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(Mis)Matched College Aspirations and Expectations: The Role of Social Background and Admission Barriers

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Abstract

Not all high school students who wish to study think that they will be able to realize this wish. This article examines whether admission barriers to higher education are a potential reason for this mismatch between educational aspirations and expectations and whether they are more constraining for students from socially less advantaged backgrounds. It does so for the German context in which the role of admission barriers for social inequality in higher education has long been neglected. Empirically, the paper uses a unique combination of individual data on high school students' educational aspirations and expectations and institutional data on admission barriers that vary by field of study. Findings indicate that the socially most privileged students stick to their college aspiration regardless of admission barriers to their aspired field of study. However, they seem to be willing to compromise their preferred field of study if this comes along with high admission barriers. Contrastingly, socially less privileged students seem willing to compromise both their general college aspiration and their aspired field of study if admission appears difficult. The concluding section discusses the implications of these findings for social inequality in education.

Keywords: social inequality, aspirations, expectations, higher education, admission barriers, Germany

Introduction

Educational aspirations have been identified as a major determinant of educational attainment and an important mediator of social background differences therein (Sewell *et al.*, 2004). Yet several studies show that students differ in their (perceived) chances to realize their aspirations: A substantial share of high school students of up to 30 per cent who wish to study (i.e., have an ‘unconstrained’ college *aspiration*) do not believe that they will be able to realize this wish (i.e., do not have a college *expectation* or a more realistic plan that might be constrained by a lack of resources and anticipated institutional barriers) (Hanson, 1994; Khatthab, 2015; Roderick, Coca and Nagaoka, 2011; Vaisey, 2010). These studies further demonstrate that this mismatch between college aspirations and expectations is stronger for students from disadvantaged social backgrounds. At the same time, aligned aspirations and expectations strongly predict educational attainment (Vaisey, 2010). It is thus important to examine the mechanisms behind this aspiration–expectation (mis)match to better understand educational inequalities and the social stratification of advanced societies.

Previous research focused on performance-related and social-psychological variables to explain the described patterns (e.g., Hanson, 1994; Khattab, 2015; Roderick *et al.*, 2011). Institutional constraints originating from the higher education (HE) system have, however, rarely been examined even though they can be assumed to be decisive for the translation from idealistic *college* aspirations into more realistic expectations. These constraints could relate to costs such as college fees (Grodsky and Jones, 2007), geographical coverage (Turley, 2009), or admission barriers (i.e., as opposed to open admission programmes, access to HE might be restricted to those high school graduates who outperform their competitors in terms of school grades, test scores, essays, and the like, or who can proof further skills, such as artistic or athletic talent). Taking Germany as an example, this article focuses on *admission barriers* to HE and examines *whether they relate to a (mis)match between college aspirations and expectations and whether they are more constraining for students from socially disadvantaged backgrounds*.

Existing research on the role of admission barriers shows that they are associated with socially selective intakes (Boliver, 2013; Buchmann, Condron and Roscigno, 2010; Thomsen, 2018; Zimdars, Sullivan and Heath, 2009). They can have a *direct effect* when institutional actors act as gatekeepers and decide whom to reject or to let in during the admission process as well as an *indirect effect* via anticipation and self-selection processes of students and might thus lower the probability that college aspirations translate into college expectations and—later on—in application decisions. If the perception and evaluation of admission barriers differs by social background, they might furthermore be one reason for social-background-specific educational expectations. With regard to college applications, such an interaction effect has been shown for the United States (Hoxby and Avery, 2013) and Sweden (Hällsten, 2010). These studies, however, focus on college *applicants* and examine whether admission barriers attract or deter their application decision for specific programmes. It is thus not possible to conclude whether admission barriers negatively influence expectations and decisions of those who do *not* apply in the first place.

This article makes several contributions to the literature. *First*, it links different streams of research by discussing and analysing admission barriers as potential reason behind (mis)matched aspirations and expectations and related social background differences. *Second*, it does so for the German context. Here, the education system is assumed to exert its selection function mainly at earlier thresholds and the potential influence of admission barriers to HE is barely even mentioned in empirical studies (for a theoretical discussion see Helsper and Krüger, 2015). Yet, the German admission system is more complex and restrictive than often assumed, and increasingly so. Specifically, there is a strong variability in admission chances by fields of study (comparable to institutional prestige in other contexts). This makes the German case especially interesting, as admission barriers might not only require compromises regarding the level of education, but also the far-reaching decision for a field and a related occupation. Despite their increasing complexity, related information is rather scarce. Thus, a *third* contribution is to provide a detailed description as well as novel data on admission barriers in the German context and to relate them to students' expectations.

Empirically, I combine two data sets: individual data of students from Berlin high schools at the end of their penultimate year that contain information on educational aspirations and expectations. As admission is mainly decentralized in Germany, no comprehensive data set on admission barriers exists so far. We thus collected institutional data on admission barriers to approximately 400 undergraduate college programmes and combine them with the individual data, which allows studying the indirect role of admission barriers to German HE for the first time. Theoretically and analytically, I distinguish two kinds of ‘aspiration–expectation (mis)-matches’: In a first step, I focus on students with college aspirations and examine whether admission barriers relate to their probability of also having a college expectation (“college aspiration–expectation match”). In a second step, I analyse whether admission barriers relate to the probability of aspiring and expecting the same field of study (‘field-specific aspiration–expectation match’).

Access to HE in Germany

Because of the highly stratified German secondary education system, in 2016 only 52 per cent of all school leavers obtained a HE entrance certificate—the so-called (*Fach*)*Abitur*. Despite this strong selection, only around 75 per cent of eligible students attend HE (Autorengruppe Bildungsberichterstattung, 2018: Tab. F2-1A, F2-6web). Nevertheless, the transition to HE is strongly socially selective (Mayer *et al.*, 2007); one reason being the attractive apprenticeship system, which serves as a “safety net”, especially for students from lower social backgrounds (Shavit and Müller, 2000). Moreover, the Abitur is a *de facto* requirement for apprenticeships in some attractive occupations (e.g., bank clerk). Thus, some students seem to obtain the Abitur primarily to increase their chances of getting into specific vocational programmes instead of entering HE (Schindler and Lörz, 2012).

Those who wish to follow the HE pathway face less pronounced institutional barriers than students in many other HE systems: Currently, there are no tuition fees and lower-income students are eligible for federal means-tested financial aid. Around 400 officially recognized German HE institutions

exist (Autorengruppe Bildungsberichterstattung, 2018: 152) meaning that geographical distances between students' place of residence and the closest university are rather moderate (Spieß and Wrohlich, 2010).

Formally, access to the approximately 10.000 undergraduate programmes is open to all those who hold a HE entrance certificate. Yet those high school graduates who want to attend HE face a quite complex admission system that is characterized by the coexistence of different regulations, following two logics: (i) whether the number of available places in a program is restricted via enrolment caps and (ii) whether programmes define further eligibility requirements (see Finger, Fitzner and Heinmüller, 2018).

(i) Universities are legally allowed to introduce enrolment caps for certain programmes if they can prove limited capacities. Such a *numerus clausus* (NC) is either organized at the national or at the local (university) level. National enrolment caps are enforced for the highly sought after medical and pharmaceutical programmes. Students who want to study one of these fields need to apply via a central clearinghouse that administers the allocation of places. Enrolment caps for all other fields are organized at the university level. Study places are usually allocated via different quota: a grade point average (GPA)-quota, a waiting-period-quota and a quota in which further program-specific selection criteria such as test scores, grades in specific school subjects, interviews, or professional experience might be used besides the GPA (as a mandatory criterion).¹ Within each quota all applicants are ranked according to the relevant criteria and selected until the pre-defined number.

(ii) Besides questions of capacity, admission to some programmes, such as sports, arts, or language programmes, is based on the assumption that they require further competences or skills that go beyond those certified as part of the *Abitur*. Accordingly, applicants have to prove, for instance, athletic or artistic talent in order to qualify for admission. Whether and in what form the definition of such additional requirements is permitted is determined in the HE acts of the 16 federal states; the decision to apply them rests on the single university. Common examples for eligibility requirements are scores in specific aptitude tests, work samples, or language skills.

Both enrolment caps and eligibility requirements are different ways to select students. The former follow a *relative* logic. Eligibility only depends on the required school certificate and admission chances

crucially depend on the demand-supply ratio and one's own performance relative to other applicants. In contrast, eligibility requirements follow an *absolute* logic in that they define who belongs to the pool of eligible candidates. Both procedures are not mutually exclusive; some programmes restrict the number of available places, but allocate them only to those who can prove additionally defined criteria (Finger *et al.*, 2018; Winter *et al.*, 2012). “Open admission” programmes in a narrower sense are thus only those which abstain from both procedures.

Comprehensive information on existing admission barriers is quite scarce. Exceptions are publications by the German Rectors' Conference (*Hochschulrektorenkonferenz, HRK*) and—based on the same data source—the Centre for Higher Education (CHE) that report the share of programmes with enrolment caps on a yearly basis. They show that the share of programmes with national enrolment caps amounts to roughly 1 per cent per year. A local NC has been applied by around 40-50 per cent of all undergraduate programmes over the last decade. In Berlin—the context of this study—the share of programmes with enrolment caps was above average in each year (HRK, 2019).

Information on enrolment caps alone only roughly indicates the selectivity of programmes. Depending on the demand, restricted programmes can be very (performance-)selective while others can be accessed with a GPA that is below average. There is no official source that provides statistics on the selectivity of programmes. Such information is usually published on university websites after each term's admission process. Likewise, there is no comprehensive information source on the extent and content of eligibility requirements.²

In HE systems with a pronounced vertical differentiation, admission chances strongly relate to institutional prestige (Boliver, 2013; Hoxby and Avery, 2013). While this vertical dimension is less pronounced in Germany, horizontal differentiation is strongly institutionalized already at the undergraduate level. Variation in admission chances are thus likely to occur mainly by field of study. As mentioned above, medical and pharmaceutical programmes are always restricted on the national level. Regarding the share of undergraduate programmes with local enrolment caps, a rough differentiation by

field of study reveals a 20 percentage points variation (32 per cent humanities, 52 per cent social sciences) (Gehlke, Hachmeister and Hüning, 2019).

There are again no statistics available on the average selectivity of programmes with enrolment caps by field of study or the field-specific share of programmes that require eligibility criteria. Some basic information and general ideas are spread widely via the internet³ and can be expected to belong to the general knowledge on the German admission system: for instance, that admission to medical programmes is always and to psychological programmes mostly very selective, or that arts programmes often require applicants to demonstrate their ‘talent’. It would go beyond the scope of this study to analyse whether and how correctly admission barriers are anticipated by high school students. One assumption underlying the following theoretical considerations and empirical analyses is that students are to a certain extent aware of existing restrictions and thus able to anticipate them.

Theoretical considerations

The term aspirations is a widespread buzz word in social stratification research that is often used interchangeably with terms such as expectations, plans, intentions, goals, or wishes. Different authors advise against this ‘terminological confusion’ (Haller, 1968: 485) as it runs risk to ‘conflat[e] what people *want* to happen with what they *predict* will happen’ (Vaisey, 2010: 84, original emphasis) and distinguish between two concepts: educational *aspirations* and educational *expectations* (see also Hanson, 1994; Morgan, 2007).⁴ *Aspirations* are defined as ‘idealistic goals’ (Morgan, 2007: 1529), ‘hopes’, or ‘dreams’ (Khatthab, 2015: 732), which mirror social values. College aspirations develop in a supportive environment and are associated with social background as well as individual ability (Sewell *et al.*, 2004). As a motivational source, aspirations can be understood as an important component of individual agency (Schoon and Lyons-Amos, 2016).

Educational *expectations*, on the other hand, ‘take into account real-life perceptions of what is possible given students’ location in the web of class and status relationships’ (Lloyd, Leicht and

Sullivan, 2008: 3). They are not only constrained by students' social origin, but also by institutional barriers. According to rational choice (RC) models, students can be expected to evaluate these barriers—and related costs, benefits and success probabilities—against their resources (Erikson and Jonsson, 1996). This process might contribute to (mis)aligned college aspirations and expectations.

Aspirations and expectations should be understood as two points on a continuum between an ideal (unconstrained) pole and a realistic (constrained) one.⁵ The analytical distinction between both concepts does not mean that aspirations are completely unconstrained as research on their relation to social origin (Vaishey, 2010) or RC-components (Zimmermann, 2019) demonstrates. Nor does it signify that expectations will always be realized. However, in the German 'sponsored mobility regime' with its early sorting and frequent feedback mechanisms (Turner, 1960), college expectations can be assumed to be fairly realistic. This is confirmed empirically: an expectation-behaviour gap can only be observed for 7 per cent of German high school seniors (Spangenberg and Quast, 2016: 21).

A more or less pronounced discrepancy between the aspired and the expected mirrors a gradual compromise between individual preferences and perceived barriers. According to Gottfredson (2002), compromise is an important step in the development of (realistic) occupational aspirations during which students not only assess the *compatibility* of certain occupations and—relatedly—fields of study with their own self-concept but also the *accessibility* of existing options. Perceived accessibility might be influenced by costs, regional supply, and admission barriers.

As described above, direct study costs are rather low in Germany, whereas the regional coverage with HE institutions is quite dense. Depending on the preferred field of study, formal admission barriers can, however, be quite high making compromises necessary. Using RC-terminology, admission barriers relate to the *expected success probability* of gaining access to HE⁶ as well as *material and social costs* as students might be forced to be regionally mobile to circumvent high admission barriers. This might, first, lead students with a college aspiration to turn away from the academic pathway and from expecting to attend college at all (*college aspiration–expectation mismatch*).

H1a: The probability that high school students have matched college aspirations and expectations decreases with increasing admission barriers to the aspired field of study.

Second, students might reorient within the HE system, that is, they might have a college expectation in general, but might expect to study a different field than they actually aspire (*field-specific aspiration–expectation mismatch*).

H1b: The probability that high school students expect to study the same field as they aspire decreases with increasing admission barriers to the aspired field of study.

The strength of this association might differ between students from different social backgrounds: From an RC-perspective, HE attendance should be particularly beneficial for students from privileged social backgrounds as a degree is crucial for them ‘to avoid downward social mobility’ (Breen and Goldthorpe, 1997: 283). In contrast, their socially less advantaged peers do not necessarily need to attend HE to reproduce their parents’ social status. For them, the German apprenticeship system provides a less risky opportunity for social reproduction than attending HE as (perceived) success probabilities are higher and opportunity costs are lower. These factors have been shown to divert lower-background students from the HE pathway even if they gained HE eligibility (e.g., Becker and Hecken, 2008; Hillmert and Jacob 2003; Meyer *et al.*, 2007; Shavit and Müller, 2000).

Turning to the potential impact of admission barriers, it can be argued that, relative to students’ economic, social, and cultural resources, such barriers might appear higher to students from lower social backgrounds: First, they might be more likely to anticipate lower admission chances than their socially privileged peers because of their lack of valuable information and support from their social networks (Erikson and Jonsson, 1996). Second, they might be less likely to be able (and willing) to bear the social

and financial costs of being regionally mobile (Turley, 2009), decreasing the perceived chances of getting access to a programme within a field that is very selective *on average*, but not everywhere. Third, the fields chosen by lower-background students need to secure high monetary returns in order to make the educational investment worthwhile (as costs are usually higher and success probabilities lower for them). If admission chances to such fields are low, they might opt for a (well-paid) apprenticeship occupation instead as a less costly alternative than switching to a less remunerative field within the HE system. Fourth, if students' GPA is the most important admission criterion, students from lower social backgrounds are more constrained because they obtain on average poorer grades than their socially privileged peers (Schindler and Lörz, 2012). However, reverse causality might be an issue (as discussed by Jackson *et al.*, 2007; Morgan, 2012), because it is not clear whether a) students from lower social backgrounds are less likely to expect to realize their (field-specific) college aspiration because they perform poorer in school than their socially advantaged peers or whether b) their poorer school performance is the result of not expecting to realize their aspirations in the first place, which, in turn, translates into lower admission chances.

However, not only the result of the evaluation process of different educational options and existing institutional barriers but also the extent to which a conscious and rational evaluation takes place might differ between students as proposed by the model of frame selection (Esser 2001; Kroneberg and Kalter, 2012) or dual-process theory (Evans and Stanovich, 2013). How strongly aspirations as motivational source or as a ready-to-use script guide (intended and actual) individual action should depend on the degree of their internalization. As the value of education is continuously transmitted within their families, college aspirations are more strongly incorporated by students from advantaged social backgrounds. For them, attending college is often taken-for-granted so that they follow their aspirations more or less automatically and translate them into expectations and later decisions without actively considering institutional barriers (Ball *et al.*, 2002; Bourdieu and Passeron, 1990). If college aspirations are less deeply internalized—as can be expected for students from lower social backgrounds—a more conscious and deliberate decision-making-process as assumed by RC-models is likely that includes the

evaluation of existing barriers (Kroneberg and Kalter, 2012). Overall, this leads to the following assumption.

H2a: The negative association between admission barriers to the aspired field of study and the probability of a college aspiration–expectation match should be more pronounced for students from lower social backgrounds.

Moreover, students from higher social backgrounds might—for the same reasons (better grades, more information, support, and regional flexibility)—be more confident to be able to realize their field-specific preference even if they aspire an on average very selective field. Such fields might even appear especially attractive to them as they signal exclusivity and prestige and might thus serve as a means of social reproduction (Triventi, 2013). Compromises regarding the aspired field of study might thus be less likely.

H2b: The negative association between admission barriers to the aspired field of study and the probability of a field-specific aspiration–expectation match should be more pronounced for students from lower social backgrounds.

On the other hand, also the Null-hypothesis (no social background difference regarding the negative association between admission barriers and the field-specific match) might be theoretically plausible: Their strongly internalized college aspiration or the necessity to obtain a HE degree to maintain their parents' social status might lead students from higher social backgrounds to stick to their general college aspiration even if this makes compromises regarding the field of study necessary. Moreover, compared to their lower-background peers, changing fields within HE due to low admission chances might be less costly for them even if this means switching to a less remunerative field as they can rely on other (family)

resources to obtain a well-paid job (despite having studied an *on average* less well-paid field) or a materially secure life.

Research Design

Data

I use two data sources from the ‘Berliner-Studienberechtigten-Panel’ (Best Up): individual data on high school students’ college aspirations and expectations and institutional data on admission barriers.

The *individual data* consist of a sample of 27 schools in Berlin leading to a HE entrance qualification, including three school types (*Gymnasium*, vocational *Gymnasium*, and comprehensive schools). To ensure a sufficiently high number of students from lower social backgrounds and to homogenize the school context the sampling focused on districts with a high share of low-educated adults (ISCED level 0–2). We surveyed the whole cohort of students in 2013, at the end of their penultimate school year (paper and pencil class-room interview). The response rate was 60 per cent (N: 1,578). Best Up is a panel study consisting of five waves (1 year before until 1.5 years after high school graduation). To answer the research questions posed above, I use the first wave (around 1 year before high school graduation) (for more information on the data, see Ehlert *et al.*, 2017).⁷

The sample is not representative for Berlin or Germany. Thus, rather than providing population estimates the aim of this study is to uncover mechanisms that encourage or discourage students from different social backgrounds to translate their college aspirations into college expectations. Berlin represents an urban area that offers, on the one hand, plenty of study options.⁸ On the other hand, external demand for study places is high and the share of programmes with enrolment caps is above-average (Gehlke *et al.*, 2019). Given varying institutional and structural HE opportunities between and within German federal states, the restriction to Berlin reduces the influence of possible confounders. The same is true for the restriction to certain districts within Berlin: Social background differences can more easily be

attributed to the family because they are less confounded with, for instance, the quality of schools that differs between districts.

The *institutional data* contain information on admission barriers to 391 undergraduate programmes for the winter term 2013 (279 at universities and 112 at universities of applied sciences).⁹ Programmes are defined as majors at specific universities to which students apply (for instance Sociology at University A, Sociology at University B, Political Science at University A, Biology at University B). Information was mainly gathered on websites of universities and the central clearinghouse. Among others, the data include general information on the programme (e.g., university, field of study, type of degree), information on enrolment caps, eligibility criteria (such as language competences, test scores, or professional experience), and—for programmes with enrolment caps—the GPA of the last admitted applicant (for more information on the institutional data, see Ehlert *et al.*, 2017; Finger *et al.*, 2018).

The selection of the programmes was based on respondents' answers in later waves¹⁰ and is therefore not representative for undergraduate programmes in Germany or Berlin. Programmes in Berlin constitute the majority (55 per cent) of all programmes in the data which, in turn, cover almost 50 per cent of all available undergraduate programmes in Berlin, but only around 3 per cent of German programmes. It has been shown, however, that students limit their choice set to certain—often regionally accessible—options (Niu and Tienda, 2008).

Variables

I analyse two binary dependent variables. We asked all respondents about their educational aspirations ('If only your wishes would count: What type of education do you wish to pursue after leaving school?') and expectations after high school graduation ('Based on everything you know now: What type of education will you probably pursue after leaving school?'¹¹). Those who chose 'college' to one or both of these questions were asked about the field that they wish/expect to study, respectively. The first dependent variable—college aspiration–expectation match—measures whether students with a college

aspiration also report a college expectation. The second dependent variable—field-specific aspiration—expectation match—indicates whether students’ aspired field of study is the same as their expected field. I use 13 subject-categories to measure this binary variable. The individual data also contain a more fine-grained categorization. However, this would also include rather minor chances (e.g. from chemistry to bio-chemistry) that are unlikely to relate to admission barriers. This is because high school students are unlikely to anticipate admission barriers in such a detailed way as information on that level is rarely available. Furthermore, the institutional data do not allow aggregating admission barriers over a higher number of fields as mean values would have to rely on a very small number of programmes (see below). Given this operationalization, it is important to keep in mind that field-specific mismatches are somewhat underestimated as they also occur within broader categories.¹²

Social background is operationalized via a composite measure of both parents’ education with three categories: no parent with a HE degree (HE0), one parent with a HE degree (HE1), and two parents with a HE degree (HE2).

I calculated average *admission barriers* to fields of study for which information on a minimum of 10 programmes is available in the institutional data. I built three variables that are summarized in Table 1: (A) the share of programmes with enrolment caps for each field that ranges from 33 per cent to 100 per cent. (B) I added the share of programmes with eligibility requirements (such as language skills or aptitude test scores) to the first measure. The share of programmes with either enrolment caps or further eligibility criteria always lies above 70 per cent, implying that the share of open admission programmes is rather low. (C) For programmes with enrolment caps, I calculated the average performance-selectivity by measuring the average GPA that applicants of the previous year needed for admission. In Germany, Abitur grades range from 1.0 (top grade) to 4.0 (just passed). I inverted this scale in order to ease interpretation (higher values indicate a higher selectivity). Table 1 reveals that successful applicants had on average very good to good grades.¹³ To exploit the variation in admission barriers by field of study shown in Table 1, I merge these variables to the individual data via students’ aspired field of study. Thus,

three variables are added to each student indicating the average admission barriers to the field that the student wishes to study.

As discussed above, an assumption of the following analyses is that students are to a certain extent informed about admission barriers. It would, however, go beyond the scope of this study to examine social background differences in the knowledge of admission barriers or distinguish empirically if a potential null effect of admission barriers is due to a lack of relevance or information.

Table 1: Average admission barriers (winter term 2013) and average ISEI, by field of study

Sources:	Institutional data (Best Up)				German Microcensus 2007-2012	
	N (programs) 391	A	B	C	N (persons) 225,915	Average ISEI
Fields of study		Mean (SD)	Mean (SD)	Mean/ Mean inverted (SD)		Mean (SD)
Language/ literature	34	0.82 (0.39)	0.91 (0.29)	2.1/ 2.6 (0.44)	6,264	60.27 (11.1)
Culture	13	0.62 (0.51)	0.77 (0.44)	1.9/ 2.8 (0.45)	5,312	58.33 (11.60)
Education	10	1.00 (0)	1.00 (0)	2.0/ 2.7 (0.36)	6,658	59.79 (12.88)
Law	18	0.89 (0.32)	0.89 (0.32)	1.9/ 2.8 (0.42)	22,193	67.76 (14.34)
Economics	19	0.68 (0.48)	0.74 (0.45)	2.3/ 2.4 (0.31)	7,803	58.61 (10.91)
Social sciences	20	0.95 (0.22)	1.00 (0)	2.1/ 2.6 (0.54)	12,436	60.66 (10.36)
Natural sciences	69	0.70 (0.46)	0.71 (0.46)	1.8/ 2.9 (0.67)	27,036	64.35 (13.17)
Medicine/ health	35	0.89 (0.32)	0.94 (0.24)	1.2/ 3.5 (0.17)	17,215	79.51 (13.56)
Engineering	59	0.71 (0.46)	0.78 (0.42)	2.2/ 2.5 (0.37)	52,773	65.17 (12.59)
Art	24	0.33 (0.48)	0.92 (0.28)	2.0/ 2.7 (0.38)	10,770	58.35 (10.70)
Psychology	15	0.87 (0.35)	0.93 (0.26)	1.3/ 3.4 (0.22)	2,897	64.37 (10.89)
Business	32	0.66 (0.48)	0.91 (0.30)	2.0/ 2.7 (0.58)	28,161	59.26 (10.92)
Teaching	43	0.91 (0.29)	1.00 (0)	2.0/ 2.7 (0.34)	26,397	64.71 (9.84)

Author's calculation

A: Share of programs with enrolment caps

B: Share of programs with enrolment caps or eligibility criteria

C: Average selectivity: average GPA of last admitted applicant (only restricted programs); the first mean is based on the original German GPA-scale (1.0 (very good) – 4.0 (sufficient)) with higher numbers indicating less selective fields, the second mean is based on the inverted GPA-scale with higher numbers indicating more selective fields (used for multivariate analyses)

Fields of study do not only differ with regard to admission barriers but also in terms of further characteristics that could confound the association of interest. The status of fields and related occupations, for instance, could be a pull factor especially for students from higher social backgrounds and—at the same time—relate to admission barriers. I thus calculated the average ISEI score of occupations (Ganzeboom, de Graaf and Treiman, 1992) to which the 13 fields of study lead and merge these values to the individual data via students' aspired field of study. To this end, I pooled the 2007 to 2012 waves of the German Microcensus¹⁴ and restricted the sample to (self-)employed HE graduates below 65 years of age. I then aggregated the ISEI-score of their occupation (Schimpl-Neimanns, 2004) over the HE field in which they graduated (see Table 1). As a robustness check, I used the same procedure to calculate average earnings. The results do not change when I add this measure to the models presented below.

On the individual level, I include students' *school performance*. In Germany, the HE entrance certificate contains a summary measure of grades in specific subjects obtained on the school reports of the last 2 years and in the final examinations: students' GPA. To approximate an 'early GPA', I created a summary measure of the grades obtained in mathematics, German, English and the two advanced courses.¹⁵ Again, I inverted the German GPA-scale so that higher values indicate better school performance.

As further control variables, I include gender, migration background (at least one parent born outside Germany), school type, and cognitive test scores (verbal and figural)¹⁶. Appendix Tables A1 and A2 provide descriptive statistics on all included variables for the two study samples (see below) by social background.

Analytical steps and sample restrictions

I distinguish two kinds of 'aspiration–expectation (mis)-matches' that are based on two different study samples: In a first step, I focus on students with college aspirations, who aspire a certain field of study characterized by more or less severe admission barriers, and examine whether these barriers relate to

students' general college expectation ('college aspiration–expectation match'). I thus first restrict the sample to those respondents who stated a college aspiration (11.6 per cent deleted, N: 183) (for a similar approach, see Hanson, 1994; Roderick *et al.*, 2011) which leads to a further positive selection of the sample in terms of, for instance, social background, school type, and school performance (see Supplementary Table O-A1). According to the differential selection hypotheses positive selection might especially be the case for students from disadvantaged social backgrounds (Mare, 1980). Descriptive statistics by social background show that restricting the sample to students with college aspirations does only slightly affect the (observable) performance composition of students from different social backgrounds (Table O-A1). However, differential selection on unobservables might still lead to rather conservative estimates of social background differences. Second, I restrict the sample to respondents who provided information on their aspired field (7.8 per cent deleted, N: 109).¹⁷ Third, I excluded cases with missing values on all relevant variables (5.7 per cent, N: 74). This leads to a case number of 1212 for the first analytical step, which is the basis for the second one.

As argued above, high school students, who expect to enroll in college *per se*, might differ in their (perceived) chances to realize their field of study aspiration. In the second analytical step, I therefore analyse whether admission barriers relate to the probability of aspiring and expecting the same field of study ('field-specific aspiration–expectation match'). This second step only includes respondents with a college expectation—as only these students have been asked to report their expected field of study—(N: 1,043) and information on their field-of-study expectation (6.1 per cent deleted, N: 64). The sample size for analysing the second dependent variable is 979.

For both study samples, descriptive statistics of included and excluded cases are provided in the Supplementary (Section 1, Table O-A2).

Estimation method

To account for the multi-level structure of the data (students nested in schools), I apply generalized linear mixed models (GLMM) for binary dependent variables (logit link, random intercept at the school level). If the number of upper-level units is small, standard approaches to correct for a nested data structure (such as cluster-robust standard errors) often lead to biased estimates. Different simulation studies with varying case numbers on both levels could, however, demonstrate that GLMM provide unbiased estimates of lower-level coefficients and standard errors even with case numbers well below those I can rely on (e.g., Austin, 2010).¹⁸

Coefficients are reported as Average Marginal Effects (AME) for continuous and Average Discrete Chances (ADC) for categorical predictors. The interaction between social background and admission barriers is shown graphically as predicted probabilities.

Findings

College aspiration–expectation (mis)match

Overall, a quite high share of students with a college aspirations also expects to go to college (86 per cent), with a difference of 11 percentage points between students from different social backgrounds (HE0: 84 per cent, HE1: 87 per cent, and HE2: 95 per cent) (see Appendix Table A1). Further descriptive statistics show that this share lies over 80 per cent for all aspired fields of study, with the exception of cultural sciences. Accordingly, average admission barriers to the aspired field of study are only slightly associated with a college aspiration–expectation match (see Appendix Table A3).

The multivariate estimates in Table 2 show that the shares of programmes with enrolment caps in the aspired field of study (M-A1) and eligibility criteria (M-B1) are not related to the probability of having matched college aspirations and expectations. This is different with regard to the average performance-selectivity of the aspired field (M-C1): If the GPA which applicants of the previous year needed for

admission increases by one point (for instance from 1.5 to 2.5, indicating increasing selectivity on the inverted GPA-scale), the probability of a match decreases by 9 percentage points (M-C1). Overall hypothesis H1a, expecting a negative association between admission barriers to the aspired field and a college aspiration–expectation match, is *only* supported for the GPA-selectivity of programmes.

Note that one point is a quite pronounced change on the GPA-scale (one fourth of the whole scale) so that a 9 percentage point decrease in the probability of having matched aspirations and expectations might not seem very substantial. The similarly scaled school performance shows an ADC of 12 percentage points. If I z-standardize both variables, the school performance coefficient is twice as high as the one of the average selectivity (0.7 versus –0.35). Thus, the individual performance seems to be more strongly associated to a college aspiration–expectation match than the required performance for admission to the aspired field of study.

As discussed in the theory section, one possible mechanism behind the association between admission barriers and the college aspiration–expectation match is students’ perceived probability of getting admitted. Additional analyses show that this success probability is indeed an important mediator as it is negatively related to the average selectivity of students’ aspired field and positively related to their probability of having matched college aspirations and expectations (see Supplementary Section D for more details and supplementary analyses, also on the second dependent variable).

Regarding social background, Table 2 shows that students from a double-academic background (HE2) are nine percentage points more likely to have matched college aspirations and expectations than students from a non-academic background (HE0). The difference between students from single- and non-academic backgrounds is small and non-significant.

Table 2: Determinants of college aspiration-expectation match, AME/ ADC (standard error)

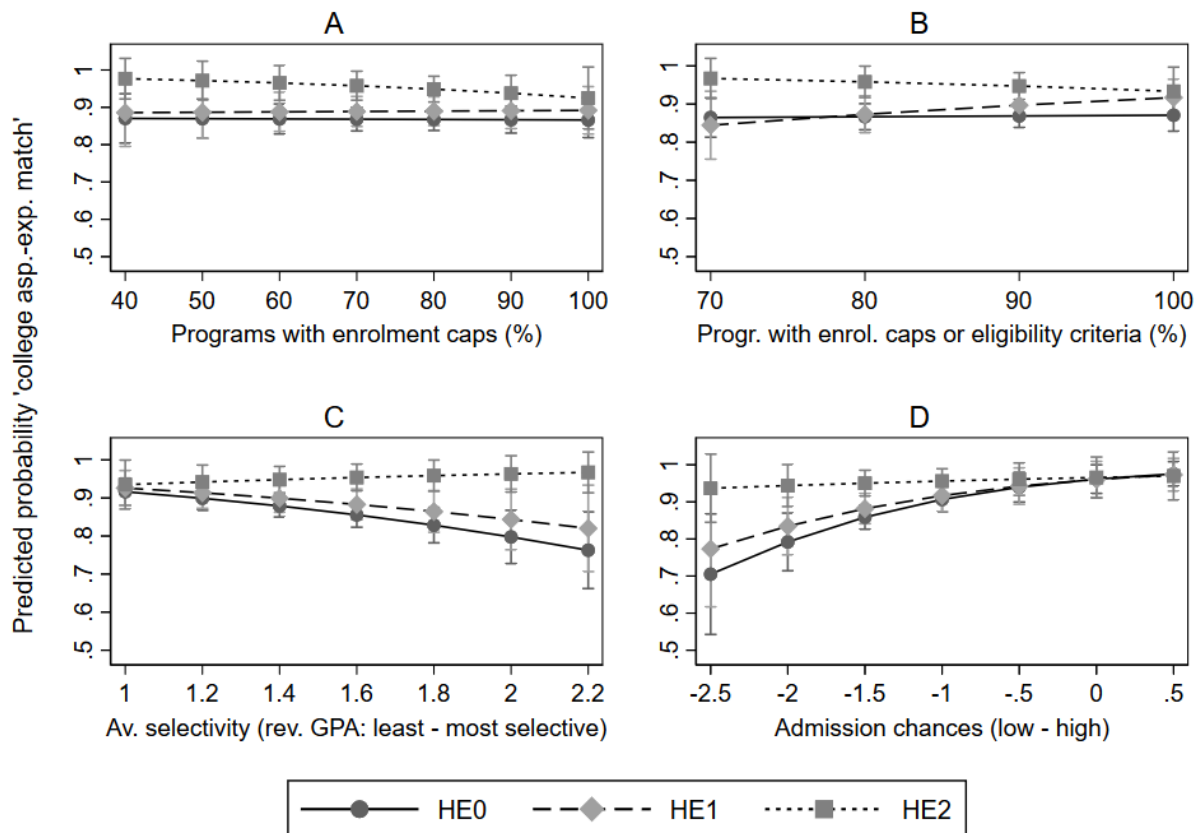
	M-A1	M-B1	M-C1
Average admission barriers of aspired field of study			
A: Share of programs with enrolment caps	-0.000 (0.001)	-	-
B: Share of programs with enrolment caps or eligibility criteria	-	0.001 (0.001)	-
C: Av. selectivity of programs (av. GPA of last admitted applicant, inverted GPA-scale)	-	-	-0.092* (0.037)
Social background, ref. HE0			
HE1	0.023 (0.023)	0.023 (0.023)	0.026 (0.023)
HE2	0.089** (0.024)	0.089** (0.024)	0.092** (0.024)
Control variables			
Av. ISEI	-0.002 (0.002)	-0.002 (0.001)	0.002 (0.002)
School performance (inverted GPA-scale)	0.117** (0.020)	0.117** (0.020)	0.117** (0.020)
Fluid competences (z-standardized)			
Verbal	-0.012 (0.011)	-0.012 (0.011)	-0.010 (0.011)
Figural	-0.020+ (0.010)	-0.019+ (0.010)	-0.021* (0.010)
Gender: Male	0.045* (0.021)	0.049* (0.022)	0.036+ (0.021)
Migration background	-0.003 (0.021)	-0.002 (0.021)	-0.000 (0.021)
School type, ref.: Gymnasium			
Comprehensive school	-0.047+ (0.027)	-0.047+ (0.027)	-0.049+ (0.026)
Vocational Gymnasium	-0.077** (0.029)	-0.077** (0.029)	-0.078** (0.029)
Rho	0.027 (0.022)	0.027 (0.022)	0.027 (0.023)
AIC	922.236	921.955	916.172
BIC	988.537	988.255	982.473
Maddala R ²	0.050	0.050	0.053
N respondents /schools	1212/27	1212/27	1212/27

Source: Best Up institutional and individual data (wave 1), Microcensus 2012-2017, study sample 1 (for details see section “analytical steps and sample restrictions”)

GLMM (for details see section “estimation method”), author’s calculation, ** p<0.01, * p<0.05, + p <0.1

To test whether students from lower social backgrounds are more strongly deterred by admission barriers (H2a), I added interaction terms to the models presented in Table 2 (see Supplementary Table O-B1). Based on these estimates, Figure 1 visualizes this moderation as predicted probabilities of a college aspiration–expectation match at different values of the admission barrier variables (Panels A–C; Panel D is introduced and discussed below; for further information on the significance of social background differences see Supplementary Figure O-B1).

Figure 1: Predicted probabilities of college aspiration–expectation match, by social background and admission barriers/ admission chances (95%-CI)



Source: Best Up institutional and individual data (wave 1), Microcensus 2012-2017, study sample 1 (for details see section “analytical steps and sample restrictions”), author’s calculation; for underlying models and information on statistical significance of social-background differences see Supplementary Table O-B1 and Figure O-B1.

Starting with the share of programmes with enrolment caps and eligibility criteria (panels A and B), the following can be observed: no relationship for non-academic background students, a slightly negative one for students from double-academic backgrounds and even a positive one for students from single-academic backgrounds (especially panel B). The differences between the groups are, however, at odds with H2a.

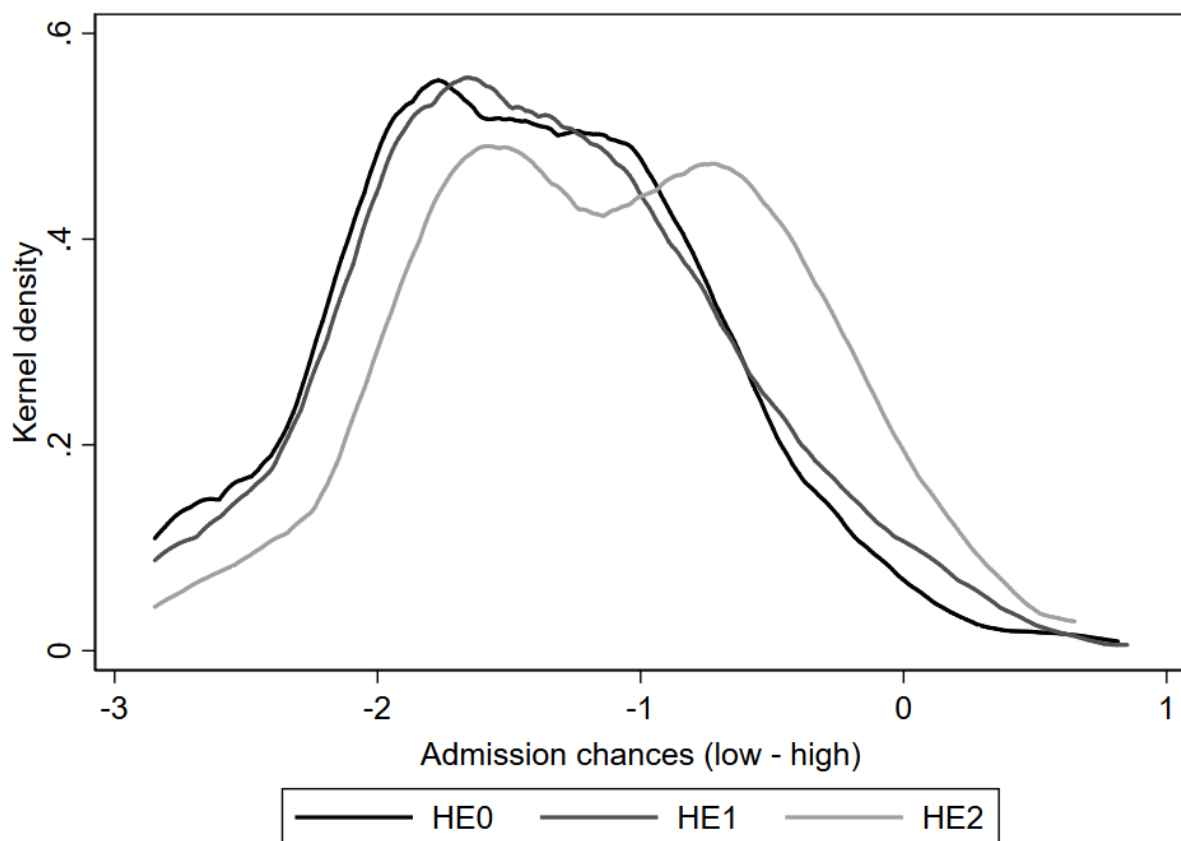
With regard to the average selectivity of the aspired field, Figure 1 (panel C) clearly shows a negative relationship for students from non-academic and to a lesser degree also for students from single-academic backgrounds. Hence, the social-background difference (between HE0 and HE2) is pronounced and significant for students who aspire very selective fields (right-hand side of the x-axis) and decreasingly substantial and significant for students who aspire less selective fields (see also Supplementary Figure O-B1). Thus, also H2a is partly supported by the data: only for the average selectivity of the aspired field of study and only for the comparison between the two extreme groups.

While students from single-academic backgrounds occupy the middle position in most models, they are mostly closer to non-academic background students. In this study, having two college-educated parents seems to make the difference confirming the importance of considering resources of both parents (Beller, 2009).

The observed difference between students from different social backgrounds could be due to differences in how realistic the aspired field is, given students' school performance. If students from double-academic backgrounds have more realistic aspirations, this could be one reason for a higher probability of having a (realistic) college expectation. To examine this, I calculated *average admission chances* by relating the individual GPA to the GPA that applicants of the previous year needed on average to get admitted to the aspired field. Negative values indicate low(er) admission chances. Figure 2 shows the distribution of this variable by social background. Overall, admission chances are more often negative than positive and students from double-academic backgrounds have somewhat higher admission chances on average.¹⁹ This is because students from different social backgrounds aspire approximately similarly selective fields while students from double-academic backgrounds have a higher GPA on average

translating in their higher admission chances (see Appendix Tables A1). However, it cannot be disentangled with the data at hand whether the lower admission chances of students from lower social backgrounds (and thus their lower college expectation, see below) are due to their poorer school performance or whether their poorer school performance is due to their higher probability not to expect what they aspire.

Figure 2: Distribution of admission chances, by social background



Source: Best Up institutional and individual data (wave 1), study sample 1 (for details see section “analytical steps and sample restrictions”), author’s calculation

How admission chances relate to the college aspiration–expectation match is shown in Figure 1 (Panel D). Students from double-academic backgrounds are rarely affected, indicating that they stick to their college aspiration even if it is fairly unlikely that they will be admitted to their aspired field. For

students from non- and—somewhat less strongly—from single-academic backgrounds the probability of a match increases with rising admission chances. This positive relationship flattens out when admission chances become positive. Overall this indicates that the social background difference observed in Figure 1 cannot be attributed to double-academic background students having more realistic field-of-study aspirations. They rather do not seem to include admission barriers in their evaluation process. This could be due to a lack of information. However, I consider it unlikely that double-academic background students are less well informed than their peers from single- and non-academic backgrounds. They might, in contrast, rely on their informational and economic resources and thus be confident to circumvent existing barriers to their aspired field by, for instance, opting for a less selective programme within an on average very selective field, by studying abroad, at a private university or by taking advantage of the ‘waiting-time’ option of the German admission system (see above). On the other hand, they might be willing to compromise their aspired field of study in order to realize their college aspiration as a minimum level of education. While the former explanations cannot be tested directly with the data, the latter one will be examined below.

Field-specific college aspiration–expectation (mis)match

Descriptive statistics show that a field-specific aspiration–expectation match is—compared to a college aspiration–expectation match—less frequent (overall 75 per cent) and almost similarly distributed across students from different social backgrounds (see Appendix Table A2). Furthermore, students aspiring different fields of study show a much higher variability regarding their field-specific match, ranging (non-linearly) from 49 per cent for the highly selective medical field to 93 per cent for the much less selective business field (see Appendix Table A3).

Table 3 shows whether the match between field-specific aspirations and expectations is negatively related to admission barriers (H1b). It reveals that the shares of programmes with enrolment caps and eligibility criteria (M-A2/M-B2) are not related to the field-specific match; even though the

coefficient in model M-B2 is statistically significant, the effect size is close to zero. The average selectivity of the aspired field (M-C2), however, is substantially related to the dependent variable: If the GPA that applicants of the previous year needed for admission increases by one point, the probability of a field-specific match decreases by 26 percentage points. This again partly supports H1b.

Table 3: Determinants of field-specific aspiration-expectation match, AME/ ADC (standard error)

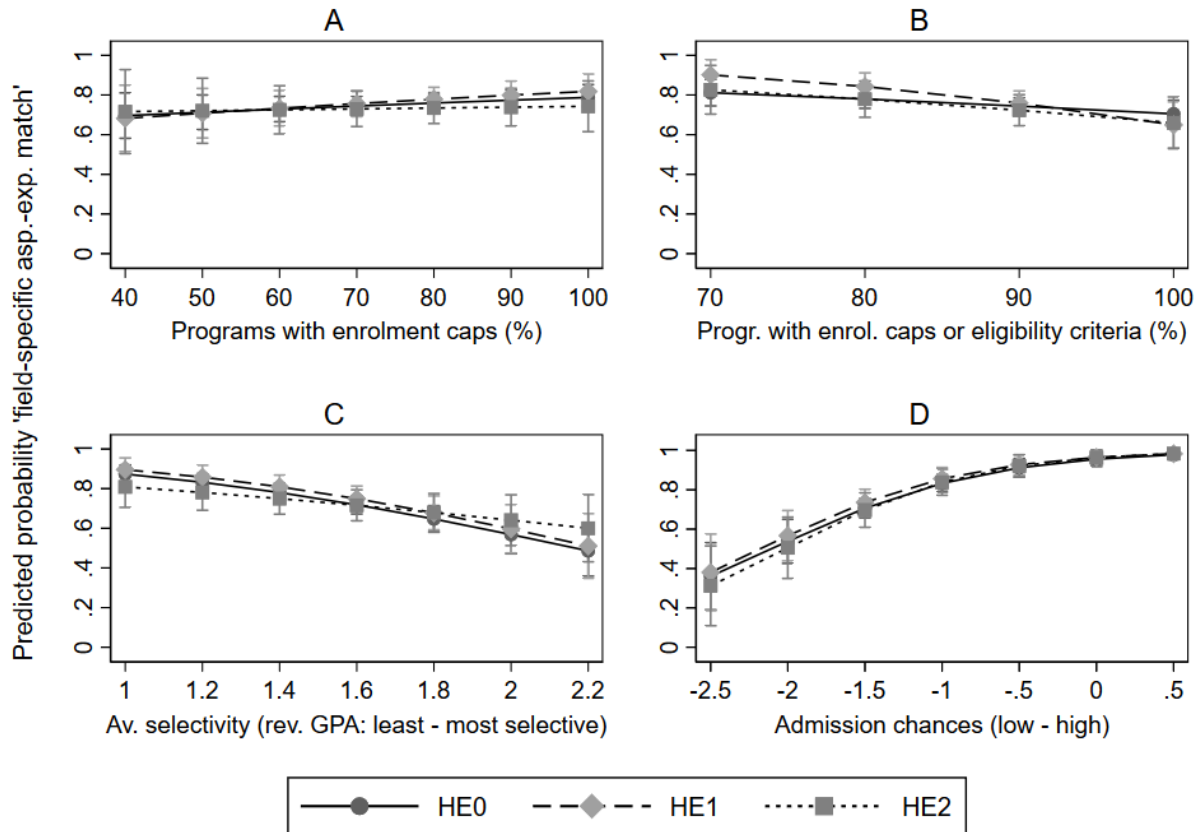
	M-A2	M-B2	M-C2
Average admission barriers of aspired field of study			
A: Share of programs with enrolment caps	0.001 (0.001)	-	-
B: Share of programs with enrolment caps or eligibility criteria	-	-0.005** (0.002)	-
C: Av. selectivity of programs (av. GPA of last admitted applicant, inverted GPA-scale)	-	-	-0.262**(0.050)
Social background, ref. HE0			
HE1	0.016 (0.033)	0.017 (0.033)	0.026 (0.032)
HE2	-0.023 (0.041)	-0.018 (0.040)	-0.003 (0.040)
Control variables			
Av. ISEI	-0.014** (0.002)	-0.011** (0.002)	-0.001 (0.003)
School performance (inverted GPA-scale)	0.040 (0.025)	0.039 (0.024)	0.037 (0.024)
Fluid competences (z-standardized)			
Verbal	-0.011 (0.016)	-0.008 (0.016)	-0.002 (0.016)
Figural	0.014 (0.014)	0.010 (0.014)	0.014 (0.014)
Gender: Male	0.048+ (0.029)	0.015 (0.030)	0.013 (0.029)
Migration background	-0.021 (0.030)	-0.028 (0.030)	-0.023 (0.030)
School type, ref.: Gymnasium			
Comprehensive school	0.018 (0.044)	0.016 (0.039)	0.012 (0.039)
Vocational Gymnasium	0.002 (0.045)	-0.004 (0.040)	0.001 (0.040)
Rho	0.032 (0.208)	0.018 (0.018)	0.019 (0.018)
AIC	1080.402	1072.537	1056.663
BIC	1143.927	1136.062	1120.188
Maddala R ²	0.050	0.057	0.071
N respondents /schools	979 /27	979 /27	979 /27

Source: Best Up institutional and individual data (wave 1), Microcensus 2012-2017, study sample 2 (for details see section “analytical steps and sample restrictions”)

GLMM (for details see section “estimation method”), author’s calculation, ** p<0.01, * p<0.05, + p <0.1

While students' school performance is more strongly related to the general college aspiration–expectation match (see previous section) than the average performance required for admission to the aspired field of study, it is the other way around for the field-specific aspiration–expectation match (the z-standardized coefficient for the GPA-selectivity is five times as strong as the one for school performance; –0.10 versus 0.02).

Figure 3: Predicted probabilities of field-specific aspiration–expectation match, by social background and admission barriers/ admission chances, (95%-CI)



Source: Best Up institutional and individual data (wave 1), Microcensus 2012-2017, study sample 2 (for details see section “analytical steps and sample restrictions”), author’s calculation; for underlying models see Supplementary Table O-B1.

Figure 3 shows the predicted probabilities of a field-specific match by social background at different values of the admission barriers variables (panels A–C). The slopes do barely differ, contradicting H2b. The same is true for the association between admission chances—introduced above—and the field-specific aspiration–expectation match (panel D; for underlying models, see Supplementary Section B).

An implicit assumption of these analyses is that students who expect to study a different field than they aspire ‘change’ to a less selective field if admission barriers are the actual reason for this mismatch. This is the case for the majority of students (70 per cent) who fall in this category. Due to low case numbers (especially for academic-background students), differentiating this share by social background is not feasible.

Discussion and conclusion

This article discussed and analysed admission barriers as potential reason behind mismatched college aspirations and expectations. More concretely, I examined whether admission barriers to the aspired field of study contribute to such a mismatch and whether they do so especially for students from socially less privileged backgrounds. I considered two steps—the (mis)match regarding the educational level (college or not) and the (mis)match regarding the field of study. The empirical analyses were based on unique data combining individual and institutional information on admission barriers in Germany, a context for which these institutional constraints have largely been neglected in previous research on social inequality in HE.

The main findings are: First, *restrictions of study places* in the form of enrolment caps and eligibility criteria alone do rarely contribute to mismatched (field-specific) college aspirations and expectations. This might be due to the fact that such restrictions and admission chances are only loosely coupled: if the demand for a certain programme or field does not exceed its supply, admission can be quite easy even if the programme is restricted. This logic does, however, not apply to eligibility criteria as additional requirements *must* be met (regardless of competition). Yet as respective information is limited,

students might barely anticipate them which might contribute to their weak impact. Furthermore, they offer few opportunities for comparison so that it is difficult to assess one's own ranking position. Second and as expected, the *average (GPA-)selectivity* of the aspired field decreases the probability of both matches, most substantially the probability that high school seniors expect to study the same field as they wish to.

Third, regarding *social background differences*, the perception of a high-performance-selectivity of the aspired field of study makes students with no or one college-educated parent(s) more likely to compromise their aspired level *and* field. For students with two college-educated parents compromises can *only* be observed regarding the field of study. Apparently, the socially most privileged students stick to their general college aspiration regardless of admission barriers and individual admission chances. However, they seem to be willing to compromise their preferred field of study if this comes along with high admission barriers. The boundaries they draw are thus stronger with regard to the level of education than the field within the higher level. This is in line with RC-theory, in particular the status maintenance motive (Breen and Goldthorpe, 1997). It is also in line with cultural explanations assuming that socially advantaged students have deeply internalized college aspirations and simultaneously exploit their resources to strategically navigate through the complexity of available alternatives (Ball *et al.*, 2002). Contrastingly, socially less privileged students seem willing to compromise their general college aspiration if admission to their aspired field appears difficult. They do not need to attend college for social reproduction and their college aspiration is often less deeply internalized so that they seem more likely to engage with existing (or perceived) barriers in a deliberative way (Kroneberg and Kalter, 2012).

That high school students are able to anticipate variations in admission barriers remains, however, an assumption that could not be tested empirically. Instead of not being relevant for students' decision processes, the null effect of enrolment caps and eligibility requirements could thus result from information deficits among students. Furthermore, being well-informed about admission barriers might differ by social background. Such information asymmetries might contribute to an underestimation of the true social background difference regarding the impact of admission barriers. If students from socially

less advantaged backgrounds are able to anticipate admission barriers to a lesser extent than their advantaged peers, such barriers might exert a (relatively) weaker influence on the formers' educational expectations. The underlying mechanism, however, might be disadvantaged students' lower awareness of admission barriers instead of admission barriers' (relatively) limited relevance for them. Disentangling the effects of information asymmetries on the one hand and differences in the relevance of perceived institutional barriers on the other is a promising avenue for future research.

This article complements previous studies on the important role of admission barriers for social inequality in HE. These studies mainly refer to the Anglo-American (and to a lesser extent Scandinavian) context. One reason for this regional focus is data availability. In contrast to countries with centralized admission or test-taking systems, the largely decentralized German admission system lacks comprehensive data. Another reason for the lack of (quantitative empirical) research on the role of admission barriers for social inequality in German HE lies in the less pronounced vertical stratification of the German HE system. Yet, this article's findings on the usage and impact of admission barriers indicate that the horizontal differentiation by field of study in Germany is a functional equivalent to vertical prestige differentials in other contexts.

With the regional focus of this study questions of external validity arise. In Berlin, both demand for and supply with study places is high: Berlin high school graduates have the opportunity to apply to several HE institutions and a large variety of fields of study in close proximity to their place of residence. At the same time, their chances of getting admitted likely increases with increasing regional flexibility due to the harsh competition for study places in Berlin. While the findings might hold for other urban areas that provide a comparable supply and demand ratio, this is rather uncertain for high school graduates living in rural regions. Here admission barriers can be expected to be lower, while accessibility of HE in general and certain fields in particular more likely depends on geographic distance.

Thus, the current study can only be one of the first steps to systematically discuss and examine the role of admission barriers for socially selective intakes in Germany (see also Helsper and Krüger, 2015; Winter *et al.*, 2012). Besides a broader regional coverage, future research should also include later

stages of the transition process to HE. This article focused on behavioural intentions rather than actual behaviour. While this is an advantage compared to studies on HE applicants, which exclude those who do not apply in the first place, it remains open whether the findings hold in the application and enrolment stage. With approaching decisions, students from privileged backgrounds might be more likely to realize their field-of-study aspiration via strategies to circumvent existing barriers (e.g., via waiting time or studying abroad). Furthermore, gatekeepers can also influence transition processes directly in that they use specific criteria and procedures, such as tests or interviews, to select certain applicants. Recently, the weight of aptitude tests for admission to the highly selective programmes with national enrolment caps increased dramatically in Germany. Whether this will lead to varying admission chances of applicants from different social backgrounds (e.g., Thomsen, 2018) is still an open, but highly relevant question.

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Notes

¹ Until 2019, the share of the quota for programmes with national enrolment caps was 20 per cent (GPA), 20 per cent (waiting period), 60 per cent (further criteria). The quota for programmes with local enrolment caps and the criteria that are allowed for student selection differ by federal states.

² Since 2017, the HRK differentiates between programmes with a binding local NC and programmes without such a binding NC which nevertheless use selection procedures/ eligibility assessments. This applies to around 6 per cent of programmes formerly classified as programmes with a local NC (HRK, 2019).

³ A google search of '*numerus clausus*' leads to more than 1.5 million hits to websites of newspapers, universities, associations, applied research institutes, and further non- and for-profit websites, mostly explaining the admission system (sometimes multiplying existing myths); some even providing lists of the GPA of previously admitted applicants (e.g., <https://www.studis-online.de/Studiengaenge/NC/>) (last accessed: 20 May 2021).

⁴ Early on, Haller (1968) suggested distinguishing between idealistic and realistic aspirations. In the literature, the terms aspirations for the former and expectations (also intentions or plans) for the latter are commonly used, also in this article.

⁵ The degree to which aspirations are adjusted towards 'the probable' also depends on the context and timing of their measurement. Due to early tracking, educational aspirations of academic-track students are already more realistic in Germany than in countries with a less stratified school system (Buchmann and Park, 2009). This might be further amplified by the timing of this study—1 year before graduation—which might lead to conservative estimates regarding the discrepancy between aspirations and expectations.

⁶ When modelling success probabilities, RC-models mainly refer to the perceived probability of *successfully graduating* from a given educational level/field and thus to the uncertainty of reaping the benefits of an educational investment (e.g., Erikson and Jonsson, 1996). The perceived probability of *successfully gaining access* to a specific programme is a necessary precondition of successfully graduating from it and should thus not be neglected.

⁷ We conducted two field experiments after the first wave (with respondents from two-thirds of the schools). The analyses rely on the pre-treatment measures.

⁸ According to a comprehensive data base provided by the HRK (<http://www.hochschulkompass.de/hochschulen/hochschulen-in-deutschland-die-hochschulsuche.html>, accessed: 20 May 2021), 38 HE institutions are listed in Berlin (10 universities, 5 colleges of art and music, and 23 universities of applied sciences).

⁹ An edited version of this data set is freely available: Finger, C. (2021): *Auswahlverfahren an deutschen Hochschulen*. Version 1.0.0. Wissenschaftszentrum Berlin für Sozialforschung. Dataset. <https://doi.org/10.7802/2292>

¹⁰ After high school graduation (waves 3–5), we asked respondents to list programmes to which they applied/ plan to apply and collected information on these programmes. It is possible that respondents already adapted their original aspirations to programmes that they perceived as accessible. Thus, the average selectivity of aspired fields of study could be somewhat underestimated and aspiration–expectation mismatches overestimated leading to rather conservative estimates.

¹¹ Questions based on: German National Education Panel Study (see Stocké *et al.*, 2011).

¹² The Best Up data also contain a more fine-grained measure of field of study aspirations and expectations with 80 categories. The share of mismatches is 8 percentage points higher with this fine-grained categorization than with the broader one used in this article (33.5 per cent versus 25.4 per cent).

¹³ Publicly available information on the selectivity of programmes (i.e., the GPA that previous applicants needed to get admitted) is based on the GPA-quota and thus oftentimes refers to only 20 per cent of

available places. Thus, this measure likely overestimates the GPA-selectivity of programmes. However, this is the only information that is available to students (and researchers). Furthermore, this bias would only be a problem if the degree of overestimation would differ between fields of study.

¹⁴ DOIs: 10.21242/12211.2007.00.00.1.1.0 to 10.21242/12211.2012.00.00.1.1.0

¹⁵ The school performance measure contains the mean of up to five grades. As students can also choose mathematics, German or English as an advanced course, the measure only contains three or four subjects in such cases. The German grading scale ranges from 1.0 (top grade) to 6.0. In order to pass the Abitur and gain HE eligibility, students need an average grade of 4.0 or better. This is the reason why the ‘average selectivity’ measure (average GPA of the last admitted applicant) only contains values between 1.0 and 4.0. The ‘early GPA’ in the individual-level data contains also poorer grades than 4.0. To harmonize the individual and institutional measures, I truncated students’ GPA at 4.0. To test the robustness of the results, I provide additional analyses of all models with alternative GPA-specifications and sample restrictions in the Supplementary (Section C): 1) using the whole GPA-range, 2) adding a dummy variable which indicates whether students are above or below the 4.0 (=pass) threshold to models with the truncated GPA-measure, and 3) restricting the sample to students with an early GPA of at least 4.0. The estimates are very robust towards alternative specifications.

¹⁶ I included cognitive test scores because school performance is not a perfect measure of students’ ability. Higher ability students at a given level of school performance might be more optimistic when evaluating average admission barriers and this pattern might vary with students’ social background. Models (available upon request) excluding test scores yield almost similar results.

¹⁷ I decided against multiple imputation (MI) for at least two reasons. First, as there was no ‘don’t know’ category, it is not possible to differentiate between refusal and uncertainty regarding field-specific aspirations. Second, this variable has many nominal categories making MI technically barely possible with the case numbers at hand.

¹⁸ As a robustness check, I repeated all analyses with cross-classified models with field of study as a further upper-level, since the institutional-level predictor variables (admission barriers) are measured on the field-level. The point estimates as well as standard errors (available upon request) are almost similar to those obtained by the simpler random intercept models reported in this article.

¹⁹ Note that actual admission chances are likely underestimated as students have the opportunity to choose specific programmes within a broader field that are less selective than the average captured by the selectivity measure. Furthermore, the average selectivity of fields only refers to the GPA-quota of study programmes and thus covers only a rather GPA-selective subset of available places (see also endnote 10).

Appendix

Table A1: Descriptive statistics, study sample 1 for analyses of college aspiration-expectation match

	All		HE0	HE1	HE2
	N: 1212		N: 744	N: 290	N: 178
	Range	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)
Social background					
HE0	0 – 1	61.39	-	-	-
HE1	0 – 1	23.93	-	-	-
HE2	0 – 1	14.69	-	-	-
Dependent variable					
College aspiration- expectation match	0 – 1	86.06	83.60	86.90	94.94
Admission barriers of aspired field of study					
A: Programs with enrolment caps	33.33 – 100	77.13 (15.87)	77.35 (15.84)	76.14 (16.30)	77.85 (15.28)
B: Programs with enrolment caps or eligibility criteria	71.01 – 100	87.31 (10.15)	87.33 (10.22)	87.24 (9.98)	87.32 (10.23)
C: Av. selectivity of programs (av. GPA of last admitted applicant)					
Original GPA-scale	1.15 – 2.31	1.83 (0.39)	1.83 (0.38)	1.83 (0.39)	1.80 (0.40)
Inverted GPA-scale	1 – 2.16	1.48 (0.39)	1.48 (0.38)	1.48 (0.39)	1.51 (0.40)
D: Admission chances	-2.85 – 0.85	-1.38 (0.70)	-1.44 (0.68)	-1.38 (0.70)	-1.11 (0.71)
Control variables					
Av. ISEI of aspired field	58.33 – 79.51	64.94 (6.48)	65.02 (6.58)	64.89 (6.56)	64.69 (5.93)
School performance, GPA-scale:					
Original	1.2 – 4	3.21 (0.60)	3.28 (0.59)	3.21 (0.58)	2.91 (0.62)
Inverted	1 – 3.8	1.79 (0.60)	1.72 (0.59)	1.79 (0.58)	2.09 (0.62)
Fluid competences (z-standardized)					
Verbal	-2.54 – 2.83	0.05 (1.01)	-0.10 (0.99)	0.10 (1.01)	0.57 (0.93)
Figural	-3.76 – 2.88	0.02 (1.01)	-0.04 (1.02)	0.12 (0.91)	0.09 (1.08)
Gender: male	0 – 1	41.42	38.84	44.83	46.63
Migration background	0 – 1	53.63	58.60	46.90	43.82
School type:					
Gymnasium	0 – 1	30.20	30.11	28.62	33.15
Comprehensive school	0 – 1	36.22	34.27	43.10	33.15
Vocational Gymnasium	0 – 1	33.58	35.62	28.28	33.71

Note: For categorical variables, deviations from 100 per cent due to rounding.

Source: Best Up institutional and individual data (wave 1), Microcensus 2012-2017, author's calculation

Table A2: Descriptive statistics, study sample 2 for field-specific aspiration-expectation match

		All	HE0	HE1	HE2
		N: 979	N: 589	N: 232	N: 158
	Range	% /Mean (SD)	% /Mean (SD)	% /Mean (SD)	% /Mean (SD)
Social background					
HE0	0 – 1	60.16	-	-	-
HE1	0 – 1	23.70	-	-	-
HE2	0 – 1	16.14	-	-	-
Dependent variable					
Field-specific aspiration-expectation match	0 – 1	74.57	73.85	76.72	74.05
Admission barriers of aspired field					
A: Programs with enrolment caps	33.33 – 100	76.74 (15.85)	76.97 (15.67)	75.63 (16.61)	77.55 (15.28)
B: Programs with enrolment caps or eligibility criteria	71.01 – 100	87.04 (10.06)	86.98 (10.13)	87.16 (9.82)	87.07 (10.22)
C: Av. selectivity of programs (av. GPA of last admitted applicant)					
Original GPA-scale	1.15 – 2.31	1.83 (0.39)	1.85 (0.39)	1.84 (0.39)	1.79 (0.40)
Inverted GPA-scale	1 – 2.16	1.48 (0.39)	1.46 (0.39)	1.48 (0.39)	1.52 (0.40)
D: Admission chances	-2.85 – 0.85	-1.33 (0.70)	-1.38 (0.69)	-1.36 (0.70)	-1.11 (0.72)
Control variables					
Av. ISEI	58.33 – 79.51	64.92 (6.56)	65.02 (6.69)	64.66 (6.49)	64.92 (6.19)
School performance, GPA-scale:					
Original GPA	1.2 – 4	3.17 (0.61)	3.23 (0.60)	3.19 (0.59)	2.91 (0.62)
Inverted GPA	1 – 3.8	1.83 (0.61)	1.77 (0.60)	1.81 (0.59)	2.09 (0.62)
Fluid competences (z-standardized)					
Verbal	-2.54 – 2.83	0.06 (1.01)	-0.09 (0.99)	0.11 (1.01)	0.58 (0.92)
Figural	-3.76 – 2.88	0.02 (1.00)	-0.05 (1.03)	0.11 (0.90)	0.12 (1.04)
Gender: male	0 – 1	42.70	40.92	43.97	47.47
Migration background	0 – 1	53.22	58.74	46.12	43.04
School type:					
Gymnasium	0 – 1	31.56	32.60	28.88	31.65
Comprehensive school	0 – 1	35.75	33.28	43.97	32.91
Vocational gymnasium	0 – 1	32.69	34.13	27.16	35.44

Note: For categorical variables, deviations from 100 per cent due to rounding.

Source: Best Up institutional and individual data (wave 1), Microcensus 2012-2017, author's calculation

Table A3: Descriptive statistics on (field-specific) aspiration-expectation match, by aspired field of study and average admission barriers

	College aspiration-expectation match ^{a)}		Field-specific aspiration-expectation match ^{b)}	
	No (N: 169)	Yes (N:1,043)	No (N: 249)	Yes (N: 730)
Aspired field of study: row percentage (N)				
Language/ literature	8.33 (4)	91.67 (44)	30.00 (12)	70.00 (28)
Culture	28.57 (4)	71.43 (10)	40.00 (4)	60.00 (6)
Education	17.07 (7)	82.93 (34)	15.63 (5)	84.38 (27)
Law	16.67 (14)	83.33 (70)	8.57 (6)	91.43 (64)
Economics	7.87 (7)	92.13 (82)	16.25 (13)	83.75 (67)
Social sciences	16.47 (14)	83.53 (71)	22.39 (15)	77.61 (52)
Natural sciences	18.39 (32)	81.61 (142)	12.50 (17)	87.50 (119)
Medicine/ health	16.07 (27)	83.93 (141)	51.45 (71)	48.55 (67)
Engineering	9.56 (13)	90.44 (123)	18.97 (22)	81.03 (94)
Art	13.25 (11)	86.75 (72)	35.29 (24)	64.71 (44)
Psychology	17.36 (21)	82.64 (100)	46.24 (43)	53.76 (50)
Business	9.78 (9)	90.22 (83)	7.50 (6)	92.50 (74)
Teaching	7.79 (6)	92.21 (71)	22.45 (11)	77.55 (38)
Av. admission barriers of aspired field of study: Mean (SD)				
A: Programs with enrolment caps	78.07 (15.94)	76.98 (15.86)	78.46 (17.26)	76.16 (15.31)
B: Programs with enrolment caps or eligibility criteria	87.27 (10.41)	87.31 (10.12)	89.83 (8.62)	86.09 (10.34)
C: Av. selectivity of programs (av. GPA of last admitted applicant)				
Original GPA-scale	1.76 (0.39)	1.84 (0.39)	1.66 (0.45)	1.90 (0.35)
Inverted GPA-scale	1.55 (0.39)	1.47 (0.39)	1.66 (0.45)	1.41 (0.35)
D: Admission chances	-1.72 (0.60)	-1.32 (0.70)	-1.55 (0.73)	-1.25 (0.68)

^{a)} study sample 1 (for details see section “analytical steps and sample restrictions”)

^{b)} study sample 2

Source: Best Up institutional and individual data (wave 1), author’s calculation