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To cite this article: Juliane Achatz, Kerstin Jahn & Brigitte Schels (2022) On the non-standard routes: vocational training measures in the school-to-work transitions of lower-qualified youth in Germany, Journal of Vocational Education & Training, 74:2, 289-310, DOI: [10.1080/13636820.2020.1760335](https://doi.org/10.1080/13636820.2020.1760335)

To link to this article: <https://doi.org/10.1080/13636820.2020.1760335>



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ARTICLE

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On the non-standard routes: vocational training measures in the school-to-work transitions of lower-qualified youth in Germany

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ABSTRACT

This study explores school-to-work transitions in Germany, aiming to achieve a richer understanding of the complexity of labour market entry trajectories while focusing on transition measures. The term transition measures refers to additional training courses that complement the regular vocational education and training system of firm-based or school-based qualification routes. The contribution of supplementary training measures to the school-to-work transitions of young adults is a controversial issue. While programmes aim to ease the transitions of low-skilled youth in the training and labour market, critics point to the risks of long-term subsidised careers or fragmented employment trajectories in subsequent years. By applying sequence analysis to administrative data of the Federal Employment Agency, individual trajectories of a cohort of school leavers with an at-most intermediate school-leaving certificate are analysed for the period 2008 to 2014. The results show a complex picture of ten distinct school-to-work transition patterns. Youth passing through transition measures tend to experience a less continuous but still purposeful transition pathway. We also identify a small number of youth experiencing at-risk trajectories characterised by a highly discontinuous transition process, which points to sustained detachment from the training and labour markets.

ARTICLE HISTORY

Received 19 September 2019
Accepted 21 April 2020

KEYWORDS

School-to-work transition;
sequence analysis; transition
measures

Introduction

The transition period from school to working life is of utmost importance for the future labour market outcomes and overall life opportunities of young people (Halpin 2010; Luijckx and Wolbers 2009; Nilsen and Reiso 2014). Therefore, various fields of research pay special attention to the school-to-work passage (e.g. Brzinsky-Fay and Solga 2016; Protsch and Dieckhoff 2011; Schoon et al. 2001). So far, the relevant research has predominantly focused on single transition events such as

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 Supplemental data for this article can be accessed [here](#).

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starting vocational training, employment, or other non-employment activities after full-time education (e.g. Beicht and Walden 2017; Skrobanek, Reissig, and Matthias 2011; Solga and Kohlrausch 2013). Research on transition patterns, or trajectories, considers the entire school-to-work transition period. Transition patterns are sequences of multiple episodes. One core interest of this research tradition is to describe how experiences of different groups are shaped within historical and institutional structures. This paper intersects with this approach by identifying the longitudinal patterns of labour market integration of youth in Germany.

Empirical evidence indicates that transition patterns have become more diversified, protracted and risky over time (Brzinsky-Fay and Solga 2016). Against this background, individual school-to-work trajectories are many-faceted and may deviate from the pre-structured routes of the system of vocational education and training (VET) (cf. Dorsett and Lucchino 2014). There is an increasing prevalence of problematic transition patterns in younger cohorts (Baas and Philipps 2019; Schoon and Lyons-Amos 2016). However, knowledge about the configuration of more complex patterns of lower-qualified youth in Germany is still limited.

This study adds to the existing literature by paying close attention to the stages of participation in vocationally orientated transition measures, i.e., prevocational measures, supplementary fully qualifying training programmes and various labour market programmes. In general, transition measures aim to ease school-to-work transitions to avoid the adverse consequences of early unemployment. At the same time, these measures create intermediate stages for young people at the institutional level, in addition to the regular tracks of the VET system. Research on these stages is of crucial importance because prevocational measures in particular are a controversial issue in Germany. While measures seek to improve the training prospects of low-skilled youth, critics note the risks of channelling participants into long-term subsidised or discontinuous employment careers (cf. Kohlrausch 2012). Existing transition research findings are inconclusive, indicating that participation in prevocational programmes marks the beginning of at-risk trajectories for particular subgroups, while for others, it postpones the common transition process into vocational training and employment (Geier 2013; Skrobanek, Reissig, and Matthias 2011). Due to data limitations or underreporting of programme participation in surveys, this strand of research either has considered only certain education and training programmes or has merged various states into combined categories (e.g. Brzinsky-Fay, Ebner, and Seibert 2016; Brzinsky-Fay and Solga 2016; Gaupp, Geier, and Hupka-Brunner 2012). VET research in particular addresses the institutional set-up of specific support measures and their outcomes for scheme participants, such as the development of occupational aspirations, learning motivation, basic skills and professional competencies as well as transition probabilities into regular apprenticeships and paid jobs. Evidence of the evaluation of single measures reveals both beneficial and adverse outcomes over the course of programmes (e.g. Atik and Nickolaus 2017; Rahn, Fuhrmann, and Hartkopf 2017; Vetter et al. 2018).

This study explores the school-to-work transition patterns of lower-qualified youth in Germany by illustrating the underlying structure and heterogeneity that we actually observe from a holistic longitudinal perspective. What do the school-to-work trajectories of school leavers with an at-most intermediate secondary school degree look like, and how do various transition measures shape the transition pathways? How are the personal characteristics of youth correlated with the likelihood of following a specific transition pattern?

The study's main goal is to generate an elaborate understanding of school-to-work trajectories, which is important for policy makers, who often assess any deviation from the pre-structured routes of the VET system as alarming at first. The holistic approach helps to assess the integrative potential by, for example, characterising long-term at-risk patterns that should be given particular policy attention (Dorsett and Lucchino 2014) and to avoid possibly biased conclusions from the examination of single status changes (Brzinsky-Fay 2014, 220). In this way, the results are also informative for researchers who carry out programme evaluations and therefore have to identify success indicators.

Based on administrative data of the German Federal Employment Agency, the analysis traces the school-to-work transitions of a cohort of German school leavers with an at-most intermediate school-leaving certificate for more than six years after they ended their general education in 2008. This cohort left school during the Great Recession of the late 2000s, which had only a short and relatively weak impact on the German youth labour market. From 2009 on, the conditions on the VET market improved, driven by economic and demographic factors. However, there is still market mismatch, and thousands of young people remain without a VET position and enter transition measures. Thus, the subject remains relevant (BMBF 2018). Notably, this study sheds light on transitions that occur largely in the specific segment of transition measures subsidised by the Federal Employment Agency and the apprenticeship sector. There are no data containing exact information on school-based programmes for regular vocational training or for transition measures, which are funded by the Federal States.

School-to-work transitions from a life course perspective

Key concepts

The transition from school to work can be conceptualised as a consequence of institutionally stipulated decisions that cumulate over time (e.g. Meulemann 1990). The resources and constraints of education and labour market institutions constitute the scope of decision-making regarding VET and labour market activities. Although training regulations and skill requirements specify common paths into training and employment, transition processes may differ from the pre-structured and normatively expected routes embedded in the education

and training system that foster continuous progress. Individuals may deviate from standard routes by moving back and forth between education and the labour market, which leads to complex sequences of status changes that reveal both beneficial directions and unfavourable developments (Sackmann and Wingers 2003, 102). This perspective elucidates two issues. First, the exploration of the individual dynamics of transition processes should focus on sequences of status changes rather than single transition events (Sackmann and Wingers 2003, 96). Second, aggregating individual transition sequences into transition patterns also provides a basis for analysing how transition experiences are socially structured (Meulemann 1990).

Institutional structure of VET in Germany

The organisation of VET – as well as the opportunity structures of the training and labour markets – are major structural factors that set the framework for manoeuvring through the transitional phase. Transitions into unemployment, for example, become more likely during times of tight training and labour markets, whereas the expansion of education and training types and programmes generates additional options for individually shaping the transition pathway. While low-qualified youth represent the majority of participants in public training schemes, participants also include youth with intermediate school degrees (Protsch and Solga 2016). Thus, institutional configurations may allow or even stimulate, but possibly also deter, deviations from established transition routes.

In Germany, graduates from a lower or intermediate secondary school may choose from various transition alternatives, such as continuing their general education to earn a higher-level school certificate, starting vocational training, taking up unskilled work, or any other kind of activity not in education, employment or training, such as homemaking or volunteer work. Secondary-school leavers most commonly start vocational education in one of the two German non-academic vocational training sectors that lead to accredited occupation-specific certificates, which constitute prerequisites to skilled employment at the intermediary level (Protsch and Solga 2016). First, highly standardised apprenticeships formally based on a training contract with an employer represent the largest sector. Apprenticeships combine firm-based on-the-job training with vocational school education. This sector is highly institutionalised in the so-called dual system of skill formation, providing the standard route to employment in the non-academic field. Apprenticeships in particular still ensure a rather smooth transition into stable employment (Brzinsky-Fay, Ebner, and Seibert 2016; Brzinsky-Fay and Solga 2016). Second, youth may complete training at fulltime vocational schools. School-based training programmes frequently require at least an intermediate secondary school degree, whereas access to apprenticeships is not limited to a particular school-leaving qualification.

During an increasing shortage of training positions in the late 1970s, transition measures were implemented for youth who failed to take up vocational training after completing general schooling. These prevocational programmes can be funded by the Federal Employment Agency or the Federal States. Programmes aim at improving training opportunities by providing basic vocational skills through internships in firms, through outside workshops, or through school-based courses. However, such programmes do not lead to an accredited vocational certificate. Some programmes offer the opportunity to obtain a basic school-degree or a higher-level school certificate.

Over the years, the so-called transition sector has become a constitutive third track of Germany's VET system, reaching its peak in 2003, when approximately 43 percent of all new entrants into the three sectors of VET entered a prevocational measure. By 2008, the initial year of the analysis presented here, the corresponding share dropped to 34 percent and further to 30 percent in 2016 (BMBF (Bundesministerium für Bildung und Forschung) 2018; Ulrich et al. 2011, 7).

Furthermore, alternative training positions were implemented to supplement the primary established VET paths. Programmes such as extra-company vocational training carried out by accredited training providers or subsidised vocational training involving flanking assistance for apprentices now lead to fully qualifying vocational degrees. These training alternatives not only target low-achieving youth but also were implemented to generally offset a shortage of training places during periods of poor economic market conditions, as in East Germany after reunification, where extra-company training is still more important than in West Germany (BMBF (Bundesministerium für Bildung und Forschung) 2018). Regarding access to these training options, career counsellors play an important role. Counsellors' tasks include assessing the trainability of young people, which is used as a basis for steering candidates into regular or supplementary training positions or prevocational training.

The creation of a prevocational training track and of qualifying supplementary training places has enhanced the variety of options available for moving through the school-to-work passage and probably has also increased the complexity of this transition. Although the additional training positions still provide a structured course of training stages, changes between the various training options and other labour market states may also be expected. Due to the differentiation of the VET system, we expect to find distinct detour routes that represent a middle course between rather straight school-to-work transition pathways and more volatile pathways to labour market integration.

Social inequalities in the school-to-work transition

The occurrence of diverse transition patterns also raises questions about inequalities. Individual characteristics of school leavers at the beginning of the school-to-work transition may provide insights into initial inequalities in 2008

that translated into differences in subsequent transition pathways. In Germany, post-school transition chances clearly differ according to educational degrees, gender, regional, social and ethnic background and the intersections among these variables (e.g. Beicht and Walden 2015; Haasler and Gottschall 2015; Hillmert, Hartung, and Katarina 2017; Holtmann, Menze, and Solga 2017; Jacob, Kleinert, and Michael 2013; Malin and Jacob 2019).

The segmentation of the VET sector as described above goes hand in hand with a vertical stratification that implicates pronounced differences in future employment and income prospects of youth. In Germany, training tracks are highly stratified by school attainment (Protsch and Solga 2016, 645). School leavers without a school degree or with a lower-level degree are significantly overrepresented in prevocational measures. These youth are, in particular, at risk of not completing a fully qualifying vocational training, which is essential for subsequently accessing skilled work (cf. Baas and Philipps 2019; Geier 2013). This situation may be a result of withdrawal from the training market due to negative school experiences and perceived stigmatisation. Furthermore, it is argued that potential employers tend to sort out low-qualified youth during recruitment processes because they use low formal qualifications as a signal of youth's limited trainability (cf. Holtmann, Menze, and Solga 2017). Even if they succeed in getting an apprenticeship, they are usually restricted to lower skilled and rather insecure training occupations (Protsch and Solga 2016).

As school graduates who are considered less trainable by career-counselling caseworkers or do not find regular apprenticeships are steered into specific programmes, the question arises as to whether programme participation may itself hamper access to fully qualifying vocational training and skilled work. Potential employers may interpret programme participation as an additional negative signal of low achievement potential or lower qualification, which may increase the likelihood of these youth being excluded from applicant pools (see Dettmann and Jutta 2013; Liechti et al. 2017). Processes of withdrawal and being sorted from the training market at the beginning of the school-to-work transition may be evident in aggregate transition patterns, characterised by participation in institutionalised detours embedded in a relatively unstable transition pattern overall.

Family background turned out to be another important factor associated with transition progress following the completion of general schooling (Dorsett and Lucchino 2014; Giudici and Pallas 2014; Haapakorva, Ristikari, and Gissler 2017; Schoon and Lyons-Amos 2016). Adverse living conditions such as long-term poverty, parental unemployment and parental low educational attainment rigidly restrict families from supporting the educational and career advancement of their children. The experience of financial shortage and lack of opportunities for underprivileged youth generates poor starting conditions for the transition into training and employment, possibly negatively affecting the development of agentic resources such as achievement orientation, educational

ambition and skills in general (Mortimer et al. 2014; Schoon 2014). This scenario can have far-reaching consequences for the later stages of life, potentially increasing the risk of following a pathway with low prospects for success in the training and labour market. Effects of adverse initial conditions in the school-to-work transition may continue over time (Bäckman and Nilsson 2011). Thus, we expect school leavers from socio-economically disadvantaged families to be more likely to experience a problematic school-to-work transition than those from less disadvantaged families.

The foreign background of youth is another characteristic that is associated with barriers at key stages in the school-to-work transition. Young migrants are, for instance, less likely to get access to VET compared to their German age-mates, even after controlling for individual human capital endowments, opportunity structure and educational preferences (Diehl, Friedrich, and Hall 2009; Tjaden 2017). In the literature, there are discussions about the extent to which discrimination by potential employers complicates the school-to-work transitions of migrants (Imdorf 2010; Scherr, Janz, and Stefan 2015). Based on empirical evidence, it is reasonable to expect that a foreign nationality – compared to a German background – is associated with a higher risk of being steered into problematic school-to-work trajectories.

Data and method

Database and sample

This study is based on a unique set of longitudinal data from two administrative data sources. We use information generated by career counselling procedures of the German Federal Employment Agency to draw a 5 percent random sample of school leavers aged 21 or younger who were registered for the career counselling service (CC) in 2008. Taking individual advice from CC is quite common but voluntary.¹ The sample is restricted to young people who completed general education with an at-most intermediate school-leaving certificate in 2008. This database contains important person-related information, such as school-leaving qualification, school type, school-leaving year and the career counsellor's assignment of an applicant's status. The assignment is mainly based on the assessment of the individual trainability of school leavers seeking apprenticeships.

An identical person identifier allows merging the CC sample with the database of integrated employment biographies (IEB) provided by the Institute for Employment Research (IAB).² This dataset covers individual information about periods of standard and marginal employment, apprenticeship, unemployment, receipt of unemployment insurance benefit, receipt of means-tested basic income support (welfare benefit) as well as participation in transition measures and labour market programmes (Dorner et al. 2010). The resulting data contain information on the labour market status biographies of 9975 individuals. A high

number of individual records and precise information on the start and end of labour market status episodes are major benefits of using administrative data sources, which are less prone to subjectivity compared to survey-based information. However, the drawbacks are that the range of personal information is limited and that periods in school-based vocational training, higher education and other types of employment or non-employment are not registered in the database (e.g., self-employment, civil servant or homemaker).

Empirical approach and variables

To explore the temporal and social structure of school-to-work transition experiences, we focus on the formative period of vocational education and entry into working life, which we observe for 78 consecutive months from July 2008 to December 2014. We organise the administrative data into individual month-by-month histories. To unravel the complexity and diversity of transition processes, we apply sequence analysis and cluster analysis, an established explorative approach in research on school-to-work transitions (e.g. Baas and Philipps 2019; Brzinsky-Fay 2007; Brzinsky-Fay and Solga 2016; Dorsett and Lucchino 2014; Middeldorp, Edzes, and van Dijk. 2019). The analysis allows us to derive a typology that highlights different transition patterns in the data without blurring underlying heterogeneity (Anyadike-Danes and Duncan 2010, 484). The typology is built by statistical definitions of similarity in the individual month-by-month histories of the school leaver cohort of 2008, with each month denoted by one of nine categorical labour market states (see Table 1).

The applied optimal matching algorithm generates a measure of (dis)similarity of the individual school-to-work transition sequences (Elzinga 2003) by comparing all pairs of individual sequences of labour market states and transforming each sequence into the others by operating insertion, deletion or substitution of single sequence elements. Numerical values (transformation costs) allocated to the

Table 1. State space overview.

Status	Description
Employment	Regular employment in full-time or part-time, subject to social security contributions; including employment with employer allowances
Marginal employment	Employment up to 400 € (450 € since 2013); not subject to social security contributions; internships, working students, unpaid family workers
Unemployment	Registered unemployed
Apprenticeship	Regular firm-based apprenticeship, subject to social security contributions
External vocational training	Non-company apprenticeship carried out by vocational training providers
Subsidised vocational training	Firm-based apprenticeship subsidised by employer allowances or accompanying social assistance
Transition scheme	Prevocational training programmes either by training providers or as internships in firms
Other programme	Any other short-term training or publicly funded work opportunity
Gap	Status not registered in the administrative data (residual category); e.g., parental leaves, general education in schools or universities, school-based vocational training, voluntary work, neither in education nor in employment or training

operations quantify distances between individual sequences. The methodological literature critically discusses how to specify transformation costs (Brzinsky-Fay 2014; Gauthier et al. 2009), but there is no consistent theoretical basis. Commonly, the cost of insertion and deletion operations are fixed at the value 1, and substitution costs amount to the value 2 by default, which we also applied in the present study. The optimal matching algorithm minimises the total sum of operations as a similarity measure. The resulting distance matrix forms the basis for the subsequent hierarchical cluster analysis, deploying Ward's fusion algorithm to group similar sequences into clusters of ideal-typical transition patterns by minimising within-group differences and maximising the between-group differences (cf. Dlouhy and Biemann 2015). Based on a comparison of measures of the quality of partitions³ and clearly interpretable patterns, we come to a 10-cluster-solution.⁴

In the following results section, we first use sequence visualisations to explore what transition patterns of lower-qualified youth in Germany look like. Figure 1 shows three different formats. The horizontal axis denotes the timeline for all graphs in months. From the top down, the index plots reproduce the status sequences of all individuals in each cluster, displayed as a series of stacked horizontal colour-coded lines corresponding to the labour market states. Next, status proportion plots aggregate the monthly distribution of labour market states by cluster. Finally, modal plots illustrate the most frequent status per month within each cluster. Important concepts in portraying the ten transition patterns and illustrating differences are whether they provide continuity, i.e., they include longer episodes in socially expected labour market states, such as apprenticeships, and have integrative potential, i.e., they are clearly directed towards employment (Brzinsky-Fay 2007). We also refer to information on the average aggregated duration of labour market states within the clusters (see also Figure A2, supplementary material) and information on cluster size (Table A, supplementary material).

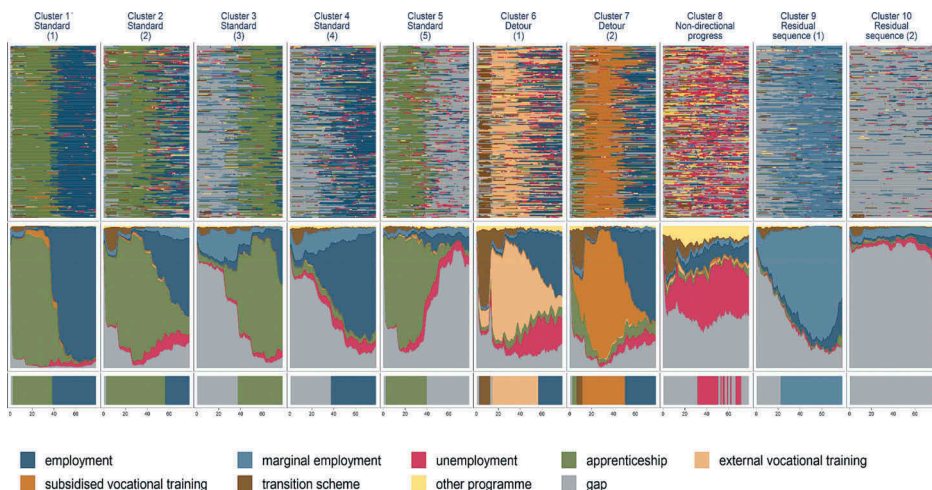


Figure 1. Sequence index plots, status proportion plots and modal plots by cluster.

Next, we analyse social differences in transition experiences by estimating a multinomial logit regression on the transition types. As discussed in the second section, educational attainment, family background, foreign nationality and the CC classification of applicant status after completing schooling in 2008 constitute different initial conditions expected to predict the likelihood of taking a certain school-to-work transition course. Furthermore, we control for gender, age, residential region and unemployment rate at the district level (see [Table 2](#)).

Results

Transition patterns

Based on our interpretation of the transition patterns, the ten clusters can be subdivided into four segments: variations of standard school-to-work transitions (c1 to c5), an in-between segment of institutionalised detours (c6, c7), a single non-directional progress pattern (c8), and a residual segment with mainly hidden courses (c9, c10).

Varying standard transitions

Cluster c1 represents the standard transition pathway of Germany's apprenticeship system. Individuals pass smoothly through the established stages of apprenticeship to gainful employment. The average accumulated length of both the apprenticeship period (34 months) and the period of gainful employment (36 months) demonstrate a high continuity, which is considered a major benefit of the highly standardised training provided by firms. The cluster size – 32 percent of the overall sample – also underlines the high quantitative relevance of this pathway (cf. Brzinsky-Fay [2007](#)).

Cluster c2 (20 percent of the total sample) represents a more volatile standard transition that differs from c1 by its delayed succession. Youth in this cluster have longer apprenticeship periods on average (39 months), and entry into vocational training runs less smoothly. There are short periods of participation in transition schemes (2 months on average) or in an unknown state (11 months on average). Furthermore, c2 includes longer periods of unemployment (4 months on average compared to only 1 month in the first cluster), which mainly show up at the transition into employment.

Clusters c3 to c5 distinguish themselves by distinct patterns of ordered progress, but they also contain longer periods with unknown gap states. These sub-sequences probably contain unmapped periods of school-based vocational training or further education. Cluster c3 (10 percent of the total sample) is consistent with the course of an additional education stage after the end of compulsory schooling, such as attendance of higher secondary education or a vocational school before starting an apprenticeship. Shorter periods of marginal employment (9 months on average) are increasingly evident during the first half of the observation time. It is plausible

Table 2. Multinomial logit regression on cluster membership (average marginal effects, standard errors in brackets).

Cluster	Standard transition pattern variations					Detours		Non-directional		Residual sequence types	
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	
AME/SE	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	
School leaving degree	-0.140*** (0.026)	-0.078*** (0.019)	-0.053*** (0.011)	0.009 (0.013)	-0.004 (0.013)	0.124*** (0.017)	0.026* (0.011)	0.125*** (0.015)	-0.025*** (0.004)	0.016 (0.018)	
No degree	-0.070*** (0.010)	0.003 (0.009)	-0.022** (0.007)	0.016** (0.006)	-0.018*** (0.005)	0.054*** (0.005)	0.025*** (0.004)	0.045*** (0.004)	-0.018*** (0.003)	-0.015 (0.008)	
Lower-level secondary						Reference					
Intermediate secondary						Reference					
Nationality (German)						Reference					
Foreign	-0.100*** (0.016)	-0.022 (0.014)	-0.007 (0.010)	0.033** (0.011)	-0.003 (0.009)	0.004 (0.006)	0.001 (0.005)	0.011 (0.006)	0.014* (0.007)	0.069*** (0.014)	
Welfare benefit (No)						Reference					
Under 6 months	0.159*** (0.011)	0.013 (0.010)	-0.043*** (0.007)	-0.019** (0.006)	0.010 (0.006)	-0.003 (0.005)	0.008* (0.004)	0.007 (0.004)	-0.007 (0.004)	-0.126*** (0.008)	
6 to under 24 months	0.089*** (0.014)	0.020 (0.013)	-0.035*** (0.009)	0.000 (0.008)	0.001 (0.007)	0.002 (0.005)	-0.002 (0.004)	0.021*** (0.006)	0.004 (0.005)	-0.099*** (0.010)	
At least 24 month	0.015 (0.014)	0.019 (0.013)	-0.022* (0.010)	-0.001 (0.008)	-0.003 (0.007)	0.006 (0.005)	0.002 (0.005)	0.065*** (0.007)	-0.004 (0.005)	-0.076*** (0.011)	
CC Status ^a (Applicant)						Reference					
No applicant	-0.252*** (0.009)	-0.050*** (0.009)	0.094*** (0.007)	0.026*** (0.006)	-0.008 (0.005)	0.008* (0.004)	-0.008* (0.003)	0.023*** (0.004)	0.018*** (0.004)	0.149*** (0.008)	
Gender (Male)						Reference					
Female	-0.065*** (0.009)	-0.046*** (0.008)	0.013* (0.006)	0.036*** (0.005)	-0.009* (0.004)	-0.003 (0.003)	-0.013*** (0.003)	0.003 (0.004)	0.012*** (0.003)	0.072*** (0.007)	
Age group (18 to 21)						Reference					
Under 16	0.085*** (0.020)	0.009 (0.019)	0.047*** (0.014)	-0.027*** (0.010)	-0.005 (0.010)	-0.030*** (0.007)	-0.019*** (0.006)	-0.010 (0.008)	0.005 (0.007)	-0.056*** (0.015)	
16 to 17	0.039*** (0.011)	0.001 (0.010)	0.015 (0.008)	-0.008 (0.007)	0.006 (0.006)	-0.020*** (0.006)	-0.009 (0.005)	-0.007 (0.005)	0.007* (0.003)	-0.024* (0.010)	
Residence (West Ger.)						Reference					
East Germany	0.131*** (0.018)	-0.020 (0.015)	-0.061*** (0.009)	-0.002 (0.010)	0.006 (0.009)	0.017* (0.008)	-0.006 (0.006)	-0.007 (0.006)	-0.027*** (0.004)	-0.030* (0.013)	
Regional unemployment rate ^b	-0.017*** (0.002)	0.003* (0.002)	0.005*** (0.001)	-0.000 (0.001)	-0.000 (0.001)	0.002** (0.001)	-0.000 (0.001)	0.004*** (0.001)	0.002*** (0.001)	0.003* (0.001)	

Notes. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ^a CC Status = Applicant status designated by career counselling service; ^b Regional unemployment rate at district level. Observations N = 9975

that youth take on small side-jobs in addition to attending upper secondary school or school-based training. On average, apprenticeship lasts 31 months within the observation period and partially continues at the end.

Cluster c4 (7 percent of the total sample) is characterised by transitions into gainful employment that commonly follow a gap period (31 months on average). We assume that within this cluster, school-based vocational training leads the way into employment. Furthermore, shorter interim phases of apprenticeships, unemployment, participation in transition schemes and marginal employment show up, also signalling a less straight course compared to the standard cluster c1.

Youth affiliated with cluster c5 (5 percent of the total sample) also mainly enter an apprenticeship with an average duration of 29 months, followed by a longer gap period. Subsequent phases of gainful employment, marginal employment and unemployment are rather short. Taking up higher secondary education or school-based training, as well as caring for family, upon termination or completion of an apprenticeship are plausible reasons for the occurrence of this sequence pattern.

Detours

Alternative training options shape the transition experience of youth in clusters c6 and c7 over a longer period. Cluster c6 (3 percent of the total sample) commonly starts with participation in prevocational transition schemes (average of 8 months compared to 2 months for all youth in the sample). Most cluster members take up external vocational training as the next training step (average duration of 28 months), partially followed by gainful employment (average of 13 months). Compared to the standard pattern c1, this pattern is characterised by stronger intermittent progress, evidenced by more frequent status changes due to unemployment, mainly in the second half of the observation period.

Cluster c7 (2 percent of the total sample) resembles c6 regarding the sequencing logic. At the beginning of the observation time, rather short phases of prevocational transition schemes (average of 4 months) and apprenticeships (average of 7 months) accumulate. These activities often precede continuous periods of subsidised vocational training lasting 32 months on average. While the average number of states amounts to 6 in c6, it is somewhat lower (5) in c7, indicating more stable progress within this track (see Table A, supplementary material).

The two patterns have prevocational measures at the early transition stage in common. Both pathways seem to encourage a continuous course of vocational training, but compared to c1, there is a delayed entry into apprenticeships and into gainful employment. However, there are also differences in the integrative potential between the detour patterns, as youth in c6 have a much higher risk of unemployment after leaving external vocational training and are less often in gainful employment compared to all youth in the sample and compared to those in c7.

Non-directional progress

Cluster c8 (4 percent of the total sample) clearly represents a pattern that the literature occasionally denotes as ‘floundering’, characterising apparently directionless movements among education, jobs and other activities (e.g. Vuolo, Mortimer, and Staff 2014). Youth affiliated with this group show sustained accumulated periods of unemployment (overall 24 months on average compared to the sample mean of 4 months). Participation in transition measures (5 months on average compared to the sample mean of 2 months) or other programmes (7 months on average compared to the sample mean of 1 month) also shape this pattern. Periods of gainful employment are below average (7 months compared to 20 months on average of the total sample), as in the case of apprenticeships (2 months compared to an average of 24 months of the total sample). Even if there are long-lasting periods of undefined gap states (28 months on average), the apparent undirected progress containing numerous status changes suggests the pronounced aimlessness of this subgroup’s pathway after leaving compulsory school. Despite partially expanded programme participation, these youth obviously fail to establish themselves in the training and labour market.

Residual sequence types

The two residual clusters c9 (2 percent of the total sample) and c10 (15 percent of the total sample) do not add to a coherent picture of the transition process due to high shares of gap episodes, partly marginal part-time jobs over longer periods (c9) and no plausibly interpretable order of states. Both patterns might reflect periods of school-based vocational education, upper secondary and tertiary education but also prolonged non-education and non-employment periods, e.g., due to family formation or other reasons.

Continued inequality in school-to-work transitions

Next, we use multinomial logit regression analysis to examine how educational attainment, socio-economic background and foreign background at the end of schooling as well as additional control variables predict the subsequent transition process.⁵ Table 2 presents average marginal effects in percentage points, indicating the impact of a given characteristic value compared to a reference value on the average probability of showing a specific transition pattern.

In line with expectations drawn from research on educational stratification, school attainment turns out to be an important predictor of a school leaver’s school-to-work transition. For example, compared to peers with an intermediate degree, youth without any school-leaving certificate are 14 percentage points less likely to smoothly transition into an apprenticeship and employment thereafter (c1). They are, however, 12 and 3 percentage points more likely to be steered into an in-between pattern (c6 and c7), which depict institutionalised detours for those

with limited transitional opportunities from the outset. Nevertheless, despite these options, compared to the reference group of intermediate qualified peers, non-qualified youth are 12 percentage points more likely to start down an at-risk pattern labelled as non-directional progress (c8).

Foreign and German youth partly differ in their transition progress. Contrary to our expectation that foreigners are at higher risk of experiencing problematic transitions, empirical results are not clear-cut. The results confirm that foreign school leavers are 10 percentage points less likely than Germans to follow an apprenticeship-based standard pathway (c1). However, they are 3 percentage points more likely to belong to c4, which probably implies participation in school-based training before taking up employment. There is no significant difference regarding affiliation with cluster c8 (non-directional progress) or detour patterns (c6 and c7).

The association between the welfare benefit receipt of the family of origin and the school leaver's transition experiences proves to be more complex than expected. If families used welfare benefits only short-term or medium-term before the end of compulsory schooling in 2008, school leavers are more likely (16 percentage points and 9 percentage points) to pass through an apprenticeship-based standard pathway (c1) compared to youth with no benefit receipt at all. Irrespective of its duration, benefit receipt per se reduces the likelihood of following a transition pathway that probably implies further school education (c3). The correlates are significantly negative in all categories of benefit duration, amounting to -2 up to -4 percentage points. This suggests that benefit recipients and non-recipients differ regarding preferred vocational courses; differences may also be attributable to school-leaving degrees. In this regard, it may be important that apprenticeships are remunerated at a specific training allowance within the framework of the dual system. Against the background of growing up with monetary cutbacks at home, apprenticeship earnings might constitute a financial incentive to take up an apprenticeship to achieve financial self-sufficiency or to end benefit receipt. However, a subgroup of benefit recipients shows highly at-risk trajectories. Compared to non-recipients, medium-term and long-term benefit recipients have a slightly higher likelihood (2 and 6 percentage points) of experiencing a highly detrimental school-to-work transition characterised by discontinuous undirected progress (c8).

Moreover, there are some informative findings concerning the control variables. The career counselling service classifies youth who seek advice according to an administrative scheme for assigning trainability, whereby the classification 'no applicant' refers to low trainability. As shown in [Table 2](#), the classification 'no applicant' significantly correlates with 9 out of 10 sequence patterns. Compared to classified 'applicants', school leavers not considered for training placement are less likely to experience a smooth standard school-to-work transition (c1), a more volatile standard pattern (c2) or a detour via subsidised vocational training (c7). In turn, these youth are more likely to show transition patterns

that probably include either extended schooling or school-based vocational training (c3 or c4) or a detour through external vocational training (c6). They are also more likely to be selected into residual sequence types (c9 and c10). Hence, the findings point to possible long-term implications of preliminary sorting when career counsellors may act as gatekeepers who contribute to steering youth down specific pathways. The findings, however, do not provide any insight into the real sorting criteria or mechanisms applied by the career counselling service. Future research should look more closely at vocational guidance processes to reach a better understanding.

Labour market conditions are highly relevant for the transition behaviour of school leavers. Unemployment may affect the options as well as the individual decisions of school leavers for further schooling, school-based or firm-based training routes, employment or taking up a labour market programme (e.g. Hillmert, Hartung, and Katarina 2017). The results show that the unemployment rate at the district level in 2008 affects the longer-term transition experiences of the cohort of school leavers under examination. Regional unemployment is negatively associated with the chance of starting a smooth standard school-to-work transition (c1). However, it is positively associated with experiencing a more volatile standard transition (c2), following alternative routes based on further education (c3), or taking a detour based on prevocational programmes and external vocational training (c6). Regional unemployment also increases the risk of undirected progress (c8). These findings suggest that tense labour market conditions delay or even prevent transition progress.

Discussion and policy implications

Referring to life course research on the increasing flexibility of transitions, we employ a differentiated classification of vocational training and labour market states to reveal diverse pathways of sequential labour market integration using methods of sequence and cluster analysis. The study identifies a typology of ten fine-grained transition patterns of a specific cohort, indicating a wide variety of youth career development during the 78 months after young people leave school with an at-most intermediate school degree in 2008. In the training and job market as well as in labour market policy, continuous and goal-oriented progress along pre-structured pathways conforms to the idea of an ideal-typical and successful school-to-work transition. Following Schoon (2015), our approach goes beyond a straightforward distinction of successful versus failed transitions by uncovering in-between patterns, notably in conjunction with target-oriented training programmes aiming to prevent youth from drifting into long-lasting labour market exclusion.

The findings show that the largest cluster c1 corresponds most closely to the ideal of a smooth transition in the German labour market, characterised predominantly by continuous participation in firm-based apprenticeships and

gainful employment. However, the cluster incorporates only about one third of the youth cohort under examination. While another four clusters (c2 to c5) also distinguish themselves through a rather continuous and goal-oriented labour market integration, they still indicate a higher complexity and uncertainty of youths' transition experiences over observation time. We also find an undirected, highly at-risk transition pathway (c8). The relatively small group of youth move through mainly short training and labour market activities in a seemingly aimless manner without establishing themselves in vocational training or in the job market. Another two detour clusters (c6 and c7) represent in-between patterns, situated amongst the extremes of standard routes and at-risk trajectories. While cluster members most commonly alternate between labour market states on average, their transition progress is essentially shaped by rather continuous participation in specific training programmes and longer and more stable periods of gainful employment compared to c8. However, trainees in external vocational training (c6) face greater difficulties at the transition stage between vocational education and gainful employment compared to trainees in subsidised apprenticeships (c7).

Taken together, our results suggest that prevocational training and labour market programmes in combination constitute distinct supplementary pathways that appear to normalise the school-to-work transitions of low-educated school leavers, although there is still variation in their integrative potential. This becomes clear in the so-called detour clusters, which show a noticeable tendency to follow a continuous and purposeful transition pathway that complies with a pre-structured course despite numerous status changes. Even if prevocational schemes and training programmes pose a certain risk to low-educated school leavers – i.e., remaining in subsidised employment careers for considerable periods – the schemes may contribute to a decrease in rigidified detachment from the labour market, at least for a subgroup. Regarding the significance of prevocational courses, the findings also reveal predominantly short episodes within the standard cluster as well as within its variations. In this context, vocational preparation appears to bridge waiting times until transitions into regular vocational education and training paths.

The limitations of the study and its implications for future research should also be mentioned. The present study examines the transition routes of a single cohort of school leavers in 2008 in detail. In subsequent years, the situation in the training and job markets shifted significantly towards an increasing demand for apprentices; however, the markets still do not include all (interested) youth in vocational training, especially low-skilled young people (Eckelt and Schauer 2019). Although it is not plausible to assume that the transitions patterns identified in our study have disappeared in later school-leaver cohorts, their quantitative significance and the youth' likelihood to follow a specific pattern may have changed. It is up to future research to explore these changes in transition patterns and the stratified access to transition types.

Furthermore, some relevant states are unregistered within the administrative data of the Federal Employment Agency, which leads to two residual clusters that do not allow a clear description or interpretation of the transition processes. Among the unregistered states are school-based training, higher education and labour market inactivity; thus, we may underreport the complexity of school-to-work transitions in Germany. The data also do not contain information on vocational preparation programmes at vocational schools, which are not funded by the Federal Employment Agency. In that regard, we may only underreport the true complexity in the transition pathways when these programmes adopt a different 'bridging role' beyond the programmes subsidised by the Federal Employment Agency. Otherwise, additional data on these programmes would mainly shift the quantitative sizes of the clusters, mainly the detour clusters (c6 and c7) and the cluster for undirected progress (c8).

Another point is that administrative data contain little information on individual characteristics. From a life course perspective, school-to-work transition experiences result from both individual resources and constraints related, for example, to social background, educational attainment and labour market context and from individual agency reflected by aspirations, active decision-making and choice (e.g. Schoon and Lyons-Amos 2016). Based on administrative data, we cannot rule out the complex interplay between individual characteristics pertaining to foreign nationality or welfare benefit receipt and decisions on training routes and jobs.

Finally, we assessed school-to-work transitions based on the interpretation of continuity and directedness. Future research should also consider how different pathways are related to labour market outcomes at later stages to more fully appraise the progression routes.

Despite these limitations, this study clearly shows which transition patterns show up after individuals leave compulsory school in Germany and how the diversity and complexity of this transition are shaped by the existence of diverse transition measures. It also sheds light on how essential characteristics of social stratification are associated with the transition process. These findings inform policy makers and researchers who carry out programme evaluations about the complexity and dynamics of the transition experiences of youth with lower and intermediate qualifications. Although a rather small group of young people in our sample takes detours after leaving school, our findings indicate that participation in external and subsidised vocational training programmes facilitates far-reaching biographical normality and may fill the role of regular apprenticeships. However, some youth need further support when they attempt to enter employment upon completion of vocational training. The group of young people experiencing undirected at-risk trajectories should receive particular attention because persistently failing in vocational training and in the labour market may result in lifelong disadvantages. One can question whether this group, comprising 4 percent of our sample, is rather small, perhaps as a result of the existence of transition measures,

or is too large when, in times of demographic change and growing demand for qualified workers, there is the credo of leaving no one behind. For these young people, the role of transition measures and labour market programmes should be critically questioned, as these measures partly fail to build bridges into employment. Some authors assume adverse consequences of programme participation when measures do not fit individual life circumstances and aspirations (e.g. Malmberg-Heimonen and Vuori 2005; Walther 2015; Wulfgramm 2011). This situation is particularly relevant for those who leave school without a certificate and come from families in long-term benefit receipt. These youth are a well-known risk group, but research does not exactly understand why some young people with poor qualifications and poor family backgrounds follow directed pathways while others do not. However, the results of this study indicate that the existing programmes still seem to not meet their demands.

Notes

1. Figure A1 (supplementary online material) documents a slight overrepresentation of less-educated school leavers in the sample.
2. This data source combines contribution notifications forwarded by employers to the social insurance system with information from administrative processes of the Federal Employment Agency.
3. PBC, HGSD, ASW, ASWw recommend a 2,3,4,5 or 10- cluster solution for the given data set (cf. Studer 2013).
4. We adopt the R software packages TraMineR (Gabadinho et al. 2011) and WeightedCluster (Studer 2013).
5. See Table A in the supplementary online material for results from cross-tabulations of cluster affiliation and key variables.

Disclosure statement

No potential conflict of interest was reported by the authors.

Supplementary Online Material

Additional figures and tables are available at: <https://doi.org/10.6084/m9.figshare.12180159>.

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