

Publisher's PDF

Citation: Nennstiel, Richard. "Explaining Ethnic Differences in Access to VET in German-Speaking Switzerland: the Effects of Application Behavior and Resources" *Zeitschrift für Soziologie*, vol. 50, no. 6, 2021, pp. 396-414. <https://doi.org/10.1515/zfsoz-2021-0024>

The final publication is available at www.degruyter.com You can find the published paper (Version of Record) at the following URL:

<https://www.degruyter.com/document/doi/10.1515/zfsoz-2021-0024/html>

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Explaining Ethnic Differences in Access to VET in German-Speaking Switzerland: the Effects of Application Behavior and Resources

Zur Erklärung ethnischer Ungleichheiten beim Zugang zur Berufsausbildung in der Deutschschweiz: Effekte des Bewerbungsverhaltens und der Ressourcenausstattung

<https://doi.org/10.1515/zfsoz-2021-0024>

Abstract: The aim of this paper is to explain ethnic differences in the transition from school to vocational education and training (VET) in German-speaking Switzerland. I examine the impact of application behavior and resource endowment on access to VET and the number of applications submitted. Even after controlling for differences in resource endowment, I find clear ethnic penalties in success rates and the number of applications submitted between natives and minority students. Once I introduce different application behavior in my models, ethnic differences in success rates either diminish sharply or even vanish. However, substantial ethnic penalties remain in the number of applications submitted. There are therefore indications of discrimination in the application process on the Swiss–German VET market.

Keywords: Ethnic Differences; Discrimination; Human Capital; Social Capital; VET; School-to-Work Transitions; Application Behavior; Bayesian Analysis.

Zusammenfassung: Das Ziel dieses Beitrags ist es, ethnische Ungleichheiten beim Übergang von der Schule in die Berufsausbildung in der Deutschschweiz zu erklären. Ich untersuche den Einfluss des Bewerbungsverhaltens und der Ressourcenausstattung auf den Zugang zur Berufsausbildung und die Anzahl der eingereichten Bewerbungen. Selbst nach Kontrolle von Unterschieden in der Ressourcenausstattung finde ich deutliche ethnische Un-

gleichheiten in den Erfolgsquoten und der Zahl der eingereichten Bewerbungen zwischen Schülern mit und ohne Migrationshintergrund. Sobald ich unterschiedliches Bewerbungsverhalten in den statistischen Modellen berücksichtige, verringern sich die ethnischen Ungleichheiten bei den Erfolgsquoten stark oder verschwinden ganz. Bei der Zahl der eingereichten Bewerbungen bleiben jedoch erhebliche ethnische Nachteile bestehen. Diese Nachteile deuten auf Diskriminierungsprozesse in Bewerbungsverfahren auf dem Deutschschweizer Berufsausbildungsmarkt hin.

Schlüsselwörter: Ethnische Ungleichheiten; Diskriminierung; Humankapital; Sozialkapital; Berufsausbildung; Übergang Schule-Beruf; Bewerbungsverhalten; Bayessche Statistik.

1 Introduction

Studies from various fields of research have repeatedly shown that migrants are disadvantaged in many areas of their lives. Sociological research has focused particularly on explaining inequalities between migrants and natives in the labor market (e. g. Liebig & Widmaier 2009) and in the educational system (e. g. Heath 2014), since these areas are crucial for the social integration of migrants and their children. Migrants are more likely to be unemployed, they are likely to have (on average) lower incomes and they are less likely to be invited to job interviews (Birkelund et al. 2016; Pichler 2011; for Switzerland: SCCRE 2018; Zschirnt 2019b).

Regarding education, studies show that minority students are more likely to follow less demanding school tracks at lower secondary level, are less likely to enroll at

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universities and are less likely to enter vocational education and training (VET) after compulsory schooling (Dollmann 2017; Heath 2014; Tjaden & Hunkler 2017; Diehl et al. 2009; for Switzerland: Glauser & Becker 2016; Griga 2014; Imdorf 2017). Explaining these disadvantages is a central issue in sociology, and may be even more relevant in light of current migration phenomena (Haas et al. 2020).

The transition from school to VET is located at the border between education and labor market research. This transition is particularly relevant for later entry into working life in countries with a highly developed vocational training system, such as Germany, Switzerland, the Netherlands, Austria and Denmark (Allmendinger 1989; Brzinsky-Fay & Solga 2016). An apprenticeship facilitates the transition to the labor market (Wolbers 2007; Middeldorp et al. 2018), reduces the risk of unemployment in early working life (Korber & Oesch 2019; SCCRE 2018) and offers academically weaker students following non-academic educational tracks high economic incentives (Korber & Oesch 2019). The labor market prospects for pupils without a vocational or higher tertiary qualification have deteriorated over time in Switzerland (Meyer 2008).

In Switzerland, minority students have a 15 percent lower rate of transition into VET (64 versus 79 percent (SBFI 2017: 55)) than natives, while on average they submit more than three times as many applications to VET programs (7.2 versus 25.7 (SBFI 2019: 28)). These descriptive findings are supported by other Swiss studies that point to disadvantages for minority students in accessing the VET market (Hupka-Brunner et al. 2010; Imdorf 2017).

The high importance of the school-to-VET transition calls for an explanation of the mentioned ethnic discrepancies. The research question asked by this paper is therefore: how can these ethnic disadvantages in accessing the VET market in German-speaking Switzerland – that is, the ethnic disadvantages regarding actual success in the VET market and the number of applications submitted – be explained?

School-to-VET transitions are a commonly researched topic, with various factors influencing this transition being examined, such as gender differences, ethnic and social inequalities, aspirations, the role of social capital, and the influence of regional labor market and opportunity structures (Diehl et al. 2009; Roth 2018; Protsch & Dieckhoff 2011; Lindemann & Gangl 2019; Beicht & Walden 2017; for Switzerland: Glauser & Becker 2016; Imdorf 2017; Tjaden & Scharenberg 2017; Laganà et al. 2013). Many studies have identified considerable ethnic inequalities in access to VET (Weßling et al. 2015; Diehl et al. 2009; Lindemann & Gangl 2019; Roth 2014; for Switzerland: Laganà et al. 2013; Hupka-Brunner et al. 2010; Imdorf 2017). These ethnic in-

equalities are often attributed to differences in resources (human capital – grades, language skills, certificates; and social capital – parental support and networks) between natives and minority students, or to discrimination (e. g. Tjaden 2017; Hunkler 2016; Imdorf 2017; Roth 2018; Diehl 2009). Empirical evidence shows that ethnic differences in success rates exist even after controlling for differing resource endowment. Heath and Cheung (2007) label such remaining differences “ethnic penalties”. With regard to the state of research on access to VET, Hunkler (2016) writes that, despite the large number of studies on the subject, there is still a considerable need for further research as remaining ethnic residual effects often cannot be explained.

More recently, in an effort to explain remaining ethnic penalties beyond theories of discrimination, more attention has been drawn to the different aspirations held by natives and by migrants (e. g. immigrant optimism (Kao & Tienda 1995)). In studies on access to VET, differences in aspirations and application behavior between native and minority students are rarely taken into account. For example, these differences could help explain the varying success rates: minority students may encounter greater competition in the VET market because they focus on fewer training occupations with more demanding requirements, and start looking for VET positions later than natives (Beicht 2012; for Switzerland: SBFI 2013a; Meyer et al. 2003). Furthermore, solely focusing on success in the VET market underestimates the various dimensions of inequality (Zschirnt 2019a). The fact that minority students have to write up to three times as many applications as native students when applying to VET (SBFI 2017) is a dimension of disadvantage that should not be neglected.

I aim to explain ethnic differences in access to VET based not only on success in the VET market (a signed contract or verbal commitment), but also on the number of apprenticeship applications submitted. As I use survey data, I analyze the number of applications under the assumption that the quality of applications does not vary systematically between minority groups. Unlike most previous research, I consider differences in application behavior (e. g. occupational aspirations; VET requirements; timing of beginning the VET search; fit between qualifications and chosen VET; internship experience) in my analyses.

I estimate linear probability models (VET success) and negative binomial regression models for count data (the number of applications submitted) in a multilevel Bayesian framework. My calculations are based on data from the Determinants of Educational Choices and Vocational Training Opportunities (DAB) panel study, which, since 2012, has regularly interviewed former eighth-graders

from German-speaking Swiss cantons about their life and educational situation. My multivariate analyses include data from 1,763 pupils who aspired to VET after the end of compulsory schooling.

Several factors make German-speaking Switzerland an especially interesting case for such analyses. For one, it already has a very high proportion of foreigners: about one-third of 15- to 24-year-olds have a migration background (BfS 2020).¹ Second, the socioeconomic composition of migrants is very heterogeneous: there are numerically large groups of both socioeconomically privileged and socioeconomically disadvantaged migrants. Switzerland is also the country with the highest share of VET in Europe: roughly two-thirds of adolescents decide to pursue VET after compulsory schooling (SCCRE 2018). Hence, the analysis of access to VET does not solely have to focus on disadvantaged migrant groups. Third, because of its strong similarities to the German VET system (Buchholz et al. 2012), the results of this study can be contextualized within the large number of German studies on access to VET.

In the next section, I briefly introduce the Swiss-German context regarding migration and the VET system. I then present theoretical arguments explaining ethnic differences in the VET market, as well as the current state of research on ethnic disadvantages in the Swiss VET market. Thereafter, I provide information about the data set used, the operationalization of the theoretical constructs and the statistical models applied. I then present the descriptive and multilevel findings. The paper concludes with a discussion of these results in the context of previous literature.

2 The Swiss-German context

2.1 Migrant groups

Immigration to Switzerland after the Second World War can be divided into several phases. As part of the first phase, which lasted from the 1950s until the 1970s, mainly unskilled guest workers from southern European countries arrived – at first from Italy and Spain, and later from Portugal. From the 1980s, when the demand for labor increased due to economic growth in Switzerland and south-

ern Europe, unskilled workers began to arrive, mainly from Yugoslavia and Turkey. In the 1990s, two processes began to influence immigration to Switzerland. First, the Balkan wars led to a large number of refugees from these areas coming to Switzerland. Second, the demand for low-skilled workers in Switzerland declined significantly. As a result, Switzerland introduced a new model of work permit in 1994 that favored migrants from the European Economic Area. In 2002, the first bilateral treaty between Switzerland and the European Union was signed, allowing the free movement of labor between the signatory countries (Cattaneo & Wolter 2015; Zschirnt 2019b; Laganà et al. 2013). This change attracted highly qualified people, mainly from northwestern European countries (Griga 2014).

The consequences of these two processes can be clearly seen in the composition of the migrant population in Switzerland. In the 1990s, only 40 percent of labor migrants had a VET degree and only 10 percent of them had a tertiary degree (SCCRE 2014: 26). In 2017, by contrast, 54 percent of new migrants within the framework of the free movement treaty with the EU had a tertiary degree (Schweizerische Eidgenossenschaft 2018). For instance, 70 percent of new migrants from France and 63 percent of new migrants from Germany had a tertiary degree. In contrast, 25 percent of migrants who immigrated from outside the framework of this treaty have a tertiary degree. There are considerable differences between the various migrant groups living in Switzerland regarding their social reputation and labor market success.

With reference to recent studies on attitude research, Zschirnt (2019b) presents the following ethnic hierarchy (Hagendoorn 1993) in the Swiss population (from lowest to highest reputation): the Balkans, Turkey, the European Union, and neighboring countries. This coincides with other studies that find strong disadvantages in the labor market for migrants from the Balkans, but hardly any disadvantages for migrants from northwestern European countries, with southern Europeans located in between these two groups (Griga 2014; Auer et al. 2019; Laganà et al. 2013). One reason for the differences between these groups can be attributed to the different human capital endowments of the migrant groups (SCCRE 2014). Another reason for ethnic hierarchies are prevailing stereotypes in society (Hagendoorn 1993).

2.2 The education and VET system

The Swiss education system distinguishes between three secondary school tracks, to which students at the age of

¹ The BfS measures the migration background using the generation status. A migration background is assigned to people up to the second migrant generation. In 2013 (the survey year for the data used in this paper), 32 percent and in 2019 (most recent data) 36 percent of 15- to 24-year-olds had a migration background.

12 are assigned based on their performance levels: a track with basic requirements (*Realschule*); a track with extended requirements (*Sekundarschule*); and an academic track (*Gymnasium*). In general, the first two tracks prepare students for vocational training, while the last track prepares them for the *Matura*, which enables them to go directly to university. In Switzerland, compulsory schooling ends with the completion of the ninth grade, at the lower secondary level. Upon beginning their education at upper secondary level, students attending the non-academic tracks prepare to make the transition to vocational training or other forms of training, while pupils attending the academic track continue their schooling for three more years (for a more detailed overview of the Swiss education system see SCCRE 2018: 2; Hupka-Brunner et al. 2010: 12–13).

About two-thirds of a school-leaving cohort start a VET program (66 percent in 2013 (the survey year for the data used in this paper), SCCRE 2018: 103). These VET programs last between two and four years. A distinction is made between company-based (school and in-company training) and fully school-based training. In German-speaking Switzerland, company-based vocational training clearly dominates (91.5 percent in 2010, SERI 2013: 12).

Without an upper secondary qualification, pupils are in danger of being left behind. They face problems in accessing qualified occupations (Meyer 2008; Buchholz et al. 2012: 705) and have a higher risk of unemployment (SCCRE 2018: 26). There are institutional education programs for students who do not succeed in transferring directly to upper secondary education (Sacchi & Meyer 2016; Buchholz et al. 2012). These are referred to as bridge programs and include training preparation programs, internships or an additional year of schooling. Approximately one-third of non-academic track school leavers who aspire to VET attend such programs (Sacchi & Meyer 2016; SCCRE 2018: 105). Since attendance at such programs is accompanied by a lower likelihood of obtaining an upper secondary degree (Sacchi & Meyer 2016), direct transfer is the preferable outcome (for a similar reasoning in the German context, see Lindemann & Gangl 2019).

As mentioned above, the school and VET systems of German-speaking Switzerland and Germany are very similar (Buchholz et al. 2012). The differences that might affect VET access are primarily structural. In Switzerland, competition for apprenticeships is lower than in Germany, and training companies are smaller (e. g. Buchholz et al. 2012). These factors could have opposing effects in terms of ethnic inequalities in VET access. On the one hand, less competition could lead to smaller ethnic inequalities (Tjaden 2017; Andriessen et al. 2012). On the other hand,

larger companies show lower ethnic inequalities in the recruitment process, likely due to having more standardized recruitment procedures (e. g. Hunkler 2014).

3 Theoretical background and previous research

Among students who aspire to transition to VET at the end of compulsory education, minority students have a significantly lower transition rate than native students (SBFI 2017). The studies by Imdorf (2017) and Hupka-Brunner et al. (2010) detected ethnic disadvantages in access to VET in Switzerland. Regarding access to VET, young people from the Balkans, Turkey and Portugal face particular difficulties (Imdorf 2017; Laganà et al. 2013). These difficulties are reflected by the fact that these pupils are less likely to learn their desired profession, are less likely to secure a VET place and are confronted with stereotypes when looking for one.

With regard to the number of applications, there are also clear disparities between minority students and natives. While natives submit an average of seven applications, minority students submit more than three times as many (25) (SBFI 2019). From studies on labor market access in Switzerland, it is known that people from Turkey and the Balkans are especially disadvantaged in the application process (with more rejections, more applications and fewer invitations to interview), while people from Germany are hardly disadvantaged at all (Auer et al. 2019; Zschirnt 2019a; Zschirnt 2019b).

In attempting to explain the above-mentioned ethnic inequalities in access to VET, I focus on differences in resource endowment (human and social capital), on potential discrimination mechanisms and different application behavior. Differences in resource endowment (e. g. Diehl et al. 2009; Hunkler 2014; Hupka-Brunner et al. 2010; Roth 2018) and potential discrimination mechanisms (e. g. Imdorf 2017; Tjaden 2017) in access to VET have already been investigated extensively. Therefore, I also look at factors that have rarely been investigated in research on access to VET: different application behavior and (connected to this) the relationship between supply and demand within the apprenticeship market (Hunkler 2016). Since institutional rules, not employers, are decisive for the transition decision in school-based VET, I only focus on the transition to company-based VET in the following. In accordance with previous studies, I argue that access to company-based VET is similar to labor market entry (Roth 2014: 235; Tjaden & Hunkler 2017: 216). This similarity can

be seen, for example, in the fact that the applicants are in competition with other competitors for company-based VET places, and in the fact that the training companies are free to decide which applicant they choose. Unlike educational institutions, training companies are not bound by institutional rules in their recruitment (Imdorf 2005). Since the Swiss-German VET system is very similar to the German VET system, I also refer to relevant studies from the German context when presenting the state of research.

3.1 Differences in resources

The human capital approach assumes that employers sort applicants for a job according to their expected productivity (e. g. the labor queue model of Thurow (1972)). Human capital (e. g. grades, educational qualifications or language skills) serves as a proxy for expected productivity, since actual productivity can only be determined by expending high costs (Becker 1964). Ethnic differences in access to apprenticeships would then be explained by different provision of human capital resources. A variety of studies have shown that minority students have a lower human capital endowment than native students (for Switzerland: Becker et al. 2013; Glauser & Becker 2016; Hupka-Brunner et al. 2010, for Germany: Diehl et al. 2009; Hunkler 2014). Recent studies indicate that, in addition to classical human capital, social capital also influences access to VET (for Germany: Roth 2018; Roth 2014; Lindemann & Gangl 2019; Diehl et al. 2009). In this context, social capital includes network resources, information, and parental support in finding a VET position: for example, by asking acquaintances about vacancies, recommending a child to one's own company or searching for apprenticeship places together with the child. Minority students have lower social capital endowment compared to natives, are less familiar with the vocational training system in the host country (Salikutluk 2016) and have fewer contacts with people in training companies (Roth 2014).

To my knowledge, no multivariate studies investigate the influence of different resource endowment on the number of VET applications. From research on applications, however, it is known that the better the human capital endowment, the better applicants will be evaluated by employers (Protsch & Solga 2017). Descriptively, the higher the secondary education level, the lower the number of applications and rejections (SBFI 2019). Existing research has shown that taking resource differences into account reduces ethnic inequalities in VET access, but residual differences remain, to the disadvantage of minority students (for Switzerland: Hupka-Brunner et al. 2010;

for Germany: Weißling et al. 2015; Beicht 2011, 2012; Lindemann & Gangl 2019; Roth 2014; for a summary of recent German research, see Hunkler 2016).

3.2 Discrimination theories

The remaining ethnic residuals are often understood as an indication of discrimination (Imdorf 2017: 408; Tjaden 2017: 108). However, it must be mentioned that the existence of central productivity-relevant characteristics that are not controlled for (and may be unknown) may affect the results of observational studies (Blank et al. 2004). Therefore, one cannot directly infer discrimination if ethnic differences remain after controlling for (known) resource differences.

Discrimination theories distinguish between taste-based and statistical discrimination (Baert & Pauw 2014). On the one hand, the theory of taste-based discrimination (Becker 1973) assumes that employers have a preference for discriminating against certain groups and are prepared to accept economic disadvantages as a result. On the other hand, theories of statistical discrimination argue that employers misjudge the productivity of the applicants by considering the expected productivity of ascriptive groups (e. g. migrants) instead of the individual productivity of an applicant (Phelps 1972; Arrow 1973; England 1992). The results of various correspondence tests provide evidence for both discrimination mechanisms (Zschirnt & Ruedin 2016; Baert & Pauw 2014; Kaas & Manger 2012). Imdorf (2010) was able to identify further mechanisms that could underlie discriminatory behavior in a qualitative study on VET access in German-speaking Switzerland. For example, employers might refrain from giving apprenticeships to minority students because they expect ethnic conflicts in the workforce or reservations from their customers, or because they fear the apprentices might attract unwelcome customers.

3.3 Differences in application behavior

In addition to resource differences or potential discrimination, ethnic inequalities in access to VET and in the number of applications submitted could also be related to different application behavior (Hunkler 2016; Diehl et al. 2009; Beicht 2012). In the following, I focus on differences between minority students and natives in the following areas: aspirations, targeted professions and industries, search behavior and the interplay between supply and demand on the VET market.

Many studies indicate that minority students have on average higher educational aspirations than natives (Kao & Tienda 1995; Tjaden 2017). Once socioeconomic differences are controlled for, positive ethnic choice effects appear for minority students in the education system (Dollmann 2017; for Switzerland: Tjaden & Scharenberg 2017; Wolter & Zumbühl 2018). This means that, with the same performance and controlling for their social background, minority students are more likely to opt for a more demanding education track than their native counterparts. Applying the above to the transition from school to VET suggests that minority students are more likely to aspire to particularly prestigious and challenging VET programs in order to realize their high aspirations. Empirical evidence shows that minority students often seek more demanding VET (for Switzerland: Wolter & Zumbühl 2018, for Germany: Beicht & Walden 2019; Schels & Schwarz 2020). These higher aspirations are often attributed to the more pronounced striving for upward mobility among minority students (Kao & Tienda 1995; Schels & Schwarz 2020; Wolter & Zumbühl 2018). In Switzerland, more demanding VET programs promise lower chances of VET access and there is more competition for those positions (Meyer et al. 2003: 36; SBFI 2013a: 12, 41, 81).

However, the high aspirations of minority students may not only contribute to migrants striving to pursue demanding VET: it might also contribute to their remaining in the school system to realize their aspirations there (Dollmann 2017; Glauser & Becker 2016). With respect to Germany, Tjaden (2017) argues that minority students who aspire to VET are a negatively selected group. This means that, if one considers only those students on non-academic tracks or those who aspire to VET (a common restriction in access to VET studies, e.g. Diehl et al. 2009; Beicht & Walden 2019; Lindemann & Gangl 2019), one might overestimate ethnic differences. For the Swiss context, this assumption of a negatively selected group must be challenged. In German-speaking Switzerland, the academic track is very selective – only 20 percent of a cohort attend it. Furthermore, migrants are clearly underrepresented on this track and the proportion of those who pursue VET is higher among migrants than among natives (Glauser 2015, BFS 2017). Considerable differences are evident in the actual transitions observed, despite higher aspirations. For example, 26 percent of all native upper secondary students attend general education (the proportion of minority students from the Balkans is 8 percent) and 64 percent attend VET (the proportion of minority students from the Balkans is 78 percent) (BFS 2017). In a stratified education system such as the one in Switzerland, disadvantaged minority students often do not have the opportu-

nity to realize their aspirations directly. Hence, Murdoch et al. (2016) show that minority students seize the possibility of admission to higher education via the VET system as often as Swiss students do.² They thus use VET to realize their higher aspirations later on.

Another reason for choosing more demanding VET occupations could be that minority students might be less able to assess their skills, and thus their opportunities within the VET market, than natives (Schels & Schwarz 2020; Hunkler 2016). In Germany, for example, Siegert and Roth (2020) were able to demonstrate that Turkish minority students assess their academic abilities more positively than (performance-wise) comparable native students. In Switzerland, minority students more often choose VET programs whose academic requirements they fulfill significantly less well than natives (SCCRE 2018). For Germany, Beicht (2012) showed that minority students are more often underqualified and less often overqualified for their targeted VET programs than natives.

This mismatch between one's own qualifications and VET requirements could contribute to lower transfer rates and a higher number of applications. Employers sort applicants in a queue according to their expected productivity (a labor queue: Thurow 1972). If applicants overestimate their own abilities, and therefore meet the criteria less well than other applicants, they are placed further back in the queue. If applicants do not meet the criteria at all, employers – even in the absence of other applications – refrain from putting those people in the queue. In Switzerland, for example, 61 percent of companies reported that, if apprenticeships were not filled, it was because of a lack of qualified applicants (SBFI 2019). Beicht (2012) was able to show for Germany that underqualified applicants have a lower probability of success than qualified applicants, whereas overqualified applicants have higher success rates.

In addition to higher VET aspirations, various studies indicate that minority students concentrate more strongly than natives on fewer occupational fields (for Switzerland: Meyer et al. 2003, SBFI 2013; for Germany: Beicht 2012). Furthermore, minority students concentrate more on occupational fields that are in high demand (Meyer et al. 2003, SBFI 2013; Beicht 2012). Consequently, the higher observed number of applications and the lower success rates could be due to the fact that minority students select occupations with high competition and lower transfer chances (for a similar reasoning see Hunkler 2016). One

² In Switzerland, it is possible to obtain a Federal Vocational Baccalaureate (*Berufsmaturität*) during or after vocational training, which entitles the holder to study at tertiary educational institutions (Murdoch et al. 2016: 246 f.).

reason given for the concentration on a small number of occupations is that minority students might inherit their occupational preferences from their parents (Diehl et al. 2009) and therefore concentrate on a small number of occupational fields because their parents work in fewer sub-sectors of the labor market. Another mechanism – which also explains why minority students are increasingly drawn away from production and toward (more demanding) service occupations – could be a desire for better working conditions than those of their parents (Schels & Schwarz 2020). Various studies of access to VET in the German context have considered targeted occupations or targeted industries (e. g. Diehl et al. 2009; Beicht 2012; Hunkler 2014). However, taking this into account does not fully explain ethnic penalties.

Considering the search behavior of minority students and natives, it is noticeable that minority students on average start searching for apprenticeships later than natives (SBFI 2013a: 80). This could be due to a lack of information, since the parents of minority students have often not passed through the Swiss education system themselves and therefore may not be familiar with the particularities of the application process. This lack of information in migrant families is mirrored by the fact that minority students need to engage much more intensively with career opportunities before seeking an apprenticeship, and are less often supported by their parents in their search (SBFI 2013b: 52, 77; for Germany: Beicht & Granato 2010). This could be disadvantageous for the application process, because the later one starts searching for an apprenticeship, the more other applicants are searching at the same time, meaning that delaying the search may increase the number of competitors. Apprenticeships are often filled far in advance, and companies decide for themselves when to end their search. In addition, applicants who were successful at an early stage reduce the number of available apprenticeships. Therefore, applicants who start searching later for apprenticeships are exposed to higher competition for fewer VET positions. For southwest Germany, Hunkler (2014) showed that the applications of minority students were received later by companies than the applications of natives, and that these differences partly explained the ethnic inequalities in access to VET. Another factor that could influence VET access is internship experience. In German-speaking Switzerland, more than 90 percent of the students who want to enter a VET position have completed a short-term internship (*Schnupperlehre* – three to five days in the company) or an internship, with natives having internship experience more often than minority students (SBFI 2018). Through internships, students can demonstrate their motivation and skills,

so that these factors may be given a greater weight than formal qualifications in the decision made by companies. Imdorf (2005) was able to show for Switzerland that some companies place more value on the experience gained in internships than on formal qualifications when selecting apprentices.

Another key factor in the study of access to VET is the interplay between demand and supply (Hunkler 2016). Migrants and natives are not equally distributed spatially. Migrants live mainly in urban regions, and less frequently in rural areas (BfS 2014). Even though more apprenticeships are available in cities, the competition is greater and VET access rates are generally lower (SBFI 2013b: 41; Beicht & Granato 2010). Accordingly, there is lower competition for apprenticeships in rural areas (Tjaden 2017: 110). This means that natives face on average less competition than minority students. Furthermore, the supply–demand ratio for VET is less favorable in urban areas. For Germany, Beicht (2011) shows that a less favorable supply–demand ratio for apprenticeships has a negative impact on the chances of transition to VET. Lindemann and Gangl (2019) come to similar conclusions. Another indicator of the regional training market situation is the unemployment rate. Various German studies have shown that the higher the regional unemployment rate the lower the VET success rates of non-academic school leavers (e. g. Lindemann & Gangl 2019; Weßling et al. 2015). The regional structure has an influence on the availability of VET positions. Thus, the concentration of minority students in certain targeted professions may not only be the result of preferences: it may also be due to the regional opportunity structure (Hunkler 2016). There are strong differences in VET supply and demand by occupation and industry. In agriculture, for example, there is relatively little competition; in sales, in contrast, there is quite high competition for training positions (SBFI 2013a).

I will focus my hypothesis on the explanatory contribution of different application behavior as regards ethnic penalties in VET access and the number of applications submitted, for two reasons. First, there is already a large body of research demonstrating that resource differences can partially explain ethnic differences in access to VET (for Switzerland: Hupka-Brunner et al. 2010; for Germany: Weßling et al. 2015; Beicht 2011, 2012; Lindemann & Gangl 2019; Roth 2014). Second, as shown above, there are studies that deal with individual aspects of application behavior but there are hardly any studies that – like the present study – consider a multitude of aspects of application behavior simultaneously. Based on the above, the following rather general assumptions can be made about empirical relationships related to VET success (access to

an apprenticeship) and the number of applications submitted:

A1: Students with internship experience have a higher probability of VET success and submit fewer applications.

A2: The higher the VET requirements, the lower the probability of VET success and the higher the number of applications submitted.

A3: The later the search for VET starts, the lower the probability of VET success and the higher the number of applications submitted.

A4: The lower the match between qualifications and VET requirements, the lower the probability of VET success and the higher the number of applications submitted.

Closely related to the targeted VET occupation is the interplay between supply and demand within the VET market, and the resulting competitiveness.

A5: The lower the ratio of apprenticeships offered to apprenticeship seekers, the lower the probability of VET success and the higher the number of applications submitted.

A6: The higher the competition for VET positions, the lower the probability of VET success and the higher the number of applications submitted.

There are clear differences between migrant groups in Switzerland – in labor market success (BfS 2017), in educational attainment (Glauser 2015), and in their position in the ethnic hierarchy (Auer et al. 2019; Zschirnt 2019). Furthermore, there are no substantial ethnic penalties for minority students from, for example, northwestern Europe (Auer et al. 2019; Zschirnt 2019a; Zschirnt 2019b, Hupka-Brunner et al. 2010).

A7: The consideration of application behavior can mainly contribute to the elucidation of ethnic penalties for the most disadvantaged groups (the Balkans and Turkey and southern Europe).

As the state of research on ethnic disadvantages in VET access shows, ethnic penalties in VET access often cannot be fully explained by differences in resource endowment. The assumptions listed above show associations between application behavior and VET access, and the number of applications submitted. As indicated by the state of research described above, group comparison between native and minority students shows that the application behavior of minority students could lead to their lower VET access rates and higher number of applications submitted. Based on this, I derive the following hypothesis:

H1: Taking different application behavior into account helps explain ethnic penalties in access to VET and the number of applications submitted.

4 Data, operationalization and analytical strategy

4.1 Data

I use data from the DAB panel study for my analyses (Glauser 2015; Becker et al. 2019; Becker et al. 2020). This panel is conducted at the Department of Sociology of Education at the University of Bern and is funded by the Swiss State Secretariat for Education, Research and Innovation (SERI). For this panel, students from German-speaking Switzerland have regularly been asked about their educational and life situation since 2012. At the time of the first survey, the students were in the eighth grade. For my analyses, I use data from the first three waves (2012 and 2013), during which the pupils were interviewed within their school classes. In the third wave, students were close to the end of compulsory schooling (May/June 2013). In total, 3,140 pupils participated in the third wave of the survey (the response rate for this wave was 96 percent – Glauser & Becker 2016: 7). For a more detailed description of the study design, the sampling process and the panel attrition, see Glauser (2015: 125–132).³

4.2 Analytical sample selection

I only consider students who participated in the third survey wave and who were interested in a company-based VET program to which a classifiable vocational code can be assigned (N = 1963, see Tab. A3 in the online appendix for the sample selection steps and the respective sample size). Restricting the sample to students who aspire to VET is common in research on access to VET (e. g. Diehl et al. 2009; Beicht 2012).⁴ Pupils without information about their migration background were excluded from the analytical sample (N = 47). Further, I only consider students attending the secondary school track with either basic or extended requirements (for a similar procedure, see e. g. Lindemann & Gangl 2019), because students attending

³ The data from the first seven waves are available at SWISSUbase: <https://doi.org/10.23662/FORS-DS-946-3>.

⁴ Within the respective migrant groups, a comparison is made (before analytical sample selection) between students who aspire to VET and those who do not (see Tab. A2 in the online appendix). The results indicate that students in the sample who strive for VET have a lower resource endowment compared to students who do not strive to pursue VET. This conclusion applies to all students (native and minority students). Therefore, I do not assume that minority students who aspire to VET represent a particular negatively selected group.

the academic track hardly ever aspire to VET (BfS 2018). I am thus left with a sample size of 1,763 pupils for my analyses.

4.3 Operationalization

The first dependent variable – success – is a binary indicator variable with a value of 1 for pupils with a VET contract or verbal commitment, and a value of 0 for pupils without the prospect of a VET contract. The second dependent variable – applications – is a count variable indicating the number of applications submitted for their training occupation.⁵ One could argue that the number of applications submitted does not measure disadvantage so much as unobserved factors, such as the quality of the application or the level of motivation (e. g. Hunkler 2014). Additional analyses (see figures A1–A5 in the online appendix) examining the relationship between the number of applications and VET success shows that the number of applications is not congruent with the VET success or effort of the students. Furthermore, the results indicate that successful students submit substantially fewer applications than unsuccessful students. Therefore, the number of applications can be considered a measure of disadvantage. In correspondence test studies (controlled for applicants effort and the quality of application), group differences in the number of applications submitted are commonly considered as a measure of disadvantage (e. g. Zschirnt & Ruedin 2016).

The main independent variable is migration background. In line with previous research, I created five different groups (Griga 2014; Meyer et al. 2003; Tjaden & Scharenberg 2017; Cattaneo & Wolter 2015): (1) no migration background, (2) a migration background from northwestern European countries (Austria, the UK, Finland, France, Germany, Iceland, Lichtenstein and Sweden), (3) a migra-

tion background from southern European countries (Italy, Spain and Portugal), (4) a migration background from the Balkans and Turkey, and (5) a migration background from other origin countries. I attribute a migrant background to pupils if they (or at least one of their parents) were born abroad. Of students with a migrant background, 76 percent were born in Switzerland. I refrain from additionally differentiating the migrant groups according to their generational status, due to the number of cases.

In the following, I present the operationalization of selected variables in detail. The detailed operationalization of all variables with the corresponding questions in the survey is presented in Tab. A1 in the online appendix.

To account for human capital, I include grades (mathematics and German in grade eight, z-standardized), the secondary school track attended (basic requirements versus extended requirements), social origin (highest parental ISEI-08) and language skills (additive scale based on the student’s self-assessment in writing, reading, speaking and understanding (Cronbach’s $\alpha = 0.81$), z-standardized). As a proxy for the social capital of students, I use parental support in finding an apprenticeship (single item, z-standardized) and a dummy variable indicating whether at least one parent has a VET degree themselves.

I operationalize the application behavior using aspirations, the intellectual requirements of the VET program, the fit between qualifications (grades and secondary school track) and the intellectual requirements of the VET program, the timing of starting the search for VET, and internship experiences. In order to be able to take the students’ occupational aspirations into account, I create two variables. The first variable measures the intellectual requirements of the VET program, to map the aspirations regarding the near future. The second variable quantifies career aspirations at the age of 30, in order to map aspirations for later professional life. The intellectual requirements of VET programs are based on a classification by Stalder (2011), which comprises six categories (lowest level (1) to highest level (6)). This classification is based on three components: a statistical analysis of socio-structural patterns of the transition to VET; a survey of trainers focusing on the selection of learners; and a rating of vocational counselors.⁶ The occupational aspirations are operationalized through the desired occupation at the age of 30. These occupations are coded according to the ISEI-08 classification (10–90). Since a significant propor-

⁵ As stated above, only students who have already chosen a training occupation for which they would like to pursue VET are considered in the sample. Among successful students, 76 percent indicated that they could learn their desired occupation (“applies” and “applies very much”) through their chosen training occupation (for unsuccessful students: 72 percent). Of the successful students, 96 percent were “very satisfied” or “quite satisfied” with their VET program decision. Unsuccessful students were asked how satisfied they would be if they got a VET place in their chosen training occupation: 92 percent of them would be “very satisfied” or “quite satisfied”. These numbers may indicate satisficing processes in access to VET: the students might terminate their search with a satisfactory outcome rather than the wished-for solution. There is no information about the number of applications submitted for other VET programs.

⁶ To illustrate the classification, I present selected VET programs according to their level of intellectual requirements: (1) car painter; (2) florist; (3) plumbing technician; (4) graphic designer; (5) medical laboratory assistant; and (6) computer specialist.

tion of students answered the question about the desired occupation with “don’t know”, I group the variable as follows: don’t know, ISEI 10-29.99, ISEI 30-49.99, ISEI 50-69.99 and ISEI 70-90. To take the fit between qualifications and intellectual requirements into account, I create a variable with three categories: underqualified, qualified and overqualified. Underqualified students are those from the basic requirement track applying for VET programs with high requirements (5+6). Furthermore, students from the basic requirement track are underqualified for VET programs with medium requirements (4) if they do not have good school grades. Good school grades mean a grade point average (mathematics and German) above 5. Qualified students are those from the basic requirement track applying for VET programs with low requirements (1–3) and students from the extended requirement track applying for VET programs with medium and high requirements (3–6). Furthermore, students from the basic requirement track are qualified for VET programs with medium requirements (4) if they have good school grades. Students from the extended requirement track are overqualified for VET programs with low requirements (1+2). I generate the start of the search for an apprenticeship based on the students’ answers to the question about when they started looking for an apprenticeship and convert this information into century months (0 = January 2010). Internship experience is a dummy variable indicating whether students have completed a *Schnupperlehre* or internship within their training occupation.

The supply and demand for VET places is highly dependent on the industry of the respective VET program (SBFI 2013a, b; Beicht 2012). The VET industry can therefore serve as a proxy for the competition for vacant VET positions. Therefore, I include a categorical variable for the VET industry in the models. The VET programs are assigned to 10 industries according to the ISCED classification: architecture and construction; office and information systems; services; printing, design and arts and crafts; healthcare and social service; informatics; agriculture; technical professions; the manufacturing industry; and sales. Since I do not have regional information on supply and demand for specific VET programs, I use the regional youth unemployment rate in the *mobilité spatiale* (MS) region (Switzerland is divided into 106 MS regions) as a proxy for the regional VET competitive environment. I also consider the ratio of new apprenticeship contracts to non-academic lower secondary school track leavers at the cantonal level as an indicator for the VET supply–demand ratio.

As a proxy for competition, I also take the popularity of the respective VET programs into account. Even though

there may not be a perfectly linear relationship between popularity and competition (for example, because there are more jobs than applicants in very popular VET programs), it can be assumed that the popularity of a VET program not only indicates the supply of jobs, but it can also – albeit quite roughly – be a proxy for competition for VET places. I operationalize the popularity of a VET program as a counting variable. This variable indicates how many students from the sample have indicated that they want to strive to pursue VET in the respective occupation. The number of entries for each VET occupation has been summed up. Since the popularity of apprenticeships is very skewed (many students aspire to a few VET programs), this variable is logarithmized.

Additionally, gender, age (in months) and regional structure (urban, intermediate, rural) are included as control variables in the models.

4.4 Analytical strategy

I apply survey weights to calculate the descriptive statistics. This weight takes the probability of participation and the following additional variables into account: gender, secondary school type, municipality type and migration background (Glauser 2015: 130 f.).

For the multivariate models, all missing data are replaced using multiple imputation with chained equations (applying predictive mean matching using the 10 nearest neighbors), producing 25 complete datasets.⁷ I use Stata 16 and some user-written ados (Jann 2007a; Jann 2007b; Jann 2014) for all data preparation, multiple imputation and the descriptive analysis. For the multivariate analysis, I use R (R Core Team 2020, v4.0.0; Carpenter et al. 2017; Bürkner 2017). The code can be found in the replication material.

To account for the clustering of students and error terms within each school within each canton, I estimate multilevel models with random intercepts for schools and cantons. I estimate different statistical models for the access to VET programs and the number of applications submitted. First, I estimate multilevel linear probability models to predict success in accessing VET programs.

⁷ The missing value patterns of the model variables by migration groups are depicted in Tab. A4 in the online appendix. I include the following auxiliary variables in the imputation model alongside the model variables, cluster variables and weights: average marks in the subjects of mathematics and German collected from all available marks in grades seven to nine; university degree of the parents (yes/no); and educational aspirations (VET; further schooling; something else after ninth grade).

Because VET success is a true binary outcome and not a latent construct, I follow the suggestion of Breen et al. (2018) and estimate linear probability models. In these models, the regression coefficients indicate the effect of the model variables on the probability of success, i. e. the probability of obtaining a VET contract. Second, I estimate count data models to predict the number of applications submitted. Since the mean of the outcome variable is lower than its variance (over-dispersion; see Tab. A5 in the online appendix), I estimate multilevel negative binomial regression models to account for this (Long & Freese 2014). In this second set of models, the incident rate ratio (IRR) indicates the effect of the model variables on the incident rate (the number of applications submitted).

I estimate my multilevel analyses in a Bayesian framework for two reasons. First, these procedures are better suited for analyses with small numbers of clusters (17 cantons in my case) (Stegmueller 2013). Second, this approach provides a more intuitive interpretation of the statistical inference. The 95 percent credible intervals presented in the multivariate analyses can be interpreted in such a way that – given the data – the parameters have a 95 percent probability of being within the reported interval. To use Bayesian procedures, more computational power and time is required compared to maximum likelihood procedures. In addition, one has to make assumptions about the distribution of the parameters to be estimated, the so-called priors. For my analyses, I choose weakly informative prior distributions (Gelman et al. 2014). For a more detailed description of the technical details of the estimation, the priors and their graphical representation, see the chapter on “Bayesian analysis” in the online appendix.

For both the success and the number of applications submitted, I estimate several models. The first is a baseline model that contains the variable for the migration background and a school and cantonal random intercept, with gender and the regional type as controls. The second model is the resource model, in which the school type attended, grades in mathematics and German, social origin, parental support, parental VET degree and language skills are also taken into account. The third model is the different behavior model, in which the aspirations, the intellectual requirements of the apprenticeships, the fit between qualifications and VET programs, the timing of starting the search and the internship experience are additionally taken into consideration. The fourth model is a model in which the fixed effects for the industry of the VET are taken into account. The fifth model is the full model, in which competition in VET programs (the popularity of the VET), the youth unemployment rate and the

VET supply–demand ratio are also taken into account. For the number of applications, I additionally estimate a sixth model that includes VET success. Since I am interested in what theoretical explanation can explain ethnic differences, I focus on the presentation of the estimates of the migration background across the different statistical models. The estimates of all model variables are presented in Tables A6 and A7 in the online appendix.

5 Results

5.1 Descriptive results

Fig. 1 shows the probability of VET success and the number of applications submitted for the different migration groups. Almost all Swiss pupils are successful (96 percent). Students from northwestern Europe also have a very high success rate (93 percent). Students from southern Europe, the Balkans, Turkey and other regions have success rates of between 81 percent and 85 percent. The lowest success rate of 81 percent is observed for pupils from other countries. Swiss pupils submit the fewest applications (6.8), followed by pupils from northwestern Europe (10.1). Students from southern Europe (18), the Balkans, Turkey (20.7) and other regions (15.9) submit twice, sometimes three times, as many applications as Swiss pupils. Among the migrant groups, pupils from the Balkans and Turkey submit by far the most applications.

Tab. A5 in the online appendix contains the descriptive statistics of the model variables separated by different migrant groups. Minority students more often attend less demanding secondary school tracks, achieve lower grades, receive less parental support, have lower language skills, live more often in cities, are more often underqualified and less often overqualified, are less likely to have parents with a VET degree, have less internship experience, and start looking for apprenticeships later than natives. In terms of resource endowment, it is evident that students from southern Europe, the Balkans and Turkey are less well-equipped than students from northwestern Europe. Furthermore, the descriptive statistics show that minority students – except those from northwestern Europe – apply more frequently for apprenticeships that are more popular. Students from the Balkans and Turkey aspire for apprenticeships with middling rather than low intellectual requirements more often than Swiss, northwestern and southern European pupils. Swiss and northwestern European pupils most often strive for VET in the manufacturing industry, whereas southern European pupils strive

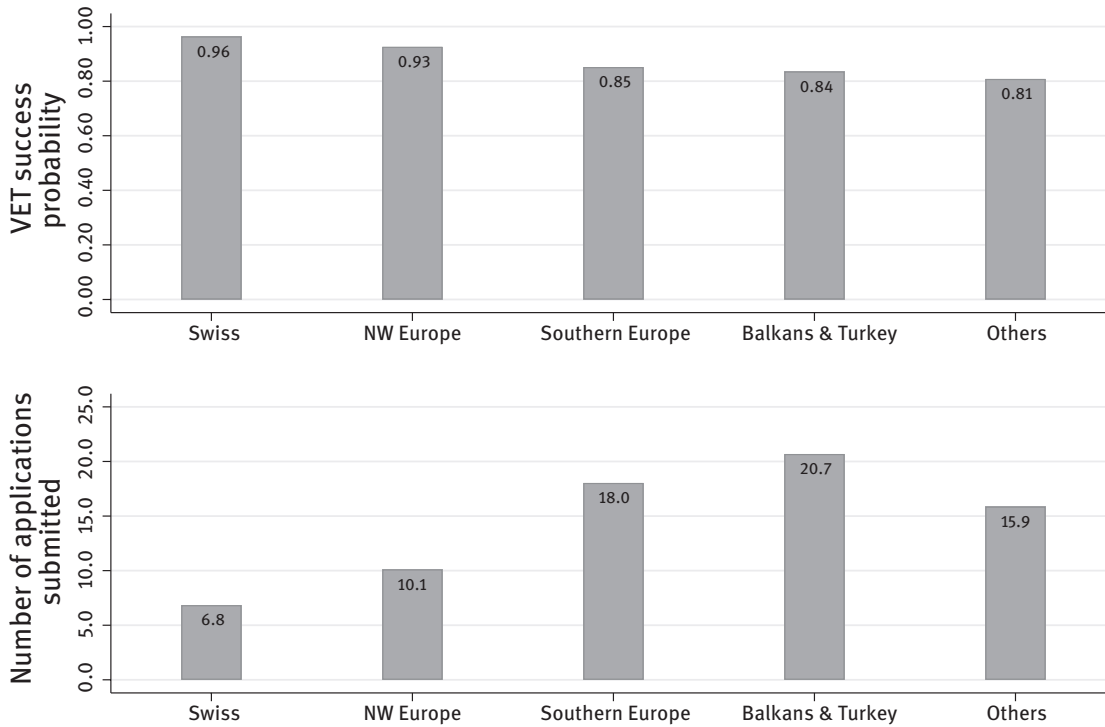


Fig. 1: VET probability of success and the number of applications submitted by migration groups
Note: NW Europe = northwestern Europe. Source: DAB panel study version 3.0.0, weighted data my own calculations.

more often for VET in the office and information systems industry. Pupils from the Balkans and Turkey are strongly focused on VET programs in the sales and office and information systems industry, while pupils from other countries focus on the office and information systems industry. Students from the Balkans and Turkey and southern Europe live in regions with higher rates of youth unemployment and lower VET supply–demand ratios.

5.2 Multilevel results

5.2.1 Success

Fig. 2 illustrates the regression coefficients of migration background on VET success across the statistical models. It is evident that pupils from northwestern Europe have no disadvantages when accessing VET. The baseline model indicates that pupils from southern Europe, from other countries, and from the Balkans and Turkey, have lower chances of success than natives (by 8–11 percentage points). These differences decrease when I account for differences in resource endowment, whereupon I no longer observe significant disadvantages for pupils from southern Europe. However, ethnic penalties continue to be observed for pupils from other countries, and from the

Balkans and Turkey. Once I control for differing application behavior, ethnic disadvantages decline sharply: compared to the baseline model, the disadvantages are considerably reduced for pupils from the Balkans and Turkey (10 percentage points versus 4 percentage points) and for pupils from other countries (8 percentage points versus 3 percentage points). After taking application behavior into account, ethnic penalties are only observed for minority students from other countries. This means that taking differences in application behavior into account helps explain ethnic differences. Consideration of the industry, competition and supply–demand indicators only contributes slightly to the further reduction of ethnic inequalities in access to VET success probabilities.

Regarding the factor of application behavior, which has rarely been investigated in previous studies, starting the search later has a negative influence on the probability of success, and for VET with very high intellectual requirements (5+6) there are lower chances of access. Internship experience has a positive influence on the probability of success. The regression coefficients of the fit between qualifications and VET requirements and occupational aspirations are not different from 0. For these variables, it cannot be clearly assessed statistically whether they influence the VET success rate positively, negatively or not at all. Furthermore, the more popular a VET program,

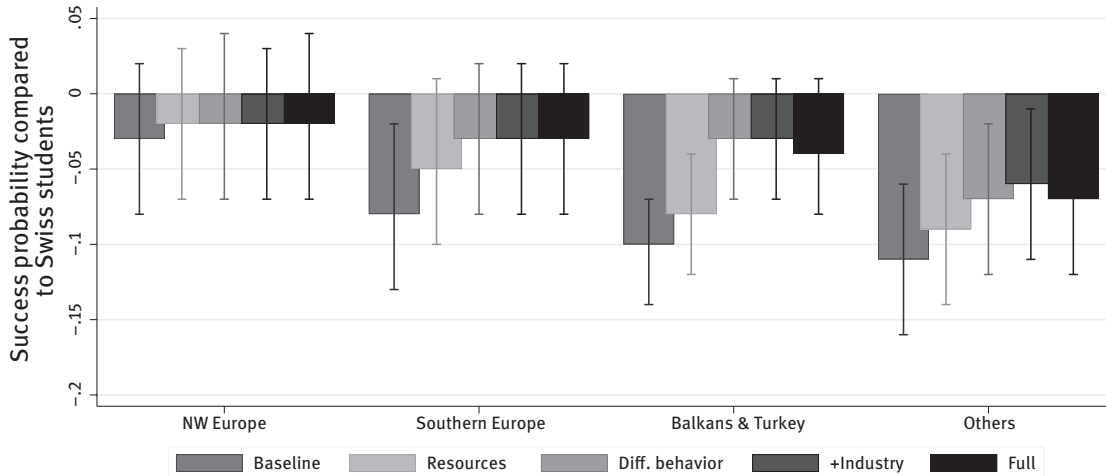


Fig. 2: Regression coefficients with 95 percent credible intervals of different migration backgrounds on VET success (reference: Swiss students), separated by estimation models

Note: Based on models in Tab. A6 in the online appendix. NW Europe = northwestern Europe. Source: DAB panel study version 3.0.0, my own calculations.

the lower the probability of success in accessing it. The regression coefficients of the youth unemployment rate and the supply–demand ratio are not statistically different from 0. As shown in previous studies, a more demanding secondary school track and better grades in mathematics and German increase the probability of success. I do not find an effect different from 0 for parental support, for language ability, for social origin or for parental VET degree.

The random intercept estimates show a larger variance between cantons than between schools. This could indicate that the chances of success in the VET market may vary more across communities (between cantons) than across regions (catchment area of the school). The variance between the cantons hardly changes, even when unemployment and the supply–demand measures are taken into account. The model fit measures also indicate that the inclusion of the industry fixed effects and the supply–demand measures do not substantially improve the model fit (see Tab. A6 in the online appendix).

5.2.2 Number of applications submitted

The IRRs of migration background on the number of applications submitted, are displayed in Fig. 3. The baseline model shows that pupils from all migration groups differ from Swiss pupils in terms of the number of applications submitted. However, there are considerable group differences. While students from northwestern Europe and other countries have an IRR of 1.4 and 1.9, respectively, compared to Swiss students, the IRR is substantially

higher for students from southern Europe (2.2), and is even higher for students from the Balkans and Turkey (2.7). This means students from the Balkans and Turkey submit 2.7 times as many applications as natives.

Considering different resource endowments only contributes to a slight reduction of the IRR. Considering different application behavior substantially decreases the IRR, especially for the three most disadvantaged groups. Nevertheless, with a probability of 95 percent, all groups except students from northwestern Europe continue to differ from natives in terms of the number of applications submitted. The highest IRR is still found for students from the Balkans and Turkey, who submit 2.4 times as many applications as natives, even after taking differences in resources and application behavior into account. Considering the industry and supply–demand measure leads to almost no reduction in the ethnic differences in the number of applications submitted. Even if I control for VET success – and possibly introduce a collider bias into the model (Elwert & Winship 2014), because the number of applications submitted and the migration background might both influence success – this does not change the reported findings substantially.

For the application behavior variables, it is evident that high intellectual requirements (5+6) are associated with submitting more applications, and that overqualified students submit considerably fewer applications. The IRRs for the search start, internship experience, and occupational aspirations are not statistically different from 1. For these variables, it cannot be clearly assessed statistically whether they influence the number of applications submitted positively, negatively or not at all. There

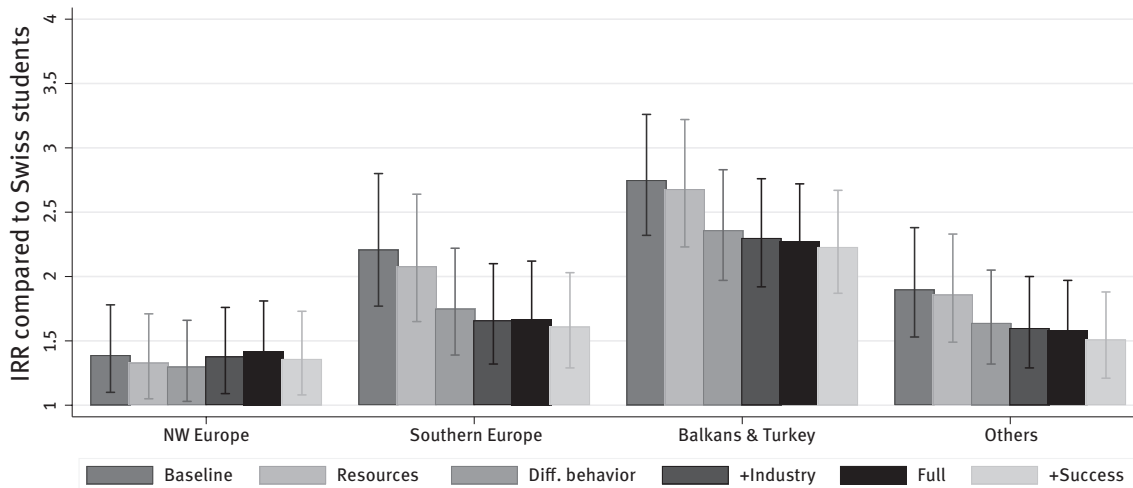


Fig. 3: IRRs with 95 percent credible intervals of different migration backgrounds on the number of applications submitted (reference: Swiss pupils), separated by estimation models

Notes: Based on models in Tab. A7 in the online appendix. NW Europe = northwestern Europe. Source: DAB panel study version 3.0.0, my own calculations.

are differences between industries (there are fewer applications to VET programs for agricultural and technical professions). Furthermore, the more popular a VET, the higher the IRR. A higher youth unemployment rate also leads to an increase in the number of applications. The supply–demand ratio has no effect different from 1 on the IRR. Females submit more applications than males, and successful students submit just 0.6 times as many applications as unsuccessful students.

Better grades in German and more parental support decrease the IRR. Language skills, the secondary school type and the social origin have no effect different from 1 on the IRR of the number of applications submitted. The variance in the number of applications is larger between schools than between cantons. While the model variables (especially the youth unemployment rate and the supply–demand measures) can reduce the variance parameter at the cantonal level from 0.3 to 0.13, the variance parameter at the school level hardly changes (0.48 to 0.43). In contrast to the VET success models, the inclusion of the unemployment rate and supply–demand measures leads to a marked improvement in model fit (see Tab. A7 in the online appendix).⁸

⁸ Further analyses (interaction between migration group and gender – not shown), which must be interpreted very cautiously due to the small number of cases, show that ethnic penalties in terms of VET success are primarily evident for men. In terms of the number of applications submitted, there are clear disadvantages for both genders.

5.3 Robustness checks

I conducted a series of robustness checks: in all of these, the results regarding ethnic differences remained largely robust. The robustness checks comprised regression models instead of negative binomial models for the number of applications submitted (see Tab. A8 in the online appendix), excluding unsuccessful pupils in the application models (see Tab. A9 in the online appendix) and logistic regression instead of a linear probability model (see Tab. A10 in the online appendix). There are clear ethnic penalties in all models, which decrease after taking application behavior into account – especially for VET success.

6 Discussion and conclusion

The objective of this paper was to answer the question of how ethnic disadvantages in access to VET in German-speaking Switzerland can be explained. I examined both the VET success rates and the number of applications submitted. I used a signed apprenticeship contract or a verbal commitment at the end of the ninth grade as an indicator of success. To explain the ethnic differences, I considered three explanatory approaches: differences in resource endowment (human and social capital), differing application behavior of natives and minority students and discrimination. My analyses are based on data from 1,763 pupils in the German-speaking part of Switzerland who

sought to pursue VET. This sample enabled me explicitly to examine ethnic differences in access to VET.

In line with previous research, I was able to illustrate that resource differences can contribute to explaining ethnic differences. However, in terms of the VET success rate, ethnic penalties for minority students from the Balkans and Turkey, and other countries, remain observable, and such penalties are also observable in regard to the number of applications submitted, for all minority groups. As in previous Swiss studies, it appears that students from the Balkans and Turkey in particular face difficulties (Hupka-Brunner et al. 2010; Imdorf 2017; Zschirnt 2019b). Taking different application behavior into account, the ethnic penalties in VET success rates can be explained for minority students from the Balkans and Turkey. Only for the very heterogeneous minority group from other countries can ethnic penalties still be observed. In particular, starting the search for a VET program later, high VET requirements and high competition reduce the probability of success. The reduction of ethnic penalties in all migrant groups by taking application behavior into account might indicate that minority students select themselves into occupations that promise lower probabilities of success. Unlike studies in the German context, which continue to report ethnic penalties (especially for Turkish minority students), despite taking occupational aspirations and targeted professions into account (e.g. Diehl et al. 2009; Beicht 2012), this study was able to explain ethnic penalties for the most disadvantaged group (students from the Balkans and Turkey) in the Swiss context. This could be due to the fact that the targeted professions were measured on a more detailed basis, and that the fit between qualifications and VET requirements, as well as the timing of starting the search, were also taken into account in this study. In the German studies, these characteristics were only partially controlled for together.

Minority students submit more VET applications than native students. Taking application behavior into account reduces the ethnic penalties in the number of applications submitted, but they remain substantial, except for students from northwestern Europe. This is especially true for students from the Balkans and Turkey, who submit 2.2 times as many applications as natives, even after accounting for all model variables. Higher VET requirements and higher competition are associated with increasing numbers of applications. Further, unqualified applicants submit more applications. Students living in regions with higher youth unemployment also submit more applications. Furthermore, it is evident that successful students submit considerably fewer applications than unsuccessful students. It is interesting to note that the timing of starting to search

for VET has no effect on the number of applications submitted. These two findings could indicate that applicants try to minimize their application effort (e.g. processes of satisficing). Once students have found a satisfactory solution, they might stop searching. The interpretation of the analyses on the number of applications is based on the assumption that the quality of applications does not vary systematically across minority groups. For the bivariate analyses and the baseline model, this assumption may seem very rigid. Thus, one could argue that some of the initially observed ethnic differences are due to systematic differences in quality (e.g. applications from minority students contain more spelling errors). In the full model, the possible explanatory power of systematically varying quality differences is likely to be substantially reduced by accounting for a large number of variables (e.g. school type, grades, language skills, aspirations). Therefore, explanatory factors that go beyond quality differences as causes should be discussed with regard to the remaining ethnic penalties in the full model. Nevertheless, future research should investigate the extent to which quality differences in applications between minority groups can be detected in bivariate analysis (e.g. number of spelling errors by minority group) and in regression models (e.g. additional control for school grades, language skills, school type, aspirations). Furthermore, research should investigate the influence of application quality on access to VET.

Regarding my hypothesis, that taking different application behavior into account helps explain ethnic penalties in access to VET and the number of applications submitted, I draw disparate conclusions. The hypothesis can be retained for access to VET, since considering application behavior can explain ethnic penalties in access to VET. The remaining ethnic penalties for students from other countries are difficult to interpret in terms of content due to the high heterogeneity of this group. Regarding the number of applications, the hypothesis has to be rejected. While accounting for application behavior helps to partially explain ethnic inequalities, substantial ethnic penalties are still evident. Because the consideration of application behavior cannot fully explain ethnic penalties, discrimination cannot be excluded as a possible cause for these inequalities. Since one should be very cautious about inferring discrimination when using observational data, due to possible endogeneity (not accounting for relevant but unmeasured influences), the findings should not be interpreted as evidence of discrimination. However, my results are similar to those from job application experiments in the Swiss labor market (Auer et al. 2019; Zschirnt & Ruedin 2016), which detected discrimination against in-

dividuals from the Balkans and Turkey. In contrast, people from northwestern Europe were hardly (or not at all) disadvantaged.

My research findings suggest that strategic search behavior matching the desired occupation could help reduce ethnic inequalities in VET access. For example, students whose intended VET program is in high demand could additionally apply for similar VET programs that also enable them to complete an apprenticeship in their desired occupation. Furthermore, students could improve their chances of VET access by completing internships or submitting applications early.

A number of limitations of this study should be mentioned. First, it could be argued that I overestimate ethnic differences, since I only consider students who aspire to VET and who might therefore be a negatively selected group (Tjaden 2017). I find no evidence of such a selection in the data; other studies conducted in the Swiss context show that VET is used to realize high educational aspirations (Murdoch et al. 2016). Second, the time structure of the data collection has to be taken into account when interpreting the results. Both the success and the number of applications were measured at the same point in time (end of the ninth grade). Thus, it is not possible to draw conclusions regarding whether more applications were submitted as a reaction to failure. However, other studies suggest that failure does lead to more applications (SBFI 2019; Zschirnt & Ruedin 2016). Third, I could only use a very rough proxy for social capital, and could only use self-assessments of language skills, rather than standardized language tests. This might explain why these effects had such a low impact in my analysis compared to previous studies. From previous research it is known that networks and language skills both positively influence the transition to VET (Diehl et al. 2009; Roth 2014; Roth 2018). Fourth, due to the low number of cases, I did not calculate models separated by gender. Therefore, I could not consider a possible intersectionality between gender and migration background. However, existing research implies that male migrants are more disadvantaged than females (Andriessen et al. 2012; Imdorf 2017).

In Switzerland, as in other European countries, VET offers pupils good career opportunities and thus contributes to social integration. Therefore, the transition from school to VET is crucial. My study shows how important it is to consider not only success but also the number of applications submitted as part of this transition. In terms of the number of applications submitted (unlike VET success), disadvantages clearly remain for minority students in German-speaking Switzerland, even after considering differences in resource endowment and dif-

ferent application behavior. Hence, minority students submit considerably more applications to enter VET than natives.

The example of the German-speaking part of Switzerland illustrates that turning to explanatory approaches that go beyond human and social capital differences and discrimination can be fruitful for explaining ethnic differences in school-to-work transitions. This could also be interesting for research in other countries with strong VET systems, such as Germany, Austria, Denmark or the Netherlands. Study results from these countries suggest that migrants and natives there also differ in their application behavior (e.g. Beicht 2012; Diehl et al. 2009). Therefore, I suggest that considering application behavior in other contexts should help us better understand ethnic differences in the transition from school to VET.

Replication material

The replication material (syntax) is stored in the GESIS data archive under the following signature:

Title: Code/Syntax: Explaining ethnic differences in access to VET in German-speaking Switzerland: the effects of application behavior and resources

URL: <https://doi.org/10.7802/2320>

Supplemental Material: The online version of this article offers supplementary material (<https://doi.org/10.1515/zfsoz-2021-0024>).

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On the way to becoming a society of downward mobility? Intergenerational occupational mobility in seven West German birth cohorts (1944–1978), in: *Research in Social Stratification and Mobility* (2021), 73: 100609.

Do more demanding lower secondary school certificates for minority students pay off? A comparison of VET access between Germany and German-speaking Switzerland, In: *Soziale Welt* (2021), 72: 313-342

Acknowledgements: For helpful comments on earlier drafts, I wish to thank Rolf Becker, Bettina Braun, Nora Moser, Fabienne Wöhner, three anonymous reviewers and the editors of this journal. The paper has benefited from comments made by participants at the 4th NEPS Conference in Bamberg and the Immigrants' Integration: Educational Opportunities and Life Chances Conference in Ascona.