Social Inclusion
2025 • Volume 13 • Article 8766
https://doi.org/10.17645/si.8766

cogitatio

ARTICLE

Open Access Journal

Inequality at the Transition to Higher Education in Germany: Social Differences by Prior Educational Pathways

Heiko Quast, Heike Spangenberg, Hanna Mentges, Jessica Ordemann, and Sandra Buchholz

German Centre for Higher Education Research and Science Studies, Germany

Correspondence: Heiko Quast (quast@dzhw.eu)

Submitted: 31 May 2024 **Accepted:** 18 February **Published:** 16 April 2025

Issue: This article is part of the issue "Vocational Schools as Pathways to Higher Education: International Perspectives" edited by Christian Imdorf (Leibniz University Hannover / Bulgarian Academy of Sciences), Claudia Schuchart (University of Wuppertal), and Nadine Bernhard (Technische Universität Berlin), fully open access at https://doi.org/10.17645/si.i423

Abstract

In this article, we assess the importance of alternative pathways via vocational schools and vocational education and training (VET) for social differences in the transition into higher education in Germany. Drawing on data from the DZHW Panel of School Leavers 2018, we use sequence analysis to identify both classical and alternative pathways to obtaining a higher education entrance certificate. We then apply logistic regressions and decomposition techniques to examine the variation in the probability of studying for each pathway compared to the classical pathway through general upper secondary school. Finally, we investigate the underlying reasons for these social differences. We show that the graduates in our analysis take six distinct and socially selective pathways to a higher education entrance certificate, four of which have strong vocational elements. All pathways differ in their study probability: Graduates of almost all alternative educational pathways are less likely to opt for higher education than graduates of the classical pathway. However, this is not solely due to the different composition of graduates in terms of social origin and school performance. Although graduates from less privileged social backgrounds and with lower school performance are disproportionately represented in the alternative pathways, they also differ in their assessment of the costs, benefits, and probabilities of success of investing in higher education. Finally, differences in study probability can be explained by several theoretical mechanisms, the individual explanatory power of which varies according to the pathways.

Keywords

educational pathways; Germany; higher education entrance qualification; study decision; vocational schools; vocational education and training

1. Introduction

Higher education plays a crucial role in shaping individual life chances around the world (Hout, 2012). Graduates typically enjoy better benefits from education over the life course (Gebel & Heineck, 2019) and specifically better labour market integration with higher average incomes (Ordemann & Pfeiffer, 2022), improved health and fertility outcomes (Brand & Davis, 2011; Oreopoulos & Salvanes, 2011), or increased longevity (Pakpahan et al., 2016) than those with other educational qualifications.

However, access to higher education remains a socially selective process, with marked inequalities between school graduates from privileged and less privileged families (Blossfeld et al., 2015; Lörz & Schindler, 2011). Germany is considered to have pronounced social inequalities in access to higher education (Scharf et al., 2023). There are indications that inequality in access to higher education has been developing less favourably in Germany compared to other European countries (e.g., Barone & Ruggera, 2018; Palmisano et al., 2022). The education system in Germany is characterised by early tracking, which has long directed students into either vocational or academic pathways. This process is strongly influenced by their family background (KMK, 2021). This early separation in the school system contributes significantly to the selectivity of access to higher education due to path dependencies (Mayer, 1990): Students from privileged families more frequently choose the classical academic pathway consisting of general upper secondary school and transition to higher education, while those from less privileged backgrounds are often referred to educational pathways that lead from middle or lower secondary school to the vocational education and training (VET) system. The education policy reforms of the 1960s and 1970s significantly strengthened alternative educational pathways in Germany. More practice-oriented types of schools that offered a higher education entrance certificate (HEEC) and the universities of applied sciences were established. A central aim of the reforms was to reduce social inequalities. Traditionally disadvantaged groups in the education system were to be given a second chance at higher education.

However, the recently published "education funnel" for Germany clearly shows that there are still major social inequalities (Kracke et al., 2024). On average, only 25 out of every 100 children from a non-academic family attend university. Out of every 100 children with an academic background, 78 transition to university. Moreover, among those with higher education entrance qualifications who come from academic families, barely 20 percent attended a vocational school. However, if they come from a non-academic family, slightly more than 40 percent, i.e., almost twice as many, have attended a vocational school to obtain a HEEC. Children from non-academically educated families, therefore, not only continue to have fewer opportunities to obtain a HEEC but are also more dependent on the vocational school system (Kracke et al., 2024, p. 4). It is also clear that pathways via vocational schools do not only open new opportunities but open new social selectivities as well (Buchholz & Pratter, 2017; Maaz, 2006). Children from academic households are more likely to use vocational schools as an opportunity to correct their educational path towards a HEEC.

With regard to the findings on persistent social inequalities in the enrolment in higher education despite the expansion of vocational school types that award a HEEC, there is a lack of detailed studies on the underlying mechanisms. Our study addresses this research gap by identifying the variety of pathways to a HEEC and going beyond a mere distinction between upper secondary vocational and general upper secondary schools. Instead, it includes the earlier educational and career paths over several years until a HEEC is obtained so that changes between school types, as well as vocational and school phases, are also considered. In this way,

any underlying (social) differences in the entrance to higher education can become visible. Following the identification of typical educational and vocational paths leading to a HEEC, the likelihood of graduates from alternative (vocational) pathways enrolling in higher education is examined in comparison to graduates from the classical educational path. A distinction is made here between the classical academic school path in Germany, which involves attending general upper secondary school after elementary school until the HEEC, and the alternative pathways, which include vocational school types, VET, or a change between school types. In the final step of the analysis, the focus shifts to the mechanisms that explain differences in access to higher education between classical and alternative educational paths.

Therefore, this article contributes to the research by exploring the complex interplay between educational pathways, social background, and higher education entrance in the German context, focusing on three key questions:

1. Which educational pathways lead to a HEEC?
2. How likely are these pathways to result in higher education entrance if social composition is also considered?
3. Why are graduates from alternative paths diverted from higher education?

To answer our questions, we proceed as follows: The next section introduces the German education system in more detail, with a focus on institutional pathways to attain a HEEC, and explains the theoretical background for the examination of our research questions. Section 3 describes the DZHW Panel of School Leavers 2018 as the dataset we use for our analyses, its operationalisation, and our methods. Section 4 presents our findings, which we discuss in Section 5.

2. Institutional and Theoretical Background

The German education system is known for its high level of stratification (Allmendinger, 1989; Leuze & Solga, 2013). Even today, after several decades of educational reform, tracking starts very early (Hadjar & Gross, 2016). As early as the age of 10 or 12, after only four to six years of joint primary schooling, children are selected into different types of secondary schooling that additionally vary between the German federal states (KMK, 2021, p. 119). While primary schools are designed to educate children of different ability levels together, secondary schools sort children by achievement based on teachers' recommendations at the end of primary school. Originally, there were three different types of secondary schools: lower secondary schools for low-achieving children, middle schools for children with average school performance, and general upper secondary schools (usually called *Gymnasium*) for high-achieving children. For some years now, Germany has been moving more and more toward a two-tier system in which the lower and middle tracks have become increasingly integrated (Hurrelmann, 2013; Maaz & Köller, 2019). Only schools of the upper track are designed to prepare for university, and only children who complete this type of school can obtain a HEEC. Schools belonging to the lower and middle tracks are supposed to prepare children for VET. However, with the expansion of education in the last century and the rising educational levels in the population, the HEEC has also become a prerequisite for access to promising positions in VET (Beicht & Walden, 2018; Konietzka & Hensel, 2017). Thus, not all graduates who obtain the HEEC transition to higher education. Instead, they opt for VET. According to administrative data, the transition rate to higher education of graduates with a HEEC is currently around 80% in Germany (Autor:innengruppe Bildungsberichterstattung, 2024, p. 212).

The high level of stratification and early tracking has always been a point of intense public, political, and academic debate (Esser, 2021; Müller & Kogan, 2010; Terrin & Triventi, 2023). Critics argue that dividing children into different types of secondary schooling at an early age promotes the formation of social inequalities (R. Becker & Hadjar, 2011; Hallinan, 1994). Research has frequently shown that social origin has a strong impact on the transition from primary to secondary school (R. Becker, 2017; Lucas, 1999). Compared to children from privileged families, children from less privileged social backgrounds have a much lower chance of going to an upper-track school after primary school (Dumont et al., 2014; Neugebauer et al., 2013; Schindler, 2017). However, the main argument in favour of this system is that early tracking ensures that children are taught according to their abilities (Ariga & Brunello, 2007; Esser, 2021). It was pointed out that there are alternative pathways that allow children who originally did *not* make it into the upper track to upgrade their level of education after completing a lower secondary or middle school. Today, we know that the German education system is indeed more open than long believed and that the role of alternative pathways to HEEC is anything but small (M. Becker et al., 2016). Administrative data indicate that about one-third of all HEECs are obtained through an alternative pathway rather than the classical path of attending an upper-track secondary school immediately after primary school (Autor:innengruppe Bildungsberichterstattung, 2024, p. 212). Against this background, it is very surprising that inequalities in alternative pathways to HEEC, in contrast to the classical path, have been comparatively little studied (for exceptions, see, e.g., Bittmann & Schindler, 2020; Buchholz & Pratter, 2017; Schindler, 2017; Schuchart & Schimke, 2022).

Institutionally, there are various ways in which children who attended and completed a lower secondary or middle school can upgrade their level of education to a HEEC (KMK, 2021, p. 121). As a rule, the only formal prerequisite is the completion of the 10th grade to receive the German middle school diploma. This entitles graduates to enrol in upper secondary school programmes. In principle, this grade also qualifies for enrolment in a general upper secondary school, i.e., the traditional *Gymnasium*. However, it is especially the schools of the vocational system that are designed to provide second chances to obtain the HEEC through alternative pathways (for an overview, see Table 1). In contrast to the traditional *Gymnasium*, these schools are characterised by a stronger vocational and practical orientation in their curriculum, making them an attractive option for children who originally attended another type of school within the stratified German system. These schools start in grade 11 and usually specialize in specific occupational fields, such as business, technics, health, or social services. There is a wide range of schools in the vocational system that offer the opportunity to earn a HEEC, and the exact institutional settings of these schools may vary from one federal state to the next. However, in broad terms, they can be classified in the following ways: First, there are specialized (vocational) grammar schools (*Berufliches Gymnasium*, or, in some federal states, *Fachgymnasium*). These schools offer 3-year programmes and graduates can earn the general HEEC, which entitles them to study at both universities and universities of applied sciences. In addition, there are several other upper secondary vocational schools (*Fachoberschule*, *Berufsfachschule*, *Berufsoberschule*, *Fachschule*) that also offer the possibility of obtaining the HEEC. In contrast to specialized (vocational) grammar schools, these schools are characterised by a stronger vocational and practical orientation in their curriculum. Typically, these schools lead to the more specialized type-restricted HEEC (*Fachhochschulreife*), which limits enrolment in higher education to universities of applied sciences. Under certain circumstances, however, it is also possible to obtain the general HEEC. In some cases, however, students are awarded the HEEC in addition to an apprenticeship or further training, as a kind of "by-product." Finally, evening schools (*Abendgymnasium*) and so-called *Kollegs* (adult education college) also offer the opportunity to obtain the

Table 1. Classification of types of schools leading to HEEC.

	Type of schools (German term)	Typical features
General upper secondary school	*Gymnasium*[1] *Gesamtschule*[2]	Part of the general school system Academic curriculum
Specialized (vocational) grammar school	*Berufliches Gymnasium* (in some federal states *Fachgymnasium*)[3]	Part of the vocational system Compared to upper secondary schools of the general school system characterised by a stronger vocational and practical orientation in their curriculum (usually in specific occupational fields)
Other upper secondary vocational school	*Fachoberschule*[4] *Berufsfachschule*[5] *Berufsoberschule*[6] *Fachschule*[7]	Part of the vocational system Compared to specialized (vocational) grammar schools characterised by a stronger vocational and practical orientation in their curriculum Usually complete with the specialized type-restricted HEEC limiting enrolment to universities of applied sciences
Evening school or so-called *Kolleg*	*Abendgymnasium*[8] *Kolleg*[9]	Part of the adult education system Particularly designed for people who already have some labour market experience or have completed VET

Notes: The Federal Ministry of Education uses a slightly different terminology. The terms used by the Federal Ministry are: [1] = grammar school, [2] = comprehensive school, [3] = specialized grammar school, [4] = specialized upper secondary school, [5] = fulltime vocational school, [6] = two-year full time vocational school, [7] = trade and technical school, [8] = evening grammar school, [9] = adult education college.

HEEC later in life. These schools are formally part of adult education and are specifically designed to allow people who already have some labour market experience or have completed VET to obtain a HEEC.

Hence, there are many institutional offerings besides the classical path to obtain the HEEC, and these alternative paths are also empirically relevant phenomena. Research has shown that alternative pathways to HEEC are particularly relevant for children from less privileged backgrounds (e.g., Bittmann & Schindler, 2020; Hillmert & Jacob, 2005; Kurz & Böhner-Taute, 2016). Although inequalities exist at *all* transition points in the educational career, social origin effects at least seem to be less pronounced at *later* points in life (Mare, 1981; Müller, 1994). An unsolved "dilemma," however, is that HEECs obtained through alternative paths less often result in transitions to higher education (Autor:innengruppe Bildungsberichterstattung, 2024, pp. 212–215; Bittmann & Schindler, 2021). The social opening of the highly stratified German system thus appears to be an "incomplete reform" when it comes to entering university. The reasons for the low probability of those who attained the HEEC over an alternative pathway may be manifold, and it is important to disentangle their relative roles to understand why the social opening of German education has so far been incomplete. Currently, we do not know much about the driving factors behind the finding that graduates who obtain their HEEC through alternative pathways are less likely to enrol in higher education. Shedding light on these mechanisms is, therefore, the starting point of our study.

First, it could be simply due to the different *social composition* of graduates. Graduates from alternative paths are more likely to come from less privileged social backgrounds, and since social origin has an impact on the

transition to higher education, this could explain why graduates from alternative paths are less likely to enter higher education. In addition, it is also likely that the school grades of graduates from alternative pathways are not as high as those from classical paths. The selection into the classical path to HEEC via the traditional *Gymnasium* is strongly based on children's performance. Alternative pathways have less strict requirements regarding prior academic achievement. A middle school diploma is often sufficient to enrol in educational programmes that allow obtaining the HEEC through alternative pathways. If previous school grades are a factor, it is not necessary to have excellent or above-average grades, which is required (Kurz & Böhner-Taute, 2016, p. 434). Thus, the fact that graduates from alternative paths are less likely to enter higher education may—at least in part—simply be an "effect" of their different composition in terms of social origin and school performance, both of which affect the transition to higher education (e.g., Müller & Pollak, 2016; Spangenberg & Quast, 2023).

However, we expect that it is not just the result of a different composition in terms of social origin and school performance, but that additional mechanisms are at work and explain the lower transition rates to higher education among graduates from alternative pathways. An important but often overlooked aspect addresses the long and strong tradition of institutional differentiation between vocational and academic education. Although the strong vocational programmes offer good job prospects also to those who do *not* enter higher education, this comes at the price of high persistence in inequalities in participation in higher education because children with less privileged social backgrounds are systematically diverted from university to vocational programmes. This criticism became known under the concept of the "educational schism" (*Bildungsschisma*; Baethge & Wolter, 2015). However, the more micro-level oriented "diversion thesis" has argued in a very similar direction (R. Becker & Hecken, 2009; Hillmert & Jacob, 2003; Shavit & Müller, 2000).

People who were diverted from the classical pathway have often first completed educational programs with a stronger vocational and practical orientation instead of a general upper secondary school. As the curricula of the alternative pathways are linked to this stronger vocational and practical orientation, they could therefore be more successful in enabling these individuals to obtain a HEEC after all. However, we also assume that the practical nature of alternative pathways might divert them from choosing to enter the higher education system. To understand why this might be the case and which mechanisms lead to this at the individual level, it is helpful to draw on rational choice theory (RCT). According to RCT, educational transitions are seen as the result of an individual decision-making process. The post-school educational decision can be understood as the result of an individual process of weighing up subjectively anticipated educational benefits, anticipated educational costs, and self-assessed prospects of success for the available educational alternatives (e.g., Breen & Goldthorpe, 1997; Erikson & Jonsson, 1996). Graduates with a HEEC should decide to study in higher education if they expect advantageous benefits (e.g., labour market benefits) from this pathway, if they anticipate the study costs to be comparatively low, and if they are confident that they will successfully complete university (Jackson, 2013; Lörz, 2012).

The subjective assessments of prospects of success, benefits, and costs are made in interaction with significant others (educational expectations of parents, schoolmates, and friends) and against the background of the individual's level of information (Reimer, 2013). From a life course perspective (e.g., Hillmert & Jacob, 2010), the decision-making process must also be seen against the background of the previous educational career and life path and the experiences gained there. Graduates with a HEEC from different pathways differ in their

previous educational biographies, skills profiles, qualification options, and educational investments (Schindler, 2014). They should, therefore, assess the prospects of success, benefits, and costs of post-school education options differently and accordingly transition to higher education at different rates.

Therefore, it is expected that graduates from alternative educational pathways, for example, will rate their chances of success at university lower. This is because their school qualifications are more strongly geared towards VET with a practical focus, making them feel subjectively less prepared for the demands of a university degree (Tieben, 2020). Furthermore, they should underestimate the labour market prospects (material benefits) of studying, as they are more familiar with the advantages of VET than the labour market benefits of studying due to their school orientation. They should also underestimate the immaterial benefits of studying, such as the promotion of academic skills and interests, as they have more practical interests due to their school career. Finally, it can also be assumed that graduates from alternative educational pathways value the monetary costs of studying more highly and are therefore less likely to go on to higher education. Graduates from alternative educational pathways who have already completed VET before obtaining the HEEC, for example, have already invested more time in education and could pursue qualified employment after completing their VET. The opportunity costs of studying are therefore comparatively high for them, which is why they forego studying more often. The opportunity costs of higher education are even higher if VET is completed after obtaining the HEEC, as VET is generally shorter than university studies and a vocational salary is usually already earned during VET. Studying at a university is often also associated with non-monetary costs, as taking up a course of study often requires a change of location, which is associated with the loss of social ties at home. These non-monetary costs, which school graduates from alternative routes consider to be higher, could also help explain why they are less likely to choose to study.

Against the described theoretical background, this article examines the following questions: Which (alternative) educational pathways lead to attaining a HEEC in Germany if the previous pathways are considered in detail? To what extent do the social disparities in the decision to study differ according to these educational pathways? This, in turn, raises the question of which mechanisms can explain these disparities and what contribution the various mechanisms (composition according to social background, school performance, and individual decision-making behaviour) contribute to explaining the disparities in detail.

3. Data, Operationalisation, and Research Design

We answer our questions based on data from the Panel of School Leavers 2018 of graduates who obtained a HEEC at a general upper secondary or vocational school in Germany in 2018, conducted by the German Centre for Higher Education Research and Science Studies (DZHW). The survey took place six months before leaving school (first wave) and six months after graduation via a randomly chosen disproportionate cluster sample. The first wave of participants consisted of 39,714 students out of 82,413 contacted at 1,185 schools of various types throughout Germany (Woisch et al., 2022). In the second wave, 25,508 people with e-mail or address details were surveyed again, with a response rate of 37% (N = 9,175). The disproportionality of the sample was adjusted to the statistical population via a design weight. Data from 8,824 respondents who participated in both survey waves is used to identify typical educational pathways leading to a HEEC; 6,751 graduates with a HEEC remain in the sample for the subsequent analysis of the mechanisms underlying the different probability of studying according to these pathways.

First, we use sequence analysis to identify educational pathways leading to a HEEC. Potential states include various types of schools (middle secondary school, general upper secondary school at grammar and comprehensive schools), evening school/*Kolleg*, specialized (vocational) grammar schools (*Berufliches Gymnasium* or *Fachgymnasium*) and other upper secondary vocational schools, staying abroad, VET, employment, temp jobs, internships, further education, voluntary social year, unemployment, and other activities. Through optimal matching (Levenshtein distance) and cluster analysis with Ward's algorithm (e.g., Abbott & Tsay, 2000), we classify clusters that identify classical and alternative pathways up to the HEEC and subsequently describe their socioeconomic composition. The dendrogram, cluster size, and content-related criteria are used to determine the number of clusters. In accordance with our research question, the sequence pattern analysis only includes the months leading up to the HEEC, i.e., the 51 months from January 2014 to March 2018. In the case of parallel activities, only school attendance was considered.

Second, we use logistic regression models to analyse the probability of graduates from the different pathways identified via sequence analysis to enter higher education. In the first model, we have no explanatory variables. In the second model, only the social origin is considered before the final school grades are included to analyse if the varying likelihood of entering higher education is due to composition in terms of social origin and performance.

Finally, a non-linear decomposition using the KHB method (Karlson et al., 2012; Kohler et al., 2011) is used to determine the percentage of further individual theoretical components (probabilities of success, benefits, costs, and educational expectations of the significant others) that contribute to explaining why graduates from alternative paths are distracted from higher education. These decompositions can be used to determine to what extent the lower probability of studying on each alternative pathway compared to the classical pathway can be attributed to or "explained" by additional variables. Tables A3 to A6 in the Supplementary File show the results of the hierarchical models and the detailed explanatory shares for the mechanisms.

The dependent variable is coded 1 for graduates who have started or are planning to start studying at university six months after attaining their HEEC and 0 for those whose intention to study is uncertain or who have no intention to study. The analysis, therefore, refers to both those who have started studying (62%) and those who have not yet done so but have definite study intentions (38%). Analyses have shown that there is a close correlation between the intention to study and the realisation of this intention (Christoph et al., 2023).

The explanatory variable *social origin* is represented by the socioeconomic status (SES) of the parents. Using the dominance principle, SES is represented by the highest International Socioeconomic Index of Occupational Status (ISEI-08) of the parents (henceforth HISEI; Ganzeboom, 2010). For interpretative purposes, the HISEI is further divided by 10. To illustrate the social composition of educational pathways, three SES groups are distinguished by forming quartiles of the HISEI, whereby the two middle quartiles were combined to form a "middle" SES. The *school performance* is operationalised using the final grade.

The *probability of success* is operationalised via the self-assessed chance of successfully completing a course of study. In terms of *anticipated benefits*, respondents were asked to rate the career prospects of higher education graduates on the one and VET graduates on the other hand over a five-point scale. Career

prospects were asked about three aspects and included the prospect of material benefits ("getting a well-paid job later," "not becoming unemployed later") and status-related benefits ("getting a respected job in society later"). For all three aspects, the difference between the material benefits of VET paths and academic qualifications was calculated. This difference reflects the relative earnings expectations for non-academic and academic qualifications. In addition, the analyses for mapping non-material benefits include how important the "opportunity for academic work" is to the respondents or how important the "inclination towards practical work" was for their post-school pathway.

Anticipated costs are operationalised as both monetary and non-monetary (social) costs. For this purpose, several variables are combined to form a sum index. On the one hand, the cost sensitivity of the respondents considers the role that costs generally have in their decision to study. In addition, the question of how difficult it would be for the respondents and their families to cover various costs during their studies is included. Opportunity costs are considered via the assessment: "How great would the loss of income be for you if you were to study?" Finally, this index includes the importance of the motive of "early financial independence" for the chosen path after school. Social costs that may arise from leaving one's hometown due to a qualification decision are formed via an index consisting of two variables on the importance of local ties. The variables describe the importance that respondents attach to the aspects of "proximity to home" and "parents, relatives or friends who live in the place of training/study" when choosing the place of training/study.

To add information about *significant others*, variables relating to the respondents' parents and friends were included in the analyses. Respondents were asked what educational preference their parents have (studies vs. VET/no preference) and what their friends' intentions are after obtaining their HEEC (rating of the phrase "most of my friends want to go to university after school").

Finally, we adjust the analyses for *gender* and *migration background*, as research indicates that both characteristics are associated with the likelihood of pursuing studies (Kristen et al., 2008; Lörz et al., 2011). A migration background is defined as the respondents themselves, or at least one parent, being born abroad. Except for the HISEI, all independent metric variables and indices are z-standardised, and effect sizes are presented as average marginal effects in the logistic regressions. For detailed information about the variables, see Table A1 in the Supplementary File. The results of the non-linear decompositions are presented clearly as confounding percentages.

4. Results

4.1. Which Pathways Lead to HEEC? How Likely Are They to Result in Higher Education Entrance?

The results of our sequence analysis in Figure 1 confirm that there are indeed many ways in which graduates in Germany reach their HEEC. In total, we find six clusters of typical pathways to HEEC in our sample. A contribution to research is that the identified pathways are not only characterised by the type of school that finally leads to the HEEC but also by the professional, educational, and life paths that precede it. This also considers any change of school type due to dropping out of previous schooling, e.g., from general upper secondary to vocational school.

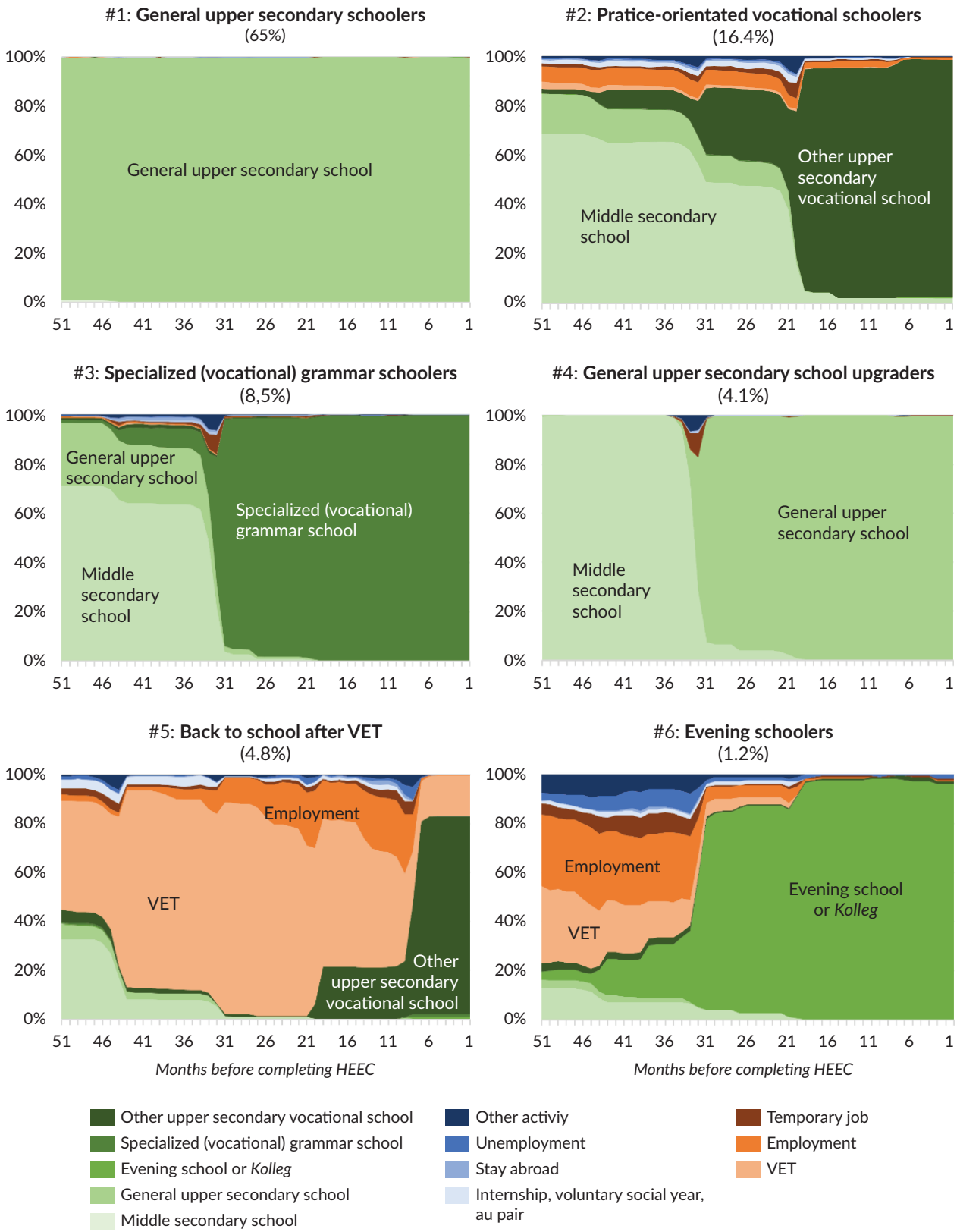

Figure 1. Individuals' pathways to a HEEC (sequence status plots). Notes: All results are adjusted to the statistical population using design weights. Source: Own calculations based on DZHW Panel of School Leavers 2018 (n = 8,824).

Unsurprisingly, the classical path, which is characterised by graduates having attended a general upper secondary school without interruption in the four years prior to obtaining their HEEC, is the dominant cluster (#1). Two out of three graduates belong to this group, and this cluster of "general upper secondary schoolers" (#1) will be the reference group in our subsequent analyses. The second largest group, by some distance, is made up of graduates who obtained their HEEC in a practice-orientated vocational school (e.g., *Fachoberschule*, *Berufsoberschule*). One in six graduates took this pathway and we refer to this cluster as "practice-orientated vocational schoolers" (#2). Typically, these graduates originally attended and completed middle school before transferring to a practice-orientated vocational school to obtain their HEEC. However, some also came from a general upper secondary school. The third group shows certain similarities with the cluster of "practice-orientated vocational schoolers," as it is also predominantly characterised by continued schooling. In contrast to the "practice-orientated vocational schoolers" cluster, these graduates obtained their HEEC at a specialized (vocational) grammar school. Like general upper secondary schools, this specific type of vocational school offers the possibility of obtaining the general HEEC (*Abitur*) while other vocational schools often lead to the more specialized type-restricted HEEC, the so-called *Fachhochschulreife*, which restricts access to universities of applied sciences. In addition, the curriculum of these schools is less vocational and practical than that of other vocational schools, though still less formal than that of general upper secondary schools. Also in this third cluster, most graduates first attended a middle school before moving on to a specialized (vocational) grammar school; only some had previously attended a general upper secondary school. In total, one out of 12 graduates belong to this group of "specialized (vocational) grammar schoolers" (#3). Rarely do those who originally attended and completed middle school choose to transfer to a general upper secondary school to obtain their HEEC. Only 4% took this pathway (cluster #4 "general upper secondary school upgraders"). Consequently, it is indeed usually schools of the vocational system that are used by graduates who obtain their HEEC via an alternative path.

The remaining cases are made up of two clusters of graduates whose pathways are quite different from those of the other clusters. In contrast to the graduates of the other clusters, these graduates interrupted their schooling for some time before returning to school to obtain a HEEC. In most cases, these graduates completed VET, sometimes followed by a (short) period of employment, and then gained their HEEC at one of the other upper secondary vocational school types (so-called *Berufsfachschule*, *Fachschule*, *Fachoberschule*, *Berufsoberschule*) that is not a specialized (vocational) grammar school. This cluster, which we call "back to school after VET" (#5), comprises 5% of the graduates in our sample. The last cluster includes graduates who earned their HEEC at an evening school (or a so-called *Kolleg*), mostly after a longer period of employment or VET. However, with only 1.2%, the cluster "evening schoolers" (#6) is by far the smallest. Just as all clusters represent specific pathways and are characterised by different general and vocational school types, school performance also differs in the form of school-leaving grades. The best grades are achieved by "general upper secondary schoolers" (#1 in the Supplementary File, Table A1). The grades of "practice-oriented vocational schoolers" (#2), "specialized (vocational) grammar schoolers" (#3), and school leavers who have upgraded to general upper secondary school after finishing secondary school (#4) are only below average.

As expected, the social composition of the clusters is also very different (Table A1 in the supplement). The cluster of "general upper secondary schoolers" (#1) is the most socially selective. Only 18% of the graduates come from families with a low SES. In all other clusters, the proportion of low(er) SES children is significantly higher. The highest proportions of low SES graduates can be found in the two clusters characterised by an interruption of formal schooling: In the clusters "back to school after VET" (#5) and

"evening schoolers" (#6), 35% and 47% of the graduates come from low SES families. Alternative pathways to a HEEC are thus indeed more socially inclusive. At the same time, however, they are, as expected and previously shown (Schindler, 2014), less likely to lead to higher education entry, as our regression analysis shows (Table 2). Compared to the group who obtained their HEEC via the classical general upper secondary school path, graduates from alternative pathways have a significantly lower probability of entering (or intending to enter) higher education. Their probabilities of making the transition to higher education are 10 to 26 percentage points lower than that of "general upper secondary schoolers" (#1). Only those who obtained their HEEC at an evening school or *Kolleg* (#6) do not differ from "general upper secondary schoolers." However, given their biographies, it seems very plausible that these persons invested in obtaining the HEEC through an alternative pathway already with the strong intention of entering higher education. As the sequence analysis shows, these graduates were often already in the labour market before returning to school to obtain their HEEC. Returning to school when already in or qualified for the labour market is a very high investment and, as our regression shows, it often appears to be an investment made with a very high intention of going to university so that this specific group from alternative pathways does not differ from graduates of the classical path (#1), even though they are more likely to come from less privileged social backgrounds (see Supplementary File, Table A1). However, at 1.2%, the cluster of "evening schoolers" (#6) is, as already mentioned, very small. Most graduates from alternative pathways have taken different routes to earn their HEEC, and for all of them, transition rates to higher education are significantly lower than those of "general upper secondary schoolers" (#1).

Model 2 in Table 2 of our regression analyses shows that these differences in graduates' probabilities of entering higher education are not due to the higher proportion of lower SES children in alternative pathways. Even after including SES in our model, the probability of graduates entering higher education remains significantly lower if they obtained their HEEC through an alternative pathway (the only exception is the small group of "evening schoolers"). The estimated average marginal effects decrease only slightly when our regression controls for graduates' SES. Also, after accounting that graduates of alternative educational pathways generally have poorer school grades on average, the differences remain highly significant and

Table 2. Logistic regressions for transitions to higher education (AME).

	Model 1	Model 2	Model 3
Individual pathway to HEEC			
(ref.: #1: General upper sec. schoolers)			
#2: Practice-orientated vocational schoolers	−0.26 ***	−0.23 ***	−0.18 ***
#3: Specialized (vocational) grammar schoolers	−0.10 ***	−0.08 **	−0.05 *
#4: General upper secondary school upgraders	−0.15 ***	−0.12 ***	−0.07 *
#5: Back to school after VET	−0.11 **	−0.07 *	−0.07 *
#6: Evening schoolers	−0.04	−0.01	−0.01
Parents' SES (HISEI/10)		0.03 ***	0.02 ***
Final school grade			0.11 ***
Pseudo R^2 (McFadden)	0.04	0.06	0.11
N	6,751	6,751	6,751

Notes: Adjusted for gender and migration background; weighted results; * = $p < 0.05$; ** $p < 0.01$; *** $p < 0.00$. Source: Own calculations based on DZHW Panel of School Leavers 2018.

barely change (Model 3 in Table 2; see also Table A2 in the Supplementary File). Thus, neither the different composition in terms of social origin nor the existing differences in their school performance can completely explain why graduates from most alternative pathways are less likely to attempt to enter higher education. Graduates from the quantitatively most relevant alternative pathway cluster—"practice-orientated vocational schoolers" (#2)—have the lowest probability of making the transition to higher education. Using this group as a reference category shows that "practice-orientated vocational schoolers" not only have significantly lower probabilities of entering higher education compared to graduates from the classical path (not presented), but they are also significantly less likely to enter higher education compared to all other groups. This shows how important it is not to simplistically reduce graduates from alternative paths into one single category but to recognise that heterogeneities may also exist *within* the group of graduates from different alternative paths.

Finally, we find that the SES of graduates has a significant impact on their likelihood of making the transition to higher education in *all* clusters (Figure 2).

Additional interaction analyses reveal that the SES gradient does, at least, not differ significantly between the various groups (not presented). To put it simply: In *all* pathways, social origin has a similarly negative impact on the probability of entering higher education. Despite being more socially inclusive, alternative pathways to HEEC not only lead to lower entry rates into higher education but also maintain the effects of social origin on higher education enrolment that are at least as strong as in the classical path (#1).

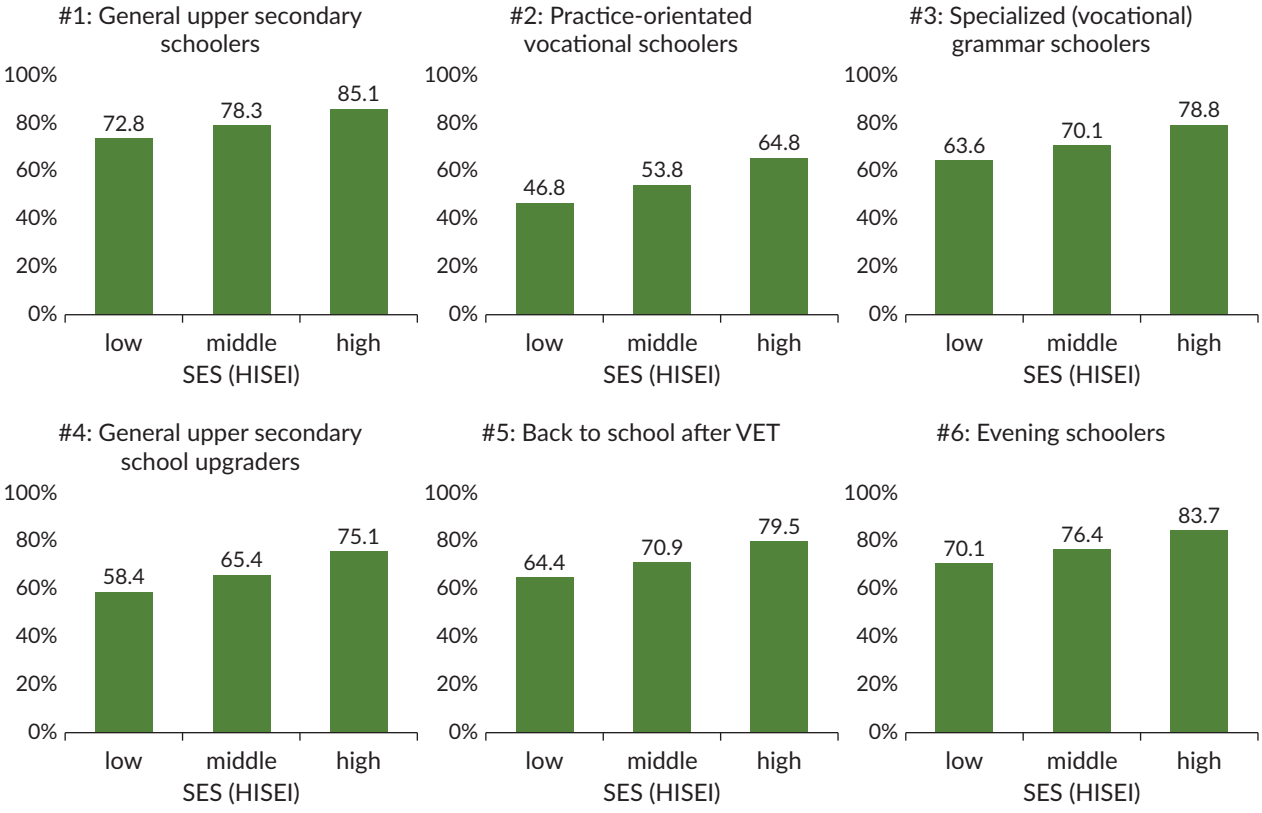

Figure 2. Predicted probabilities of entering higher education by individual pathways to HEEC and graduates' SES. Notes: Adjusted for gender and migration background; weighted results. Source: Own calculations based on DZHW Panel of School Leavers 2018 (n = 6,751).

4.2. Why Are Graduates From Alternative Paths Diverted From Higher Education?

So far, our analysis has shown that there are different ways in addition to the classical one of how school graduates with a HEEC earn their degree which permits them to enter higher education. Vocational programmes are particularly used by individuals to obtain a HEEC via alternative paths. These alternative pathways offer a second chance to earn a HEEC within the highly stratified German system, especially for children from lower SES families. At the same time, however, alternative pathways are far less "successful" in bringing graduates to university and this is not only due to a different composition in terms of social origin and school performance that explains these differences (Figure 2). In the final step of our analysis, we aim to shed light on the extent to which differences in theoretically relevant components of the individual decision-making process can explain why graduates from alternative pathways tend to enter higher education less often than "general upper secondary schoolers." We argued that graduates who obtain their HEEC through alternative pathways and enrol in vocational programmes may face a high risk of distraction from higher education. This may be due to very differing assessments of the expected probabilities of academic success, the benefits and costs of investing in higher education, and the educational expectations of the social environment (significant others) behind the decision-making process.

To understand the potential (relative) role of all these different factors in explaining why graduates from alternative pathways are less likely to attempt to use their HEEC to enter higher education, we conducted a non-linear decomposition analysis. The results are presented in Figure 3. Since "evening schoolers" (#6) do not differ from graduates from the classical path (#1) in their likelihood of entering higher education, this group was excluded in the final step of our analysis.

Indeed, we find that graduates from alternative pathways (#2 to #5) differ not only in terms of social origin and school performance from graduates from the classical pathway (#1) but also in their individual assessment of probabilities of study success, study benefits and the costs associated with higher education (for a descriptive overview of the different values of the mechanisms between the educational pathways, see Supplementary File, Table A1). The results of the decomposition (Figure 3) show that including further mechanisms of the individual decision-making process greatly helps to explain why graduates from alternative paths are less likely to attempt to enter higher education. In our full model, we can explain about 68 to 89% of their lower probabilities of entering higher education.

The fact that graduates on alternative pathways are more often from families with lower SES explains only a small proportion (2 to 9%; Figure 3) of their lower probability of entering higher education—at least directly and when controlling for other mechanisms. This is because the explanatory shares of social origin for the different study probabilities of the educational pathways are predominantly mediated by the further mechanisms (shown in Tables A3 to A6 in the Supplementary File, with stepwise decompositions).

Turning to school performance, we find that the final grade explains between around 8 and 22% of the decision to study, depending on the alternative path. This means, for example, that for "general upper secondary school upgraders" (#4), 22% of their lower propensity to study can be attributed to their comparatively lower final school grade. In contrast, the same mechanism only explains around 7% of the lower study propensity of graduates who transition from VET back to vocational school (#5).

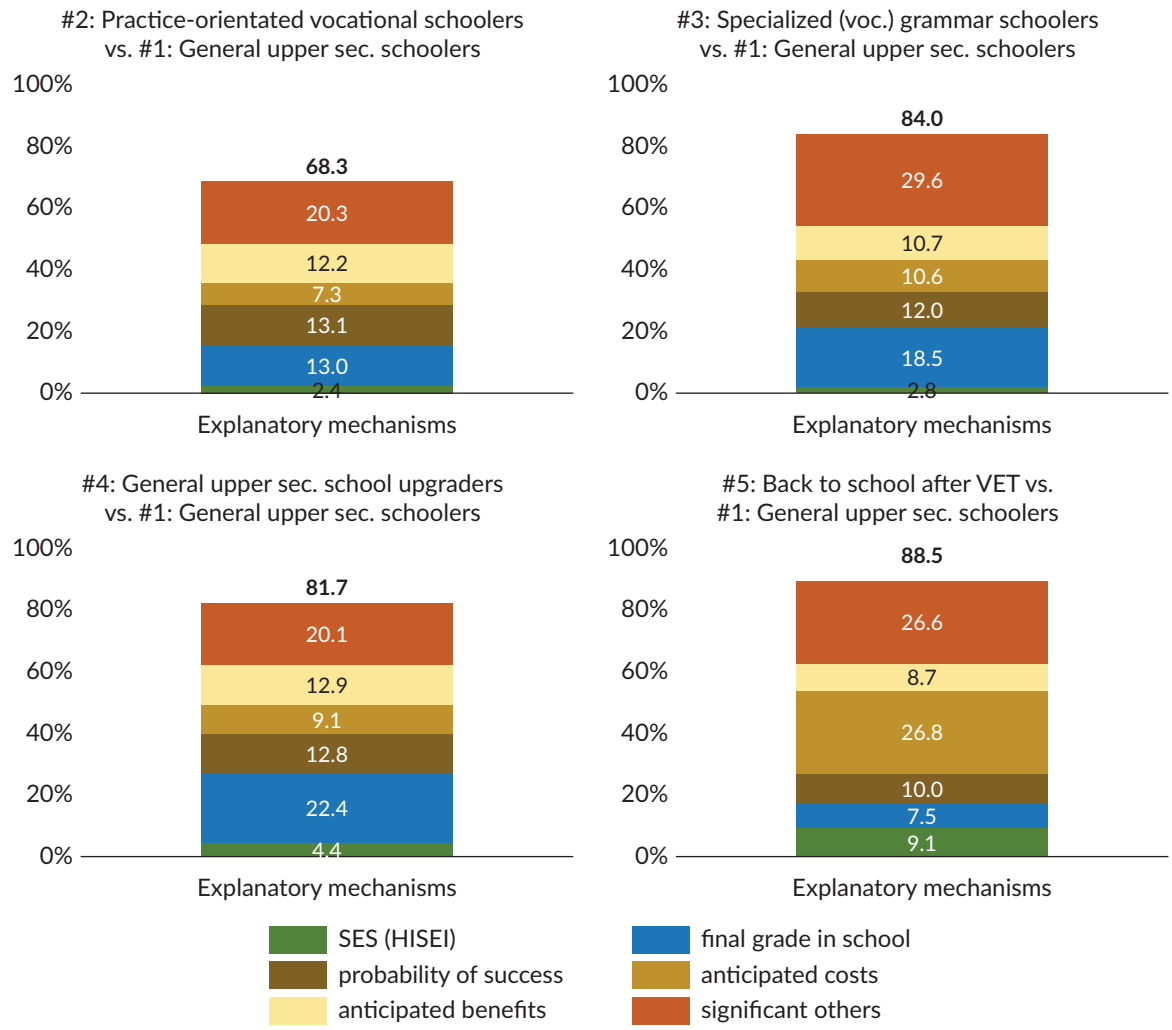

Figure 3. Confounding percentages of non-linear decompositions for the effect of the classical pathway versus alternative pathways (KHB method). Notes: Adjusted for gender and migration background; weighted results; individual variables grouped by mechanisms. Source: Own calculations based on DZHW Panel of School Leavers 2018 (n = 6,751).

Although differences in school performance also make a relevant explanatory contribution to our decomposition, their role is in almost all educational paths relatively small compared to the variables that capture the mechanisms of the individual decision-making process. Compared to graduates from the classical pathway (#1), students from the alternative pathways rate their prospects of completing higher education as lower. These self-assessed chances of completing higher education contribute, to a similar extent, to the explanation of the low probability of studying in the non-classical pathways, with shares of 10 to 13% over all pathways. Anticipated costs contribute, to a similar extent, to explaining the lower probability of studying for the clusters "practice-orientated vocational schoolers" (#2), "specialized (vocational) grammar schoolers" (#3) and the "general upper secondary school upgraders" (#4). However, if graduates went "back to school after VET" (#5), this proportion of anticipated costs is substantially higher when explaining the low study probability, even significantly higher than the proportion of the school performance. The costs of an educational alternative are offset by the expected benefits. Between around 8 and 12% of the lower probability to study is related to the fact that graduates from alternative pathways

rate the benefits from studying as lower. Next, the educational behaviour of friends and parental educational preference also significantly explains the lower study probabilities (20.1 to 29.6%). Compared to the classical pathway, friends of graduates on alternative pathways are less likely to want to study, and parents are less likely to want their children to study. Accordingly, significant others are less likely to encourage them to attend higher education.

Overall, despite all the similarities, each alternative path is characterised by a specific pattern of the investigated mechanisms compared to the classical path. "General upper secondary school upgraders" (#4) and "specialized (vocational) grammar schoolers" (#3) have more problems with school performance than students on the more practice-oriented paths. For the students on the pathway of "back to school after VET" (#5), the anticipated costs play a particularly important role compared to the classical pathway. The expectations of parents, classmates, and friends are of great importance for students on pathways #3 and #5.

5. Summary and Conclusion

This article aimed to assess the diversity of educational pathways to a HEEC, their relationship with graduates' SES and school performance during the transition to higher education, and the individual theoretical components that divert graduates on the diverse alternative pathways from studying at university. Drawing on data from the DHZW School Leavers Panel 2018, we illustrated that alternative pathways are diverse. Using sequence analyses, we identified six different educational pathways that lead to graduating from school with a HEEC. Although the straightforward classical pathway of general upper secondary schoolers remains dominant, alternative pathways to attaining a HEEC encompass around 35% of all graduates. The pathways vary not only according to the type of school attended, which has already been analysed more frequently in the context of studies on study decisions but also regarding other school and extracurricular activities (switch of school type, VET, or employment).

Furthermore, our findings show that alternative pathways are more socially inclusive than the classical pathway, as they especially offer graduates with a low SES the opportunity to attain a HEEC. While the classical pathway is more frequently attended by graduates with a high SES, graduates with a lower SES are more frequently represented in the other pathways. However, alternative pathways less often lead to higher education than the classical pathway: The probability of studying is between 10 and 26 percentage points lower for graduates from these (vocational) educational pathways than for graduates from the classical pathway. Further analysis has shown that these differences cannot be solely explained by the different composition in terms of social origin and school performance.

This brings us to our final analysis and the concluding question of why graduates from alternative pathways are distracted from higher education. According to the decomposition results, the lower probability of studying in (vocational) educational pathways compared to the classical path can be explained to a significant extent by the fact that graduates from these alternative pathways rate their prospects of academic success and the benefits from studying lower. They also rate the costs of studying higher than general upper secondary schoolers. In addition, their social network (significant others) is less likely to expect them to study, which is why they more often decide to pursue a career without a university degree after gaining the HEEC. These findings are in line with our theoretical considerations on the individual decision-making process. It seems plausible

that graduates from the alternative pathways rate their prospects of academic success lower, as their school qualifications are more vocationally and practically oriented, which is why they feel less well prepared for an academic qualification. Similarly, it seems reasonable that they underestimate the benefits of studying due to their greater familiarity with the advantages of VET as a result of their school orientation and the interests fostered at vocational school. Furthermore, as has been shown empirically, we had expected that graduates of alternative pathways in particular value the opportunity costs of studying more highly and therefore often forego studying, as some of these graduates have already completed VET with which they can immediately enter the labour market or, in the case of post-school VET, because they already earn a salary during this VET and can also enter the labour market earlier with the (shorter) VET. Compared to these components of the decision-making process, social origin and, with the exception of the "general upper secondary school upgraders," school performance can also only directly explain a relatively small proportion of the lower study probability of graduates from alternative compared to classical pathways. In the case of social origin, however, this has to do with the fact that the effects of origin are mediated by assessments of the prospects of success, educational achievements and costs (e.g., Jackson, 2013; Lörz, 2012).

Finally, considering the decomposition results, it should also be noted that there are clear differences between the educational pathways in terms of the extent of the mechanisms. While, for example, the difference in the probability of studying between graduates who returned to school after VET and graduates of the classical pathway can be explained to an above-average extent by the anticipated costs, this applies to the final school grades in the pathway of "specialized (vocational) grammar schoolers."

We acknowledge some limitations of our research. First, the survey data was collected six months after completing school. At this point, more than a third of the graduates were still in a temporary activity (e.g., travelling or volunteering) before starting higher education. It was, therefore, not possible to exclusively consider the actual decision to study as a dependent variable but rather the willingness to study, in which both the actual study decision and the study intention were considered. Even though the intention to study is a very good predictor of the decision to study (Christoph et al., 2023), further analyses with later survey waves could, therefore, be of interest. In addition, the differences in the probability of studying between the alternative and classical pathways cannot be fully explained by the mechanisms used. Further theoretical approaches would be of interest here (e.g., personality traits) since they could usefully expand the decomposition analysis.

Nevertheless, our work extends previous research by identifying the different pathways to a HEEC, particularly through vocational schools and the extended educational biography, and examining in detail the mechanisms that lead to a lower study probability of graduates of the alternative pathways compared to the classical pathway in Germany. Against the background of our results, the "decoupling" of social origin from school performance, the probability of success, the costs, and the benefits could reduce social disparities in the decision to study and, at the same time, the different probability of studying for different educational pathways. As experimental studies (e.g., Ehlert et al., 2017; Peter et al., 2021) have shown for the German context, information treatments—e.g., on opportunities to enter higher education, financial issues, or benefits of higher education—have the potential to increase the probability of enrolment. The results suggest that such information treatments could be used, particularly for alternative educational pathways, to support school graduates in their study choices and reduce the high levels of social inequality in these pathways. In this context, further research could examine the question of why students who have

completed VET and, in some cases, employment (#5), still obtain a higher education entrance certificate, but then so rarely use it to go to university. "Evening schoolers," on the other hand, who also have an apprenticeship and some professional experience, attend evening school for a longer period of time and then take up a course of university study just as frequently as school graduates from the classical pathway.

For countries that do not yet have alternative educational pathways for obtaining a HEEC but are considering introducing them to give more people access to higher education, our results suggest that alternative educational pathways for obtaining a HEEC do indeed mean inclusion for certain social groups. However, they also suggest that these alternative educational pathways should also provide an appropriate curricular and educational orientation, as well as information and guidance on the prospects of academic success and the benefits and costs of studying because otherwise, the educational potential for a course of academic study will be wasted to some extent.

Conflict of Interests

The authors declare no conflict of interest.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

References

Abbott, A., & Tsay, A. (2000). Sequence analysis and optimal matching methods in sociology: Review and prospect. *Sociological Methods & Research*, *29*(1), 3–33. https://doi.org/10.1177/0049124100029001001

Allmendinger, J. (1989). Educational systems and labor market outcomes. *European Sociological Review*, *5*(3), 231–250.

Ariga, K., & Brunello, G. (2007). Does secondary school tracking affect performance? Evidence from IALS. *SSRN Electronic Journal*. Advance online publication. https://doi.org/10.2139/ssrn.970246

Autor:innengruppe Bildungsberichterstattung. (2024). *Bildung in Deutschland 2024. Ein indikatorengestützter Bericht mit einer Analyse zu beruflicher Bildung*. https://doi.org/10.3278/6001820iw

Baethge, M., & Wolter, A. (2015). The German skill formation model in transition: From dual system of VET to higher education. *Journal of Labour Market Research*, *48*(2), 97–112. https://doi.org/10.1007/s12651-015-0181-x

Barone, C., & Ruggera, L. (2018). Educational equalization stalled? Trends in inequality of educational opportunity between 1930 and 1980 across 26 European nations. *European Societies*, *20*(1), 1–25.

Becker, M., Neumann, M., & Dumont, H. (2016). Recent developments in school tracking practices in Germany: An overview and outlook on future trends. *Orbis Scholae*, *10*(3), 9–25.

Becker, R. (2017). Entstehung und Reproduktion dauerhafter Bildungsungleichheiten. In R. Becker (Ed.), *Lehrbuch. Lehrbuch der Bildungssoziologie* (3rd ed., pp. 89–150). VS Verl. für Sozialwiss. https://doi.org/10.1007/978-3-658-15272-7

Becker, R., & Hadjar, A. (2011). Meritokratie—Zur gesellschaftlichen Legitimation ungleicher Bildungs-, Erwerbs-und Einkommenschancen in modernen Gesellschaften. In R. Becker (Ed.), *Lehrbuch. Lehrbuch der Bildungssoziologie* (2nd ed., pp. 37–62). VS Verl. für Sozialwiss. https://doi.org/10.1007/978-3-531-92759-6_2

Becker, R., & Hecken, A. E. (2009). Why are working-class children diverted from universities? An empirical assessment of the diversion thesis. *European Sociological Review*, *25*(2), 233–250. https://doi.org/10.1093/esr/jcn039

Beicht, U., & Walden, G. (2018). Neue Bildungsexpansion und Verdrängungseffekte in der betrieblichen Ausbildung. *Sozialer Fortschritt*, *67*(3), 141–172. https://doi.org/10.3790/sfo.67.3.141

Bittmann, F., & Schindler, S. (2020). *Alternative Wege zur Hochschulreife und soziale Disparitäten beim Hochschulabschluss* (LIfBi Working Paper No. 88). https://doi.org/10.5157/NEPS:WP88:1.0

Bittmann, F., & Schindler, S. (2021). Analysing diversion processes in German secondary education: School-track effects on educational aspirations. *Kölner Zeitschrift Für Soziologie und Sozialpsychologie*, *73*(2), 231–257. https://doi.org/10.1007/s11577-021-00789-1

Blossfeld, P. N., Blossfeld, G. J., & Blossfeld, H.-P. (2015). Educational expansion and inequalities in educational opportunity: Long-term changes for East and West Germany. *European Sociological Review*, *31*(2), 144–160.

Brand, J. E., & Davis, D. (2011). The impact of college education on fertility: Evidence for heterogenous effects. *Demography*, *48*(3), 863–887.

Breen, R., & Goldthorpe, J. H. (1997). Explaining educational differentials: Towards a formal rational action theory. *Rationality and Society*, *9*(3), 275–305. https://doi.org/10.1177/104346397009003002

Buchholz, S., & Pratter, M. (2017). Wer profitiert von alternativen Bildungswegen? Alles eine Frage des Blickwinkels! Eine systematische Rekonstruktion des Effektes sozialer Herkunft für alternative Wege zur Hochschulreife. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, *69*(3), 409–443. https://doi.org/10.1007/s11577-017-0484-8

Christoph, B., Spangenberg, H., & Quast, H. (2023). Tertiary education, changing one's educational decision and the role of parental preferences. *Research in Higher Education*. Advance online publication. https://doi.org/10.1007/s11162-023-09752-9

Dumont, H., Maaz, K., Neumann, M., & Becker, M. (2014). Soziale Ungleichheiten beim Übergang von der Grundschule in die Sekundarstufe I. Theorie, Forschungsstand, Interventions- und Fördermöglichkeiten. *Zeitschrift für Erziehungswissenschaft*, *17*, 141–165. https://doi.org/10.25656/01:12370

Ehlert, M., Finger, C., Rusconi, A., & Solga, H. (2017). Applying to college: Do information deficits lower the likelihood of college-eligible students from less-privileged families to pursue their college intentions? Evidence from a field experiment. *Social Science Research*, *67*, 193–212. https://doi.org/10.1016/j.ssresearch.2017.04.005

Erikson, R., & Jonsson, J. O. (Eds.). (1996). *Social inequality series. Can education be equalised? The Swedish case in comparative perspective*. Westview Press.

Esser, H. (2021). *"Wie kaum in einem anderen Land…?": Die Differenzierung der Bildungswege und ihre Wirkung auf Bildungserfolg—ungleichheit und- gerechtigkeit. Band 1: Theoretische Grundlagen*. Campus Verlag.

Ganzeboom, H. B. (2010). *A new International Socio-Economic Index (ISEI) of occupational status for the International Standard Classification of Occupation 2008 (ISCO-08) constructed with data from the ISSP 2002–2007* [Paper presentation]. Annual Conference of the International Social Survey Programme, Lisbon, Portugal. https://www.researchgate.net/publication/242660186_A_new_International_Socio-Economic_Index_ISEI_of_occupational_status_for_the_International_Standard_Classification_of_Occupation_2008_ISCO-08_constructed_with_data_from_the_ISSP_2002-2007

Gebel, M., & Heineck, G. (2019). Returns to education in the life course. In R. Becker (Ed.), *Research handbook on sociology of education* (pp. 454–475). Edward Elgar Publishing. https://doi.org/10.4337/9781788110426.00035

Hadjar, A., & Gross, C. (2016). Education systems and inequalities. In C. Gross & A. Hadjar (Eds.), *Education systems and inequalities: International comparisons* (pp. 1–10). Policy Press. https://doi.org/10.56687/9781447326113-004

Hallinan, M. T. (1994). Tracking: From theory to practice. *Sociology of Education*, *67*(2), 79–84.

Hillmert, S., & Jacob, M. (2003). Social inequality in higher education: Is vocational training a pathway leading to or away from university? *European Sociological Review*, *19*(3), 319–334. https://doi.org/10.1093/esr/19.3.319

Hillmert, S., & Jacob, M. (2005). Institutionelle Strukturierung und interindividuelle Variation: Die Entwicklung herkunftsbezogener Ungleichheiten im Bildungsverlauf. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, *57*, 414–442.

Hillmert, S., & Jacob, M. (2010). Selections and social selectivity on the academic track: A Life-course analysis of educational attainment in Germany. *Research in Social Stratification and Mobility*, *28*(1), 59–76.

Hout, M. (2012). Social and economic returns to college education in the United States. *Annual Review of Sociology*, *38*(1), 379–400.

Hurrelmann, K. (2013). Das Schulsystem in Deutschland: Das "Zwei-Wege-Modell" setzt sich durch. *Zeitschrift für Pädagogik*, *59*(4), 455–468.

Jackson, M. (Ed.). (2013). *Determined to succeed? Performance versus choice in educational attainment*. Stanford University Press.

Karlson, K., Holm, A., & Breen, R. (2012). Comparing regression coefficients between same sample nested models using logit and probit: A new method. *Sociological Methodology*, *42*(1), 286–313. https://doi.org/10.1177/0081175012444861

KMK. (2021). *The education system in the Federal Republic of Germany 2018/2019. A description of the responsibilities, structures and developments in education policy for the exchange of information in Europe*. https://www.kmk.org/fileadmin/Dateien/pdf/Eurydice/Bildungswesen-engl-pdfs/dossier_en_ebook.pdf

Kohler, U., Karlson, K. B., & Holm, A. (2011). Comparing coefficients of nested nonlinear probability models. *The Stata Journal*, *11*(3), 420–438. https://doi.org/10.1177/1536867X1101100306

Konietzka, D., & Hensel, T. (2017). Berufliche Erstausbildung im Lebensverlauf. In R. Becker (Ed.), *Lehrbuch der Bildungssoziologie* (pp. 281–309). Springer. https://doi.org/10.1007/978-3-658-15272-7_10

Kracke, N., Schwabe, U., & Buchholz, S. (2024). *Neuer Bildungstrichter: Trotz Akademisierungsschub immer noch ungleicher Zugang zur Hochschule*. (Brief No. 02|2024). DZHW. https://doi.org/10.34878/2024.02.dzhw_brief

Kristen, C., Reimer, D., & Kogan, I. (2008). Higher education entry of Turkish immigrant youth in Germany. *International Journal of Comparative Sociology*, *49*(2/3), 127–151. https://doi.org/10.1177/0020715208088909

Kurz, K., & Böhner-Taute, E. (2016). Wer profitiert von den Korrekturmöglichkeiten in der Sekundarstufe? Der Einfluss von Bildungsherkunft und Migrationshintergrund im Bildungsverlauf. *Zeitschrift für Soziologie*, *45*(6), 431–451. https://doi.org/10.1515/zfsoz-2015-1025

Leuze, K., & Solga, H. (2013). Bildung und Bildungssystem. In S. Mau & N. M. Schöneck (Eds.), *Handwörterbuch zur Gesellschaft Deutschlands* (pp. 116–129). Springer.

Lörz, M. (2012). Mechanismen sozialer Ungleichheit beim Übergang ins Studium: Prozesse der Status- und Kulturreproduktion. In R. Becker & H. Solga (Eds.), *Soziologische Bildungsforschung. Kölner Zeitschrift für Soziologie und Sozialpsychologie* (Vol. 52, pp. 302–324). Springer. https://doi.org/10.1007/978-3-658-00120-9_13

Lörz, M., & Schindler, S. (2011). Bildungsexpansion und soziale Ungleichheit: Zunahme, Abnahme oder Persistenz ungleicher Chancenverhältnisse—Eine Frage der Perspektive? *Zeitschrift für Soziologie*, *40*(6), 458–477.

Lörz, M., Schindler, S., & Walter, J. G. (2011). Gender inequalities in higher education: Extent, development and

mechanisms of gender differences in enrolment and field of study choice. *Irish Educational Studies*, *30*(2), 179–198. https://doi.org/10.1080/03323315.2011.569139

Lucas, S. R. (1999). *Tracking inequality: Stratification and mobility in American high schools*. Teachers College Press.

Maaz, K. (2006). *Soziale Herkunft und Hochschulzugang. Effekte institutioneller Öffnung im Bildungssystem*. Springer.

Maaz, K., & Köller, O. (2019). Der Sekundarschulbereich. In O. Köller, M. Hasselhorn, F. W. Hesse, K. Maaz, J. Schrader, H. Solga, C. K. Spieß, & K. Zimmer (Eds.), *Das Bildungswesen in Deutschland. Bestand und Potenziale* (pp. 505–532). Verlag Julius Klinkhardt.

Mare, R. D. (1981). Change and stability in educational stratification. *American Sociological Review*, *46*(1), 72–87.

Mayer, K. U. (Ed.). (1990). *Lebensverläufe und sozialer Wandel*. Verlag.

Müller, W. (1994). Bildung und soziale Platzierung in Deutschland, England und Frankreich. In H. Peisert & W. Zapf (Eds.), *Gesellschaft, Demokratie und Lebenschancen* (pp. 115–134). DVA.

Müller, W., & Kogan, I. (2010). Education. In S. Immerfall & G. Therborn (Eds.), *Handbook of European societies: Social transformations in the 21st century* (pp. 217–289). Springer.

Müller, W., & Pollak, R. (2016). Weshalb gibt es so wenige Arbeiterkinder in Deutschlands Universitäten? In R. Becker & W. Lauterbach (Eds.), *Bildung als Privileg* (pp. 345–386). Springer. https://doi.org/10.1007/978-3-658-11952-2_11

Neugebauer, M., Reimer, D., Schindler, S., & Stocké, V. (2013). Inequality in transitions to secondary school and tertiary education in the German school system. In M. Jackson (Ed.), *Determined to succeed? Performance versus choice in educational attainment* (pp. 56–88). Stanford University Press.

Ordemann, J., & Pfeiffer, F. (2022). The evolution of educational wage differentials for women and men in Germany, from 1996 to 2019. *Journal of Labour Market Research*, *56*(1), 1–12. https://doi.org/10.1186/s12651-022-00323-6

Oreopoulos, P., & Salvanes, K. (2011). Priceless: The nonpecuniary benefits of schooling. *Journal of Economic Perspectives*, *25*(1), 159–184.

Pakpahan, E., Hoffmann, R., & Kröger, H. (2016). The long arm of childhood circumstances on health in old age: Evidence from SHARELIFE. *Advances in Life Course Research*, *31*, 1–10.

Palmisano, F., Biagi, F., & Peragine, V. (2022). Inequality of opportunity in tertiary education: Evidence from Europe. *Research in Higher Education*, *63*(3), 514–565.

Peter, F., Spiess, C. K., & Zambre, V. (2021). Informing students about college: Increasing enrollment using a behavioral intervention? *Journal of Economic Behavior & Organization*, *190*, 524–549. https://doi.org/10.1016/j.jebo.2021.07.032

Reimer, D. (2013). Kontexteffekte und soziale Ungleichheit beim Übergang von der Schule zur Hochschule. In R. Becker & A. Schulze (Eds.), *Bildungskontexte* (pp. 405–429). Springer.

Scharf, J., Becker, M., Neumann, M., & Maaz, K. (2023). Rapid expansion of academic upper secondary graduation in Germany—Changing social inequalities in the transition to secondary and to tertiary education? *Research in Social Stratification and Mobility*, *84*, Article 100771. https://doi.org/10.1016/j.rssm.2023.100771

Schindler, S. (2014). *Wege zur Studienberechtigung—Wege ins Studium? Eine Analyse sozialer Inklusions- und Ablenkungsprozesse*. Springer. https://doi.org/10.1007/978-3-658-03841-0

Schindler, S. (2017). School tracking, educational mobility and inequality in German secondary education: Developments across cohorts. *European Societies*, *19*(1), 28–48. https://doi.org/10.1080/14616696.2016.1226373

Schuchart, C., & Schimke, B. (2022). The development of the intention to study of pupils from different social backgrounds in non-traditional pathways to higher education. *Social Psychology in Education*, *25*(2/3), 471–507. https://doi.org/10.1007/s11218-022-09685-8

Shavit, Y., & Müller, W. (2000). Vocational secondary education. Where diversion and where safety net? *European Societies*, *2*(1), 29–50.

Spangenberg, H., & Quast, H. (2023). Zum Einfluss vorgelagerter Bildungspfade auf die Studienentscheidung. In J. Ordemann, F. Peter, & S. Buchholz (Eds.), *Vielfalt von hochschulischen Bildungsverläufen. Wege in das, durch das und nach dem Studium* (pp. 21–46). Springer. https://doi.org/10.1007/978-3-658-39657-2

Terrin, É., & Triventi, M. (2023). The effect of school tracking on student achievement and inequality: A meta-analysis. *Review of Educational Research*, *93*(2), 236–274. https://doi.org/10.3102/00346543221100850

Tieben, N. (2020). Ready to study? Academic readiness of traditional and non-traditional students in Germany. *Studia paedagogica*, *25*(4), 11–34. https://doi.org/10.5817/SP2020-4-1

Woisch, A., Franke, B., Quast, H., Föste-Eggers, D., Mentges, H., Ronnenberg, A., Schoger, L., Meine, A., Klein, D., & Weber, A. (2022). *DZHW Studienberechtigtenpanel 2018—Daten- und Methodenbericht zum DZHW-Studienberechtigtenpanel 2018 (1. Befragungswelle)*. FDZ DZHW.

About the Authors

Heiko Quast studied social sciences and works at the German Centre for Higher Education Research and Science Studies in the Student Life Cycle Panel. His research focuses on educational decisions and trajectories as well as social disparities.

Heike Spangenberg holds a PhD in science of education. She works at the DZHW as project leader of the Student Life Cycle Panel. Her research focuses on transitions from school to higher education and the labour market.

Hanna Mentges works at the German Centre for Higher Education Research and Science Studies in the Student Life Cycle Panel. Her research focuses on educational decisions and social disparities.

Jessica Ordemann holds a PhD in sociology. Her research interests focus on inequalities, especially educational inequalities in higher education and their consequences for the labour market.

Sandra Buchholz is a professor of sociology at the Leibniz University of Hannover and head of the department of Educational Careers and Employment of Graduates at the German Centre for Higher Education Research and Science Studies. Her research focuses on inequalities in education, employment, and family.