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# Transitions into vocational education and training by lower and intermediate secondary school leavers. Can male adolescents compensate for their school-based educational disadvantage in comparison with female adolescents?

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## Abstract

**Background:** This paper examines the transitions made by lower secondary school leavers and intermediate secondary school leavers into vocational education and training in Germany. With the basis that boys have long been underperforming girls in school, the paper investigates the question of whether male adolescents continue to be similarly disadvantaged when transitioning into vocational education and training. A distinction must be drawn between the more male-orientated dual system of vocational education and training, which represents the most significant sector in terms of size, and the more female-orientated school-based occupational system, which is much less significant in terms of size.

**Methods:** The Transition Study 2011 by the Federal Institute for Vocational Education and Training (BIBB), a representative survey of young adults living in Germany who were born between 1987 and 1993, forms the data basis. Through 5333 interviews, the survey recorded the entire education, training and occupational biography of young adults. We calculate multinomial logistic regression models and perform Cox regressions.

**Results:** The analyses reveal that male adolescents have better opportunities when entering company-based or dual education and training, while female adolescents enjoy advantages when entering school-based vocational education and training. When considering the wider picture—i.e., overall placement into vocational training that leads to full vocational qualification—male adolescents are not identified as more disadvantaged than female adolescents in terms of opportunities. However, while there is little difference in the placement opportunities between male and female adolescents with an intermediate school-leaving qualification, female adolescents with a maximum of a lower secondary school-leaving certificate face significantly worse prospects than comparable male adolescents.

**Conclusions:** Female adolescents leaving school with no more than a lower secondary school-leaving certificate can be regarded as the "losers" when transitioning into

vocational education and training. It is our view that the disadvantage this group faces indicates a clear need for action in vocational education and training policy. Changes would appear to be appropriate in both dual and school-based education and training.

**Keywords:** Transition, Lower secondary school-leaving certificate, Intermediate school-leaving certificate, Educational disadvantage, Gender

## Background

### Introduction

Boys were significantly more successful than girls in the early years of the German general education system, but this pattern has reversed entirely. Girls have been receiving better school grades than boys for more than 60 years, and for more than 20 years, they have constituted the higher proportion of applicants with qualifications for higher education (Helbig 2013). In recent years, the disparity in performance between boys and girls has continued to rise and has led to an intense debate in education and training policy regarding boys being the new problem group (Hurrelmann and Schultz 2012).

In this paper, we want to examine whether male adolescents are able to compensate for their school-based education deficits in the process of transitioning into vocational education and training or also face disadvantages here compared to female adolescents. In the process, we intend to consider in particular the groups of school leavers that face the greatest difficulties in transitioning into vocational education and training.

The transition from school into vocational education and training in Germany continues to present a serious problem for lower secondary school leavers (Hauptschulabsolventen) (Beicht et al. 2013; Geier 2013; Solga and Menze 2013). Lower secondary school leavers have long been labelled with the term 'Bildungsverlierer' (a school leaver who loses out in terms of education and training). The opportunities for intermediate secondary school leavers[1] (Realschulabsolventen) to enter vocational education and training are significantly better than those of their peers at lower secondary school. However, even for them, the transition process does not always run smoothly (Bundesinstitut für Berufsbildung 2015). In contrast, school leavers with qualifications for higher education enjoy the best opportunities in terms of transition, particularly because they have the option of pursuing university degree opportunities, which the overwhelming majority of applicants with qualifications for higher education do. The key target group for vocational education and training in Germany thus comprises lower and intermediate secondary school leavers.

The focus of vocational education and training in Germany remains the dual system of vocational education and training, i.e., company-based and vocational school-based education and training, in accordance with the Vocational Training Act and the Crafts and Trades Regulation Code. The company-based element of dual education and training is mainly financed by companies that also have the sole decision-making authority regarding the allocation of training positions they offer. In addition, Germany has a school-based occupational system, with purely school-based training courses subject

[1] The terms "lower secondary school leaver" and "intermediate secondary school leaver" refer to all individuals who have achieved either a lower secondary school-leaving certificate or an intermediate school-leaving certificate. The terms "intermediate school-leaving certificate" and "intermediate secondary school-leaving certificate" are used synonymously.

to legal provisions other than those within dual vocational education and training. The ratio of dual training to school-based VET is approximately 70–30 % (Bundesinstitut für Berufsbildung 2015).

The various sub-areas of vocational education and training offer individual groups of school leavers differing opportunities to access education and training. Company-based and dual education and training stipulate no formal entry requirements for lower education school-leaving certificates. However, in practice, the expectations companies place on the prior school learning of training position applicants are often very demanding. Formal minimum requirements are specified by the state for school-based training courses. In many cases, this is the intermediate school-leaving certificate, which is why opportunities to access school-based education and training for lower secondary school leavers are limited from the outset (Protsch 2014, p. 59).

There are considerable differences in terms of the proportions of male adolescents and female adolescents involved in company-based or dual education and training. Female adolescents are underrepresented in dual vocational education and training, constituting a proportion of only 39 %. In contrast, school-based education and training is a largely female domain (Bundesinstitut für Berufsbildung 2015). The key reasons for this are the major differences in the vocational structures between the dual system and the school-based occupational system. The dual system offers a wide range of training in manufacturing and technical occupations, which are predominantly popular amongst male adolescents, whereas the school-based system is strongly characterised by social and healthcare occupations. These have a very low level of representation in the dual system and are mainly favoured by female adolescents. Therefore, individual occupations exhibit very different distributions of males and females in the dual and school-based systems. The gender-specific nature of the vocational education and training system, with a more male-dominated dual system, and a school-based system with a strong bias towards females has developed historically and long been the subject of discussions in the area of male and female occupations (e.g., Krüger 2004). The nature of transitions into vocational education and training is therefore likely to vary depending on which form of vocational education and training is considered.

The following analyses are differentiated according to the various sub-areas of vocational education and training. Our central thesis is that male adolescents are able to compensate for their school-based deficit in transitioning into vocational education and training because the strongly male-biased dual education and training system offers them particular advantages.

### State of the research

As mentioned, girls' performance in school has long exceeded that of boys. This is not a Germany-specific phenomenon; it is also evident in comparative international studies (Breen et al. 2010). Here, differences in the performance between girls and boys are identified at a very early stage in general schooling (e.g., Helbig 2012; Buchmann and Kriesi 2012). The previous educational disadvantage of girls has been reversed to the detriment of boys (Quenzel and Hurrelmann 2010; Diefenbach 2010; Hadjar 2011).

Although the differences between male and female adolescents in the attainment of higher-level school-leaving certificates have reversed, numerous studies still clearly

indicate the unchanged influence of social background (e.g., Ditton 2008; Dravenau and Groh-Samberg 2008; Geißler 2008). Children from lower social classes attain the Abitur (qualification for entry to higher education) much less often than children from higher social classes. The school leavers from lower and intermediate secondary schools considered in this paper thus constitute a socially selective group. This group is much more likely to include young people from lower social classes than groups of young people with qualifications for higher education. This is the case especially for adolescents coming from lower secondary schools. Investigations addressing the transition into vocational education and training regularly show that lower secondary school leavers have fewer opportunities for a successful transition into vocational education and training (e.g., Beicht et al. 2008, 2013; Protsch 2014).

As stated, female adolescents are underrepresented in the dual system of vocational education and training, and by contrast, they are overrepresented in the school-based education and training system. However, this is not due exclusively to their career choices. Studies that examine entry into dual education and training show that the prospects for female adolescents who are specifically aiming to enter into dual education and training are worse than those of their male counterparts. Beicht and Walden (2012, 2014) trace the main reasons for this phenomenon to the major differences in the degree of competition in occupations preferred by male and female adolescents. In considering the full range of vocational training that would lead to full vocational qualification, Protsch (2014, p. 164) finds that female adolescents from lower secondary schools are 14 % less likely to make the transition than men but finds no corresponding effect for intermediate secondary school leavers. Reißig et al. (2008) also show that female lower secondary school leavers have lower chances of achieving the transition to company-based training. By the same token, numerous studies indicate that young females have better chances than their male counterparts to enter school-based vocational education and training (e.g., Protsch 2014, p. 164).

Analyses of the transition into vocational education and training that set out to identify gender-specific differences must be placed in the overall context of all factors influencing the transition into education and training. In this respect, it is necessary to record and control other influencing factors. It is important first to specify individual factors and how they can be used to explain educational disadvantages in general. Differing resources between individuals and groups must be referenced (e.g., Becker 2012; Beicht and Walden 2015; Hadjar et al. 2010). Eberhard (2012) develops a theoretical resource model to explain the disparities in the opportunities for placement into company-based education and training, distinguishing among personal, social and institutional capital. Personal capital is regarded as the school-leaving qualification achieved and the school grades attained. Social capital is viewed as the social background (e.g., education and training and occupational status of the parents), and institutional capital is regarded as the conditions of the education and training market in the area where the young people live. In such analyses, many of these factors are found to have a significant influence on the transition into company-based education and training (e.g., Beicht et al. 2008; Eberhard 2012).

Many important variables influencing the transition into vocational education and training can be integrated into the resource approach. However, there are some limits. For example, it is virtually impossible to integrate different evaluations in situations

where configurations are similar. Therefore, it is also necessary to call on theoretical concepts beyond the resource approach to analyse the transition into vocational education and training. This leads us to consider the distinction between primary and secondary background effects. These were developed by Boudon (1974) in relation to the influence of social background on educational disadvantage (e.g., Becker and Müller 2011, p. 56 f.) and can also be transferred to the effects of gender. The primary effects here denote the potential impacts of the parental home on school performance, while secondary effects represent deviations in decisions regarding education and training, which are independent of the children's level of performance at school (e.g., Becker and Müller 2011, p. 56 f.).

Secondary effects can be assumed to be related to the influence of gender on transition success because both the education and training decisions of parents for their children and the occupational preferences of male and female adolescents are gender specific (e.g., Breen et al. 2010). Here, the gender-specific nature of the vocational education and training system in Germany is a reflection of a gender-specific job market, where significant differences in the vocational structures for men and women remain (e.g., Busch 2013).

The career choice theory of Gottfredson (1981) offers one explanation as to why male and female adolescents have very different career choice ideas. According to Gottfredson, their selection of an occupation depends on how the profession in question is viewed by their societal environment rather than merely on their personal abilities and preferences. This affects both the social recognition of an occupation and the question of whether the relevant job activity is perceived as being compatible with a male or female role definition. In the career-selection process, male and female adolescents exclude occupations that are not seen as gender adequate, depending on the social stereotypes of "masculinity" and "femininity". "Masculinity" is associated with objectivity and rationality and to this extent is considered to display an affinity with technology, whereas "femininity" is linked with "relationship orientation, self-reticence, attractiveness and physical awareness" (Zybell 2005, p. 31). Manufacturing and technical fields still rarely employ women, whereas men have a very low level of representation in educational and social professions. However, in addition to occupations that are strongly characterised by male or female employees, there is a series of service occupations, particularly in the commercial field, in which the ratio of men and women is more balanced. The poorer chances for female lower secondary school leavers to progress to company-based vocational education and training are probably connected with the high degree of significance of manufacturing and technical occupations in the dual system, which, for many young females, is not compatible with a feminine self-image. The major influence of gender on the selection of an occupation is also confirmed by an investigation conducted by Eberhard et al. (2015), which finds that the effect is particularly marked for young people with a lower secondary school-leaving certificate.

As mentioned, the two sub-systems of vocational education in Germany are strongly gender polarised. It is therefore expected that when career choices are determined by gender aspects, different patterns of competition for male and female adolescents will emerge. Young females in the dual system primarily pursue service-sector occupations, and in the school-based system of occupations, they show a particular interest in social

and nursing professions. By contrast, young males in the dual system mainly apply to enter manufacturing and technical occupations. Some male adolescents, however, are attracted to service occupations in the commercial sector, both within the dual system and in circumstances where such occupations are available in the school-based system. Differing competition situations in the individual occupational fields indicate that these varying focuses of demand on the part of young males and females are likely to result in different chances with regard to transitioning to vocational education and training.

In addition to individual factors, institutional factors are likely to be significant in the transition into vocational education and training. This applies at the very least to company-based education and training, in which the company has sole responsibility for the selection regarding the training position applicant. Imdorf (2012) uses company-based case studies in the Swiss automotive sector to identify that personnel managers consider gender in the appointment of trainees.

Although the research shows that gender has a strong influence on the transition to vocational training, the available results essentially relate to sub-groups or sub-areas of vocational education and training and are based on outdated data. No analysis has employed actual data to examine the influence of gender on the transition into vocational education and training, which is differentiated for different groups of school leavers and different sub-areas of vocational education and training in Germany.

The aim of this paper is to examine the extent to which differing transition opportunities emerge for male and female adolescents by separately investigating school leavers from lower and intermediate secondary schools and by differentiating them according to company-based and school-based education and training. In the analyses, other important influencing variables that have been identified in the research are taken into account mainly as control factors. These are variables relating to social background, migration background, school performance and various conditions related to the search for education and training.

#### Questions and hypotheses

The aim to start with is to demonstrate once again that social background and gender significantly affect the attainment of various general education school-leaving qualifications, a long known fact. The intention here, on the one hand is to clarify the significant extent to which school leavers with a maximum of a lower secondary school-leaving qualification or an intermediate school-leaving qualification represent socially selective groups. These school leavers constitute the focus of the analyses. On the other hand, the aim is to clarify the extent to which more high-performing female adolescents than male adolescents are lost.

The focus of the analyses is the issue of whether, and to what extent, gender differences emerge regarding entry into company-based and school-based education and training for groups of lower and intermediate secondary school leavers. These questions can be meaningfully examined only for individuals who have actually sought a training position in a specific subsystem of vocational education and training. The strongly gender-specific nature of career choice means that young males are particularly interested in typical male occupations, whereas most young females pursue occupations that are typical for

women. *In the case of company-based education and training, we anticipate a gender-specific effect in favour of young males due to the clear dominance of typical male occupations. This should apply to school leavers from both lower and intermediate secondary schools (hypothesis 1a). For entry into school-based education and training, for which—in contrast to company-based education and training—largely formal entry requirements apply, we anticipate that female adolescents will have better opportunities to gain a placement than male adolescents, due to the focus of the school-based occupational system on typical female occupations. This should apply to the group of school leavers from both lower and intermediate secondary schools (hypothesis 1b).*

*We assume that the tendency of both forms of vocational education and training is that differences in opportunities for progression between young males and females are more marked in the case of school leavers with a lower secondary school-leaving certificate than for those with an intermediate secondary school-leaving certificate (hypothesis 1c).* The results presented in the section on the status of the research show that gender aspects of career choice are particularly marked in the case of lower secondary school leavers. Individuals who possess a lower secondary school-leaving certificate should exhibit a stronger propensity to select occupations based on their gender-specific ideas, both in the dual system and in the school-based system. In the dual system, an even stronger stipulation of typical male or female occupations in the case of young females with a lower secondary school-leaving certificate would lead to still greater disadvantages vis-à-vis young males than would be the case with an intermediate secondary school-leaving certificate. In the school-based training system, a stronger degree of relative benefits for young females with a lower secondary school-leaving certificate should be revealed.

In addition to an analysis of the transition into the subsystems of vocational education and training, an overall view is necessary to clarify the key question of this paper. Therefore, to conclude, entry into vocational education and training that leads to full vocational qualification as a whole will be examined. We will include adolescents who searched for a full vocational qualification at the end of their school career and those who did not. Adolescents who did not perform such a search at the end of their school career should display strongly delayed transitions and less successful placements as they start searching for a vocational qualification (which they often do much later or never). *Due to the relative advantage of young men in dual education and training—which is significantly more relevant in terms of size—we anticipate that the entry opportunities for male adolescents will be at least as good as those for comparable female adolescents. We therefore do not anticipate a gender-specific effect to the detriment of young men (hypothesis 2a). For school leavers with a maximum of a lower secondary school-leaving certificate, we expect even better chances for young men in contrast to young women for a successful placement. For school leavers with an intermediate leaving certificate, the chances for young men and women should be balanced (hypothesis 2b).* Thus, we expect that young women with a maximum of a lower secondary school-leaving certificate—unlike those with an intermediate school-leaving certificate—cannot compensate for disadvantages in the dual system with advantages in the school-based occupational system because here, an intermediate leaving certificate is often required.

## Methods

The analyses conducted are based on 2011 Transition Study by the Federal Institute for Vocational Education and Training (BIBB).[2] This representative sample survey recorded the entire education, training and occupational biography of young adults who were living in Germany and born between 1987 and 1993. Detailed sociodemographic information was also collected as part of this study. The aim was to be able to fully examine the processes involved in transitioning from school into vocational education and training (Eberhard et al. 2013). The sample collection and computer-aided telephone interviews were conducted exclusively via the German mobile network. This allowed good access to the target group (individuals aged 18–24 years) because at the time of the interview, virtually all young adults had access to a mobile phone connection. A random sample was taken on the basis of all mobile telephone numbers theoretically existing in Germany. Contact interviews then determined whether the owner of the connection in each case belonged to one of the target groups and was prepared to participate in the interview. However, there was a cost involved with this approach: Almost two million telephone numbers had to be used to obtain 5333 interviews that were sufficiently complete.[3] The data-collection phase was from July to September 2011. The data collected was adjusted based on the micro census for the structure of the population by means of weighting according to the central characteristics (school-leaving qualification, gender, data of birth, federal state) (Eberhard et al. 2013).

For the purposes of our analyses, it is necessary to initially determine what is considered the point in time of the transition from school into vocational education and training. It has long been the case that the end school attendance is not necessarily the point when a pupil leaves general schooling. A small section of young people transfers immediately into a vocational school (school-based prevocational training year, partly qualifying full-time vocational school, technical secondary school, specialised upper-secondary school) with the aim of repeating the school-leaving certificate or obtaining a higher-level school-leaving certificate. Our analyses therefore commence at what we term the *end of the school career*, i.e., when young people leave to start vocational education and training, or an alternative,[4] following *continuous* attendance at general education or vocational school. However, we include only vocational schools within the school career if young people were actually able to achieve a school-leaving qualification while at the vocational school, which they did not have beforehand. Partly qualifying school-based education and training courses that resulted in *no* (higher value) school-leaving qualification are considered not as part of the school career but as part of the transition phase into vocational education and training.[5]

We calculate a multinomial logistic regression model for the influences on the attainment of school-leaving qualifications. The aim here is to clarify the recognised effects of gender and social background based on the data from the BIBB Transition Study 2011.

[2] BIBB Transition Study 2011, event records and cross-sectional data, doi:10.7803/202.11.1.1.10.

[3] The vast majority of numbers used were not activated, i.e., did not belong to an existing mobile phone connection.

[4] If there is a break of at least 3 months, then subsequent school attendance is no longer included in the school career.

[5] The analyses for this paper include only young people whose school career ended no later than 2010. Because a section of the students surveyed did not leave school until a later date or were still attending school at the time of the survey, the sample size upon which the analyses are based is less than the total sample size of 5333 obtained in the BIBB Transition Study 2011.

However, the problem with logistic regression for group comparisons is that the error variance in the estimation procedure is uniformly fixed, and the unobserved heterogeneity between the groups may differ; effect sizes such as the odds ratio are not comparable between the models (Auspurg and Hinz 2011). We therefore report average marginal effects—AME in place of odds ratios.[6] Averaged measurements such as the AME are barely skewed as a result of unobserved heterogeneity and can therefore safely be used for group comparisons (Auspurg and Hinz 2011).

The hypotheses regarding the transitions into the different sub-areas of vocational education and training (company-based and school-based[7]) and into vocational education training that leads to a full vocational qualification are examined using Cox regression models. The advantage of Cox regressions over binary logistic regressions is that with the transition rate as a dependent variable, the analysis does not simply include whether a transition into education and training is successful; it also considers when the placement is taken into account within an accuracy of 1 month. Right-censored cases can also be included, i.e., for cases in which the total observation period within the analyses of 38 months after the end of the school career has not been completed in full.[8] The Cox regression is based on a so-called proportionality assumption, i.e., the influence of the individual variables on the transition rate should be proportionate to one another over time. A problem occurs if there is an interaction by one of the individual variables with time because this compromises the proportionality assumption. However, if this occurs, the problem can be solved by including a corresponding interaction term in the model (Blossfeld et al. 2007). We use this solution approach in our analyses.

The Cox regression analyses are conducted separately for school leavers from lower and intermediate secondary schools. In the models of the transition into company-based education and training, we include only those young people who were seeking this type of education and training at the end of their careers.[9] We also adopt this approach in the models for entry into school-based vocational education and training. With regard to the models for the transition into vocational education training leading to a full vocational qualification in general, we calculate these models for all young people, regardless of their search activities.[10] The hazard ratios are shown for each of the Cox regressions. Hazard ratios express the influence of the individual variables on the transition rate.[11]

[6] The AME states, "by how many percentage points the probability of the event of interest changes *as an average of all (group specific) observations*, if the explanatory variable concerned increases by one unit *(marginal)*" (Auspurg and Hinz 2011, p. 66). For categorical variables, the AME states by how many percentage points the average probability for the event of interest differs in the observed group from the probability of the respective reference group.

[7] We include education and training in the career of a middle-ranking civil servant in school-based education and training.

[8] Due to the usual time gap of approximately 2 months between the end of school and commencement of education and training, the observation period is set not to exactly 3 years, or 36 months, but to 38 months.

[9] Entry into an alternative form of education and training—i.e., in this case, school-based education and training—has been interpreted as "competing risk" and is then set as right censoring in the relevant cases at the point in time of entry.

[10] We also illustrate the gender-specific differences in the transition processes between school leavers from lower and intermediate secondary schools in advance for the different types of vocational education and training and for vocational education training, leading to a full vocational qualification. We do this overall and in each case using bivariate graphical representations based on Kaplan–Meier estimators. Right-censored cases can also be taken into account in the Kaplan–Meier estimators, as with the Cox regression.

[11] With the Cox regression, it is also not possible to control for unobserved heterogeneity; however, no similar problems arise for group comparisons as in the case of logistic regression. In the analyses, we limit ourselves to determining whether a significant positive or negative effect can be identified in the respective models. In the case of hazard ratios, values greater than 1 indicate a positive influence, while values smaller than 1 indicate a negative influence. This is the case for categorical variables compared with the reference group.

We include a series of influence variables in the multinomial logistic and linear regressions and the Cox regressions in addition to the gender of the young people. These function mainly as *control variables* in the models for testing the hypotheses. In the selection of these variables, we mainly follow the aforementioned theoretical resource approach used by Eberhard (2012). This approach is adopted to explain the transition opportunities of applicants for training positions and distinguishes among social, personal and institutional capital.[12] With regard to social capital, the social background of the young people is taken into account in detail and included in all models with two variables. The first variable, "school and vocational education and training of parents", is created based on the CASMIN training classification.[13] Here, the highest level of education attained by either the mother or father is the determining factor. The second variable, "social status of the father", describes the classification of the[14] occupational activity practised by the father under the EGP classification.[15] This is a differentiation diagram by category that is based on the occupation practised, the employment status and the position in the company (Brauns et al. 2000).[16]

The school-based requirements of the young people represent a central aspect of personal capital. The school-leaving certificates of the young people are considered fully in the separate assessments of the school leavers from lower and intermediate secondary schools. In addition, we include "average grade upon leaving general schooling" in the models examining the transition into vocational education and training.[17] This also addresses whether the young people attended only a general education school during their school career or also subsequently attended a vocational school. This is included in each case, along with the "type of school most recently attended".

We also include the "migration background" of the young people in all models as an important aspect of personal capital. This is defined indirectly as follows: If a young person has German citizenship and learned only German as a child and the mother and father were also born in Germany, then *no* migration background is assumed; if one of these conditions does not apply, then a migration background is assumed.

In her theoretical resource model, Eberhard (2012) makes reference to the particular importance of so-called institutional capital. For this reason, our models related to the attainment of school-leaving certificates and to the transition from school into vocational education and training incorporate sufficient indicators related to the relevant institutional capital in each case. In the differentiation, we refer to various statistical data sources by the federal state for this purpose, or we calculate them ourselves and incorporate them into the dataset, in each case, related to the year in which the young people completed their school career.

[12] An overview with distributions of variables for the social and personal capital of young people is included in Table 6 in the appendix to this paper.

[13] This is a classification of comparative analyses of social mobility in industrial nations (Comparative Analysis of Social Mobility in Industrial Nations) (Lechert et al. 2006).

[14] The occupational status of the father at the point in time when the young person was 15 years of age was recorded in the BIBB Transition Study 2011. However, if the young person had not lived with the father for the majority of the time, the occupational status of the mother was recorded and has been included in the analyses accordingly in these cases.

[15] Class schema according to Erikson, Goldthorpe and Portocarero.

[16] Unfortunately, other aspects of social capital, such as involvement in social networks or cultural stimuli in the parental home, are not available in the BIBB Transition Study 2011 dataset.

[17] The average grade achieved on the school-leaving certificate is not always recorded in the BIBB Transition Study 2011 for the vocational schools attended.

Finally, the models related to the transition from school into company-based or school-based vocational education and training also take into account, in each case, whether the young people had also looked for an alternative training opportunity.

## Results and discussion

The following describes the key findings from the analyses conducted regarding the questions posed in this paper, based on the data in the BIBB Transition Study 2011. We will initially present the main differences apparent in the differentiation based on the school-leaving certificate and gender of the young people, revealed via bivariate evaluations. We will then look at the key results of each of the regression models that have been calculated and use them to review our hypotheses.[18]

### Differences in the attainment of school-leaving certificates

The data in the BIBB Transition Study 2011 reveal the now widely accepted fact that female adolescents perform significantly better in school than male adolescents (cf. Table 1). According to this, it is rare for female adolescents to complete their school career with a lower secondary school-leaving qualification; much more frequently, they achieve a qualification for higher education.

It is also known that the attainment of the various general education school-leaving certificates is strongly correlated to social background (Ehmke and Jude 2010). This can also be illustrated using the data from the BIBB Transitional Study 2011. The influence of social background on whether a young person achieves the maximum of a lower secondary school-leaving certificate, an intermediate certificate or a qualification for higher education can be revealed with the aid of a multinomial logistic regression model. In addition to social background and gender, this approach includes migration background and various indicators related to the institutional framework conditions in the region. The results show that the school-based and vocational education and training of the parents and the social status of the father exert a substantial effect (cf. Table 2, Model A). If parents have at least an intermediate school-leaving qualification and a vocational qualification or degree, then their children achieve qualifications for higher education significantly more frequently, and it is much less often the case that their maximum level of achievement is a lower secondary school-leaving qualification. Children whose fathers work as unskilled and semi-skilled workers or as skilled workers or technicians achieve qualifications for higher education much less often than children whose fathers belong to the upper employment class, and it is significantly more often the case that the maximum level achievement for these children will be a lower secondary school-leaving certificate. Young people who complete their school career with a lower secondary school-leaving certificate as their maximum level qualification are therefore a very selective group in social terms, which also applies to a lesser extent to those who have attained an intermediate school-leaving certificate.

[18] In doing so, only the results from the regression models that are relevant to the questions and the hypothesis testing will be presented. In general, the text will not address the influences that can be assumed from the control variables. However, the regression coefficients are shown in full in the result tables.

**Table 1 School leaving certificates at the end of the school career (in percent) (BIBB Transition Study 2011, own calculation)**

| School leaving certificate | Male adolescents | Female adolescents |
|---|---|---|
| No lower secondary school leaving certificate | 5 | 5 |
| Lower secondary school leaving certificate | 29 | 21 |
| Intermediate school leaving certificate | 38 | 34 |
| Qualification for higher education | 28 | 40 |
| Total | 100 | 100 |

Pearson's Chi squared test: $\chi^2(3) = 85.74$, $p = .000$ (two-sided test, unweighted sample)

*Basis* Young adults born between 1987 and 1993 whose school career ended no later than the end of 2010 (weighted results; unweighted sample size = 4213)

The results of the regression model also show that the probability of female adolescents attaining qualifications for higher education is 12 % points higher than it is for male adolescents, even when controlling for social and migration background and other important influencing factors. In the following, only young people whose maximum level of qualification is a lower secondary or an intermediate school-leaving certificate are considered. Consequently, among the group of female adolescents, a significantly larger proportion of (high-performing) individuals is not considered as compared to the group of male adolescents. However, in this case, female adolescents with an intermediate school-leaving certificate still have better grades in general schooling than male adolescents (cf. Table 6 in Appendix). This does not apply to female adolescents whose maximum achievement is a lower secondary school-leaving certificate. They perform no better in terms of school grades than comparable male adolescents.

#### Differences in placement in the subsystems of vocational education and training

At the end of their school career, most young people without qualifications for higher education aim to start vocational education and training. Whether their maximum level of qualification is a lower secondary school-leaving certificate or an intermediate school-leaving certificate has little bearing on whether they look for company-based or school-based education and training opportunities or consider both forms of training. Instead, the gender of the young people is the main issue in this respect, as clearly shown in Table 3. Thus, over half of male and female adolescents make the decision to seek company-based education and training. Female adolescents are interested more frequently in school-based education and training than male adolescents. However, the search focusses rarely on only school-based education and training; instead, male and female adolescents consider company-based education and training simultaneously. A small proportion of male and female adolescents does not (yet) search for a training position when leaving school, and this is significantly more often the case for those with maximum a lower secondary school-leaving certificate than those with an intermediate school-leaving certificate. There are many possible reasons for not seeking training, including an unclear career orientation or a perceived lack of readiness for training.

For young people without qualifications for higher education, Kaplan–Meier estimators can be used to present the variation in transitions into the individual forms of vocational education and training according to school-leaving certificate and gender over the

**Table 2 Influences on the attainment of school leaving certificates—results of multinomial logistic regression (average marginal effects—AME) (BIBB Transition Study 2011, own calculation)**

| Influencing factors | Maximum lower secondary school leaving certificate | Intermediate school leaving certificate | Qualification for higher education |
|---|---|---|---|
| | Model A | | |
| *Gender, social background and migration status* | | | |
| Gender (*ref.: male*) | | | |
| Female | −.079*** | −.041* | .120*** |
| School-based and vocational education and training of parents (*Ref.: Maximum intermediate school leaving certificate, without vocational qualification*) | | | |
| Maximum lower secondary school leaving certificate, with vocational qualification | −.085* | .078* | .007 |
| Intermediate school leaving certificate, with vocational qualification | −.210*** | .116*** | .094** |
| University (of Applied Sciences) entry qualification with or without vocational qualification | −.253*** | .053 | .201*** |
| University (of Applied Sciences) entry qualification | −.319*** | −.048 | .367*** |
| Missing information | .034 | −.037 | .003 |
| Social status of the father (EGP classification) (*Ref.: Higher-grade professionals, managers in large companies (I)*) | | | |
| Lower-grade professionals, managers in small companies (II) | −.028 | .035 | −.008 |
| Routine non-manual employees (III a/b) | .020 | .028 | −.048 |
| Self employed (IV a/b/c) | .048 | .063$^{+}$ | −.112** |
| Technicians, skilled workers (V,VI) | .087** | .043 | −.130*** |
| Unskilled and semi skilled workers (VII a/b) | .137*** | .042 | −.179*** |
| Never employed, missing information | .092*** | −.013 | −.079* |
| Migration background (*Ref.: without migration background*) | | | |
| With migration background | .048** | .025 | −.073*** |
| *Framework conditions in the local region (Federal State)* | | | |
| Percentage with qualification for higher education in % in the year school career is completed | −.004*** | −.005*** | .009*** |
| Percentage of school leavers with intermediate certificate % in the year school career is completed | .001 | .005*** | −.006*** |

**Table 2 continued**

| Influencing factors | Maximum lower secondary school leaving certificate | Intermediate school leaving certificate | Qualification for higher education |
|---|---|---|---|
| | Model A | | |
| Percentage of school leavers with lower secondary school leaving certificate % in the year school career is completed | .009*** | .002* | −.011*** |
| Nagelkerkes R squared | .298 | | |
| Sample size | 4213 | | |

Significance level $^{+}$ p < .1, * p < .05, ** p < .01, *** p < .001 (two-sided test)

*Basis* Young adults born between 1987 to 1993 whose school career ended no later than the end of 2010 (unweighted results)

38-month period from the end of the school. When considering young people who have searched for company-based education and training at the end of school,[19] it is noted that male adolescents with an intermediate school-leaving certificate are the most successful (see Fig. 1, left-hand graphic). Approximately 87 % of them are placed in company-based education and training within approximately 3 years after leaving school. The corresponding proportion for female adolescents with an intermediate school-leaving certificate is significantly lower, at 76 %. Male adolescents with a lower secondary school-leaving certificate succeed slightly less often in taking up company-based education and training (73 %). Female adolescents with a lower secondary school-leaving certificate, however, face by far the greatest difficulties. Only 56 % of them receive a training position having undertaken the corresponding search activities over the course of 3 years.

The transition experiences for young people seeking school-based vocational education and training at the end of their school career appear very different (see Fig. 1, right-hand graphic).[20] Here, female adolescents with an intermediate school-leaving certificate are most successful, with 63 % of them entering school-based education and training within 3 years. By contrast, 45 % of male adolescents with an intermediate school-leaving certificate and 45 % of female adolescents with the maximum of a lower secondary school-leaving certificate receive a school-based training position significantly less often. The prospects for male adolescents with a maximum of a lower secondary school-leaving certificate are very poor; only 11 % are successful.

Now, Cox regression models (cf. Table 4) are used to determine whether differences in gender-specific opportunities are evident upon transitioning into the different subsystems of vocational education and training when controlling for relevant influencing factors (social background, migration background, type of school most recently attended, search for alternative education and training and institutional framework conditions in

[19] It should be noted that a section of the young people also considered school-based education and training simultaneously.

[20] It should be noted that a section of the young people also considered company-based education and training simultaneously.

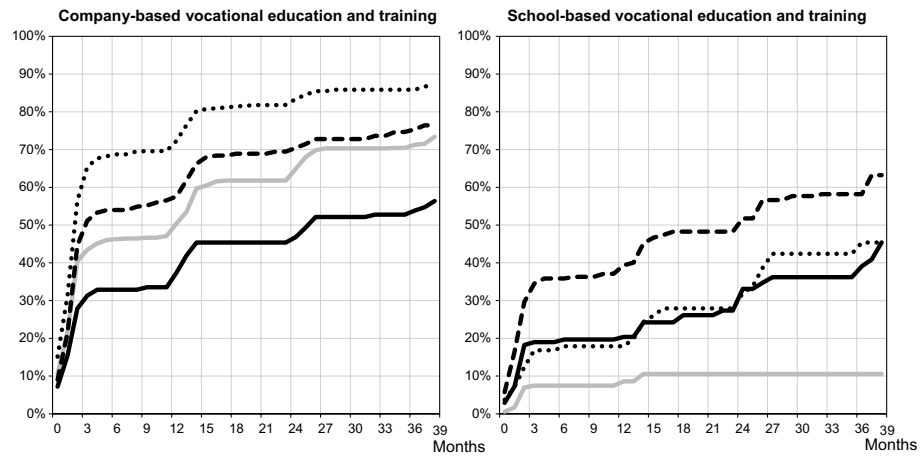
**Table 3 Search for vocational education training leading to a full vocational qualification at the end of the school career (proportion as a percent) (BIBB Transition Study 2011, own calculation)**

| Type of education and training searched for | Maximum lower secondary school leaving certificate | | | Intermediate school leaving certificate | | |
|---|---|---|---|---|---|---|
| | Male adolescents | Female adolescents | Pearson's Chi squared test (unweighted sample) | Male adolescents | Female adolescents | Pearson's Chi squared test (unweighted sample) |
| Search for *company-based* education and training (exclusively or simultaneously also for school-based education and training) | 70 | 63 | $\chi^2(1) = 7.91$ $p = .005$ | 75 | 71 | $\chi^2(1) = 3.75$ $p = .053$ |
| Search for *school-based* education and training[a] (exclusively or simultaneously also for company-based education and training) | 22 | 32 | $\chi^2(1) = 14.48$ $p = .000$ | 23 | 39 | $\chi^2(1) = 43.18$ $p = .000$ |
| Overall search for vocational education training leading to a *full vocational qualification* | 74 | 71 | $\chi^2(1) = 2.05$ $p = .152$ | 80 | 81 | $\chi^2(1) = 0.34$ $p = .560$ |
| No search for vocational education training leading to a full vocational qualification[b] | 26 | 29 | $\chi^2(1) = 2.05$ $p = .152$ | 20 | 19 | $\chi^2(1) = 0.34$ $p = .560$ |

*Basis* Young adults born between 1987 to 1993 whose school career ended no later than the end of 2010 and who achieved maximum intermediate school leaving certificate (weighted results; unweighted sample size = 2635)

[a] Including search for a civil servant career

[b] Pearson's Chi squared test (unweighted sample): male adolescents with maximum lower secondary school leaving certificate vs. male adolescents with intermediate school leaving certificate: $\chi^2(1) = 9.22$, $p = .002$; female adolescents with maximum lower secondary school leaving certificate vs. female adolescents with intermediate school leaving certificate: $\chi^2(1) = 20.67$, $p = .000$




| Company-based vocational education and training | |
|---|---|
| Male and female adolescents with maximum lower secondary school leaving certificate | Test results (unweighted sample) |
| Log Rank | $\chi^2(1) = 19.79$, p = .000 |
| Breslow | $\chi^2(1) = 16.35$, p = .000 |
| Tarone-Ware | $\chi^2(1) = 18.47$, p = .000 |
| Male and female adolescents with intermediate school-leaving certificate | Test results (unweighted sample) |
| Log Rank | $\chi^2(1) = 35.78$, p = .000 |
| Breslow | $\chi^2(1) = 32.41$, p = .000 |
| Tarone-Ware | $\chi^2(1) = 35.12$, p = .000 |

| School-based vocational education and training | |
|---|---|
| Male and female adolescents with maximum lower secondary school leaving certificate | Test results (unweighted sample) |
| Log Rank | $\chi^2(1) = 20.52$, p = .000 |
| Breslow | $\chi^2(1) = 15.93$, p = .000 |
| Tarone-Ware | $\chi^2(1) = 18.21$, p = .000 |
| Male and female adolescents with intermediate school-leaving certificate | Test results (unweighted sample) |
| Log Rank | $\chi^2(1) = 16.92$, p = .000 |
| Breslow | $\chi^2(1) = 17.12$, p = .000 |
| Tarone-Ware | $\chi^2(1) = 18.01$, p = .000 |

*Basis:* Young adults born between 1987 to 1993 whose school career ended no later than the end of 2010 and who achieved maximum intermediate school leaving certificate (weighted results; unweighted sample sizes: company-based education and training: n = 1,851, of which censored: 607; school-based education and training: n = 753, of which censored: 539).

**Fig. 1** Placement within company-based and school-based vocational education and training within 38 months following completion of school career with corresponding search for training—results of Kaplan–Meier estimates (cumulative probability of placement in percentage) BIBB Transition Study 2011, own calculation

the region). With regard to the influence of gender, it should be noted that female adolescents have significantly fewer prospects than male adolescents in finding a placement in company-based vocational education and training within 3 years when they have a maximum of a lower secondary school-leaving certificate (see Model B1) or an intermediate school-leaving certificate (see Model B2). Hypothesis 1a is thus fully confirmed. Here, a gender-specific effect in favour of male adolescents is predicted, regardless of school-leaving certificate, due to the dominance of typically male occupations in company-based education and training. Clear advantages in terms of opportunity are apparent for female adolescents compared to male adolescents concerning the transition into school-based vocational education and training. This is the case with a maximum lower secondary school-leaving certificate (see Model B3) or with an intermediate school-leaving certificate (see Model B4). Hypothesis 1b assumes this to be the case due to the focus of the school-based occupational system on typically female occupations. We essentially ascribe the differences in the chances of progression between young males and young females to aspects of a gender-specific career choices within a dual system that tends to be male dominated and to the fact that young females are more dominant in the school-based system. As revealed by a comparison of the coefficients of the gender variable

**Table 4 Influences on the transition into company-based and school-based vocational education and training within 38 months following completion of school career with corresponding search for training—results of Cox regression (hazard ratios $e^{\beta}$) (BIBB Transition Study 2011, own calculation)**

| Influencing factors | Company-based vocational education and training | | School-based vocational education and training | |
|---|---|---|---|---|
| | Maximum lower secondary school leaving certificate | Intermediate leaving certificate | Maximum lower secondary school leaving certificate | Intermediate leaving certificate |
| | Model B1 | Model B2 | Model B3 | Model B4 |
| *Gender, social background and migration status* | | | | |
| Gender *(ref.: male)* | | | | |
| Female | 0.65*** | 0.72*** | 4.62*** | 2.10*** |
| School-based and vocational education and training of parents (*Ref.: maximum intermediate school leaving certificate, without vocational qualification*) | | | | |
| Maximum lower secondary school leaving certificate, with vocational qualification | 1.79** | 1.33$^{+}$ | 1.56 | 1.32 |
| Intermediate school leaving certificate, with vocational qualification | 1.74* | 1.26 | 1.51 | 1.28 |
| University (of Applied Sciences) entry qualification with or without vocational qualification | 1.75* | 1.53* | 3.13$^{+}$ | 1.14 |
| University (of Applied Sciences) entry qualification | 1.61$^{+}$ | 1.29 | 0.85 | 1.85 |
| Missing information | 1.34 | 1.57$^{+}$ | 3.68$^{+}$ | 0.00 |
| Social status of the father (EGP classification) (*Ref.: Higher-grade professionals, managers in large companies (I)*)<br>Lower-grade professionals, managers in small companies (II) | 0.88 | 1.20 | 0.39 | 1.77 |
| Routine non-manual employees (III a/b) | 1.05 | 0.95 | 0.22 | 1.20 |
| Self employed (IV a/b/c) | 0.98 | 0.98 | 0.42 | 1.41 |
| Technicians, skilled workers (V, VI) | 0.77 | 0.99 | 0.33 | 1.51 |
| Unskilled and semi skilled workers (VII a/b) | 0.74 | 1.09 | 0.30 | 1.22 |
| Never employed, missing information | 0.83 | 0.91 | 0.17* | 1.22 |
| Migration background (*Ref.: without migration background*) | | | | |
| With migration background | 0.78* | 0.81* | 0.72 | 0.47** |

**Table 4 continued**

| Influencing factors | Company-based vocational education and training | | School-based vocational education and training | |
|---|---|---|---|---|
| | Maximum lower secondary school leaving certificate | Intermediate leaving certificate | Maximum lower secondary school leaving certificate | Intermediate leaving certificate |
| | Model B1 | Model B2 | Model B3 | Model B4 |
| *School grades and type of school most recently attended* | | | | |
| Average grade on leaving general schooling (*Ref.: 3.1–6.0*) | | | | |
| 2.6–3.0 | 1.37* | 1.36* | 1.05 | 1.45 |
| 2.1–2.5 | 1.30$^{+}$ | 1.62*** | 1.23 | 1.25 |
| 1.0–2.0 | 2.10*** | 1.78*** | 1.28 | 1.24 |
| Missing information | 0.52$^{+}$ | 1.57 | 0.41 | 2.04 |
| Type of school most recently attended (*Ref.: general schooling*) | | | | |
| Vocational school | 1.51 | 0.71* | 0.00 | 1.06 |
| *Framework conditions of search for education and training* | | | | |
| Search also for school-based education and training[a] | 0.76* | 0.61*** | | |
| Search also for company-based education and training[a] | | | 0.90 | 0.97 |
| Number of company-based and dual training positions for every 10 potential trainees in the Federal State[b] | 1.34*** | 1.10* | | |
| Proportion of starters in school-based education and training aged 15–17 in the resident population as a %[b] | | | 0.99 | 1.07* |
| *Interactions with time*[c] | | | | |
| Search also for company-based education and training* time | | | | 1.69** |
| Overall model | $\chi^2(20) = 117.52$<br>$p = 0.000$ | $\chi^2(20) = 118.95$<br>$p = 0.000$ | $\chi^2(20) = 35.65$<br>$p = 0.017$ | $\chi^2(21) = 70.76$<br>$p = 0.000$ |
| Sample size | n = 688 (censored: 279) | n = 1163 (censored: 328) | n = 271 (censored: 217) | n = 482 (censored: 322) |

*Basis* Young adults born between 1987 to 1993 whose school career ended no later than the end of 2010 and who achieved maximum intermediate school leaving certificate (unweighted results)

Significance level $^{+}$ p < 0,1, * p < 0,05, ** p < 0,01, *** p < 0001 (two-sided test)

[a] Reference in each case is "does not apply"

[b] In the year school career is completed in each case

[c] If there was a significant interaction with time for individual variables, relevant interaction terms were taken into account in the respective model, cf Blossfeld et al. (2007, p. 235 ff.)

between Models B1/B2 and B3/B4, such effects seem to have the tendency to be more prevalent amongst lower secondary school leavers. This also provides confirmation for hypothesis 1c.

#### Differences overall upon transition into vocational education training leading to a full vocational qualification

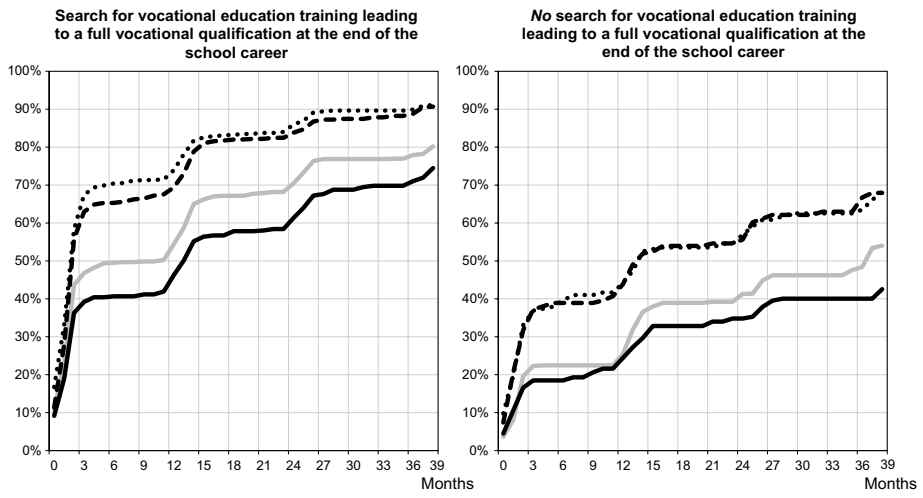
For an overview of the transitions for young people without qualifications for higher education, it is necessary to include in the analysis entry into all forms of vocational education and training that lead to a full vocational qualification, i.e., company-based and external dual education and training as well as school-based vocational education and training. To be able to present differences in transition success over time according to school-leaving certificate and gender, we again conduct Kaplan–Meier estimates (cf. Figure 2). On the one hand, we consider young people who had searched for a training position when they left school; on the other hand, we consider young people who (initially) had not searched.

Among adolescents who had searched for a training position at the end of their school career with an intermediate school-leaving certificate, approximately 91 % of the young males and young females enter vocational education training that leads to a full vocational qualification within 38 months (see Fig. 2, left-hand graphic). If the maximum attainment is a lower secondary school-leaving certificate, then the proportion for male adolescents is 80 %, but for female adolescents, it is only 74 %. For school leavers who had not searched, the relevant proportions are much lower, as expected (see Fig. 2, right-hand graphic; intermediate school-leaving certificate: young males: 37 %, young females: 38 %; maximum lower school-leaving certificate: young males: 22 %, young females: 19 %).

We arrive at the central question of whether there is evidence on differences between male and female adolescents in terms of the opportunity upon transition into vocational education training that leads to a full vocational qualification when also controlling for important influencing factors (social background, migration background, school grades, type of school most recently attended, institutional framework conditions in the region). This is explained using the Cox regression models (cf. Table 5).

If all young people are included in the analysis, regardless of whether they looked for education and training, fewer opportunities are found for female adolescents with a lower secondary school-leaving certificate in the transition into vocational education and training that leads to a full vocational qualification compared to similar male adolescents (see Model C1). In the case of the intermediate school-leaving certificate, there is an interaction between the gender of the young person and time, i.e., female adolescents attain placements less than male adolescents to start with, but over time, this evens out (cf. Model C2). When taking this interaction into account, the opportunities for female adolescents with an intermediate school-leaving certificate are just as good as for comparable male adolescents.

Due to the relative advantage of male adolescents in the dual education and training—which is significantly more relevant in terms of size—the assumption of hypothesis 2a is that the opportunities for entering vocational education and training that leads to a full vocational qualification are at least as good for male adolescents as for female




| **Search for vocational education training leading to a full vocational qualification** | |
|---|---|
| Male and female adolescents with maximum lower secondary school leaving certificate | Test results (unweighted sample) |
| Log Rank | $\chi^2(1) = 6.72$, p = .010 |
| Breslow | $\chi^2(1) = 6.67$, p = .010 |
| Tarone-Ware | $\chi^2(1) = 7.09$, p = .008 |
| Male and female adolescents with intermediate school-leaving certificate | Test results (unweighted sample) |
| Log Rank | $\chi^2(1) = 5.69$, p = .017 |
| Breslow | $\chi^2(1) = 8.21$, p = .004 |
| Tarone-Ware | $\chi^2(1) = 7.55$, p = .006 |

| ***No* search for vocational education training leading to a full vocational qualification** | |
|---|---|
| Male and female adolescents with maximum lower secondary school leaving certificate | Test results (unweighted sample) |
| Log Rank | $\chi^2(1) = 3.32$, p = .068 |
| Breslow | $\chi^2(1) = 2.06$, p = .152 |
| Tarone-Ware | $\chi^2(1) = 2.66$, p = .103 |
| Male and female adolescents with intermediate school-leaving certificate | Test results (unweighted sample) |
| Log Rank | $\chi^2(1) = .07$, p = .788 |
| Breslow | $\chi^2(1) = .09$ p = .765 |
| Tarone-Ware | $\chi^2(1) = .08$ p = .778 |

*Basis:* Young adults born between 1987 to 1993 whose school career ended no later than the end of 2010 and who achieved maximum intermediate school leaving certificate (weighted results; search for vocational education training: n = 2,025, of which censored: 328; *no* search for vocational education training: n = 579, of which censored: 269).

**Fig. 2** Placement within vocational training that leads to a full vocational qualification within 38 months following completion of school career, dependently of search for training at the end of the school career—results of Kaplan–Meier estimates (cumulative probability of placement in percentage) BIBB Transition Study 2011, own calculation

adolescents. This should hold true both for young people with maximum lower secondary school-leaving certificate and for those with an intermediate school-leaving certificate. This has been shown to be the case in the analyses. In hypothesis 2b, for school leavers with a maximum of a lower secondary school-leaving certificate, we expected advantages for young males compared to young females, while for school leavers with an intermediate leaving certificate, we expected balanced chances. This hypothesis has been completely confirmed. Accordingly, the worst chances of progression to full vocational education and training are experienced by young females with a lower secondary school-leaving certificate. This is equally the result of marked gender-specific career choices by this group and the particular construction of the German vocational education and training system.

## Conclusions

The starting point for our paper was female adolescents' long-enduring superior school performance, which is reflected particularly in the higher percentage of applicants with qualifications for higher education. There is an ongoing debate regarding boys being the new problem group (Hurrelmann and Schultz 2012). However, it is school leavers from lower and intermediate secondary schools and not applicants with qualifications for higher education who constitute the target group for the German vocational education and training system. Their opportunities for entering into vocational education and training are often not very favourable, and young people with a maximum of a lower secondary school-leaving certificate face a particularly high level of risk in this respect. The paper set out to clarify whether male adolescents are again at a disadvantage compared to female adolescents in the transition from school to vocational education and training due to their educational deficits or it is possible for them to compensate for this. The German vocational education and training system exhibits gender-specific segregation in terms of its more male-biased dual system, which is the most significant sector in terms of size, and a school-based education and training system, which has a more female bias and is much less important in terms of size. Accordingly, we proposed the hypothesis that male adolescents—in contrast to general schooling—experience no disadvantages compared to female adolescents upon transitioning into vocational education and training.

The analyses initially confirmed that the interest displayed in the different sub-areas of vocational education and training is distinctly gender specific. Male adolescents show a much greater interest in company-based and dual education and training, while female adolescents show a greater interest in school-based education and training. There is strong evidence for the significance of the career choice theory of Gottfredson (1981). Male adolescents have better opportunities when entering company-based or dual education and training; conversely, female adolescents have a better chance of entering school-based vocational education and training. When looking at the overall outcome, i.e., entry into vocational training that leads to a full vocational qualification, no disadvantages in terms of opportunity for male adolescents compared to female adolescents were identified. We attribute this result to the particular characteristics of the dual education and training system, dominant in terms of size. This offers a scope of occupational interests that are male oriented and thus makes access significantly easier for male adolescents than for female adolescents.

However, the analyses clearly showed significant differences in terms of successful entry dependent on the school-leaving certificate attained. Young people with a maximum of a lower secondary school-leaving certificate find it more difficult in general to gain a placement than those with an intermediate school-leaving certificate, which confirms the results of surveys with older data (e.g., Protsch 2014). It must be noted at this point that the attainment of general education school-leaving certificates in Germany is socially selective to a very strong degree. Young people from lower social classes not only have fewer opportunities to achieve qualifications for higher education but also attain an intermediate school-leaving certificate less often. Lower secondary school leavers are drawn to a large extent from parental homes in lower social classes. This again has a compounding effect on the transition into vocational education and training. This group

**Table 5 Influences on the transition into vocational training that leads to a full vocational qualification within 38 months following completion of school career independently of search for training—results of Cox regression (hazard ratios $e^{\beta}$) (BIBB Transition Study 2011, own calculation)**

| Influencing factors | Maximum lower secondary school leaving certificate | Intermediate leaving certificate |
|---|---|---|
| | Model C1 | Model C2 |
| *Gender, social background and migration status* | | |
| Gender (*ref.: male*) | | |
| Female | 0.78** | 1.02 |
| School-based and vocational education and training of parents (*Ref.: maximum intermediate school leaving certificate, without vocational qualification*) | | |
| Maximum lower secondary school leaving certificate, with vocational qualification | 1.64*** | 1.19 |
| Intermediate school leaving certificate, with vocational qualification | 1.44* | 1.19 |
| University (of Applied Sciences) entry qualification with or without vocational qualification | 1.55* | 1.17 |
| University (of Applied Sciences) entry qualification | 1.16 | 1.14 |
| Missing information | 1.50* | 1.07 |
| Social status of the father (EGP classification) (*Ref.: Higher-grade professionals, managers in large companies (I)*) | | |
| Lower-grade professionals, managers in small companies (II) | 0.89 | 1.17 |
| Routine non-manual employees (III a/b) | 0.80 | 0.95 |
| Self employed (IV a/b/c) | 1.08 | 1.06 |
| Technicians. skilled workers (V,VI) | 0.86 | 1.18 |
| Unskilled and semi skilled workers (VII a/b) | 0.93 | 1.22 |
| Never employed, missing information | 0.75 | 1.02 |
| Migration background (*Ref.: without migration background*) | | |
| With migration background | 0.77** | 0.73*** |
| *School grades and type of school most recently attended* | | |
| Average grade on leaving general schooling (*Ref.: 3.1–6.0*) | | |
| 2.6–3.0 | 1.06 | 1.42*** |
| 2.1–2.5 | 0.84 | 1.46*** |
| 1.0–2.0 | 1.46$^{+}$ | 1.56*** |
| Missing information | 0.37** | 1.10 |
| Type of school most recently attended (*Ref.: general schooling*) | | |
| Vocational school | 1.09 | 1.00 |
| *Framework conditions of search for education and training* | | |
| Number of company-based and dual training positions for every 10 potential trainees in the Federal State[a] | 1.32*** | 1.12* |
| Proportion of starters in school-based education and training aged 15–17 in the resident population as a %[a] | 0.96* | 1.00 |
| *Interactions with time*[b] | | |
| Gender* time | | |
| Female | | 1.13* |
| Type of school most recently attended* time | | |
| vocational school | | 1.21* |

**Table 5 continued**

| Influencing factors | Maximum lower secondary school leaving certificate<br>Model C1 | Intermediate leaving certificate<br>Model C2 |
|---|---|---|
| Average grade on leaving general schooling* time | | |
| 2.6–3.0 | 0.83* | |
| 2.1–2.5 | 0.73** | |
| 1.0–2.0 | $0.80^{+}$ | |
| Missing information | 0.80 | |
| Overall model | $\chi^2(24) = 137.23$<br>$p = .000$ | $\chi^2(22) = 79.61$<br>$p = .000$ |
| Sample size | n = 1034<br>(censored: 338) | n = 1570<br>(censored: 259) |

*Basis* Young adults born between 1987 to 1993 whose school career ended no later than the end of 2010 and who achieved maximum intermediate school leaving certificate (unweighted results)

Significance level $^{+}$ p < .1, * p < .05, ** p < .01, *** p < .001 (two-sided test)

[a] In the year school career is completed in each case

[b] If there was a significant interaction with time for individual variables, relevant interaction terms were taken into account in the respective model, cf Blossfeld et al. (2007, p. 235 ff.)

of school leavers is therefore faced with particular problems when seeking to commence education and training.

In this respect, a comparison of the transition success into vocational education and training between male and female adolescents must also be clearly differentiated according to school-leaving certificate. While the opportunities for male and female adolescents with an intermediate training qualification for finding a placement are largely similar, female adolescents with a maximum of a lower secondary school-leaving certificate find this significantly more difficult than the male comparison group. Until now, the academic literature has described young people with lower secondary school-leaving certificates as the main problem group within the transition into vocational education and training; accordingly, based on the results of our analysis, a gender-specific consideration must be made. The opportunities for female adolescents with lower secondary school-leaving certificates to take up vocational education and training are particularly limited, and they are even more heavily disadvantaged than comparable male adolescents.

As noted in the section 'state of the research', there are many other variables or resources that also are of importance for the transition of young adolescents to vocational education and training. Most important are social origin and migration background. The analyses show that social origin has a direct significant effect in the progression to company-based training. Both young people who have attained a qualification no higher than the lower secondary school-leaving certificate and those in possession of an intermediate secondary school-leaving certificate have significantly better chances in a relevant search for a training place if their parents hold a vocational qualification than if their parents have no vocational qualification. In both groups, a migrant background also exerts an inhibiting effect on the chances of progressing to company-based training. In the case of school-based vocational education and training, there is a

strong negative effect for young people with an intermediate secondary school-leaving certificate with a migrant background.

We regard the particular constitution of the vocational education and training system in Germany as the reason for the very low level of success of female adolescents with lower secondary school-leaving certificates upon transition. Dual or company-based education and training provides female adolescents with a lower secondary school-leaving certificate in a very restricted vocational spectrum. Female adolescents are barely represented in the industrial and technical occupations, where lower secondary school leavers have an opportunity because female adolescents rarely have occupational interests in this area. By contrast, an intermediate qualification is often demanded as an access requirement in the commercial and service occupations, which are strongly favoured by female adolescents. School-based education and training, which has more female pupils, also offers fewer opportunities for lower secondary school leavers as many of these training courses also require an intermediate training qualification. In this respect, the structural characteristics of the German vocational education and training system specifically place female lower secondary school leavers in a difficult situation. The causes of the difficult situation faced by young females are therefore based on a very marked gender-specific career choice and restrictive occupational provision for this group. It is our view that the disadvantage faced by this group of people indicates a clear need for action in vocational education and training policy. Changes would appear to be appropriate in both dual and school-based education and training. Within dual education and training, the range of occupations should be extended, especially with regard to the particular requirements and interests of female adolescents with a lower secondary school-leaving certificate. Similarly, courses should increasingly be created in school-based education and training for which an intermediate school-leaving certificate is not an essential requirement. New occupations and courses should reflect the career interests of young women with lower secondary school certificates. Therefore, occupations should be created mainly in service, social and nursing fields. In addition, measures should be taken to counter very narrow career choices and to move towards a situation in which both young males and young females perceive the whole of the occupational spectrum to offer an adequate choice.

**Authors' contributions**

The ideas and concepts behind the paper were developed jointly by UB and GW. GW prepared the background section. UB conducted the statistical evaluations and wrote the methods and results section. The conclusions were drawn up by UB and GW. Both authors take joint responsibility for the results. Both authors read and approved the final manuscript.

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**Competing interests**

The authors declare that they have no competing interests.

## Appendix

See Table 6.

**Table 6 Characteristics of young adults by gender and school leaving certificate. Proportions shown as percent (Column percents) (BIBB Transition Study 2011, own calculation)**

| Characteristic | Maximum lower secondary school leaving certificate | | Intermediate school leaving certificate | | Qualification for higher education | | Total |
|---|---|---|---|---|---|---|---|
| | Male adolescents | Female adolescents | Male adolescents | Female adolescents | Male adolescents | Female adolescents | |
| School-based and vocational education and training of parents | | | | | | | |
| Maximum intermediate school leaving certificate, *without* vocational qualification | 16 | 16 | 6 | 8 | 4 | 4 | 9 |
| Maximum lower secondary school leaving certificate, *with* vocational qualification | 36 | 35 | 25 | 25 | 13 | 11 | 24 |
| Intermediate school leaving certificate, *with* vocational qualification | 27 | 26 | 35 | 42 | 23 | 30 | 31 |
| University (of Applied Sciences) entry qualification with or without vocational qualification | 9 | 8 | 15 | 11 | 17 | 15 | 13 |
| University (of Applied Sciences) entry qualification | 7 | 6 | 16 | 12 | 41 | 38 | 20 |
| Missing information | 6 | 10 | 3 | 2 | 3 | 1 | 4 |
| Social status of father (EGP classification) | | | | | | | |
| Higher-grade professionals, managers in large companies (I) | 5 | 3 | 9 | 7 | 18 | 18 | 10 |
| Lower-grade professionals, managers in small companies (II) | 4 | 7 | 13 | 11 | 19 | 18 | 12 |
| Routine non-manual employees (III a/b) | 8 | 7 | 10 | 9 | 10 | 10 | 9 |
| Self employed (IV a/b/c) | 8 | 6 | 9 | 10 | 7 | 8 | 8 |
| Technicians, skilled workers (V, VI) | 25 | 25 | 25 | 25 | 17 | 16 | 22 |
| Unskilled and semi skilled workers (VII a/b) | 22 | 26 | 14 | 20 | 6 | 10 | 16 |
| Never employed, missing information | 28 | 27 | 21 | 19 | 23 | 20 | 23 |

**Table 6 continued**

| Characteristic | Maximum lower secondary school leaving certificate | | Intermediate school leaving certificate | | Qualification for higher education | | Total |
|---|---|---|---|---|---|---|---|
| | Male adolescents | Female adolescents | Male adolescents | Female adolescents | Male adolescents | Female adolescents | |
| Migration background | | | | | | | |
| Without migration background | 65 | 65 | 77 | 73 | 80 | 81 | 74 |
| With migration background | 35 | 35 | 23 | 27 | 20 | 19 | 26 |
| Type of school most recently attended | | | | | | | |
| General education school | 97 | 93 | 89 | 87 | 81 | 82 | 88 |
| Vocational school at which general school leaving certificates were attained | 3 | 7 | 11 | 13 | 19 | 18 | 12 |
| Average grade on leaving general schooling | | | | | | | |
| 1.0–2.0 | 11 | 10 | 17 | 24 | 28 | 37 | 22 |
| 2.1–2.5 | 21 | 19 | 33 | 34 | 32 | 28 | 28 |
| 2.6–3.0 | 34 | 33 | 36 | 31 | 27 | 28 | 32 |
| 3.1–6.0 | 30 | 29 | 14 | 10 | 12 | 6 | 16 |
| Missing information | 4 | 9 | 1 | 1 | 1 | 1 | 2 |
| Total (per variable) | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

*Basis* Young adults born between 1987 to 1993 whose school career ended no later than the end of 2010. (weighted results; unweighted sample size: maximum lower secondary school leaving certificate: 1051; intermediate school leaving certificate: 1585; qualification for higher education: 1577)

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