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Expansion and improved permeability of post-secondary education in Germany: Consequences for social inequalities in educational attainment

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Abstract

With this contribution, we examine the role of non-linear pathways to a higher education degree for social inequality in educational attainment. Unlike previous research, we compared the initial and final distributions of higher education degree attainment rather than the attainment of a higher education entrance certificate using the unconditional approach. Moreover, we calculated the attainment gap between social background groups (expressed as difference of predicted probabilities) rather than differences in transition rates (expressed as odds ratios).

Our results show that higher education in Germany has expanded through direct and indirect transitions likewise. An increasing share of the students who did not enter higher education directly, use the improved permeability between vocational and higher education to enter higher education via indirect pathways. Across cohorts, the absolute chances of obtaining a higher education degree hence have increased across all socio-economic groups and all groups increased their participation via indirect pathways. However, we also observe that the attainment gap between low/middle socio-economic background group and the high background group has not substantially declined across cohorts and that in all cohorts the higher socio-economic background groups maintain their advantage over the lower groups. Our results furthermore suggest that improved permeability does not contribute to decreasing inequality of higher education degree attainment.

Acknowledgments

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Introduction

Since the 1960's, the educational system in Germany has massively expanded. The expansion was primarily achieved through a growing upper secondary and higher education sector (Breen et al. 2009). Parallel to this development the permeability of secondary and post-secondary education was increased, so that a growing share of the population obtained their higher education entrance certificates via vocational pathways (Schindler 2014). Moreover, the permeability between vocational and higher education was increased so that students with vocational qualifications gained access to higher education (Pilz 2009; Tieben and Rohrbach-Schmidt 2014). As a result, non-linear pathways to a higher education degree gained importance in the German educational system since the late 1960's. Educational expansion and increasing permeability both were expected to reduce the strong association between social origin and education. Expansion was expected to increase access to higher education for students from lower socio-economic backgrounds. Given that the German educational system is tracked, permeability facilitates access to higher education via the vocational track. The origin-education association hence may be large earlier in the life course. We tackle the question if this origin-education association becomes weaker or stronger during the life-course. It becomes weaker when individuals from lower status origins are more likely to choose higher education later in life. It becomes stronger when individuals from higher status origins are more likely to choose higher education later in life. Although this seems to be a simple question, researchers come to different conclusions. This disagreement is partly caused by the fact that it matters whether we examine the transition rates of those who have not entered higher education directly or if we examine the final educational attainment. The aim of this contribution is to clarify the difference and to present both perspectives.

The majority of studies that examined how structural changes of the educational system reduce the origin-education association, come to the conclusion that expansion does not necessarily lead to a reduction of inequality (Hadjar and Becker 2006; Müller 1998; Raftery and Hout 1993) and that increased permeability primarily serves students from higher socio-economic backgrounds (e.g. Jacob and Tieben 2010; Reimer and Pollak 2010; Tieben and Rohrbach-Schmidt 2014). Nevertheless, studies that examine inequality in the final educational attainment report that inequality has decreased across cohorts (Klein et al. 2009; Müller et al. 2017). Existing research usually focuses either on expansion or on permeability - but not both. We argue that expansion and increased permeability may have independent and possibly even counteracting consequences for

inequality of educational attainment. Moreover, previous research has mainly focused on the attainment of higher education entrance certificates via non-linear pathways but not the attainment of actual academic degrees. It therefore remains largely unclear, in which way the increased permeability contributes to inequalities of educational attainment when the entire pathways, including higher education graduation, are taken into account. Unlike previous research, we do not examine transitions rates and background-related relative differences in the attainment of a higher education entrance certificate. Instead, we apply a method that allows us to evaluate the absolute gap in degree completion between students from higher and lower socio-economic backgrounds. As this attainment gap changes across cohorts and across the individual life course, we compare higher education degree completion in direct pathways (first post-secondary qualification obtained) and indirect pathways (highest post-secondary qualification obtained), under special consideration of developments across cohorts, and by using marginal effects instead of odds ratios. With this contribution, we hence aim to examine the consequences of expansion and permeability for social inequality of the final educational attainment. In the remainder of this chapter, we briefly introduce the German education system and discuss the state of research. This is followed by a description of our data, variables and methodological approach. We then summarize our results and conclude with a discussion.

The German Educational System

In international comparisons, Germany is one of the countries with a strong relationship between social origins and educational attainment (Marks 2005). Nevertheless, income inequality in Germany (measured as Gini coefficient) is lower compared to most OECD countries in the period 1970-2000 (Rohrbach 2009). The educational systems represents a specific case of a highly stratified (i.e. tracked) and standardized education system with high emphasis on vocational training (Allmendinger 1989; Shavit and Müller 1998). The school-to-work-linkage is strong and recruitment processes in the labour market rely strongly on formal qualifications, such as vocational training certificates or higher education graduation (DiPrete et al. 2017). Students are allocated to a secondary-school track after primary school at the age of 10-12 years. The post-secondary sector comprises (non-tertiary) vocational training next to (tertiary) higher education. Due to the structure of the educational system, educational pathways are “path-dependent” to a certain degree: lower secondary education is typically followed by a training in the vocational training sector (“vocational track”), whereas upper secondary education entitles graduates to enter

higher education. The sequence of upper secondary education, followed by higher education (“academic track”) still is considered the standard pathway to a higher education degree. Given that students from lower socio-economic backgrounds are more likely to be allocated to lower secondary education after primary school (Hillmert and Jacob 2010; Stocké 2007), this path-dependency contributes to the maintenance of inequality of the final educational attainment throughout the educational career. However, there is no strict separation of the academic and the vocational track. Already during secondary education, students who have graduated from lower secondary school, can enter upper secondary school in order to obtain the entry certificate for higher education (Jacob and Tieben 2009). Moreover, students who have graduated from vocational training can – under certain conditions – also obtain the entry certificate for academic higher education. As a result, a non-negligible proportion of the German population has reached a higher education degree via vocational detours (Tieben 2020).

Previous research

General Trends

Educational expansion in Germany primarily occurred in the direct transition to upper secondary education (Baumert et al. 2008; Schindler 2014). Nevertheless, an increasing proportion of students who initially chose a lower secondary track changes to upper secondary after grade 10 and obtains a higher education entrance certificate after grade 12 or 13 (Blossfeld 2019; Buchholz and Schier 2015; Jacob and Tieben 2009). At the same time, however, we observe that a decreasing proportion of upper secondary graduates enters higher education immediately, so that the expansion of upper secondary education does not directly translate into a proportionate expansion of higher education (Tieben & Rohrbach-Schmidt 2014). Nevertheless, higher education also grows across cohorts in absolute and relative participation rates.

Expansion: Consequences for inequality

Whereas Blossfeld and Shavit (1993) concluded “persistent inequalities” from their overview of inequality dynamics in 13 countries, several later analyses¹ reported a decrease of the socio-

¹ See also Breen et al. (2009) for a comparison of Germany, France, Italy, Ireland, Great Britain, Sweden, Poland and The Netherlands.

economic gradient across time, which is particularly salient in France (Selz and Vallet 2006), Sweden (Erikson 2007) and Germany (Müller et al. 2017). Especially in Germany, this was mainly because inequality in the attainment of upper secondary education certificates decreased (Klein et al. 2009). However, the assumption that expansion is a sufficient condition for decreasing inequality of educational attainment has been challenged since the 1990s (Becker 2006; Müller 1998; Raftery and Hout 1993). Raftery and Hout (1993) discuss that expansion is likely to raise transition rates of all social origins, “but in such a way as to preserve all the transition by class odds-ratios” (p. 56), unless the participation of the higher classes has reached saturation. This raises the question if processes other than increasing participation rates contribute to decreasing inequality. In the next section, we therefore shed some light on the (potential) role of increased permeability between the vocational and academic track.

Permeability

It has been frequently examined in which way permeability between the vocational and academic track contributes to social inequality in the German educational system. Hillmert and Jacob (2005a) discuss the difference between two approaches to examine inequality in “late” educational decisions. The conditional approach examines social disparities of transition rates within the “risk group”. This approach (correctly) assumes that those who have made a transition to the academic track directly have no chance to take a detour. For this reason, the odds ratio for social background indicators of taking a detour is based on the selective sample of those who initially were allocated to the lower track (“risk group”). The unconditional approach examines the background-specific distributions of educational attainment, but – unlike the conditional approach – considers the total population. This approach allows more insight into eventual inequality dynamics across the life course, because it compares the attainment gap between lower and higher social backgrounds in early and later educational transitions. The unconditional approach therefore is less affected by changes of the marginal distributions. The majority of existing studies nevertheless have applied the conditional approach. These studies have concluded that students from more privileged family backgrounds are more likely to upgrade their initial track placement to reach a higher education entrance certificate (Buchholz and Pratter 2017; Buchholz and Schier 2015; Glaesser 2008; Henz 1997a; Jacob and Tieben 2010; Tieben 2011). Studies that have applied the unconditional approach report inconsistent findings regarding changes of social inequality across the life course. Some report that inequality increases across the life course (Buchholz and Pratter 2017; Hillmert and

Jacob 2005a; b), some find a decrease (Henz 1997b; Trautwein et al. 2011). Schindler (2015) reports a slight increase of inequality in the attainment of a (general) higher education entrance certificate across the life course for a cohort born in 1964 whereas for later cohorts a slight decrease occurs. None of these results, however, are statistically significant. The inconsistencies probably are due differences in the underlying data, the cohorts considered and the selected operationalisations of socio-economic background (cf. Schindler 2015 for a detailed discussion).

Whereas the above-cited studies examined in which way detours to graduation from upper secondary education contribute to inequality across the life course, only a few authors have addressed the trends across cohorts. Jacob and Tieben (2010) compare the conditional odds ratios of two German cohorts that were affected by upper secondary school permeability to a different degree. They conclude that increasing permeability leads to lower social selectivity of postponed transitions to upper secondary education. Nevertheless, Schindler (2015) and Buchholz and Pratter (2017) point out that, from the unconditional perspective, only slight and non-significant changes of inequality in the attainment of a higher education entrance certificate can be observed across cohorts.

Research regarding the actual (non-linear) transition to higher education and degree completion is scarce. Hillmert and Jacob (2010) show that children from higher educated family backgrounds are more likely to delay² their transition to higher education, but it remains unclear to what extent these delayed entries contribute to the inequality of degree attainment. Moreover, they focus on a cohort born in 1964, so that developments in the wake of educational expansion were not observed. Tieben and Rohrbach-Schmidt (2014) examine the attainment of a higher education degree and find that the percentage of higher education degrees, obtained after vocational training, increased from 5.7% in the school-leaving cohort 1960-64 to 9.9% in the school-leaving cohort 1996-99. They report that students from higher socio-economic backgrounds are not only more likely to choose the direct route to university, but also have advantages over children from lower social classes in acquiring higher education degrees in the indirect pathway. Yet, none of these papers examines in detail, if these detours contribute to a reduction of the (unconditional) attainment gap between students from higher and lower socio-economic backgrounds across cohorts. In the following analyses, we

² Birth cohort 1964, transition rates conditional on prior attainment of a higher education entrance certificate.

therefore aim to close this research gap. To this end, we first compare how direct and indirect degree completion develops across cohorts. Second, we examine how the socio-economic gap in higher education degree completion changes across cohorts for the directly and indirectly obtained higher education degrees.

Data, variables and analytical approach

Data

The study uses the 2012 and 2018 Employment Surveys carried out by the Federal Institute for Vocational Education and Training (BIBB) and the Federal Institute for Occupational Safety and Health (BAuA). The Employment Surveys are repeated cross section surveys, each comprising around 20,000 individuals belonging to the labor force (i.e. having paid work), age 15 and older, with a hours of at least ten per week. Both samples are sufficiently comparable in design and content. Important for the given purpose of this study is that the data not only includes the highest education degree but all (up to five) vocational qualifications obtained in post-school education. Due to the comparatively large sample size, these analyses can be carried out separately for different cohorts of school leavers. In addition, the data include information on highest school leaving certificate and social origin. We restrict the analyses to five school leaver cohorts between 1960 and 2009 and school leavers who have completed their schooling in West Germany. Furthermore, we include only respondents who were 30 years and older at the time of the interview in order to ensure that the majority of respondents has finished their education. We drop cases with missing data on the social origin or education variables (complete case analysis). The final sample size is 23,940. The data were collected from a random sample of employed individuals living in Germany; selective non-response was adjusted to the marginal distributions in the population using a weighting model (based on microcensuses 2011 and 2017). Each of the following analyses is carried out using these weights. The results hence are representative for employed persons in Germany (according to the above definition) in the different school leaver cohorts in West Germany.

Variables and analytic approach

The central variables in the analyses are the respondents' (chronologically) first and highest qualification³. We group the information on the first qualification into a dummy variable that indicates whether a higher education degree was directly attained, i.e. as the first qualification, or not. The variable 'highest educational attainment' contains the highest level of education and training attained by the respondents on all (maximally five) qualifications. In comparison with the first degree, we use this variable to differentiate between three outcomes: no higher education degree⁴, indirectly (via detours) attained higher education degree and directly attained higher education degree. In order to identify trends across time, we use five school leaver cohorts (1960-1969, 1970-1979, 1980-1989, 1990-1999, 2000-2009). We operationalized socio-economic background as EGP-classes (Erikson et al. 1979) of the father or mother (if the respondent has not lived continuously with the father but the mother until the age of 15) at respondent's age 15. We derived the EGP classes from 4-digit ISCO 88 codes, self-employment and supervisor status. This resulted in 10 classes that were converted into three categories (SES high: service class professionals, SES mid: employees and proprietors, SES low: un-/skilled workers) (Hendrickx 2002). Table 1 shows the distributions of the central variables in the sample used.

In the first analytical step, we study the general and background-specific development of direct higher education attainment of school leavers across the five cohorts. In the next step, we inspect inequality across the life course, i.e. the development of direct and indirect higher education attainment, as well as the attainment gap between social classes in direct and indirect higher education attainment across cohorts. Finally, we fit a logistic regression to derive the predicted marginal contrasts of the attainment differences against the earliest cohort (Mitchell 2012; Wooldridge 2010). It has been common practice to estimate the odds ratio between two groups of socio-economic background as a measure of inequality. However, especially when it comes to trends across time, odds ratios are not suitable to determine if inequality has changed. The

³ We use the adjusted qualification variables provided by BIBB (Rohrbach-Schmidt and Hall 2020, see sec. 2.2.3). Respondents often have a different understanding of terms than an official definition would suggest, and terms are confused because of their similar connotation (for instance "Berufsfachschule", "Fachschule" and "Fachhochschule", but also "Fortbildung" (which in Germany is a valid higher vocational training degree) and "Weiterbildung" (which is not).

⁴ This includes no degree, vocational training, further training degrees (e.g. as master and technician, business administrator, specialist, business administrator).

estimation of odds ratios is based on the marginal distributions within socio-economic backgrounds, and these marginal distributions are not stable across cohorts (Best and Wolf 2015; Mood 2010). Changes in odds ratios hence may be generated through shifts in class-specific transition rates, but also through general shifts in the social composition of the population. We compare the results of logistic regressions across cohorts using predicted marginal contrasts. These allow us to express the chances of making a transition as predicted probability rather than odds ratios.

Table 1: Sample distributions

	N	%
First qualification		
No HE degree	18129	75.7
HE degree (direct)	5811	24.3
Highest qualification		
No HE degree	15906	66.4
HE degree (indirect)	5811	24.3
HE degree (direct)	2221	9.3
Cohort		
1960-1969	1505	6.3
1970-1979	6870	28.7
1980-1989	8298	34.7
1990-1999	5214	21.8
2000-2009	2053	8.6
Socio-Economic Background		
High	8685	36.3
Mid	5034	21.0
Low	10221	42.7
Sex		
Male	11679	48.8
Female	12261	51.2
N (total)	23940	

Source: BIBB/BAuA-Employment Survey 2012, 2018 (pooled data).

Results

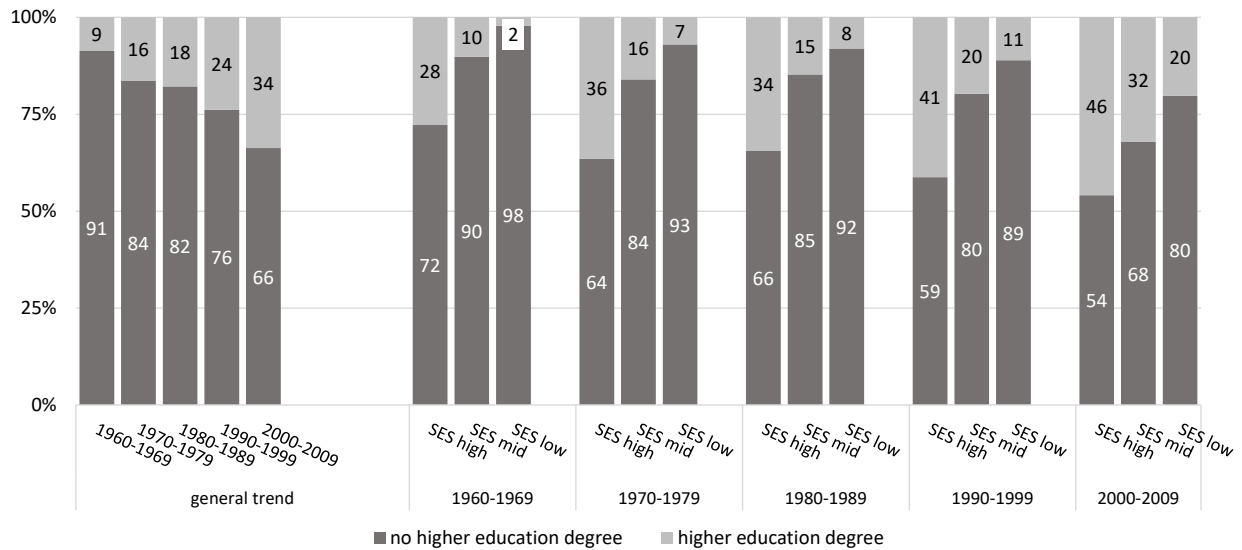
Expansion

Figure 1 shows the general increase of higher education degrees obtained via the direct pathway (left panel “general trend”). The right panel displays the background-specific growth in direct higher education degree attainment. All background groups increased their degree attainment, but

we also observe that students from higher socio-economic backgrounds maintain their advantage throughout the decades.

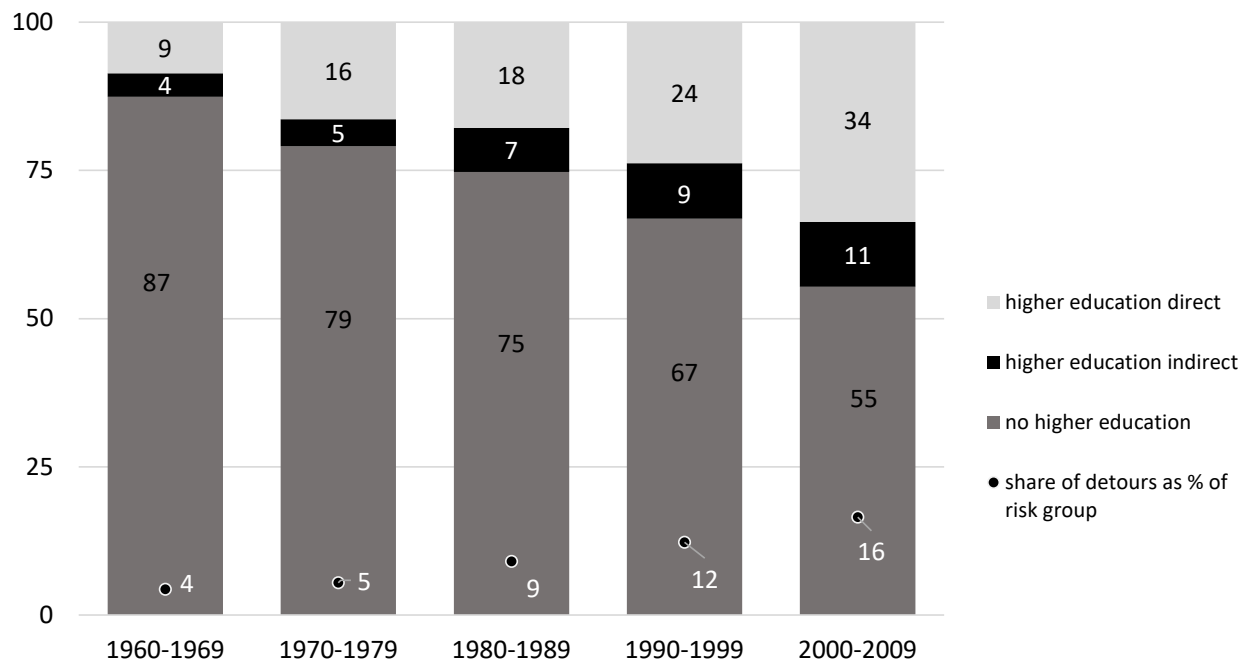
Figure 2 shows the expansion of direct and indirect higher education degree attainment across cohorts: the percentage of the total population that has obtained a higher education degree via detours (higher education indirect) has increased from 4% to 11% between the first and the last school leaver cohort. As the proportion of those without a direct higher education degree attainment decreases significantly across cohorts (the risk group becomes smaller), the importance of detours for the risk group increases (black dots). This illustrates how the marginal distributions change across cohorts and how the odds ratios of making the indirect transition “from the risk group” are affected by this development.

Figure 1. General and background-specific increase in direct higher education degree attainment across school leaver cohorts (%).



Source: BIBB/BAuA-Employment Survey 2012, 2018 (pooled data), weighted by survey weights. Own calculations.

Figure 2. Absolute and relative changes in direct and indirect higher education degree attainment across cohorts (in%)



Source: BIBB/BAuA-Employment Survey 2012, 2018 (pooled data), weighted by survey weights. Own calculations.

Inequality across the life course

Whether expansion and detours contribute to decreasing inequality depends on the extent to which specific social groups use the opportunities of expansion and permeability. Figure 3 therefore reports the directly and indirectly obtained higher education degrees of the socio-economic background groups across cohorts. In all cohorts, the highest status group has the highest total share of detours to a higher education degree. Moreover, in all cohorts (except the youngest cohort), the highest status group has the highest share of indirectly acquired higher education degrees. Again, we calculated the share of detours as the percentage of the risk group in order to illustrate how the transition as such can get less selective without having a tangible effect on the actual attainment gap between groups. These figures suggest that the highest status group even increases the advantage they gained in the direct degree attainment through the indirect routes to a higher education degree.

We therefore express “inequality” as the percentage-point difference between the highest and the lowest class in obtaining a higher education degree. Figure 4 shows the attainment gap between students from higher and middle respectively lower socio-economic backgrounds across cohorts.

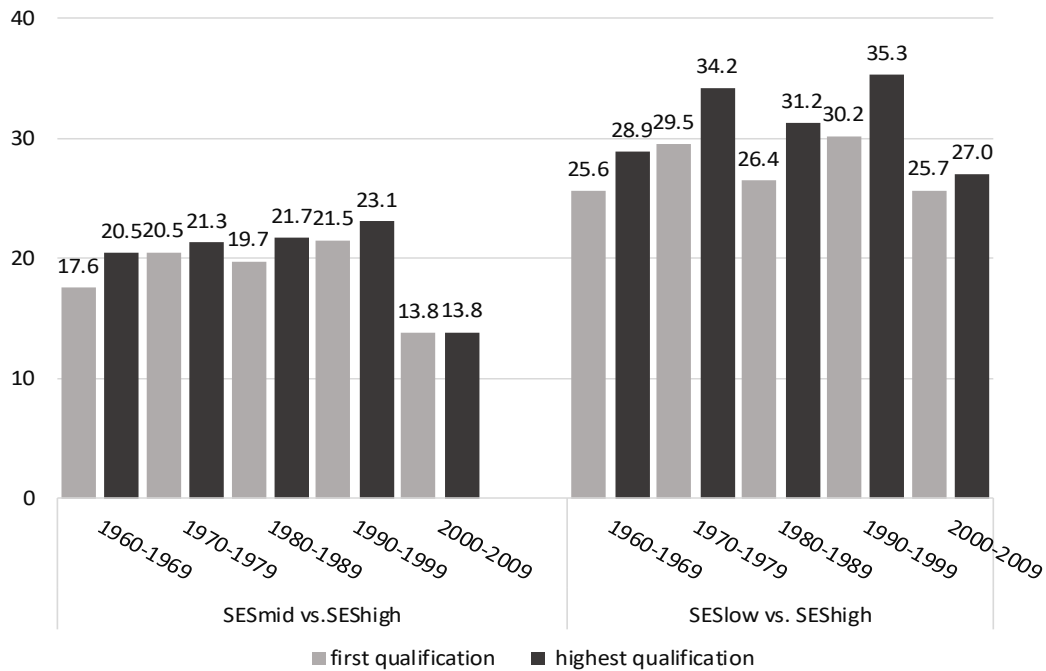
The grey bars show the gap when only directly obtained degrees were considered, the black bars show the gap when indirectly obtained degrees were included. In none of the cohorts, the indirectly obtained degrees contribute to a reduction of the gap. This would be the case if the black bars were shorter than the grey bars. The increasing permeability across cohorts (i.e. the increase in the number of indirectly obtained higher education degrees) rather tends to increase the difference between low and high socio-economic background groups, at least up to the second-last cohort. This is less clear for mid- versus high socio-economic background groups. Moreover, we observe that inequality (in terms of attainment gaps across cohorts) does not consistently decrease across cohorts – for neither directly nor indirectly obtained degrees. However, in general, we observe a pronounced drop of the attainment gap between the 1990-99 and 2000-2009 cohort for the middle status group (relative to the high status group). No such decrease can be observed for the lower status group.

Table 2. Background-specific direct and indirect higher education degree attainment and relative indirect higher education degree attainment across cohorts (%).

		No higher education	Higher education indirect	Higher education direct	Share of detours as % of risk group
1960-1969	SES high	65.7	6.5	27.8	9.1
	SES mid	86.2	3.7	10.2	4.1
	SES low	94.6	3.3	2.1	3.3
1970-1979	SES high	56.3	7.2	36.5	11.4
	SES mid	77.6	6.4	16.0	7.6
	SES low	90.5	2.5	7.0	2.7
1980-1989	SES high	55.4	10.1	34.5	15.5
	SES mid	77.1	8.2	14.7	9.6
	SES low	86.6	5.3	8.0	5.8
1990-1999	SES high	46.8	11.9	41.2	20.3
	SES mid	69.9	10.4	19.7	12.9
	SES low	82.2	6.8	11.1	7.6
2000-2009	SES high	42.7	11.4	45.9	21.1
	SES mid	56.5	11.4	32.1	16.7
	SES low	69.7	10.1	20.2	12.7

Source: BIBB/BAuA-Employment Survey 2012, 2018 (pooled data), weighted by survey weights. Own calculations.

Figure 3: Higher education attainment gap – expressed as percentage-point difference between students from middle and low socio-economic backgrounds versus high background



Source: BIBB/BAuA-Employment Survey 2012, 2018 (pooled data), weighted by survey weights. Own calculations.

Attainment inequality across cohorts

In a further step, we contrast these gaps of each cohort against a reference cohort (1960-1969), in order to identify trends in inequality across cohorts and whether these differences are statistically significant. To this end, we fit a logistic regression and derive the contrasts of predicted margins (Mitchell 2012; Wooldridge 2010). Table 2 shows the contrasts of predictive margins resulting from these models and figure 5 shows these values plotted with confidence intervals. A negative contrast tells us that the gap in the predictive margins between the socio-economic background groups has increased compared to the reference cohort, whereas a positive value indicates a decrease of the gap compared to the reference cohort. If the value is zero, inequality for the group has not changed since the 1960-1969 cohort. Let us first note that none of the values are significantly different from zero – this indicates that no statistically significant change in inequality has taken place since the 1960s. We nevertheless summarize the information of figure 5. The left panel of the figure shows that the advantage (in obtaining a higher education degree as first qualification) of the children of the high socio-economic background group relative to both comparison groups has slightly increased between the reference cohort and the 1970-1979, 1980-1989 and 1990-1999 cohorts. In the 2000-2009 cohort, the middle socio-economic background group could slightly decrease their disadvantage (from an attainment-gap of 17.6 percentage points in 1960-1969 to an attainment-gap of 13.8 percentage points in 2000-2009 (see figure 4)) which constitutes a contrast of .038 (or, expressed as the decrease of the percentage point-difference, 3.8).

Table 3. Differences in predicted probabilities of attaining a higher education degree in first and highest education. Contrasts of cohorts and social background

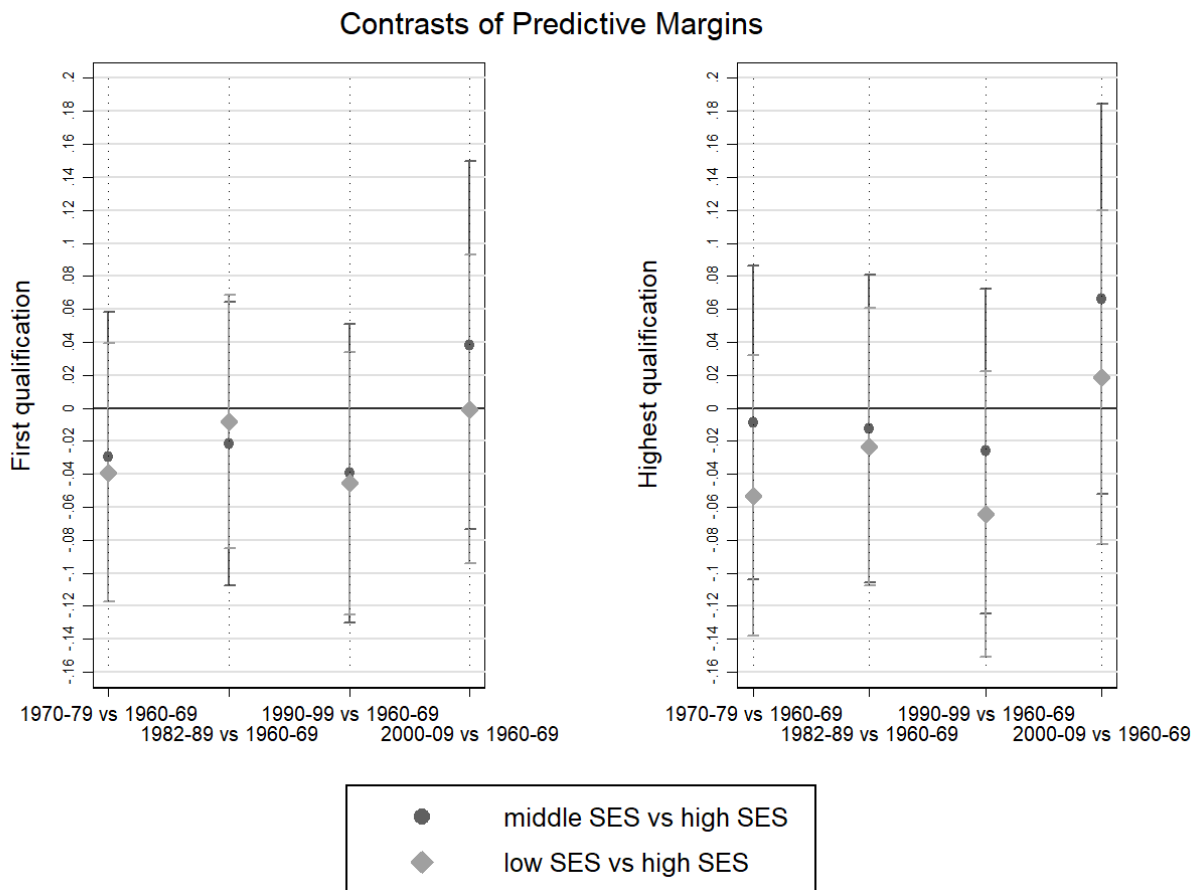
first qualification	middle SES vs. high SES				low SES vs. high SES			
	contrast	sd	conf. int.		contrast	sd	conf. int.	
1960-1969 (ref.)								
1970-1979	-0.029	0.045	-0.117	0.058	-0.039	0.040	-0.117	0.039
1980-1989	-0.022	0.044	-0.107	0.064	-0.008	0.039	-0.085	0.068
1990-1999	-0.040	0.046	-0.130	0.051	-0.046	0.041	-0.125	0.034
2000-2009	0.038	0.057	-0.074	0.150	-0.001	0.048	-0.094	0.093

highest qualification	middle SES vs. high SES				low SES vs. high SES			
	contrast	sd	conf. int.		contrast	sd	conf. int.	
1960-1969 (ref.)								
1970-1979	-0.009	0.048	-0.104	0.086	-0.053	0.043	-0.138	0.032
1980-1989	-0.012	0.048	-0.106	0.081	-0.023	0.043	-0.107	0.060
1990-1999	-0.026	0.050	-0.124	0.072	-0.064	0.044	-0.151	0.022
2000-2009	0.066	0.060	-0.052	0.185	0.019	0.052	-0.082	0.120

Source: BIBB/BAuA-Employment Survey 2012, 2018 (pooled data), weighted by survey weights. Own calculations.

The right panel of figure 4 shows a similar picture for the highest qualification: the disadvantages in obtaining a higher education degree of children of middle and low socio-economic background group relative to the high socio-economic background group has also not decreased significantly compared to the earliest cohort. Only in the latest cohort, i.e. school leavers from 2000 to 2009, the attainment gap between the middle socio-economic background group and the high socio-economic background group has slightly decreased (i.e. the differences in the predictive margins is lower in 2000-2009 as compared to the earliest cohort).

Figure 4: Marginal effects plot of contrasts of social background across cohorts (reference cohort: 1960-69)



Source: BIBB/BAuA-Employment Survey 2012, 2018 (pooled data), weighted by survey weights. Own calculations.

Conclusions and discussion

With this contribution, to shed light on the role of non-linear pathways to a higher education degree for social inequality in educational attainment. As discussed above, one of the reasons to improve permeability was the aim to reduce inequality in access to higher education. Existing literature has remained inconclusive as different methodological approaches resulted in contradictory conclusions. Unlike previous research, we compared the initial and final distributions of higher education degree attainment rather than the attainment of a higher education entrance certificate using the unconditional approach. Moreover, we calculated the attainment gap between social background groups (expressed as contrasts of predictive margins) rather than transition rates (expressed as odds ratios).

Our results show that higher education in Germany has expanded through direct and indirect transitions. An increasing share of the students who did not enter higher education directly, use the improved permeability between vocational and higher education to enter higher education via indirect pathways.

All socio-economic background groups profited from general expansion and from improved permeability. The absolute chances of obtaining a higher education degree hence have increased across all socio-economic groups and all groups increased their participation via indirect pathways. However, we also conclude that the attainment gap between low/middle socio-economic and the high background groups has not substantially declined across cohorts and that in all cohorts the higher socio-economic background groups maintain their relative advantage over the lower groups. It is particularly striking that – contrary to the initial intention of this policy – indirect pathways to a higher education degree do not contribute to decreasing inequality in final degree attainment. Although we only observe small and non-significant percentage point differences, our results suggest that the indirect pathways rather contribute to a slight increase of the attainment gap than to a decrease. Altogether, our findings support the thesis that inequality is largely maintained despite educational expansion (Raftery and Hout 1993). However, especially for the comparison of the middle versus the high socio-economic background groups, we also observe that this disadvantage is less pronounced in the youngest cohort (school leaving cohort 2000-2009). This is the first cohort in our sample that was fully affected by the Bologna-Reform of the mid-1990s. This reform had the aim to reduce the “investment risk” of higher education by shortening the duration

until the first full qualification for the labour market from five to three years. This reduction of the “perceived cost” of higher education might have lowered the threshold for the lower socio-economic backgrounds classes to a higher extent.

Our results highlight that social mobility may also comprise „intragenerational mobility“ in a sense that - through the later decision to attain a higher educational level - the same person increases their occupational opportunities and social position during the life course. From the individual perspective, this upward mobility probably pays off - a higher educational level results in more opportunities for upward mobility regarding occupational status. Yet, regarding the inequality from a societal perspective, increasing permeability is unlikely to result in relative mobility, as long as this opportunity is most attractive for students from higher social origins.

For the interpretation of this finding, however, it is important to bear in mind the following limitations of the data. First, the data contain only respondents who were employed at the time of the interview. We hence acknowledge that the sample differs from the resident population age 30-67 in terms of education, age and gender. This means that there are more highly educated, fewer older people and slightly fewer women in the sample compared to the resident population of this age. This bias probably does not drastically affect our results, as we are mainly interested in the attainment gap between social groups and not in an accurate estimation of population means. The total sample comprises nearly 25,000 respondents – this appears very large at first glance. However, especially in early cohorts, the subpopulations in direct and indirect higher education are small and given the fact that changes in inequality are notoriously small as well, it remains challenging to provide statistical support in terms of strict significance testing.

Our results regarding trends in inequality across cohorts deviate from previous findings (e.g. Müller et al. 2017, Klein et al. 2009, Blossfeld 1993). Whereas these researchers report decreasing inequality across cohorts, we do not find a comparable trend. This may be due to different analytical approaches. These authors use logistic regressions and comparisons of odds ratios across cohorts, our approach evaluates contrasts of predictive marginal effects. Moreover, it depends on the range of cohorts and on the sample size, whether a change of inequality across cohorts can be detected or not. Our data do not cover cohorts born before the 1950’s when possibly more pronounced changes of inequality could be observed. Obviously, inequality does not seem to increase or decrease linearly across cohorts, but instead more or less fluctuates around zero in the cohorts we

observe in our data. With a very large sample size and birth cohorts ranging between the 1910's and the 1960's (as applied by Blossfeld 1993, Klein 2009 and Müller et al 2017), it may be more probable to detect a slight decrease.

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