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## Temporary employment and further training. Does training promote the transition from temporary to permanent employment?

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### ABSTRACT

The article analyses the returns to further training courses among a vulnerable group: the temporary employed. We address the important question of whether non-formal further training promotes the transition to permanent work and thus helps to escape precarious employment trajectories. According to human capital theory, work-related training increases workers' productivity and might also serve as a positive signal to employers, as signaling theory suggests. On the other hand, firms may combine training and transitions to permanent jobs for selected workers. We use data from the German Educational Panel Study and apply event history models to test these conflicting theoretical assumptions. In general, the results suggest positive effects of non-formal further training on transitions to permanent work. Especially employer-funded training shows a strong correlation with transitions within the same firm, but not with transitions to other firms. This seems to be both due to signaling of motivation and firm internal pathways that combine training and transitions. Individual, self-funded training on the other hand does not seem to affect any transition chances further indicating that firm-internal mechanisms are more important than human capital development.

### 1. Introduction

Flexible forms of employment are widespread in many countries (Kalleberg, 2018). For workers, these jobs are partly associated with insecurity, precarity, and exclusion (Gundert & Hohendanner, 2014; Morgenroth, Schels, & Teichler, 2022). One of the most important and prevalent forms of flexible employment are temporary contracts (Latner, 2022). This form of flexibility is a double-edged sword for employees: For some, fixed-term employment serves as a (re)entry opportunity into the labor market or as a stepping stone into permanent employment (Gash, 2008; Gebel, 2013), while another part is confronted with unemployment or renewed temporary work at the end of the fixed-term period and thus with considerable precariousness risks (Giesecke & Groß, 2002). Moreover, transitions to permanent positions not only improve employment security, but are also often accompanied by wage increases (Fauser, 2024; Latner, 2024). It is therefore natural to ask about conditions and opportunities that improve the chances of transition. One possibility that is often mentioned in the public debate is further training and qualification of employees. The goal of this paper is to analyze the relationship between further training and the transition to permanent employment in Germany.

Theoretically, further training could counteract insecure and precarious employment trajectories by providing new knowledge and skills, which both workers and firms generally want to make use of. Studies show that the transition probability increases with formal education and job level (Kiersztyn, 2021; Reichelt, 2015; Schmelzer, Gundert, & Hohendanner, 2015). Accordingly, further training might also enhance transition opportunities. Previous research additionally showed that further training is associated with job stability at the current employer and fewer job changes among workers in general (Dolton & Kidd, 1998; Ebner & Ehlert, 2018; Parent, 1999; Veum, 1997). The question is whether this also holds for fixed-term employees given that they often have poorer opportunities for further training than employees in a standard employment relationship (Adolfsson, Baranowska-Rataj, & Lundmark, 2022; Bellmann, Grunau, & Leber, 2015; Fouarge, Grip, Smits, & Vries, 2012).

The few studies that have explored the link between further training and transitions to permanent employment generally find a positive correlation in the Netherlands, Japan, and Australia respectively (Fouarge et al., 2012; Higuchi, 2013; McVicar, Wooden, Leung, & Li, 2016). Yet, McVicar et al. (2016) find that the correlation is driven by selection after applying fixed-effects to their models. Germany is an

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interesting additional case to study the effect of further training on transitions to permanent employment, because labor market dualization makes such transitions less likely. The relatively strong employment protection for permanent employment and the weak protection for temporary employment in Germany lead to a sharp divide between labor market "insiders" with regular contracts and labor market "outsiders" with fixed-term contracts (Biegert, 2014; Hassel, 2014; OECD, 2020; St-Denis & Hollister, 2023). Thus, the barriers for transitions to permanent positions are rather high. At the same time, the incidence of temporary employment is comparatively large in Germany, at around 13 % of the workforce, placing it in the European midfield (eurostat, 2019).

The relationship between further training and the transition to permanent employment is likely to differ significantly depending on the type of further training and the type of transition to permanent jobs. In this study, we examine the effect of non-formal further training, which is characterized as intentional and institutionalized learning and does not lead to a formal educational certificate. Non-formal further training typically consists of relatively short, work-related courses and seminars and is the most widespread form of adult education among workers in Germany and many other countries (Cedefop, 2015). It is thus different from formal further training such as returning to university to get a M.A and informal learning activities like reading a journal or learning from colleagues (eurostat, 2016).

For the present study, it is important to differentiate between courses funded by employers and those funded by employees. Most further training is paid for by employers as part of their human resources strategy. Thus, there may be a direct connection to decisions about permanent contracts. This connection is possibly weaker for employee-funded courses. Furthermore, the importance of further training could differ depending on whether the transition is to a permanent position within the current firm or to a different firm (Fouarge et al. 2012). This also has consequences for the workers, because transitions to permanent positions within the firm lead to larger wage gains than changing employers (Fauser, 2024). In this paper, we therefore investigate the following research questions: First, does participation in non-formal further training increase the chance of transition to permanent employment in Germany for temporary workers? Second, are there differences in transition probabilities between different types of further training?

To answer the research questions, we use the high-quality panel data of the adult cohort (SC6) of the National Education Panel Study (NEPS). The data allows us to track temporary employed workers in Germany and to determine the time of transition to a permanent contract in the current firm, which we will refer to as an "internal transition", or in other firms, referred to as an "external transition". Furthermore, it offers a fine-grained measurement of different types of non-formal further training. Finally, it also includes measurements of many individual-level and firm-level factors that may confound the relationship between non-formal further training and transitions to permanent positions.

The article makes several contributions to the literature: First, our results contribute to a better understanding of the conditions under which temporary employment can have a bridging function to permanent employment. Second, we add to the body of knowledge on the returns to further training by examining its role for employment stability in a group with unstable contracts. Third, we replicate and contextualize the existing results on the role of further training for transitions to permanent employment from different countries with data from Germany.

The article is structured as follows: In Section 2, we provide an overview of the literature. Then, in Section 3 we review the literature on work-related non-formal training and fixed-term employment in Germany. We then introduce the theories relevant to our research questions and derive hypotheses in Section 4. After describing the data and methods in Section 5, we present the empirical results in Section 6. The article concludes with a discussion of the results.

## 2. Research on effects of training on transition probabilities to permanent work

To our knowledge, there are three previous studies that aimed to analyze the relationship between further training and transitions from temporary to permanent contracts. Two are from countries that have a dualized labor market comparable to Germany, namely the Netherlands and Japan, while the third is from Australia, which features a more liberal labor market with generally lower employment protection (OECD, 2020).

Using EU Labor force Survey data for the Netherlands, Fouarge et al. (2012) show that employer-funded non-formal further training for temporary employees is positively correlated with transitions with the same employer. Simultaneously, this form of training reduces transition chances with other employers. Self-funded training on the other hand was not found to be connected to transitions. However, the training measure that the authors use captures only training occurring within the previous four weeks. Thus, training participation might be heavily underestimated, as previous training courses are not considered.

In the study on Japan, Higuchi (2013) found that men were able to improve their chances of obtaining permanent employment with the same employer through employer-funded mandatory training in the last year, while women were more likely to benefit from training (both firm-funded and self-funded) when it came to transitioning to permanent employment with other employers. However, the paper used a rather uncommon training measure to analyze the impact of training on transitions. Instead of using information on the financing of training to distinguish self- and firm-funded training, the author differentiated between mandatory firm-initiated further training and voluntary further training that could either be self- or firm-funded in the previous 12 months.

McVicar et al. (2016) show a positive correlation between further training and transition processes among men in Australia. Yet, when they added individual fixed-effects to their regression models, the coefficients became much smaller and statistically non-significant. They conclude that the observed relationship between training and transitions is not causal, but instead results from selection into training. They use a broad training measure that captures training during employment in the last 12 months with the aim of enhancing skills. Thus, employer-funded and self-funded training is lumped together. Furthermore, no distinction is made between transitions within the same employer and to a different employer.

All three papers use further training measures that are not linked to the current job. Consequently, it cannot be ruled out that training considered in the models took place in a previous or a second job. In addition, while all papers use standard individual level control variables, such as formal education, they do not control for important individual-level confounders, such as ability or personality traits, and important firm-level confounders, such as human resources policies. Clearly, this heterogeneity is captured by the fixed-effects analyses in McVicar et al. (2016), yet at the cost of excluding non-switchers from the estimation, because only those with a transition can be used for these analyses.

Our study contributes to the literature by replicating the previous findings based on more detailed data from a country that has not previously been studied. The NEPS data we use offers a fine-grained measurement of further training – including course funding – and enables linking training spells with employment spells. Second, the NEPS provides a wider range of individual-level and firm-level control variables than the previous studies. This leads to more precise estimates of the impact of further training on transitions to permanent employment, considering the important distinctions between funding of the courses and job mobility.

### 3. Background: Non-formal further training and fixed-term employment in Germany

Currently, there are two main forms of temporary work arrangements and a number of other special regulations in Germany. In the case of new hires, it is possible to initially limit the duration of employment contracts without an objective reason (“*Sachgrundlose Befristungen*”). A maximum duration of two years applies and no more than three extensions of the fixed-term contract are possible within this period. Deviations from this two-year rule are only possible if the collective bargaining partners negotiate a different maximum period, in the case of a newly established firm or in the case of unemployed persons aged 52 years or older. There are also fixed-term contracts with an objective reason (“*Befristungen mit Sachgrund*”). Although these are not subject to a time limit, they are only justified if there is a corresponding objective purpose. This includes, for example, a temporary position as a replacement for parental leave or illness, or positions in projects with temporary external funding. Special legal rules apply to certain areas, such as in science or for physicians in further training (Hohendanner, 2018).

In international comparison, it is rather easy to hire temporary workers in Germany. Based on the OECD indicator for the overall strictness of hiring temporary workers, including temporary agency work, Germany is below the OECD average (OECD, 2020). When only fixed-term contracts are considered, the regulations are even less strict in international comparison. Here, the strictness is even lower than in the Netherlands.

By far the most prevalent form of temporary employment in 2018 were contracts without an objective reason, accounting for 1800,000 contracts (Seils, Emmler, & Rogall, 2020). In contrast, fixed-term contracts with an objective reason affected around 900,000 employment contracts. All other fixed-term arrangements affected significantly smaller groups of employees. While the share of other types of fixed-term contracts in Germany has remained fairly stable over time, the number of fixed-term contracts without objective reason has more than tripled since the turn of the millennium, rising from 554,000 to 1800,000 (Seils et al., 2020).

The chances of moving to permanent employment should be highest among those who have a fixed-term contract without an objective reason, as they are neither subject to structural barriers nor to short-term replacement needs compared to those with other forms of fixed-term contracts. According to Hohendanner (2014), fixed-term contracts without an objective reason are often used to extend probationary periods<sup>1</sup> and therefore fulfill the so-called bridging and stepping stone function into permanent employment more often than other forms of fixed-term employment. However, even with other forms of fixed-term contracts, the possibility of transitioning to permanent employment cannot be ruled out. This is merely less likely, as extended probationary periods play little or no role in these employment contracts.

Research on temporary employment provides evidence for both the bridging (or stepping stone) function and the trap scenario (Filomena & Picchio, 2022). Several studies suggest that temporary jobs can serve as a pathway to secure a permanent employment in Germany (Boockmann, 2006; Gash, 2008; Gebel, 2010, 2013; Schäfer, 2019). At the same time, others find that temporary employment in Germany may not lead to permanent employment but traps workers in precarious job trajectories (Boockmann, 2006; Gebel, 2010; Giesecke & Groß, 2002).

In fact, these two scenarios are not mutually exclusive; rather, the key question is under what circumstances and for which groups each scenario applies (Latner & Saks, 2022; Mattijssen, Pavlopoulos, & Smits, 2022). Latner and Saks (2022) highlight the important role of the reference group in the bridge-or-trap debate: When the comparison

<sup>1</sup> In Germany, all new employment contracts have a probationary period of up to 6 months, during which both parties have a short-term special right of termination.

group is unemployed individuals, the bridging thesis is more likely to be supported. In contrast, when permanent workers serve as the reference group for temporary workers, the literature tends to identify a trap scenario.

Considering all workers regardless of contract type, non-formal further training is mainly connected with employment stability in Germany. Previous studies indicate that further training participation reduces transitions to unemployment and increases the probability that employees will stay with the current employer (Dieckhoff, 2007; Ebner & Ehlert, 2018). At the same time, upward mobility due to training seems to occur only in certain labor market segments and is generally low after controlling for unobserved heterogeneity (Ehlert, 2017; Görlitz, 2011; Pischke, 2001). There is evidence, however, that non-formal further training certificates increase the chance of being hired when applying for a new job (Schimke, 2023).

### 4. Theoretical background and hypotheses

Human capital theory predicts a positive effect of any kind of further training on transitions to permanent jobs. An important assumption of human capital theory is that participation in education leads to increases in skills and, as a result, individual productivity levels rise (G. S. Becker, 1975). In principle, employers should have a strong incentive to retain productive workers over less productive workers. In this sense, temporary workers who participate in further training should have better chances of obtaining permanent contracts than temporary workers who do not participate in training. Based on these considerations, we derive our first hypothesis:

#### H1. : Participation in further training leads to a higher transition probability to permanent employment.

However, non-formal further training is characterized by great heterogeneity. This has important implications on its effects. Compared to formal continuing education, non-formal courses and training programs tend to be of short duration, but the scope of this form of training is nevertheless very broad. It ranges from work-related courses that last only a few hours to very time-intensive courses that can stretch over several months and hundreds of hours. In addition, some individuals participate in a very large number of courses each year, while others participate in only a few or none at all. From a human capital theory perspective, longer durations of training should lead to greater effects, as more human capital gains can be expected. Therefore, we formulate a second hypothesis that predicts this relationship:

#### H2. : The likelihood of transition to permanent employment increases with duration of further training participation.

Human capital theory also suggests that it makes a difference for transitions to permanent positions whether training was funded by the employer or by the worker. This is based on the differentiation between general and firm-specific human capital. Human capital theory assumes that self-funded further training leads to general human capital. This is because rational individuals only invest in skills that are of general use on the labor market and not just in one firm to increase their wage bargaining potential. Thus, according to this line of reasoning, self-funded further training should be beneficial for both internal and external transitions. Therefore, our third hypothesis is:

#### H3. : Participation in self-funded further training leads to a higher transition probability to permanent employment.

Based on signaling and screening theories however, self-funded training could have a different impact. Self-funded training can signal both skills and special motivation and high professional commitment on the part of the employee (Arrow, 1971; Spence, 1973). However, the signals have to be perceived by the employers to be used for screening. In the case of external transitions, workers can mention training participation on their resumes. Schimke (2023) showed that mentioning

further training in applications increases the chance of being hired. For internal transitions, it is less likely that the employer will observe the self-funded trainings. Accordingly, self-funded further training should have larger effects on external transitions as formulated in our next hypothesis:

**H4. : Self-funded further training increases the chances of an external transition to a greater extent than the chances of an internal transition.**

If firm-specific human capital is accumulated through firm-funded training, the probability that the employee will remain in the firm should increase, since the human capital gained can be optimally utilized there. Accordingly, both the firm and the employee are interested in a sufficiently long employment relationship, whereby the revenues ultimately exceed the costs of further training (R. Becker & Hecken, 2008). Human capital theory suggests that firms should not invest in general human capital because they would fear losing their employees to other firms (Leber, 2000).

From the employer's perspective, participation in training could also be seen as a positive signal that the employees involved are highly motivated. In line with this, Autor (2001) showed that temporary agency firms provide training to screen their workers for productivity. Consequently, it should be irrelevant for the transition chances whether non-formal training leads to human capital gains or not. Rather, the training participation per se should already lead to higher probabilities of moving to permanent employment. Ultimately, both the specific human capital perspective and the screening perspective imply that firm-funded training should lead to transitions to permanent positions within the current firm. This is reflected in our fifth hypothesis:

**H5. : Firm-funded further training increases the chances of an internal transition to a greater extent than the chances of an external transition.**

From a signaling and screening perspective, it should furthermore make a difference whether firm-funded training participation was voluntary. Workers wanting to signal their skills and motivation are likely to take any training chance they can get and not just mandatory trainings. For employers on the other hand, workers who take part in courses voluntarily are visible and may be perceived as higher skilled or more motivated. From this perspective, voluntary firm-funded further training should have an effect on internal transitions. Following this, we formulate our next hypothesis:

**H6. : Firm-funded voluntary further training increases the chances of an internal transition to a greater extent than firm-funded mandatory training.**

With regard to possible effects of firm-funded training, transaction cost theory can also be used as a theoretical perspective that takes greater account of firm cost calculations (Williamson, 1981). According to this theory, the chances of receiving firm-funded training are likely to be lower for temporary employees than for permanent employees, since the uncertainty about the length of the employment relationship makes investments in further training much riskier (Fritsch & Schank, 2005; Neubäumer & Tretter, 2008). Therefore, firms primarily invest in the human capital of their temporary employees when they expect a payback of the training costs. As a rule, this is only the case when a longer-term employment perspective already exists, i.e. when a transition is likely or has even already been decided or implemented. Consequently, firm-funded training is likely to be understood less as a cause of transitions to permanent positions than as part of the transition process itself or even as a consequence of it. Accordingly, training does not necessarily have to precede the transition, but can also take place after it, especially if individuals change jobs within the firm after getting a permanent contract (Westerman, 2021). In any case, further training should occur relatively soon before or after the transition, once an initial screening phase has been completed and the productivity of the

temporary employee can be better assessed. Based on this reasoning we introduce our next hypothesis:

**H7. : Firm-funded further training in the same year of transition is more strongly related to internal transitions than firm-funded training in the year before.**

In addition to that, this line of reasoning also implies a counter-hypothesis to H6. It is possible that employees perceive further training courses that are completed as part of a planned or ongoing transition as mandatory. They could be initiated by the firm as part of the transition process and explicitly or implicitly made a condition for the transition. Even if the employer does not explicitly request training participation, it may be perceived as mandatory by the employee if it was discussed in connection with the transition to a permanent contract. Accordingly, our counter hypothesis to H6 is:

**H8. : Firm-funded mandatory further training increases the chances of internal transitions to a greater extent than firm-funded voluntary further training.**

## 5. Data, sample and methods

### 5.1. Data

We use data of the adult cohort (starting cohort 6) from the National Educational Panel Study (NEPS) for our analyses (Blossfeld & Roßbach, 2019).<sup>2</sup> With fourteen survey waves now available in the period 2007–2021 and a largely seamless recording of the educational and employment histories of 17,140 adults born between 1944 and 1986, the data offer high potential for investigating educational returns of various kinds in Germany. For the present study on the influence of training on the transition probability from temporary to permanent employment, they are particularly suitable. Most notably, NEPS records non-formal work-related training in a very differentiated way in terms of both form and scope. Moreover, employment histories and, in particular, fixed-term employment contracts are surveyed in great detail. Another advantage of the data is the rich set of additional background characteristics for each individual. This information makes it possible to deal with confounding and selectivity problems by accounting for differences between training participants and non-participants.

### 5.2. Sample

A total of thirteen survey waves (2009–2022) of the Scientific Use File version 14.0.0 are used for the analyses (NEPS-Netzwerk, 2023). Since no further training information was collected in the first survey wave (2007/2008), this wave is excluded from the analyses. The analysis sample is limited to individuals of prime working age between 23 and 55 years old.<sup>3</sup> Individuals over 55 years are excluded because the near retirement age increases the complexity of employment histories. In particular, it is questionable to what extent the employees themselves are still interested in longer-term employment. The sample is also reduced to individuals who are in temporary employment at some point in their employment histories between 2009 and 2021. We removed all employment spells that are part of apprenticeships and that occur parallel to formal education to ensure that temporary employment is not due to education.

For the analyses, the employment biographies are left-censored at

<sup>2</sup> The NEPS is carried out by the Leibniz Institute for Educational Trajectories (LifBi, Germany) in cooperation with a nationwide network.

<sup>3</sup> The minimum age of 23 is derived from the SC6 sample in which the youngest respondents are 23 years old. In fact, 23–55 years refers to the age when they are being observed in temporary employment for the first time. Thus, there are observation years in the sample where respondents are actually older than 55.

the point where a temporary employment is observed for the first time during this period. In order to capture the transitions of temporary employees, we then create episodes from the beginning of the temporary employment until either the transition to permanent employment, another labor market state or right censoring in temporary employment. As soon as a change of state has occurred, the episode is manually right-censored at this point.<sup>4</sup> Furthermore, only employment histories that cover at least two observation points (person-years) in a row are considered. This is necessary to ensure that further education and other covariates can be measured before the transition (see below). Possible re-entries into temporary employment after an observed transition to permanent employment are also regarded in the processing, i.e. persons may also be “at risk” again after a transition. Ultimately, this results in a sample size of 1136 temporary workers with a total of 2288 person-years observed. A detailed description of the analysis sample can be found in table A1 and figure A1 in the online appendix. Table A2 in the appendix also shows which steps of data preparation lead to which reduction in the number of cases. Table A2.1 compares the distributions of some demographic covariates between the initial and the final sample. Finally, in figure A2 we visualize the prepared data structure and the concept of “person-years” that we use.

### 5.3. Variables

For our analyses we make use of two different central *dependent variables* on employment status for each person-year. The first one is a dummy variable which only differentiates between transition and no transition to permanent employment and is used for testing H1 and H2. The other one is a status indicator with five characteristics: 1. “Temporary”, 2. “Temporary with another firm”, 3. “Permanent”, 4. “Permanent with another firm”, or 5. “Other” (unemployed, inactive, in training or in other types of employment<sup>5</sup>). This variable is formed using various firm- and employment-related information. It is used for testing the remaining hypotheses.

Fig. 1 illustrates the distribution of these different employment statuses in our sample by summarizing the trajectories of employees with fixed-term contracts. There are two main takeaways from this figure. First, it becomes clear that temporary employment phases tend to be

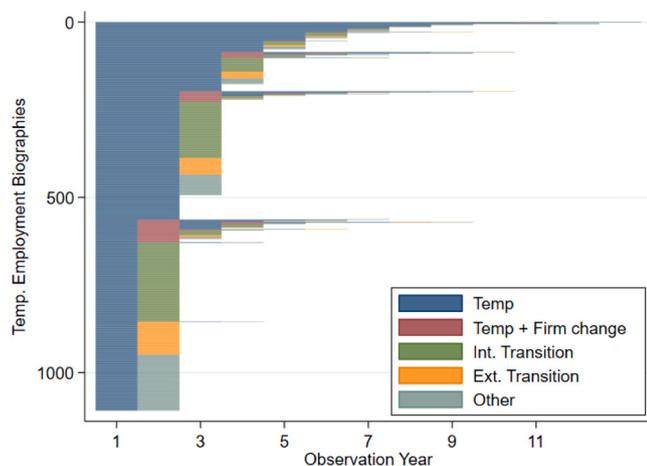


Fig. 1. Sequence index plot of the episodes in the analysis dataset. Source: Own calculations based on NEPS SC6 14–0–0.

<sup>4</sup> With exception from the change of “temporary” to “temporary with another firm” because technically this leads to still being “at risk”.

<sup>5</sup> Other employment types include self-employment, freelance work and employment in the family business.

short. After two years, only a minority of the temporary workforce remains in this status with the same employer. Second, the majority of temporary workers makes the transition to permanent work. Indeed, more than 60 % of fixed-term employment ends in permanent employment (see also table A3 in the appendix for exact numbers). While the majority of workers in our sample appear to use temporary employment as a stepping stone to permanent positions, the data also reveal that a significant portion of workers do not and instead remain in precarious employment trajectories over multiple years.

Based on the question whether the respondent has participated in any courses since the last wave or since the start of the employment episode, we form three central *independent variables* for each person-year: Participation in further training, participation in firm-funded training, and participation in self-funded training. We define further training as any non-formal course for which the respondent indicated a job-related motive. All training courses that are reported in the context of an employment episode and are either financed by the employer or take place during working hours are considered as firm-funded training. Self-paid training courses, on the other hand, are work-related but took place outside working hours and were financed by employees themselves (Grüttgen, Helbig, & Ehlert, 2023).<sup>6</sup> Furthermore, based on the respondents' assessment, we distinguish between voluntary and compulsory courses.

Whereas the NEPS asks for the date of transition to permanent employment by month and year, the exact timing of participation in training courses between two waves is not known. Therefore, it is often unclear whether the course participation took place before or after the transition. To ensure that training courses precedes the transition to permanent work in the models, the central independent variables of further training participation and all other covariates are lagged and refer to T-1<sup>7</sup> (see Figure A2).

### 5.4. Empirical strategy

To estimate the training impact on transition chances, we use Competing Risks Event History models for discrete time with clustered standard errors (Rabe-Hesketh & Skrondal, 2011). These models are able to accurately model the temporal sequence of events. Thus, we can examine whether training actually precedes transitions in time, as predicted by some theories. Since some respondents were already in temporary employment at the first observation point, we are partly dealing with left-centered data, which is also known as the “delayed entry” problem (ibid.). We address this by assigning the current employment duration (which is always known due to the retrospective recording of employment in NEPS) to the first observation of individuals with left-centering as a starting hazard. Employment duration is included in the models as a baseline hazard in the form of six dummy variables.<sup>8</sup>

To account for selection and to avoid confounder bias, it is important to consider which factors influence both the participation in further training and the chances of transitioning to permanent employment. At the macro level, there is a strong correlation of both variables with cyclical conditions in the labor market or in the respective industry (Brücker, Walwei, Klinger, & Möller, 2013; Dieckhoff, 2013; Hohen-danner & Gerner, 2010). There are also strong sectoral differences in

<sup>6</sup> In the NEPS data, information about financing and timing with regard to working hours is only available for up to two randomly selected courses. As a result, there is a discrepancy in the training rates between general further training on the one hand and firm-funded training and self-funded training on the other hand.

<sup>7</sup> With the exception of the model for testing hypothesis 7, in which training attendance deliberately refers to T0.

<sup>8</sup> These dummies consists of the following six employment duration categories: 1. up to 1 year, 2. > 1 and <= 2 years, 3. > 2 and <= 4 years, 4. > 4 and <= 6 years, 5. > 6 and <= 10 years, 6. > 10 years.

Germany regarding the chances of transitioning as well as the opportunities of training (Hohendanner & Gerner, 2010; Hubert & Wolf, 2007). At the individual level both factors are also influenced by qualifications and job tasks. In addition, there is also ample evidence in the literature that age, work experience, and working hours, as well as the size of the firm and the firm's HR policy, are related to both variables (Cedefop, 2015; Giesecke & Groß, 2002; Hohendanner & Gerner, 2010; Kleinert & Wölfel, 2018).

We can control for these confounding factors in the regression model because the NEPS provides a wide range of additional information. Based on retrospective data, we have developed a set of cumulative indicators to measure employment and unemployment experience, as well as the duration of employment in the current job. In addition, several sociodemographic and employment- and firm-related characteristics are operationalized and considered in the analyses to control for entry selectivity into further education and transitions. Thus, we control for the following individual-level factors: gender, age, age squared, education, employment experience, unemployment experience, socioeconomic status (ISEI). To capture the influence of job and firm characteristics, we furthermore add occupational area (KldB 2010 – first digit), public service, working hours, firm size, and financing of training in the firm. Furthermore, we add wave dummies to capture the influence of the economic cycle.

We deliberately decided not to apply fixed-effects modeling for our analyses because we are mainly interested in describing the relationship between further training and the timing of transitions in comparison to those who remain in temporary employment. While the fixed-effects approach is better suited to recover causal effects because it controls for unobserved time-constant heterogeneity, this comes at the cost of a reduced sample that excludes workers in temporary jobs without transitions. Furthermore, the fixed-effects approach is less well suited to provide information about the timing of the event and assumes equivalence of transitions from and to temporary employment. We therefore believe that our model provides a more encompassing description of the influence of further training on the process of transitioning to permanent employment, which varies in duration and is usually one-way. At the same time, we acknowledge that our strategy may lead to biased estimates of the effect of further training because we cannot control for unobserved factors. To get an idea about the influence of important unobserved factors, we use the rich data from the NEPS to conduct robustness checks controlling for cognitive competencies and personality traits (see 5.3). Both are factors that can influence training participation as past research has shown (Gauly & Lechner, 2019; Laille, Anger, & Baumann, 2020).

## 6. Results

### 6.1. Descriptive results

Fig. 2 shows that the average further training participation rates of persons who transitioned internally (39 %) or externally (36 %) are noticeably higher than those of persons who stay on fixed-term contracts (32 %). The lowest average training rate is shown by the group of temporary employees who change firms (20 %) and persons who change to another labor market status (25 %). These differences appear to be driven mainly by firm-funded training, as there are similar differences in training rates between the five outcome groups. The self-funded training rates however hardly differ at all between the five groups and are in general on a very low level of 5 % or less.

Overall, it is already quite evident that there is a positive correlation between training participation and transition probabilities. However, this correlation may also be due to confounding factors that influence both participation in training and transitions. Moreover, these analyses do not consider the temporal sequence of further training and transitions. Therefore, in the next step, we examine these correlations using multivariate event analysis models.

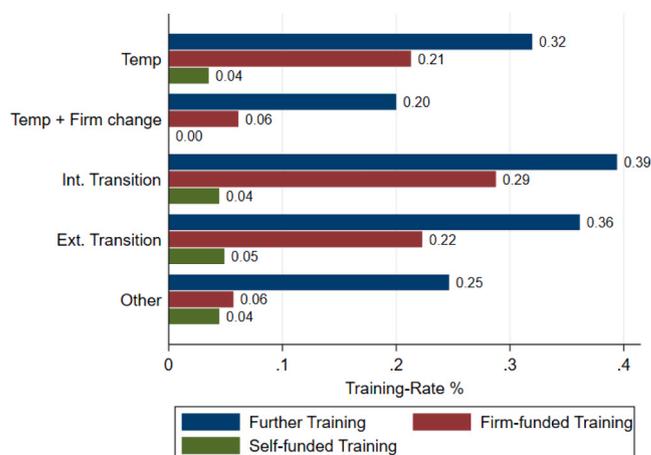


Fig. 2. Average annual further training rates by labor market status in the last person-year. Source: Own calculations based on NEPS SC6 14–0–0. Note that “firm-funded” and “self-funded” do not add up to total “further training” due to measurement issues, see footnote 6.

### 6.2. Multivariate results

The results of the multivariate analyses on the association between further training and the subsequent transition chances are shown in Table 1 (Full regression outputs are shown in tables A4–A13 in the online appendix).<sup>9</sup> In model 1, we observe a statistically significant relationship between training and transitions to permanent employment. Specifically, training participation increases the transition probability by more than five percentage points. Compared to the observed overall transition probability of roughly 60 % across all episodes, this association is comparatively small. Nevertheless, it supports hypothesis H1, which assumes a positive association between training and transitions into permanent employment. To investigate the influence of different training intensities, model 2 uses a categorical variable on training duration in hours (see table A1 for a distribution of this variable). Contrary to our expectation in hypothesis H2 that longer participation should be associated with higher transition probabilities, medium-

Table 1

Event history model for discrete time intervals: Further training and transitions to permanent employment. Average marginal effects.

| DV: Transition (Dummy)           | Model 1 (H1)        | Model 2 (H2)        |
|----------------------------------|---------------------|---------------------|
| Further Training                 | 0.054***<br>(0.020) |                     |
| <i>h</i> of training             |                     |                     |
| 1–8 h training in previous year  |                     | 0.046<br>(0.040)    |
| 9–40 h training in previous year |                     | 0.076***<br>(0.029) |
| > 40 h training in previous year |                     | 0.032<br>(0.030)    |
| N (person-years): 2288           |                     |                     |

Source: Own calculations based on NEPS SC6 14–0–0. Baseline condition: fixed-term. Average marginal effects are shown. Standard errors in parentheses and clustered for individuals. Both models include the following control variables: Age, age squared, gender, education level, socioeconomic index (ISEI), length of employment, hours worked, work experience, unemployment experience, job requirements (occupational level), occupational area, establishment size, public sector, funding of training in firm, skill level and wave dummies. \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01.

<sup>9</sup> A basic description of the sample itself, training participation and transitions can be found in Tables A1–3 and in Figures A1/A2 in the online appendix.

length participation in further training actually shows the largest coefficients compared to non-participation. Both short- and long-length training participations have a rather small and non-significant coefficient. Thus, longer participation seems to foster transitions only up to 40 h which corresponds to about one work-week per year. Although this result may seem surprising from a human capital perspective, it aligns with signaling theory, since very brief further training participation likely signals nothing, while excessively long training participation may even be perceived negatively.

Turning to the models that take the specific types of training and transitions into account, we observe in the first model in Table 2 that self-funded training is associated with a three percentage points increase in external transition chances. However, this association is not statistically significant and also small compared to the other coefficients of interest. In fact, self-funded training does not show any substantial significant association with the transitions in our models. The lack of statistical significance may be partly due to the low number of recorded self-financed training courses (see Table A1 in the appendix). Nevertheless, we have to reject hypotheses H3 and H4 based on our analysis.

The second model in Table 2 shows the results on the relationship between firm-funded training and labor market status. The results support H5, which assumes that firm-funded training should increase the internal transition chances more than the external transition chances. Indeed, internal transitions increase by almost 7 percentage points if firm-funded training was completed in the previous year. Compared with the overall probability of internal transitions of 43 %, this correlation is noteworthy. In contrast, no statistically significant association can be observed for external transitions.

Based on transaction cost theory, H7 assumes that firms only invest in temporary employees when the amortization of the costs incurred is certain, i.e. when a decision has already been made to hire them permanently. Based on this reasoning, we assumed that firm-funded training in the year of transition is more strongly related to the transition than firm-funded training in the year before. This assumption is confirmed in the third model in Table 2. Firm-funded training in the year of transition does show a large and significant correlation with internal transitions. In fact, it increases transition chances by almost 10

**Table 2**  
Event history model for discrete time intervals: Self-funded and firm-funded further training and labor market status. Average marginal effects.

|   | Int. Transition     | Ext. Transition    | Other status         |
|---|---------------------|--------------------|----------------------|
| M1: Self-funded training in the previous year (0/1) (H3/4).   | 0.024<br>(0.038)    | 0.033<br>(0.025)   | 0.013<br>(0.029)     |
| M2: Firm-funded training in the previous year (0/1) (H5).   | 0.069***<br>(0.021) | 0.023<br>(0.015)   | -0.031<br>(0.020)    |
| M3: Firm-funded training in final year (0/1) (H7).  | 0.098***<br>(0.024) | 0.037**<br>(0.016) | -0.312***<br>(0.057) |
| M4: Mandatory vs. voluntary firm-funded training in the previous year (H6/H8).<br>Base: No firm-funded training |                     |                    |                      |
| Voluntary training in the previous year   | 0.083**<br>(0.033)  | 0.005<br>(0.023)   | -0.050**<br>(0.021)  |
| Mandatory training in the previous year   | 0.061**<br>(0.030)  | 0.040*<br>(0.024)  | -0.014<br>(0.023)    |
| N (person-years): 2288  |                     |                    |                      |

Source: Own calculations on the basis of NEPS SC6 14-0-0. Base state of Dependent Variable (DV): Temporary employment. DV state 2 not shown: "Temporary with other employer." Average marginal effects are shown. Standard errors in parentheses and clustered for individuals. All models include the following control variables: Age, age squared, gender, education level, socioeconomic index (ISEI), length of employment, hours worked, work experience, unemployment experience, job requirements (occupational level), occupational area, establishment size, public sector, funding of training in firm, skill level, wave dummies and the respective other type of training. \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01.

percentage points. However, in these models we may overestimate the effect of training, as we cannot ascertain that the training took place before the transition.

In addition, based on the same theoretical argumentation, hypothesis H8 assumes that mandatory firm-funded training should be more strongly related to transitions than voluntary training. The fourth model differentiates between mandatory and voluntary training versus nonparticipation in training. The findings do not support the assumption of H8. Voluntary training has a slightly stronger association with internal transitions than mandatory training. Instead, H6, which predicted a higher importance of voluntary further training, is supported. However, both mandatory and voluntary firm-funded training are significantly correlated with transitions within the company.

### 6.3. Robustness checks

Although we were able to control for a large number of possible confounding variables with the NEPS, it cannot be ruled out that unobserved factors may bias the results. In particular, the correlations shown may be due to individual factors such as skills and personality. It is known from previous research that employees with high competencies (Gauily & Lechner, 2019) and curious open-minded personalities (Laible et al., 2020) are more likely to participate in further training. Furthermore, it can be assumed that HR managers are more likely to consider individuals with such characteristics for permanent positions.

Both cognitive competencies and personality traits are available in the NEPS data. We construct a cognitive competence indicator from the mean of three competence measures on perceptual speed, reasoning, and vocabulary, which have so far only been collected in wave 7 (Details in: Lockl et al., 2020). In addition, we create an indicator of personality traits by using the Big 5 measures in the NEPS collected in wave 5 and wave 8<sup>10</sup>: openness, conscientiousness, extraversion, agreeableness, and neuroticism (Laible et al., 2020; Wohlkinger et al., 2019). The Neuroticism scale is rotated so that the positive opposite pole "Emotional Stability" is mapped. Even though only openness has shown an effect on further training participation, we expect all five psychological factors might be positively related with transitions to permanent work, because research has shown that they tend to correlate with job performance (Barrick & Mount, 1991). We finally compute models controlling for cognitive competencies and personality traits as an additional robustness check. However, it should be noted that the number of cases is smaller here, since the variables are only available for part of the sample. In addition, we assume that the constructs are constant over time, since we have the measurements available only at one or a few time points in the panel.

After including the additional control variables of cognitive competencies and personality traits, we observe only minor differences between the main analyses in Tables 1 and 2 and the additional analyses in Tables 3 and 4. If anything, the coefficients of interest decreased a little and the standard errors increased. Yet, the direction and the magnitude of the coefficients remained stable. Thus, we conclude that our main results are not influenced by confounding through cognitive competencies and personality traits.

## 7. Conclusion

In recent decades, not only has the share of fixed-term employment in total employment increased, but the importance of further training in employment trajectories has also steadily grown (R. Becker, 2017; Hohendanner, 2019). Given the precarious conditions that often accompany fixed-term employment, we asked in this study what (special) value training has for this group of people with regard to their

<sup>10</sup> We use data from the wave that is available for the respondents and if there is data in both waves, we use the mean of the sub-scales.

**Table 3**  
Event history model for discrete time intervals (robustness check): Further training and transitions to permanent employment. Average marginal effects.

| DV: Transition (dummy)  | Model 1<br>Robust  | Model 2<br>Robust  |
|---|--------------------|--------------------|
| Further training  | 0.050**<br>(0.023) |                    |
| Duration of further training ( <i>basis: no further training in the previous year</i> ) |                    |                    |
| 1–8 h training in previous year   |                    | 0.052<br>(0.045)   |
| 9–40 h training in previous year  |                    | 0.067**<br>(0.033) |
| > 40 h training in previous year  |                    | 0.017<br>(0.034)   |
| <b>Robustness</b>   |                    |                    |
| Cognitive skills  | ✓                  | ✓                  |
| Big 5   | ✓                  | ✓                  |
| N (person-years): 2288 / 1753 (robust models)   |                    |                    |

Source: Own calculations based on NEPS SC6 14–0-0. Baseline condition: fixed-term. Average marginal effects are shown. Standard errors in parentheses and clustered for individuals. The models include the following control variables: Age, age squared, gender, education level, socioeconomic index (ISEI), length of employment, hours worked, work experience, unemployment experience, job requirements (occupational level), occupational area, establishment size, public sector, funding of training in firm, skill level and wave dummies. \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01.

**Table 4**  
Event history model for discrete time intervals (robustness check): Self-funded and firm-funded training and labor market status. Average marginal effects.

|   | Int.<br>Transition  | Ext.<br>Transition | Other<br>status      |
|---|---------------------|--------------------|----------------------|
| M1 <b>robust</b> : Self-funded training in the previous year (0/1) (H3/H4).   | 0.026<br>(0.046)    | 0.024<br>(0.029)   | 0.027<br>(0.031)     |
| M2 <b>robust</b> : Firm-funded training in the previous year (0/1) (H5).  | 0.062**<br>(0.024)  | 0.028*<br>(0.017)  | -0.033<br>(0.022)    |
| M3 <b>robust</b> : Firm-funded training in final year (0/1) (H7).   | 0.098***<br>(0.026) | 0.027<br>(0.018)   | -0.278***<br>(0.056) |
| M4 <b>robust</b> : Mandatory vs. voluntary firm-funded training in the previous year (H6/H8).<br><i>Base: No training</i> |                     |                    |                      |
| Voluntary training in the previous year   | 0.072*<br>(0.037)   | 0.004<br>(0.025)   | -0.061***<br>(0.023) |
| Mandatory training in the previous year   | 0.053<br>(0.034)    | 0.050*<br>(0.026)  | -0.008<br>(0.025)    |
| N (robust models): 1753   |                     |                    |                      |

Source: Own calculations based on NEPS SC6 14–0-0. Base state of Dependent Variable (DV): Temporary employment. DV state 2 not shown: "Temporary with other employer." Average marginal effects are shown. Standard errors in parentheses and clustered for individuals. All models include the following control variables: Age, age squared, gender, education level, socioeconomic index (ISEI), length of employment, hours worked, work experience, unemployment experience, job requirements (occupational level), occupational area, establishment size, public sector, funding of training in firm, skill level, wave dummies and the respective other type of training. \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01.

transition opportunities into permanent employment.

Our results based on high-quality panel data from the German National Educational Panel Study (NEPS) suggest that further training has a positive, albeit small, association with the transition chances to permanent employment in Germany net of important confounders. Further analyses revealed that only medium-length training durations for up to one week increase transition chances. Longer training participation does not seem to pay off. The firm seems to play a major role: training that is funded by the employer has a comparably strong association with transitions to permanent jobs within the current firm. On the other hand, self-funded training does not improve any transition chances, also not to

permanent jobs in other firms. To further explore the role of the employer, we also considered the timing of the training and showed that further training participation in the same year has a larger correlation with transitions to permanent jobs than training in the year before. In addition, both voluntary and mandatory training courses were associated with transitions to permanent positions in the firm.

Overall, our results are more in line with firm-centered transaction cost accounts than with human capital theory and signaling approaches. In particular, the finding that it is not self-funded training but employer-funded training that is associated with transitions to permanent employment raises doubts on the importance of the skill-enhancement mechanism postulated by human capital theory for such transitions. Instead, our finding that training that is closer to the transition is more important suggests that firm-funded training is part of the transition process. This indicates that employers tend to invest more in further training of their temporary workforce when their long-term prospects in the firm are assured. Thus, the decision to provide training and human resource planning seem to be connected. This may be one of the reasons why transitions within the company result in the largest wage gains (Fausser, 2024).

Nevertheless, the finding that courses taken voluntarily by temporary workers also increase the chances of permanent employment within the firm suggests that this is not the whole story. Workers apparently also signal their commitment to the firm through voluntary investments in firm-specific human capital and are subsequently selected for permanent jobs. This is in line with the idea that some firms use further training to screen the ability of workers (Autor, 2001).

Our findings are largely consistent with the international literature (Fouarge et al., 2012; Higuchi, 2013; McVicar et al., 2016) and provide an extension of this research to the German context. Similarly to the Netherlands, in Germany it is above all firm-funded training that has a positive correlation with transitions to permanent work in the current firm (Fouarge et al., 2012). We could show that this even holds when controlling for more firm and individual-specific confounders than the study by Fouarge and colleagues. Yet, our findings on the timing indicate that at least some of this association is not causal, but driven by selection. Going beyond the analyses by McVicar et al. (2016), we could show that there are several pathways that drive the association in Germany: While a part of the total association seems to be driven by the selection of workers for training who were already considered for permanent positions, another part seems to be indeed caused by training. This adds to the previous literature showing that in strongly dualized countries like the Netherlands and Japan workers can overcome the barriers between temporary and permanent positions through further training. Furthermore, our analyses reveal several pathways through which further training is linked to employment stability adding to previous literature that analyzed this relationship among employees in general (Dolton & Kidd, 1998; Ebner & Ehlert, 2018; Parent, 1999; Veum, 1997). Notably, our estimates are larger than those in the cited literature where a comparison can be made. This suggests that further training is more important in precarious employment relationships.

Our results thus show, that further training is one of the prerequisites of a bridging function of temporary employment. With an increase in probability of about 6–10 percentage points, firm-funded further training seems to be as important as job complexity (Reichelt, 2015). The results from other studies are more difficult to compare, since they use different metrics for the coefficients. Yet, it seems that the association between firm-funded further training and transitions to permanent employment is not much weaker than the respective association with formal education (see also Table A5 in the Appendix). Moreover, our results are in line with Mattijssen et al. (2022), indicating the importance of human resources policies on the firm level for transitions to permanent contracts. Further training seems to be part of a screening process that some firms apply (Autor, 2001). Ultimately, it seems that being in the right firm, where employers offer training and screen workers, is an important factor for transitions to permanent

employment.

Because of different employer motives for using temporary contracts our estimates may represent lower bounds of the effect of further training on transitions to permanent employment. About one-third of fixed-term contracts in Germany are fixed-term with an objective reason, which indicates that there is no possibility of permanent employment in this position. This is the case, for example, when there are fixed-term public subsidies that expire after a certain period of time. Accordingly, in this segment of temporary employment, training should have no effect on internal transitions to permanent work, since transitions are effectively ruled out by the employer's motive. However, in the case of fixed-term contracts that serve the screening of employees, the possibility of transitioning to a permanent employment relationship is generally given. Assuming that this is possible for all fixed-term contracts without a substantive reason, i.e. for about two-thirds of the fixed-term contracts, the effects in this group could be about one-third larger.

There are several limitations to our analyses. First, even though we use more detailed measurements of participation in training courses than previous studies, our data is not sufficient to test the theoretical mechanisms directly. An analysis at the monthly (or at least quarterly) level would be preferable to our person-year analysis, given that many temporary jobs and non-formal training participations last much less than one year. In addition, the data provides no information on the employer's motive for using temporary employment contracts. As mentioned before, it should make a big difference for the transition chances whether the purpose of the fixed-term contract is employee screening or flexibility (Mattijssen et al., 2022). After all, with the variables of economic sector, firm size, and fixed-term employment duration in the models, we can account for some factors that influence the motive for fixed-term employment (cf. Brücker et al., 2013, 173 f). Finally, the rather small number of temporary employees in the NEPS significantly limits the robustness of the results, especially when looking at different types of training.

Nevertheless, our contribution provides a nuanced picture of the relationship between training and transitions to permanent employment considering the heterogeneity in both training courses and transitions. The results suggest that firm-specific human resource strategies play a key role in transitions to permanent employment. This highlights the significance of employers in the 'bridge or trap' debate. Accordingly, policy makers could provide incentives for firms to develop training strategies for temporary workers. At the same time, individual motivation to participate in training courses seems to play a role, given their availability. Temporary workers should therefore be encouraged and enabled to participate in continuous training if it is offered. At the same time, publicly provided individual further training courses should be made available for workers who are in firms that do not offer further training. Future research could follow up on our study and analyze the role of training in the effect of transitions to permanent employment on wage or status (Fauser, 2024; Kopycka, 2023). In future, studies could use linked employer-employee data to test our predictions about the role of firm strategies in more detail (Mattijssen et al., 2022). Furthermore, our results indicate that comparative studies employing a harmonized methodology could help determine whether institutions influence the effect of training on transitions to permanent positions.

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## CRediT authorship contribution statement

**Martin Ehlert:** Writing – original draft, Methodology, Conceptualization. **Alexander Helbig:** Writing – original draft, Methodology, Conceptualization.

## Declaration of Competing Interest

none'.

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## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.rssm.2026.101130](https://doi.org/10.1016/j.rssm.2026.101130).

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