

ORIGINAL ARTICLE

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# Intergenerational transmission of unemployment after apprenticeship graduation: does parental socioeconomic background still matter?

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## Abstract

A smooth transition from apprenticeship to standard employment is a key step in the professional biographies of apprenticeship graduates. In this study, the transition of apprenticeship graduates from households that receive unemployment benefits are considered. These graduates are thought to be disadvantaged because their parents' socioeconomic background is assumed to influence their employment outcomes through processes of intergenerational transmission and cumulative disadvantage. Based on administrative data from the Sample of Integrated Welfare Benefit Biographies (SIG) provided by the Institute for Employment Research (IAB), this analysis offers deeper insights into parental socioeconomic background and the individual factors that affect the risk of unemployment following the completion of an apprenticeship. In the case of an unsuccessful direct transition to standard employment, the factors influencing the duration of the first unemployment are also assessed. The results show that, as with individual characteristics, parents' education level has a significant effect on the graduates' risk of unemployment. The duration of the household's benefit receipt, on the other hand, significantly influences the duration of the first unemployment in the case of an unsuccessful transition following an apprenticeship.

**Keywords** Apprenticeship, Disadvantaged youth, Parental socioeconomic background, Unemployment, Transition, Welfare benefit

**JEL Classification** I24, J62, J64

## 1 Introduction

The completion of an apprenticeship and the subsequent transition into employment are crucial steps in the professional careers of young people. In Germany, a high proportion of apprenticeship graduates are retained by their training firm, and graduates have good employment opportunities in general. Despite these positive circumstances, not all apprenticeship graduates

successfully directly transition into standard employment; rather, they are either affected by unemployment or find themselves in temporary, involuntary part-time or low-paid employment (Bellmann et al. 2016; Dorau 2018; Dummert 2021). Across the apprenticeship graduate cohorts from the period of 2008 to 2014, approximately 58 percent of graduates remained employed at their training establishment one month after graduation, 19 percent moved to a different establishment, and 12 percent became unemployed (Dummert 2021).

When apprenticeship graduates have problems transitioning into the labour market, there are negative effects that often persist far into their employment careers (scarring effects). Numerous scientific studies

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have concluded that unemployment occurring at an early career stage has a negative impact on future income, quality of employment and participation in the labour market (Gregg 2001; Luijck and Wolbers 2009; Nilsen and Reiso 2014; Möller and Umkehrer 2015; Riphahn and Zibrowius 2016).

Young apprenticeship graduates are unequally exposed to the risk factors for becoming unemployed (Dummert 2021). This study considers the risk of unemployment after completing an apprenticeship and, in the case of an unsuccessful direct transition into the labour market, the duration of the first unemployment of a specific group of apprenticeship graduates, namely, those living in households that receive unemployment benefits. Young people from households that receive benefits are usually considered a vulnerable social group that is disadvantaged in terms of their employment opportunities and poverty risk, as their parents' socioeconomic background is assumed to influence their employment outcomes and school-to-work transition due to processes of intergenerational transmission and cumulative disadvantage (Vandecasteele 2011; Schels 2018; Achatz et al. 2022). Unfavourable living conditions such as long-term benefit receipt, parental unemployment and low levels of parental education limit families' ability to support their children's educational and professional advancement (Kallio et al. 2016; Vauhkonen et al. 2017; Achatz et al. 2022). The successful completion of an apprenticeship and the subsequent transition to standard employment are important steps for young people who come from households receiving unemployment benefits. These steps enable them to shift away from receiving benefits and towards securing their own subsistence (Gangl 1998; Bäckman and Bergmark 2011; Lui et al. 2014; Schels 2018). Since they completed their apprenticeship, graduates are considered to have successfully mastered the first of these important steps.

This study is aimed at elucidating the second important step and the factors that influence the risk of unemployment for apprenticeship graduates from households receiving unemployment benefits; a group that has rarely been considered in the literature. This study is aimed at closing this research gap by addressing the following research questions: Does parental socioeconomic background influence unemployment risk after apprenticeship graduation? Is parental socioeconomic background (still) related to the duration of the first period of unemployment in cases of an unsuccessful transition after graduation? This paper examines these questions through the use of administrative data provided by the Institute for Employment Research (IAB) on the biographies of welfare benefit recipients and the members of their

benefit-receiving household. This study contributes to the literature on the intergenerational transmission of unemployment, cumulative disadvantage and the effects of parental socioeconomic background.

The remainder of the paper is structured as follows. In the "Institutional Considerations" section, background information on the apprenticeship system and the unemployment benefit system in Germany is briefly outlined. In the "Intergenerational Transmission of Disadvantages, Intergenerational Mobility and Previous Research" section, the theoretical background and previous research are discussed. This is followed by the "Data and Empirical Methods" section, in which the data and sample, the definition of a successful completion of an apprenticeship, the dependent and independent variables, and the empirical methods are described. In the "Empirical Results" section, the results are presented, and a discussion of the results and the conclusion are provided in the final section.

## 2 Institutional considerations

### 2.1 Apprenticeship system in Germany

The dual system of apprenticeship training in Germany combines practical work in companies with theoretical training in public vocational schools. During the practical work in companies, apprentices perform productive activities in their training firms, and the employers and their apprentices jointly bear the costs of the apprenticeship. The human capital that is acquired during apprenticeship is largely general or occupation specific (Acemoglu and Pischke 1998; Kambourov and Manovskii 2009).

Once the apprenticeship has been completed, companies decide whether to submit an offer of employment to graduates depending on their performance during the apprenticeship period and the company's need for skilled workers. When a company offers a job, graduates decide whether to accept the job, accounting for alternatives that may be available in the external labour market and their own satisfaction with the training firm. If graduates do not remain with the company after completing their apprenticeship, do not find another job or do not return to the education system, they become unemployed and thus enter the German Unemployment Benefit system to secure their own livelihood.

### 2.2 German Unemployment Benefit system

The German Unemployment Benefit system is an important aspect of social security for unemployed people and is based on two main components, namely, Unemployment Insurance Benefit (UIB) and Unemployment Benefit II (UB II). UIB is an insurance

benefit that is financed by employee and employer contributions. All employees subject to social security who have paid contributions to the insurance scheme for at least 12 of the last 24 months prior to losing their job are entitled to receive UIB. Its duration depends on the age and employment biography of the recipient.

After the expiration of the UIB or in the absence of UIB entitlement, eligible persons can apply for UB II. UB II (also known as Hartz IV) was introduced in Germany in 2005 and is a combination of the former unemployment assistance and social assistance (Eichhorst et al. 2008). UB II is a means-tested benefit paid to persons between the ages of 15 and 64 and their households (“benefit receiving units”), who are capable of working but do not receive a (sufficient) income from employment, further insurance benefits (e.g., unemployment insurance) or allowances (e.g., training allowances) to secure their needs and subsistence (Schels 2013; Hohmeyer and Lietzmann 2020).

According to legal requirements, people who are younger than 25 years old typically have to stay with their parents as long as they are not able to cover their own subsistence costs. In this case, they still belong to the parents’ benefit receiving unit (§ 7 (3) No. 2 and 4 SGB II). Only when the recipients have their own children do they qualify as their own benefit receiving unit, but they can theoretically remain in the household of their parents. Underage, unmarried children with an income that is sufficient to cover their own needs are not legally members of the benefit unit (according to § 7 (3) SGB II). Furthermore, § 7 (5) SGB II specifies that trainees who attend an eligible apprenticeship per the German Federal Law on Training and Education Promotion (“Bundesausbildungsförderungsgesetz (BAföG)”) or vocational training allowance (“Berufsausbildungsbeihilfe”) are not entitled to receive UB II. Nevertheless, the statistics of the Federal Employment Agency count underage children and apprentices without entitlement to benefits as members of the benefit unit for comprehensive social reporting. Therefore, they are still assigned to the benefit receiving unit in the available data.

### **3 Intergenerational transmission of disadvantages, intergenerational mobility and previous research**

Young people from households that receive benefits are considered disadvantaged in terms of their career prospects and life opportunities through the process of the intergenerational transmission of (social) disadvantages. In the literature, several mechanisms that could lead to the intergenerational transmission of (social) disadvantages have been discussed (D’Addio 2007; Black and Devereux 2011; Hillmert 2013;

Bubonya and Cobb-Clark 2021). First, children with less advantaged parental social backgrounds are less likely to choose a higher educational path. A theoretical explanation of educational choice can be found in the Breen-Goldthorpe model, which postulates that parents’ main focus is to preserve their children’s status and that upward mobility holds only minor importance (Breen and Goldthorpe 1997; Stocké 2007; Kallio et al. 2016). Parents with lower income, lower education and who receive welfare benefits have fewer opportunities to provide financial and advisory support to their offspring to maintain and promote their children’s educational levels and to invest in their human capital, thereby resulting in inequalities in educational attainment and promoting the accumulation of disadvantages among the next generation (Wiborg and Hansen 2009; Cobb-Clark and Gørgens 2014; Kallio et al. 2016; Vauhkonen et al. 2017; Achatz et al. 2022). Another explanation may be the sociocultural transmission of disadvantages. Children who grow up in socially disadvantaged families lack in positive education and employment role models, and they may suffer from reduced expectations of themselves, a lack of future perspectives, hopelessness and low self-esteem (Kunz and Kalil 1999; Kallio et al. 2016; Vauhkonen et al. 2017). Unemployment and the receipt of welfare benefits are seen as less stigmatizing, and the (mental) barriers to claiming benefits may be lower (Black and Devereux 2011; Vauhkonen et al. 2017). In addition, information differences should also be kept in mind when considering educational attainment or taking further steps in vocational careers. Parents with a higher level of education have a better understanding of the importance of higher education for career advancement opportunities and employment biographies, and this understanding can be transferred to their children (Buis 2013; Kallio et al. 2016; Vauhkonen et al. 2017).

This paper is focused on young people raised in a socially disadvantaged parental household who have already successfully mastered the first important step in their career, namely, the completion of apprenticeship. They have succeeded in taking a first step towards “breaking the intergenerational cycle of disadvantage” (Redmond et al. 2014: 14) and increasing their opportunities in the labour market and their chances to become financially independent without receiving public benefits (intergenerational mobility). To my knowledge, this paper is the first in which the influence of parental socioeconomic background on the transition of socially disadvantaged young people at the second threshold, i.e., from apprenticeship to the labour market, as well as the duration of unemployment when the transition is not directly successful, is examined.

**Table 1** Parental socioeconomic background and individual characteristics of employed and unemployed graduates one month after successfully completing an apprenticeship

	Employment		Unemployment		Diff.
	Mean	Std. dev.	Mean	Std. dev.	Sign. t-test
<i>Parental socioeconomic background</i>					
Duration of welfare benefit receipt of the household					
Up to two years	0.07	0.26	0.06	0.24	n.s
Two to five years	0.30	0.46	0.38	0.49	***
Five years or longer	0.63	0.48	0.56	0.50	***
Parents: vocational training or university degree	0.51	0.50	0.45	0.50	***
Siblings under 15 years	0.32	0.47	0.35	0.48	n.s
Single parent	0.21	0.41	0.19	0.39	n.s
<i>Individual characteristics</i>					
Age at time of graduation	20.91	1.50	21.04	1.52	**
Nationality (1 = German)	0.73	0.44	0.71	0.45	n.s
School leaving certificate					
No recognized school leaving certificate	0.03	0.18	0.08	0.27	***
Low secondary school leaving certificate	0.39	0.49	0.52	0.50	***
Intermediate secondary school certificate	0.48	0.50	0.35	0.48	***
University entrance qualification certificate	0.10	0.30	0.05	0.22	***
Sex (1 = woman)	0.46	0.50	0.40	0.49	***
Apprenticeship occupation					
Production	0.34	0.47	0.40	0.49	***
Personal services	0.33	0.47	0.29	0.45	**
Commercial, business-related, IT or other services	0.33	0.47	0.31	0.46	n.s
Duration of apprenticeship					
Up to 2.5 years	0.12	0.33	0.21	0.41	***
2.5 to 3 years	0.54	0.50	0.47	0.50	***
3 years or longer	0.34	0.47	0.32	0.47	n.s
Year of graduation	2014.37	2.70	2013.71	2.75	***
Unemployment rate	7.90	2.89	8.70	2.97	***
N	1384		1296		

Estimation sample, employment status one month after completion of apprenticeship, t-test significant at \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ , n.s.:  $p > 0.1$ . Source: SIG 0720

A growing body of literature in Germany addresses the effect of parents' socioeconomic background, such as parental unemployment experience, benefit receipt or educational attainment, on the risk of benefit receipt or unemployment for their offspring. Siedler (2004) found causal evidence of an intergenerational transmission of welfare benefit receipt, while Schels (2018) observed a positive correlation between parents' employment status at the timepoint when their child was 15 years old and the probability that child's receipt of social benefits will end as soon they find full-time employment. Furthermore, Schels (2011) noted that young beneficiaries with a poorly qualified mother or father are disadvantaged in terms of finding a lucrative job or training place as a means of escaping from benefit receipt. Lindemann and

Gangl (2019) found negative effects of parents' unemployment on young people's likelihood of taking on an apprenticeship. Müller et al. (2017) observed different effects depending on the sex of the children assessed. They found no causal effect of parents' unemployment on the employment outcomes of sons, while they found positive effects on those of daughters. This finding is in line with Mäder et al. (2015), who also observed no causal effect, but the presence of a positive correlation between the unemployment experiences of fathers and sons. Achatz et al. (2022) observed a complex association between welfare benefit receipt of the family of origin and the school-to-work transitions of lower-qualified youth. First, the authors concluded that school leavers who live in a household that has been receiving benefits for two years or less are more

**Table 2** Risk of unemployment one month after apprenticeship completion, average marginal effects (AMEs)

	Average marginal effects (AME)			
	Model I (without parents' socioeconomic background)		Model II (with parents' socioeconomic background)	
	dy/dx	Std. dev.	dy/dx	Std. dev.
<i>Parental socioeconomic background</i>				
Duration of welfare benefit receipt of the household (ref.: up to two years)				
Two to five years			0.053	0.040
Five years or longer			0.050	0.042
Parents: vocational training or university degree			− 0.056***	0.020
Siblings under 15 years			0.024	0.021
Single parent			− 0.030	0.024
<i>Individual characteristics</i>				
Age at time of graduation	0.019***	0.006	0.017***	0.006
Nationality (German)	− 0.047**	0.021	− 0.024	0.023
School education (ref.: no recognized school leaving certificate)				
Low secondary school leaving certificate	− 0.084*	0.046	− 0.081*	0.046
Intermediate secondary school certificate	− 0.228***	0.045	− 0.217***	0.046
University entrance qualification certificate	− 0.321***	0.056	− 0.309***	0.057
Sex (woman)	− 0.007	0.023	− 0.009	0.023
Apprenticeship occupation (ref.: commercial, business-related, IT or other services)				
Production	0.034	0.026	0.038	0.026
Personal services	− 0.019	0.024	− 0.019	0.024
Duration of apprenticeship (ref.: up to 2.5 years)				
2.5 to 3 years	− 0.135***	0.027	− 0.138***	0.027
3 years or longer	− 0.158***	0.029	− 0.159***	0.029
Unemployment rate	0.020***	0.003	0.020***	0.003
Log likelihood	− 1744.286		− 1738.479	
Likelihood ratio test Model II vs Model I	11.61**			
N	2680			

Logistic regression, average marginal effects, robust standard errors, \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ . The years of graduation are included as control variables. Source: SIG 0720

likely to follow an apprenticeship-based standard pathway than school leavers who did not receive benefits. Apprenticeship earnings seem to act as an incentive for becoming financially independent and leaving the benefit system. However, the authors also found that school leavers who had received benefits over the medium and long terms were more likely to exhibit highly at-risk trajectories characterized by undirected movements among education, work, and other activity types.

Evidence of the impact of parents' socioeconomic background on their children's risk of unemployment or welfare benefit receipt has also been found in international studies. Ekhaugen (2009) and Edmark and Hanspers (2015) observed no causal effects of parents' unemployment or welfare benefit receipt in Norway and Sweden but did uncover a significant intergenerational correlation. Vauhkonen et al. (2017) found that parental

receipt of social assistance is a strong predictor of children's social disadvantage compared to other parental social disadvantages in Finland. Kauppinen et al. (2014) also found that in Nordic countries, children whose parents receive social assistance are more likely to receive social assistance themselves. The findings of Wiborg and Møberg (2010) do not support previous evidence of intergenerational transmission through educational achievements but are rather focused on the importance of ascriptive resources. Lorentzen et al. (2012) found that the educational level of parents has strong independent effects on the probability of receiving benefits in Norway.

## 4 Data and empirical methods

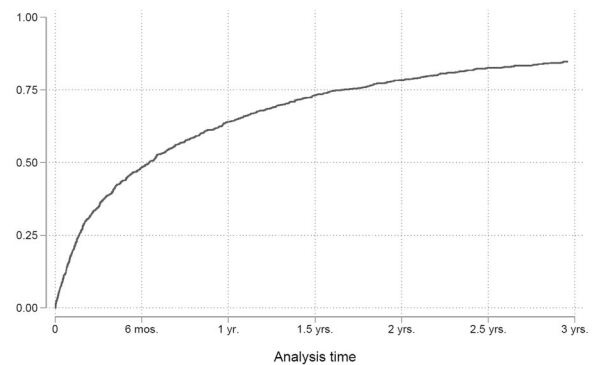
### 4.1 Data and sample

The data used in this analysis are taken from an administrative dataset provided by the Research Data Centre (RDC)

of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB), namely, the Sample of Integrated Welfare Benefit Biographies (SIG). The SIG dataset is an administrative dataset comprising a four percent sample of all UB II recipients during the period from 2007 to 2020. In addition to containing individual information on the sample individuals and their employment biographies on a daily basis, the dataset also contains information on the employment histories of all members of these individuals' benefit receiving units ("Bedarfsgemeinschaft", household hereafter). This unique aspect of the dataset enables the inclusion of information regarding household contexts, such as household composition or parental socioeconomic background, in the analyses of (un)employment histories (Bruckmeier et al. 2020; Dummert et al. 2022). The following analyses include only apprenticeship graduates who were not yet living in their own household at the time of graduation and who initially graduated between 2010 and 2019. The years of 2007 through 2009 and that of 2020 were excluded to ensure that the estimates were not confounded by the Great Recession and the COVID-19 pandemic. Finally, only young apprenticeship graduates who were older than 16 years but younger than 25 years were included in the analyses.

#### 4.2 Definition of successful apprenticeship completion

The data contain information about the current employment status of an employee. Unfortunately, successfully completed apprenticeships cannot be directly identified in the data. Therefore, an apprenticeship is assumed to have been successfully completed if the apprentice had attended the apprenticeship for at least two years and no longer than four years without an interruption of more than 14 days (Dummert 2021; Fitzenberger et al. 2015). Depending on the occupational field, an apprenticeship in Germany generally takes three or three and a half years. Although the German apprenticeship system is strictly regulated, the apprenticeship period can be shortened by up to a year. To do this, an apprentice must have graduated from school with a university entrance qualification ("Abitur") or achieved good marks on the intermediate examination at the vocational school. However, apprenticeship periods lasting less than two years are rare and are likely to comprise early dropout (Patzina and Wydra-Somaggio 2020). For this reason, a two-year period is set as the minimum length of an apprenticeship. For an apprenticeship to be considered successfully completed, its end date must fall between January and August (Zwick and Mohrenweiser 2015; Dummert 2021). This is because final apprenticeship exams generally take place during these months. Furthermore, the apprentice must be observed as holding no vocational degree during the apprenticeship period, and the information on the



**Fig. 1** Kaplan–Meier failure curve (in percentage). Failure: Entry into employment subject to social security contributions. Source: SIG 0720.

apprenticeship occupation must be non-missing in the last apprenticeship spell (Fitzenberger et al. 2015). As a result, 2680 apprenticeship graduates were identified in the data.

#### 4.3 Dependent variables

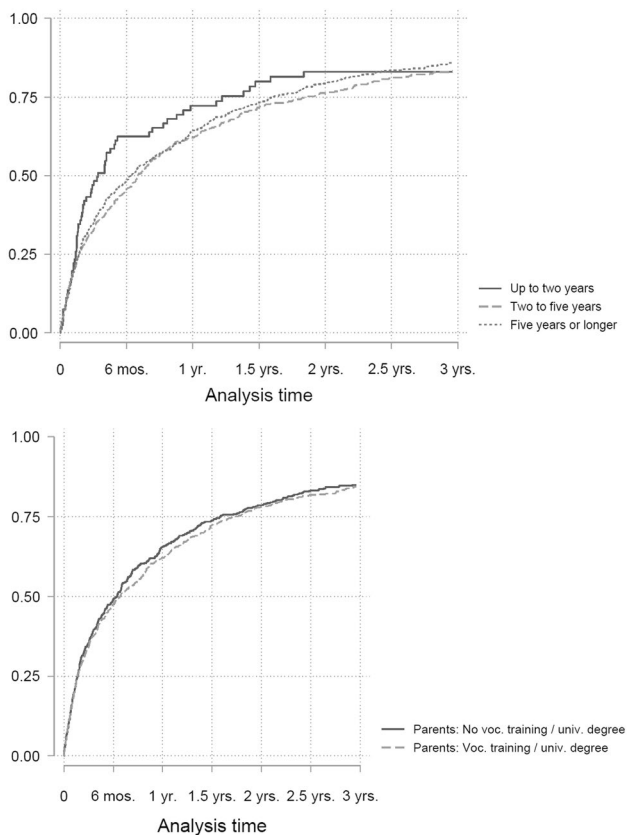
After the completion of an apprenticeship, graduates can find themselves in one of the following employment states: employee subject to social security, unemployed or receiving welfare benefits, marginally employed, reengaged in education/apprenticeship or self-employed. This paper focuses on the state of being unemployed and receiving welfare benefits (hereafter unemployment).

The first research question, i.e., whether parental socioeconomic background influences unemployment risk following apprenticeship graduation, is analysed by the first outcome variable, which takes the value 1 if the graduate was unemployed one month after the end of apprenticeship and 0 otherwise. The highest priority is given to unemployment or benefit receipt notification; thus, if a person has marginal employment as well as being registered as unemployed or is both working and receiving benefits ("Aufstocker"), then the person is treated as unemployed in the following analyses.

The second research question, i.e., the relationship between parental socioeconomic background and the duration of the first unemployment period of apprenticeship graduates who are unemployed directly after graduation, is analysed by the second outcome, the duration of unemployment in days.

#### 4.4 Independent variables

Rather than placing the focus on a single indicator to measure the relationship between parents' socioeconomic background and the two outcome variables as precisely as possible, different factors are considered (Kallio et al. 2016; Vauhkonen et al. 2017). In addition to the



**Fig. 2** Kaplan–Meier failure curves (in percentages) for different subgroups. Failure: Entry into employment subject to social security contributions. Source: SIG 0720.

duration of the household's benefit receipt from 2007<sup>1</sup> through the completion of the apprenticeship (up to two years, two to five years or five years or longer), the parents' highest level of vocational education is of particular interest, distinguishing between parents having no vocational education and parents having completed vocational education or holding a university degree. When both parents were present in the household, their higher vocational status is used. Furthermore, factors such as the presence of siblings younger than 15 years in the household and whether the head of the household was a single parent are accounted for. The individual factors included in the analyses are age at the time of apprenticeship completion, nationality (German or non-German), sex, the occupational sector of the completed apprenticeship, the year of graduation, the duration of the apprenticeship, and the education level of the graduate. Education level is differentiated according to four categories (no school-leaving certificate, low or intermediate secondary

school-leaving certificate and university entrance qualification certificate). All of the individual characteristics and parental socioeconomic factors are taken from the last spell of the graduates' apprenticeship. In addition to parental socioeconomic factors and individual characteristics, the unemployment rate in the district of residence at the time of graduation is also accounted for to control for the possibility of graduates finding a new job in the external labour market. The (temporary) employment of apprenticeship graduates through their training establishment following graduation is often regulated by collective agreements. Unfortunately, the available data do not allow to distinguish between establishments with and without collective agreements. However, existing studies show that the risk of unemployment does not differ between apprenticeship graduates from establishments with collective agreements and those without such agreements (Zwick and Mohrenweiser 2015; Dummert 2021).

Table 1 provides descriptive information on the parental socioeconomic background and individual characteristics of the apprenticeship graduates in the sample. The estimation sample consists of 2680 apprenticeship graduates, of whom 1296 were unemployed a month after graduation. Table 1 shows significant differences at the 5 percent level between graduates who experienced a direct transition into the labour market and those who became unemployed according to the following indicators: receiving benefits for more than two years, the parents' vocational education, age at time of graduation, their own education level, their sex, whether the apprenticeship occupation was in the field of production or personal services, whether the duration of apprenticeship was up to two and a half years or between two and a half and three years, the average year of graduation, and the unemployment rate.

#### 4.5 Empirical methods

Logit models are used in the analysis of the first outcome to assess the risk of unemployment following apprenticeship completion. The average marginal effects (AMEs) are calculated to obtain the actual probability of becoming unemployed. The analysis relies on a quasi-pooled dataset with only a single observation per apprenticeship graduate.

The second outcome, namely, the duration of first unemployment of those graduates who were unemployed directly after graduation, is assessed through a consideration of the transition rate into initial employment (subject to social security) through the use of discrete event history models. The transition (hazard) rate is defined as the conditional probability of leaving unemployment and entering employment in a given time interval  $t$ , given that unemployment persisted until time

<sup>1</sup> Since the data for the first two years following the introduction of UB II are incomplete, the left margin of the dataset corresponds to the year 2007.

**Table 3** Duration of first unemployment after apprenticeship graduation, hazard ratios

	Model I (without parents' socioeconomic background)		Model II (with parents' socioeconomic background)	
	Hazard ratios	Std. dev.	Hazard ratios	Std. dev.
<i>Parental socioeconomic background</i>				
Duration of welfare benefit receipt of the household (ref.: up to two years)				
Two to five years			0.690*	0.153
Five years or longer			0.624**	0.149
Parents: vocational training or university degree			1.043	0.119
Siblings under 15 years			0.845	0.098
Single parent			1.119	0.156
<i>Individual characteristics</i>				
Age at time of graduation	0.966	0.036	0.968	0.036
Nationality (German)	0.883	0.107	0.847	0.105
School education (ref.: no recognized school leaving certificate)				
Low secondary school leaving certificate	1.202	0.252	1.204	0.247
Intermediate secondary school certificate	1.477*	0.326	1.455*	0.314
University entrance qualification certificate	1.403	0.459	1.321	0.420
Sex (woman)	0.730**	0.097	0.735**	0.096
Apprenticeship occupation (ref.: commercial, business-related, IT or other services)				
Production	1.141	0.171	1.129	0.165
Personal services	1.284*	0.188	1.268*	0.181
Duration of apprenticeship (ref.: up to 2.5 years)				
2.5 to 3 years	1.839***	0.282	1.840***	0.275
3 years or longer	1.745***	0.289	1.725***	0.279
Unemployment rate	0.923***	0.018	0.930***	0.018
Log likelihood	− 2328.7997		− 2325.7009	
Likelihood ratio test Model II vs Model I	6.20			
Number of observations	13316			
Number of subjects	1293			
Number of failures	1035			

Piecewise-constant hazard rate model, gamma-distributed frailty term, \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ . The years of graduation and dummy variables for each quarter are included as control variables. Source: SIG 0720

t. A lower likelihood of leaving unemployment implies a longer duration of unemployment, whereas a higher probability of entering employment indicates shorter periods of unemployment. The period of observation begins one month after apprenticeship graduation and either ends with entry into first employment or is right-censored in the case when the graduate does not succeed in entering his or her first employment during the observation period of three years after successful graduation. The estimation sample of the second analysis consists of a subsample from the first analysis (the apprenticeship graduates who become unemployed directly after graduation) and includes 13316 observations of 1293 subjects with 1035 failures, which indicates that an individual started his or her first employment in a given period t. To estimate the hazard rate, a piecewise constant exponential model suitable for controlling the dependence on duration without requiring complicated assumptions

about the time dependency of the event was used (Blossfeld et al. 2007). By introducing a dummy variable for each quarter after the unsuccessful transition following the completion of an apprenticeship, the hazard rate within these intervals is assumed to be constant, but it may vary between quarters. To address unobserved heterogeneity or frailty in the estimates of successful transition from unemployment, a gamma-distributed frailty term is included to account for time-constant, unobserved individual characteristics (Bäckman and Bergmark 2011; Christoph and Lietzmann 2022).

## 5 Empirical results

### 5.1 Effects of parents' socioeconomic background on the risk of unemployment after apprenticeship graduation

First, the effects of parental socioeconomic background on the unemployment risk of apprenticeship graduates



directly following graduation are analysed through the use of logit models. Table 2 shows the results of two models. Model I does not include variables for parental socioeconomic background, while Model II includes these variables. A likelihood ratio test comparing the two models reveals that including parental socioeconomic background improves the model fit. The duration of the household's benefit receipt, parents' vocational training, the presence of siblings and single parent status are therefore all important indicators of the risk of unemployment following the completion of an apprenticeship.

The AMEs of Model II reveal a significant effect of parental vocational education on the likelihood of apprenticeship graduates becoming unemployed after graduation. Graduates with parents who have a vocational training or a university degree are less likely to face unemployment immediately after their apprenticeship than are graduates whose parents do not have these vocational qualifications. The duration of household benefit receipt, the single parent status and the presence of siblings seem to have no significant impact on the risk of unemployment at the second threshold. The graduate's own education level, age at time of apprenticeship graduation and duration of apprenticeship all have significant influences on the probability of being unemployed a month after apprenticeship completion. The greater that an individual's level of education is, the lower their probability of experiencing unemployment. Moreover, a shorter apprenticeship, older age at the time of apprenticeship graduation and a higher unemployment rate in the graduate's district of residence all increase the risk of unemployment after graduation. Adding parental socioeconomic background to the model has only a slight influence on the strength of the individual characteristic effects, with a single exception, i.e., the nationality of the graduate. Model I shows that apprenticeship graduates with German citizenship are less likely to face unemployment directly after graduation than are graduates with non-German citizenship. However, once the indicators of parental socioeconomic background are included in the model (Model II), this effect is no longer significant. Robustness checks, including an interaction term between parents' vocational education and the duration of the household's benefit receipt, also reveal a significant negative effect of parental vocational education on the probability of unemployment after graduation. Additionally, the duration of benefit receipt was also found to have a nonsignificant effect (Table 4 in the appendix). In addition, the AMEs of the duration of benefit receipt at the different levels of parental vocational education (no vocational or university degree,

vocational or university degree) indicate that apprenticeship graduates from households that have had a medium or long benefit receipt period have a greater risk of unemployment after completing their apprenticeships than graduates from households that have had a shorter benefit receipt period as long as their parents have a vocational or university degree. If their parents do not have a vocational or university degree, then there is no evident difference (Table 5 in the appendix).

## 5.2 Effects of parents' socioeconomic background on the duration of unemployment after an unsuccessful transition

Second, the effects of parental socioeconomic background on the duration of the first unemployment period after an unsuccessful transition at the second threshold are analysed through the use of discrete event history models. The Kaplan–Meier failure curve (Fig. 1) shows the proportion of graduates who had left their first unemployment period for every day after the completion of an apprenticeship and an unsuccessful transition. After half a year and after one year, 48 percent and 64 percent of graduates from UB II households with an unsuccessful transition at the second threshold, respectively, had left their first unemployment period. After 2 years and after 3 years, 78 percent and 85 percent, respectively, of the graduates had succeeded in making the transition.

When distinguishing between subgroups, a noticeable difference in the duration of benefit receipt of the household can be observed. As shown in Fig. 2, apprenticeship graduates who come from households with shorter benefit receipt periods experience shorter durations of unemployment than do graduates from households with longer benefit receipt periods. The most obvious difference can be observed after six months, when 62 percent of apprenticeship graduates from households with a benefit duration of up to two years have transitioned to employment, while only 46 and 49 percent of apprenticeship graduates from households with longer benefit durations have successfully transitioned. Subsequently, the proportion of successful transitions between graduates from households with shorter and longer benefit receipt durations continues to equalize throughout the end of the observation period. However, when the Kaplan–Meier failure curve is differentiated according to the level of vocational training of the parents, no significant difference is observed.

To analyse the factors influencing the duration of first unemployment in case of an unsuccessful transition at the second threshold, a piecewise-constant hazard rate model was estimated, and the hazard ratios are displayed in Table 3. Hazard ratios of smaller than one indicate a

decline in the likelihood of leaving the first unemployment and thus imply a longer duration of unemployment, whereas hazard ratios of larger than one imply shorter periods of unemployment.

Table 3 displays the results of two models, Model I, which omits variables for parental socioeconomic background, and Model II, which includes these variables. The likelihood ratio test shows that the inclusion of variables representing parental socioeconomic background does not significantly improve the model fit. This finding suggests that parental socioeconomic background, in contrast to individual characteristics, plays little role in affecting the duration of unemployment in the case of an unsuccessful transition at the second threshold.

The results of Model II show that apprenticeship graduates from households with longer benefit receipt periods who become unemployed after their apprenticeship undergo longer periods of unemployment prior to entering employment than do those from households with shorter benefit receipt periods. On the other hand, parental educational level and other parental socioeconomic background factors do not significantly influence the duration of first unemployment following the completion of an apprenticeship. Graduates with an intermediate secondary school leaving certificate undergo shorter periods of unemployment after completing their apprenticeship than graduates with no recognized school leaving certificate. Moreover, the duration of unemployment is shorter for graduates with longer apprenticeship periods, whereas women and apprenticeship graduates from districts with higher unemployment rates face longer periods of unemployment. The inclusion of parental socioeconomic background has almost no influence on either the strength or the significance of the effects of individual characteristics (see Model I). Robustness checks, including an interaction term between parents' vocational education and the duration of the household's benefit receipt, do not reveal any differences in the main effects or any significant effects of the interaction term (Table 6 in the appendix).

## 6 Discussion and conclusion

Various studies have shown that parents' socioeconomic background influences their children's employment opportunities. Thus, young people from households receiving unemployment benefits are considered disadvantaged in their chances of entering into their occupational careers. In this paper, whether the parental socioeconomic background of apprenticeship graduates from households that receive benefits has an effect on the risk of unemployment after graduation is examined. Furthermore, the influence of the parental home on the

duration of unemployment for apprenticeship graduates who did not succeed in directly transitioning into the labour market is considered.

The results show that apprenticeship graduates whose parents have a vocational training degree or a university degree face with a lower probability of unemployment directly following graduation than apprenticeship graduates whose parents do not have vocational qualifications. In contrast, other parental socioeconomic background indicators, such as the duration of the household's benefit receipt, have no influence on the risk of unemployment. Regarding the duration of the first unemployment following an unsuccessful transition at the second threshold, the results show that the longer the period that the graduate's household has received benefits is, the longer the duration of initial unemployment.

The results suggest that the educational level of the parental home influences the risk of unemployment at the second threshold. Parents with higher vocational education have more opportunities to support their children, even if they receive benefits, e.g., through advisory support. The duration of first unemployment in the case of an unsuccessful direct transition seems to be particularly related to the length of time the household, i.e., the parents, have received benefits. Among other things, the lower stigmatization of longer periods of unemployment might play a role here.

To mitigate any long-term negative effects on further employment careers, support services offered at the second threshold, i.e., during the transition from apprenticeship to the labour market, are essential, particularly for disadvantaged young people from socially weaker parental homes. This importance of such support seems to increase during times of crisis, such as during the COVID-19 pandemic. In Germany, fewer apprenticeship graduates were retained by their training companies during the COVID-19 pandemic (Leber et al. 2023). Future research is needed to determine whether disadvantaged young people are more affected by these conditions, and such research can be conducted as soon as longer-term data become available. A successful transition from apprenticeship to employment is a further important step towards achieving independence from the parental home, a positive career path and the ability to finance one's own livelihood without being dependent on social benefits.

## Appendix

See Tables 4, 5, and 6.

**Table 4** Risk of unemployment one month after completion of apprenticeship, logit model with interaction term between parental vocational education and duration of benefit receipt

	<b>Model II (with parents' socioeconomic background)</b>	
	<b>Coeff.</b>	<b>Std. dev.</b>
<i>Parental socioeconomic background</i>		
Duration of welfare benefit receipt of the household (ref.: up to two years)		
Two to five years	− 0.120	0.267
Five years or longer	− 0.086	0.261
Parents: vocational training or university degree	− 0.816**	0.327
Interaction: duration of benefit receipt # parental vocational education		
Two to five years # parents: vocational training or university degree	0.657*	0.354
Five years or longer # parents: vocational training or university degree	0.588*	0.341
Siblings under 15 years	0.110	0.090
Single parent	− 0.137	0.105
<i>Individual characteristics</i>		
Age at time of graduation	0.073***	0.028
Nationality (German)	− 0.106	0.099
School education (ref.: no recognized school leaving certificate)		
Low secondary school leaving certificate	− 0.365*	0.204
Intermediate secondary school certificate	− 0.961***	0.205
University entrance qualification certificate	− 1.363***	0.255
Sex (woman)	− 0.042	0.101
Apprenticeship occupation (ref.: commercial, business-related, IT or other services)		
Production	0.166	0.115
Personal services	− 0.076	0.107
Duration of apprenticeship (ref.: up to 2.5 years)		
2.5 to 3 years	− 0.611***	0.120
3 years or longer	− 0.701***	0.130
Unemployment rate	0.085***	0.016
Log likelihood	− 1736.6426	
N	2680	

Logistic regression, robust standard errors, \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ . The years of graduation are included as control variables. Source: SIG 0720

**Table 5** Risk of unemployment one month after completion of apprenticeship, average marginal effects of the duration of benefit receipt at different levels of the parents' vocational education

	<b>Duration of welfare benefit receipt of the household (ref.: up to two years)</b>			
	<b>Two to five years</b>		<b>Five years or longer</b>	
	<b>Average marginal effects (AME)</b>			
	<b>dy/dx</b>	<b>Std. dev.</b>	<b>dy/dx</b>	<b>Std. dev.</b>
Parents: no vocational training or university degree	− 0.028	0.061	− 0.020	0.060
Parents: vocational training or university degree	0.119**	0.050	0.111**	0.051
N	2680			

Logistic regression, average marginal effects, robust standard errors, \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ . Source: SIG 0720

**Table 6** Duration of first unemployment after apprenticeship graduation, hazard ratios with interaction term between parental vocational education and duration of benefit receipt

	Hazard ratios	
	Model II (with parents' socioeconomic background)	
	dy/dx	Std. dev.
<i>Parental socioeconomic background</i>		
Duration of welfare benefit receipt of the household (ref.: up to two years)		
Two to five years	0.598*	0.176
Five years or longer	0.522**	0.157
Parents: vocational training or university degree	0.723	0.300
Interaction: duration of benefit receipt # parental vocational education		
Two to five years # parents: vocational training or university degree	1.408	0.625
Five years or longer # parents: vocational training or university degree	1.528	0.665
Siblings under 15 years	0.847	0.098
Single parent	1.110	0.155
<i>Individual characteristics</i>		
Age at time of graduation	0.967	0.036
Nationality (German)	0.849	0.105
School education (ref.: no recognized school leaving certificate)		
Low secondary school leaving certificate	1.177	0.242
Intermediate secondary school certificate	1.429*	0.308
University entrance qualification certificate	1.301	0.414
Sex (woman)	0.731**	0.095
Apprenticeship occupation (ref.: commercial, business-related, IT or other services)		
Production	1.121	0.164
Personal services	1.271*	0.181
Duration of apprenticeship (ref.: up to 2.5 years)		
2.5 to 3 years	1.818***	0.271
3 years or longer	1.716***	0.277
Unemployment rate	0.931***	0.018
Log likelihood	- 2325.2137	
Number of observations	13316	
Number of subjects	1293	
Number of failures	1035	

Piecewise-constant hazard rate model, gamma-distributed frailty term, \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ . The years of graduation and dummy variables for each quarter are included as control variables. Source: SIG 0720

### Abbreviations

IAB	Institute for Employment Research
SGB II	Social Code Book II
SIG	Sample of Integrated Welfare Benefit Biographies
UIB	Unemployment Insurance Benefit
UB II	Unemployment Benefit II

### Acknowledgements

I would like to thank the editor and the two anonymous reviewers of this journal as well as the participants at the 27th annual workshop transitions in youth (TIY), the ISA RC28 Spring Meeting 2021 and the annual conference of the Society for the Advancement of Socio-Economics (SASE) 2021 for their invaluable feedback.

### Author contributions

Sandra Dummert prepared, analysed and interpreted the data and wrote the entire manuscript in single authorship.

### Funding

There are no fundings to declare.

### Availability of data and materials

The data basis of this paper is the Sample of Integrated Welfare Benefit Biographies (SIG 0720 v2). The data are available at the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB), <https://doi.org/10.5164/IAB.SIG0720.de.en.v2>.

### Declarations

#### Competing interests

There are no competing interests to declare.

Received: 26 September 2023 Accepted: 14 March 2024  
Published online: 27 April 2024

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