2000 and 2005, own calculations.
Male student, full eligibility for higher education (Abitur), academic track in secondary school, business program in full university, studying in preferred program. Other variables (including GPA) on sample mean.

The resulting probabilities show that we would e.g. in 2000 expect that 46 percent of the salariat class students enter a top university, in 2005 even 56 percent. Among the working classes on the contrary, only 31 per cent of young adults with the attributes of our ideal case enter a top institution, and this number even drops to 17 per cent in 2005.

Discussion and conclusion

In this article we studied two exemplary situations in the German educational system, in which we expected the emergence of effectively maintained inequality: secondary educational attainment and the choice of highly ranked universities among university freshmen.

The German secondary school system features strong differentiation of attainment levels, with the basic, traditional distinction into lower, intermediate and upper secondary degrees. A consideration of the gross association between social origins and attainment has revealed a quantitative EMI pattern according to the modus-based evaluation criterion. We argued that upper secondary schooling differentiates even further: on a quantitative dimension concerning

restricted and full degrees and on a qualitative dimension related to vocational or general degrees. For the gross association this does not alter our conclusion. But if we consider focal persons, we find some instances when a more differentiated conception of the dependent variable leads us to revoke our finding of EMI. This is counter-intuitive since the consideration of qualitative aspects in addition to quantitative aspects is supposed to uncover formerly hidden aspects of inequality. In our opinion this is a consequence of applying the rather strict modus-based evaluation criterion of EMI to a (highly fragmented) context where qualitative differentiation takes place within a (quantitative) educational level that captures only a part of the system. If we instead consider the social class-specific distributions across the differentiated categories of education attainment, we in fact find quite pronounced inequalities. For this reason, we are generally rather hesitant to conclude that our analyses of focal persons provide evidence against the existence of EMI in German secondary education.

Another reason why we hardly find differences in modal categories across social classes is that we have to condition on initial track placement when we construct our focal persons. Even if school tracks are not collinear with attainment, they are highly correlated. In consequence, the modal categories cluster strongly at specific outcomes as soon as we condition on initial school track. In contrast, when we consider the unconditional attainment rates in the gross associations, we do find differences in modal categories.

In our second analysis, we studied the beginning differentiation of higher education institutions through the introduction of university ranking lists. We expected that one consequence of this development would be the emergence of a new qualitative dimension of inequalities manifested in the choice of highly ranked universities. We indeed find new inequalities in the assignment to highly ranked institutions – however only if we look at the top-rated universities by scientific quality indicators of faculty-recommendations. Other dimensions of the ranking are irrelevant. As we observe a slight development towards this pattern even before to introduction of ranking lists, we suspect that the rankings are just a part of a broader process of differentiation in German higher education and the societal construction of academic excellence. This process continued with the federal “excellence initiative” which after 2006 named several universities as elite institutions and equipped them with additional funding for research or doctoral programs. A restriction of our study is certainly that we are unable to observe all universities or a broader range of fields of study. Particularly problematic is that the university that ranked first or second in all rankings in the economic sciences is not in our micro-data. Therefore, we might miss a part of the students whose choice was driven by rankings, which might lead to an underestimation of inequalities. Yet we find a pattern of EMI: in 2005 the modal category for

our ideal-typical example is to visit a top ranked institution among the upper class students, and to visit a low ranked institution for the lower class students. However, much more important than the discovery of EMI in this instance is the developmental aspect entailed in the EMI concept. One of the strengths of the concept is that it directs attention to changes in the way social inequalities are transmitted. Our analyses have shown that the introduction of a new dimension of differentiation can quite swiftly translate into a new line of social distinction – and we might just have documented the beginning of a process.

When introducing the German education system, we already discussed challenges for the adaption of the EMI framework to the German case. As a suggestion for a further discussion of the concept, we would like to point at two additional issues that we encountered when conceptually transferring the concept to a tracked education system. First, the wording of the expression "socioeconomically advantaged actors secure for themselves and their children some degree of advantage" suggests that it is presumed that inequality exclusively is determined by the action of the privileged group. But deviating modal categories in the outcome variable can also be the result of the disadvantaged group's behavior. Thus, comparing modal categories is not necessarily a test of the underlying mechanisms that are generating the observed inequalities. In order to make more informed and precise statements about underlying social mechanisms, we would very much welcome an extended version of EMI that is complemented by a theory of action. Second, the hypothesis that qualitative inequalities secure advantages for socioeconomically advantaged actors can only be tested empirically if we have an idea about the advantages that are connected to qualitative categories. In other words: For evaluating the consequences of qualitative differentiation for intergenerational mobility, we also have to explain why some programs are more beneficial than others. Hence, we need a hierarchical conception of the consequences of qualitative differentiation, which could probability only be developed by more precise empirical research on the labor market outcomes of education.

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Online-Appendix

Table A1: University rankings in the German higher education system in the 1990s, overview

Ranking (published by)	First published, continuing...	Fields of study	Methodology
„Stern"-Ranking	**1993**, published once	14 subjects, incl. bussiness and economics	Interviews with professors
„Capital"-Ranking	**1997**, published once	Bussiness	Interviews with recruiters and rating by final GPA in university
„Focus"-Ranking	**1997**, repeated irregularly	Now 20 fields, Buss. Admin and Economics from the beginning.	Interviews: recruiters and scientists
CHE-Ranking (first „Stiftung Warentest" and „Stern", later „Die Zeit")	**1998**, annually for alternating fields of study	Started with limited number of fields (incl. business and economics), now 34 different fields of studies.	Interviews: students and professors, additional statistics (e.g. publications)
„Manager Magazin"-Ranking	**1998**	Bussiness and economics	Interviews with company representatives
„Wirtschafts-woche"-Ranking	**1999**, annually	Bussiness, engineering, law, computer science.	Interviews with recruiters

(Sources: CAPITAL, 1997; Gronwald & Wöhrle, 1998; Hornbostel & Daniel, 1995; Kriz, 1995; Ott, 1999; SPIEGEL, 1989)

Table A2: Multinomial logistic regression of highest secondary school attainment

		Full upper secondary at Gymnasium (reference) vs.				
		No degree	Lower secondary	Intermed. secondary	Restricted upper	Full upper vocational
Interactions: initial school and EGP class						
Lower secondary	Working (ref.)					
	Intermediate	0.34	-0.24	-0.07	-0.32	-14.81
		(0.94)	(0.82)	(0.83)	(0.97)	(895.26)
	Salariat	-1.04	-1.6	-0.91	-0.02	-1.06
		(0.81)	(0.61)	(0.62)	(0.68)	(0.87)
Intermediate	Working	-2.17	-3.10	-0.41	-0.24	0.01
		(0.60)	(0.45)	(0.43)	(0.49)	(0.53)
	Intermediate	-16.12	-4.43	-0.96	-0.58	-0.20
		(483.79)	(0.56)	(0.46)	(0.53)	(0.57)
	Salariat	-3.20	-4.32	-1.50	-0.75	-0.28
		(0.76)	(0.49)	(0.44)	(0.51)	(0.54)
Upper secondary	Working	-3.90	-7.61	-4.11	-3.20	-4.01
		(0.55)	(0.60)	(0.41)	(0.48)	(0.61)
	Intermediate	-4.00	-8.40	-4.60	-3.97	-3.90
		(0.57)	(0.81)	(0.43)	(0.54)	(0.61)
	Salariat	-5.08	-8.42	-5.00	-3.70	-3.94
		(0.58)	(0.60)	(0.41)	(0.47)	(0.54)
Comprehensive	Working	-2.55	-3.45	-2.50	-1.50	-2.04
		(0.60)	(0.44)	(0.44)	(0.51)	(0.61)
	Intermediate	-3.74	-4.22	-3.00	-2.10	-2.67
		(1.13)	(0.55)	(0.52)	(0.65)	(0.89)
	Salariat	-4.47	-5.64	-3.04	-2.50	-2.09
		(1.11)	(0.62)	(0.47)	(0.60)	(0.63)
Female		-0.98	-0.98	-0.48	-0.53	-0.29
		(0.25)	(0.15)	(0.11)	(0.15)	(0.18)
Migration background		0.48	-0.23	-0.15	0.04	-0.06
		(0.29)	(0.20)	(0.16)	(0.19)	(0.24)
East Germany		-0.11	-0.10	-0.21	-0.80	-1.07
		(0.35)	(0.21)	(0.14)	(0.21)	(0.27)
Intercept		1.18	4.14	3.09	1.34	0.74
		(0.48)	(0.40)	(0.40)	(0.45)	(0.49)

Source: BIBB Transition Survey 2006, own calculations. N=3,332, Pseudo-R^2=0.27, standard errors in brackets

Table A3: Multinomial logistic regression of highest secondary school attainment, graduates from Intermediate Secondary School only

		Intermediate degree (reference) vs.		
		Restricted upper secondary	Full secondary vocational	Full secondary Gymnasium
GPA (1.0=excellent – 4.0=sufficient)		-0.55 (0.17)	-1.92 (0.22)	-1.92 (0.28)
Interactions: gender and EGP class				
Male	Working (ref.)			
	Intermediate	0.12 (0.34)	0.39 (0.37)	0.49 (0.45)
	Salariat	0.79 (0.29)	0.65 (0.34)	0.97 (0.40)
Female	Working	0.12 (0.24)	-0.10 (0.30)	-0.39 (0.41)
	Intermediate	0.38 (0.31)	0.23 (0.39)	0.54 (0.46)
	Salariat	0.68 (0.26)	0.63 (0.32)	0.65 (0.40)
Migration background		0.02 (0.24)	0.28 (0.27)	0.73 (0.31)
East Germany		-0.70 (0.24)	-1.07 (0.31)	-1.38 (0.45)
Intercept		-0.28 (0.45)	2.59 (0.52)	1.94 (0.64)

Source: BIBB Transition Survey 2006, own calculations. N=1,180, Pseudo-R^2=0.08, standard errors in brackets