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Empirical Research in Vocational Education and Training (2025) 17:27
https://doi.org/10.1186/s40461-025-00201-8

Empirical Research in Vocational Education and Training

RESEARCH Open Access

Conflict and support during apprenticeship training in Germany: consequences for apprenticeship success and further employment in the company

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Abstract
Dual vocational training, i.e., the combination of on-the-job training in a company and school-based teaching, is of major importance to a smooth transition into the labor market and for the recruitment of skilled labor in Germany. However, around 30 percent of all training contracts are not successfully completed and not all successful apprentices remain in their training company afterwards. Previous studies have shown that apprentices who terminated their training prematurely often report conflicts and insufficient support within the company as reasons. However, these studies do not include the group of successful apprentices for whom these two aspects might also have been an issue. Moreover, to our knowledge, no study has yet appropriately investigated how conflicts and a lack of support are related to the likelihood of staying in the training company as an employee after training graduation. Using panel data from the Starting Cohort 4 of the National Educational Panel Study (NEPS SC4), we address these research gaps. Our results indicate that apprentices are less likely to finish their training successfully when they report conflicts in the company and more likely when they report support. Support does not buffer the negative effects of conflicts. Successful trainees are only less likely to subsequently remain in the training company when they report high levels of conflicts combined with low levels of support. Our detailed analyses suggest that this is rather due to missing employment offers from companies than due to graduates refusing these offers.

Keywords Success of apprenticeship training, Labour market entry, Conflict, Support, School-to-work transition

Introduction

The transition from school to working life is a decisive phase in the lives of young adults. In Germany, dual vocational training is of central importance for entering the labour market and a successful labour market career for young people who do not start university: More than 40 percent of young adults aged 20–25 had a dual vocational training

qualification in 2021 in Germany (Autor:innengruppe Bildungsberichterstattung 2022). In the dual system, vocational school attendance is combined with practical on-the-job training and most training companies enter a regular employment relationship with their trainees once they have successfully completed their training.

However, this transition is not equally smooth for all young people: around 30 percent of dual training contracts were terminated prematurely in 2022 (BIBB–Bundesinstitut für Berufsbildung 2024). Previous empirical research shows that alongside compromises in the type of training occupation, conflicts and missing support are often named as reasons for premature termination among former trainees (Beckmann et al. 2023; Beicht and Walden 2013; Böhn and Deutscher 2022; Schöngen 2003; Uhly 2015). Although these findings indicate that conflicts and missing support are important determinants of dropping out of training, available studies have various limitations that restrict their informative value. For one, information on the role of conflicts and missing support in training termination usually stems from interviews with those who did not finish training. However, it can be expected that also those who finish their training experience conflicts in their company (Uhly 2015, p. 19). Moreover, retrospective interviews with unsuccessful trainees carry the possibility of retrospective justification of failure and potentially misattribution of responsibilities for terminations to companies, supervisors, and colleagues by (former) trainees (Uhly 2015, p. 20). Consequently, it remains unclear to what extent support and conflicts in the training company influence the risk of dropping out, and such analyses need information on both, successful and unsuccessful apprentices (Uhly 2015, p. 22).

Moreover, the school-to-work transition process not only includes starting vocational training and graduating from it but also entering the regular workforce. Also here, the process is not smooth for all graduates: About 24 percent of successful training graduates do not start regular employment in their training company, and around 20 percent of successful graduates are registered as unemployed for at least a short time directly after completing their training (BIBB–Bundesinstitut für Berufsbildung 2024). Nonetheless, previous research has largely neglected the fact that support and conflict can have an impact not only on the successful completion of training, but also on the likelihood of remaining in the training company after graduation.

Against this background, we investigate how perceived conflicts and support during apprenticeship training relate to the likelihood of successful completion and remaining in the company after graduation. To gain a deeper understanding, we will partition this second question of remaining in the company into two parts: the likelihood that the training company makes a takeover offer and the inclination of training graduates to accept such an offer. In doing so, we acknowledge that conflicts and support might affect the decisions of the two actors differently.

We use panel data from the German National Educational Panel Study (NEPS) that provides measures about the situation in the company before success or failure occurred. This prevents biases due to retrospective justification and enables a comparison between graduates and dropouts. In addition, for those who were successful, the data provides information on whether companies offered further employment and on whether apprenticeship graduates accepted the offer. Thus, we have detailed information on the process of remaining in the training company after graduation. Overall, the data provide a

unique opportunity to investigate the role of conflict and support during apprenticeship training for training success and further employment in the company after graduation.

A successful vocational training qualification and a smooth transition to the first regular job is not only important for a successful labour market career of trainees, but also for training companies for which apprenticeship training is an important way of recruiting skilled workers (Ebbinghaus 2018). For companies, premature training termination or apprentices leaving the company after graduation means losing prospective skilled employees and a bad investment given the costs of training. Particularly in times of skilled labour shortages, the successful training and integration of young adults into the labour market is also of great economic importance, as in-house training is the most common way for companies to recruit skilled workers (Ebbinghaus 2018; Schönfeld et al. 2020). It is therefore of great scientific, economic, and social relevance to better understand the determinants of successful completion of dual training and subsequent employment by the training company.

We start with an overview of the German apprenticeship system and present previous findings on the role of conflicts and support during training for training success before we delineate theoretical assumptions about their consequences for training success and further employment in the company.

The German apprenticeship system and previous findings on conflict and support during apprenticeship training

Non-tertiary, fully qualifying vocational training in Germany is largely organized as a so-called dual system which is characterized by several institutional features (see also Konietzka 1999, p. 58ff.). It combines workplace-based practical training three to four days a week and school attendance during the remaining days (Solga et al. 2014). To start an apprenticeship, school-leavers must apply to companies that provide dual vocational training, and the companies choose from the pool of applicants. Training companies instruct apprentices during everyday activities and pay them a small salary. Apprenticeships usually last between 2 and 3.5 years and graduates receive a fully qualifying, nationally recognized occupational certificate (see also Konietzka 1999, p. 61ff.).[1]

For young adults, apprenticeship training serves as an important gateway into the labour market in Germany (Solga et al. 2014). Training companies mainly train to obtain skilled workers, and training costs are usually higher than the rewards generated by apprentices for the company (Solga et al. 2014, p. 23; Ebbinghaus 2018; see also Schweri et al. 2021). However, returns on training investment can be realized through the subsequent employment of successful apprentices: These graduates already received firm-specific training and no costs incur for recruiting skilled workers from the external labour market (Schönfeld et al. 2020; Walden et al. 2002). Training companies are free to offer graduates a regular employment position. At the same time, a non-negligible

[1] Around two in three trainees are part of this dual system, while one in three trainees are trained in a school-based system (BIBB–Bundesinstitut für Berufsbildung 2024, p. 78). It must be noted that while also in the school-based system, trainees often have extended periods of practical training in companies, the school-based system is less standardized due to it being organized by each federal state (Solga et al. 2014, p. 5f.). Thus, the extent to which trainees participate in on-the-job training as well as the degree to which training establishments are responsible for recruiting trainees and bearing the costs of training is heterogenous. In the dual system, in contrast, there is a stronger market orientation (Konietzka 1999, p. 61ff.). Companies generally bear the cost of training and are responsible for recruiting their apprentices (Konietzka 1999; Solga et al. 2014, pp. 8, 10), which is why they should be especially interested in keeping and supporting their apprentices. Thus, for our research purpose, we will focus only on trainees in the dual system.

share of around 30 percent of training contracts were terminated prematurely in 2022 and about 24 percent of training graduates did not start regular employment in the company (BIBB–Bundesinstitut für Berufsbildung 2024).

Regarding reasons for premature training termination, trainees and training companies highlight different aspects: while former trainees often say that conflicts or inadequate training input were responsible for the training arrangement to fail, training companies more often identify inabilities of trainees in terms of, for instance, performance and motivation (Uhly 2015, p. 20f.). However, this research mostly relies on regionally (and often occupationally limited) surveys among those who have terminated training (e.g., Mischler 2014; Piening et al. 2012; representative or nation-wide studies are the BIBB-Termination Study, e.g., Schöngen 2003; or the BIBB Transition Study, e.g., Beicht and Walden 2013).

Apart from the limited generalisability of the results due to regional or occupational margins and the danger of measuring retrospective justification of decisions or interpretation of events, these studies lack a comparison with those who have successfully completed their training. As around three out of four trainees complete their training successfully, it is likely that successful trainees also experienced conflicts or a lack of support. Thus, the extent to which conflicts and missing support in the training company threaten training success cannot be deduced from dropout surveys (Uhly 2015, p. 22).

Some few studies investigate adolescents during their apprenticeship. For instance, Kropp et al. (2016) identify poor business climate and conflicts as often-named reasons for trainees to fear that their training would be terminated. Hecker (2000) finds that those who thought about terminating their training more often experience conflicts during training and less often support as those who did not have those thoughts. These findings further indicate the importance of both positive (support) and negative (conflicts) social relations in the training company for the stability of training in Germany. However, these cross-sectional studies do not provide information on how many of the apprenticeships were actually discontinued later and what ultimate role conflicts and support played (see also Findeisen et al. 2024 on the relation between turnover intentions and actual turnover).

Concerning the final challenge in the successful school-to-work transition in the German dual vocational system, namely entering the workforce as a regular employee after a successful graduation, to our knowledge, no study has yet appropriately investigated how conflicts and support in the training company are related to the likelihood of receiving offers to continue to work in the company and the likelihood of graduates to accept such offers.

While part of the theoretical arguments as to why conflict and support should affect the likelihood of an apprenticeship dropout can be similarly applied to the likelihood of staying in the training company after a successful apprenticeship, the two situations also differ significantly, and certain aspects may have different relevance. In the following section, we will present a detailed theoretical discussion.

Theoretical considerations

Premature training termination

What are the potential consequences of the occurrence of conflicts during training or missing support from colleagues and supervisors for the likelihood of premature training

termination? Apprentices are newcomers to both the labor market and their specific companies. As such, they need to adjust to their new working and learning environment (Bauer et al. 2024, 2021, 2007). During this adjustment phase, they learn how to perform their tasks, their role in the organization and what is demanded of them, acquire a sense of confidence in their actions, and integrate in the social structure in the company (Bauer et al. 2007; Feldman 1981; Fisher 1985; Lee 2024).

Positive relationships with superiors, supervisors and colleagues are of great importance for successful adjustment (Lee 2024; Zhou et al. 2022), especially at the beginning (Bauer et al. 2021; Kammeyer-Mueller et al. 2013). Literature on organisational socialization and newcomer adjustment suggests that support and help from employees and supervisors can improve newcomers' learning outcomes, such as understanding their role in the organization and mastering the associated tasks (Bauer et al. 2007; Chi et al. 2020; Lee 2024; Sparrowe et al. 2001) and is also generally related to job performance (Sparrowe et al. 2001; Talukder and Galang 2021). Furthermore, social support can also increase interest in training (Powers and Watt 2021), is related to job satisfaction (Martínez-Corts et al. 2011; Valero and Hirschi 2019), can improve perceived social acceptance (Bauer et al. 2007) and identification (Edwards and Peccei 2010), and can decrease the likelihood of conflicts (Caesens et al. 2019). As high-quality training input and social inclusion are conductive to apprentices' learning progress and the identification with the company and likely increases their satisfaction with training (Bauer et al. 2007), such support and inclusion should decrease turnover intentions (Bauer et al. 2007; Findeisen et al. 2022; Peltokorpi and Allen 2024; Rubenstein et al. 2020) and actual turnover (Bauer et al. 2007; see also Negrini et al. 2016).

Besides positive relationships and support, negative relationships within the company can also influence the likelihood of terminating training prematurely. Literature on different forms of workplace conflicts suggests that conflicts between trainees and colleagues or superiors should be detrimental to apprentices' learning experience (see overview of De Dreu and Weingart 2003, p. 741f.) and should be negatively related to performance (Shaukat et al. 2017). At the same time, conflicts in the company might not only harm the newcomer's learning process, but might also be negatively related to well-being (Sonnentag et al. 2013), the attachment to the company (Thomas et al. 2005), satisfaction with the job (Martínez-Corts et al. 2011) and with coworkers (Hagemeister and Volmer 2018), and consequently increase apprentices' turnover intentions (Shaukat et al. 2017). Moreover, conflicts between apprentices and colleagues or supervisors decrease productivity (De Dreu and Weingart 2003; Wu et al. 2021) and harm organizational cooperation processes (Lu et al. 2011). Thus, also companies might want to terminate training contracts with such apprentices.[2]

Finally, as laid out above, we can assume that conflicts not only occur among those who ultimately terminate their training, but also among graduates. But why are some trainees that report conflicts less likely to experience training termination than others? One reason might be that other aspects of the social situation during training might off-set the negative consequences of conflicts (De Clercq and Belausteguigoitia 2023; Kuriakose et al. 2019; Martínez-Corts et al. 2011). In this regard, an interactive relationship between social support and conflicts in the company can be assumed regarding their influence

[2] Such terminations likely occur during the probation time (that usually lasts for four months) as terminations afterwards are possible only if important reasons apply or if trainees agree to the termination (Uhly 2015, p. 12f.).

on the probability of premature training termination. For example, when conflicts arise between colleagues, third parties can intervene to reduce the discrepancies and mediate between the parties, and thus mitigate the associated negative consequences (Giebels and Janssen 2005). In addition, disagreements about how to execute tasks should be less likely to lead to negative consequences in collaborative and supportive contexts, as positive relationships between employees are associated with improved communication channels which facilitate conflict resolution (Martínez-Corts et al. 2011). Consequently, social support might buffer the negative consequences of disagreements and conflicts. While several studies lend support to this assumption (e.g., De Clercq and Belausteguigoitia 2023; Giebels and Janssen 2005; Martínez-Corts et al. 2011), others do not (Ducharme and Martin 2000).

Considering the theoretical arguments in the literature on organizational socialization, newcomer adjustment, and workplace conflicts, as well as the empirical evidence pointing to the importance of conflicts and support in the training company, we propose the following hypotheses: First, we expect that trainees who have reported conflicts with colleagues and superiors during training are less likely to complete their training successfully (Hypothesis 1a). Simultaneously, we expect that trainees who reported higher levels of support from colleagues and superiors during training are more likely to graduate from training (Hypothesis 1b). Lastly, we expect that negative associations between conflicts and training graduation can be mitigated by high levels of support from coworkers and superiors (Hypothesis 1c).

Continuing employment in the training company

In Germany, apprenticeship training is the most common way of recruiting skilled workers for companies (Ebbinghaus 2018). Given the net costs associated with apprenticeship training, companies are generally interested in recouping these investments through subsequently employing training graduates (Schönfeld et al. 2020; Walden et al. 2002). Thus, companies should have an incentive to prepare them for skilled employment in the company and to keep graduates in the firm. When deciding whether to offer graduates a regular employment position, companies consider not only the graduate's ability and performance, but also the fit between the graduate and the incumbent work force.

In general, compared to the start of an apprenticeship, those who graduate from their training should be positively selected in terms of ability and performance (Arrow 1973), but also in terms of their fit with the company. However, graduation from apprenticeship training does not constitute a perfect selection criterium. Companies can terminate training contracts after the probation time (that usually lasts for four months) only if important reasons apply or if the trainee agrees to the termination (Uhly 2015, p. 12f.). Thus, it can be expected that conflicts between apprentices and other employees also occurred for training graduates. As laid out above, such conflicts between employees have negative consequence for group performance (De Dreu and Weingart 2003; Wu et al. 2021) and harm organizational cooperation processes (Lu et al. 2011). Thus, training graduates that were often involved in conflicts with other employees can be expected to cause trouble also as regular employees, and companies should be reluctant to hire such graduates. Thus, we expect that successful apprentices that have reported conflicts during training are less likely to receive an employment offer after graduation (Hypothesis 2a). At the same time, we do not expect that successful apprentices that have reported

higher levels of support are more likely to receive employment offer after graduation (Hypothesis 2b). This is because the extent of the support does not necessarily reflect the endeavor of the training company to subsequently take on the trainee but can also depend on whether the trainee needed this support and whether the company had the resources available to do so.

Apprenticeship graduates who have received an employment offer from their training company may either accept the offer or seek employment in another company. Given the strong qualification-orientation of the German labour market and the occupation-wide standardization of the training content, transition between companies within the same occupation is comparatively easy (Solga et al. 2014, p. 7). Thus, we can expect graduates to weigh both positive and negative aspects of the social structure of the company when evaluating employment offers, while negative experiences in the training company should make changing to other companies more attractive, and positive experiences should make staying more likely.

Based on these considerations, we formulate the following hypotheses. First, we expect that training graduates that have reported conflicts during training are less likely to accept an employment offer by the company (Hypothesis 3a). In contrast, we expect that training graduates who reported higher levels of support during training are more likely to accept an employment offer by the company (Hypothesis 3b).

When the arguments regarding the probability of receiving a takeover offer and the probability of accepting such an offer are considered together, it is possible to derive expectations regarding our second main research question, namely how perceived conflicts and support during apprenticeship training are associated with the likelihood of remaining in the company after graduation. We expect that training graduates are less likely to start regular employment in the training company after graduation if they have reported conflicts during their training in the company (H4a). Moreover, we expect that training graduates are more likely to start regular employment in the training company after graduation if they have reported higher levels of support (H4b).

Data and analytical approach

Data source and sample selection

We base our analyses on data from Starting Cohort 4 of the German National Educational Panel Study (NEPS SC4, NEPS Network 2024). NEPS SC4 is a nationally representative panel study that sampled grade nine students by randomly selecting schools and classes within these schools across Germany in the fall of 2010 (Steinhauer and Zinn 2016). Students in these classes were thus interviewed for the first time at the start of the school year 2010/2011 and subsequently interviewed once or twice a year. Overall, 16,379 respondents participated in at least one wave of NEPS SC4. In wave 1, also 9,173 parents of students were interviewed. The student data contain information on general education achievement as well as detailed information on vocational training episodes, including characteristics of single episodes as well as on training outcomes. For our analyses, we only include apprenticeship training episodes (7,373 episodes from 6,349 respondents). As students that were sampled in schools for special needs received different achievement tests in Grade 9 which were included in our analyses (see below), we excluded this group from our analyses (resulting in 6,829 training episodes from 5,889 respondents).

Dependent variables

In our analyses, we are interested in four outcomes of vocational training: The first dependent variable indicates whether trainees graduated from apprenticeship training with a training certificate. For those who did, the second variable indicates whether graduates received an employment offer from the training company. The third variable indicates whether those who received an employment offer accepted it. Lastly, while the third dependent variable included only those training graduates that received an employment offer, we constructed a fourth dependent variable as an overall measure of remaining in the training company after graduation. For this, we coded those without an employment offer together with those who did not accept their offer.

As we observe some cases with multiple apprenticeship training episodes in the data, we defined the samples of analyses in the following way: For the first dependent variable, we refer to the first observed training episode of a respondent, regardless of training outcome.[3] For the other three variables, we refer to the first observed episode that ended with a vocational training qualification.

Independent variables

We use two measures that indicate the quality of social relations in the apprenticeship company during training. First, to measure support from co-workers and supervisors, we rely on respondents' reaction to the following statement: "My colleagues and my superiors take the time to explain new tasks to me. Does this not apply at all, rather not apply, partly apply, rather apply or apply completely?" We coded this five-point scale to a variable indicating three levels of support: "does not apply at all", "does rather not apply", "does partly apply" were coded "low level of support" (1), "does rather apply" was coded "medium level of support" (2), and "does completely apply" was coded "high level of support" (3). We combined the first three categories to one as only few respondents report missing support from coworkers. Second, to measure conflicts of apprentices with co-workers and supervisors, we use the reaction to the following statement: "I often have problems or conflicts with my colleagues and superiors." Again, respondents could use the same 5-point scale for their statement which we grouped the following way: "does not apply at all" was coded "low level of conflict" (1), "does rather not apply" was coded "medium level of conflict" (2), and "does partly apply", "does rather apply", "does completely apply" were coded "high level of conflict" (3). We combined the last three categories to one as only few respondents report frequent conflicts with colleagues or superiors.[4]

To test our hypotheses regarding the interaction of support and conflict, we have additionally devised a combined measure with nine categories that incorporates all combinations of the three levels of support and conflict. Table 4 in the Appendix gives an overview of how the original five-category-variables were combined into three categories together with a cross-tabulation that includes the cell counts for each

[3] We did not include 52 episodes that were deleted in the Biography data set and 159 episodes that were entered as re-training or other courses. We furthermore excluded shorter episodes that occurred during other education or training episodes, as well as episodes for which most of the training time took place during vocational preparation, academic secondary schooling, or higher education courses (117 episodes). As a result, 58 cases with only one apprenticeship episode were excluded and for 23 cases, the second observed apprenticeship episode was included. Overall, 5,755 first apprenticeship episodes were considered.

[4] The questions pertaining to conflict and support in the company were only asked in the interview when the respective episode was first reported and was still ongoing. For past episodes, this information was not asked.

conflict-and-support combination of the original variables, based on the estimation sample of our models pertaining to the likelihood of apprenticeship training graduation.

Control variables

In our analyses, we control for several characteristics of the apprentice and the training position that might affect both the occurrence of conflicts or support and our outcome variables.

As trainee characteristics, we include several measures of apprentices' ability, personality traits, socioeconomic background, and demography. Ability measures include the type of sampling school trainees attended in Grade 9 as well as the highest school-leaving degree acquired until the start of apprenticeship training (general secondary degree or below; intermediate secondary degree; upper secondary degree). Furthermore, we include the grades in math and German, as well as the overall grade, of the highest school-leaving degree obtained by the start of apprenticeship training.[5] Lastly, we include results from six ability tests that were administered in school in Grade 9 (ICT literacy, natural science, reading speed, reading comprehension, vocabulary, mathematics). We control for these measures to account for the assumed higher termination rates of trainees with lower abilities and the assumed higher likelihood of conflict occurrence (Dilchert et al. 2007). In the analyses regarding training graduates, we also include the final grade trainees graduated with from their vocational training.

To account for the possibility that certain personality traits of trainees affect the risk of conflict occurrence as well as likelihood of training termination or the likelihood of receiving and accepting employment offers, we included the Big-Five personality trait measures as provided by the NEPS data: extraversion, agreeableness, conscientiousness, emotional stability, and openness. Each dimension represents the mean value of two items from the 10-item Big Five Inventory (Rammstedt and John 2007) with an additional item for the agreeableness dimension (see Nießen et al. 2020).

As demographic indicators, we control trainees' year of birth (born before 1995, in 1995, and after 1995), sex, as well as a dummy variable indicating whether trainees have a migration background. We defined having a migration background if trainees themselves or at least one of their parents were born outside of Germany. We included year of birth as a measure of training readiness and cognitive maturity at the start of vocational education, both of which may influence the ability to manage workplace demands and successfully complete training.

As indicators of trainee's socioeconomic background, we include parents' highest education (general secondary degree or below; intermediate secondary degree; upper secondary degree; tertiary degree), parents' highest International Socio-Economic Index of Occupational Status (ISEI), parents' employment situation (no parent employed; one parent employed; both parents employed), whether there are two parents present in the household, as well as the number of books in the household (0–25; 26–200; 201–500; more than 500). We include the number of books in the household as an addition proxy

[5] For trainees with an upper secondary degree, the grades in math and German refer to the last report card before graduation.

for the socio-cultural background, which can influence both workplace experiences and training outcomes. All information refers to the time point in Grade 9.[6]

For training characteristics, we include several characteristics of the training position, the training company, as well as the training occupation. First, we include dummy variables that indicate the segment of the apprenticeship occupation (BA-Bundesagentur für Arbeit 2021) to account for differences in termination rates and occurrence of conflicts between different segments (Siembab et al. 2023).[7] On the company-level, we include the size of the training company (differentiating 0–49 employees, 50–249 employees, and 250+ employees) to account for differences between smaller and larger firms in the quality of training input or potential for conflicts and termination rates or continuing employment of graduates (BIBB–Bundesinstitut für Berufsbildung 2024). We furthermore include the remuneration at the start of the apprenticeship as an indicator of the attractiveness of the training position and a dummy that indicates whether trainees have participated in other training episodes before.

In addition, we also control whether the trainees indicate that the training occupation is their desired occupation, distinguishing between not or rather not desired, partly desired, and rather or completely desired. We do so because not being trained in the desired occupation strongly influences the likelihood of dropping out of training (Beckmann et al. 2023; Beicht and Walden 2013; Siembab et al. 2023) and might influence the likelihood of conflicts occurring in the company. It should be noted, however, that the question about the desired occupation is asked at the same time as the questions about conflict and support, and it is theoretically possible that conflict and missing support have a negative impact on the training experience which may also be reflected in the interest in the training position (see, for instance, Findeisen et al. 2022; Powers and Watt 2021) and in turn in the assessment of how much the occupation is desired. In this case, the measure could mediate the estimates of support and conflict and consequently should not be controlled for. Thus, while we control for desired occupation in the main analyses to obtain conservative estimates, we also ran our analyses without controlling for the desired occupation and discuss deviations to the main analyses if applicable.[8]

To account for regional differences in labour market conditions, we include the unemployment rate in the employment agency district in which respondents resided at the start of vocational training.[9] For trainees, the unemployment rate serves as a proxy variable for the apprenticeship market and thus alternatives to the current training position. For graduates, the unemployment rate serves as an indicator of employment prospects

[6] We used information from parent interviews and supplemented missing information with reports from respondents.

[7] Due to low case numbers, we combined the three segments of "other commercial service occupations".

[8] As an alternative specification, we constructed a dummy variable that indicates whether the realistically aspired occupation measured in Grade 9 matches the training occupation or not. For this purpose, we took the four-digit level (i.e., the level of occupational subgroups) of the German Classification of Occupations (KldB 2010) for both the realistically aspired occupation and the training occupation. While this measure has the advantage of capturing an occupational expectation that is not affected by the training situation, it has the disadvantage that it might not measure adolescents' actual training preferences but rather an occupation they anticipate pursuing later in life due to perceived structural constraints. Furthermore, it does not necessarily measure intermediate occupational goals, but rather long-term expectations that might be realised after vocational training (e.g., via university studies after graduation). Nevertheless, even with this measure, our findings remained robust (results upon request).

[9] We used county level information for Berlin which encompasses the three agency districts. Data were obtained from the German Federal Employment Agency's statistics web site (https://statistik.arbeitsagentur.de/DE/Navigation/Statistiken/Interaktive-Statistiken/Zeitreihen/Lange-Zeitreihen-Nav.html; retrieved 07.02.2023). Information refers to the districts' area status in January 2023. We coded area changes in earlier years to fit this status.

alternative to staying in the company. Lastly, we included a dummy variable that indicated the federal state in which the training company was located and a dummy variable that indicated whether trainees live in a rural or urban area (BMVI–Bundesministerium für Verkehr und digitale Infrastruktur, 2018).[10]

Apart from the type of sampling school trainees attended in Grade 9, the unemployment rate in the employment agency district, and the rural-urban area dummy, information on all variables is derived from trainees' self-reports or, in the case of parental reports, from their parents. An overview of the distribution of all control variables over the outcomes of the four different dependent variables can be found in Table 5 in the Appendix.

Treatment of missing values and analytical strategy

To account for missing values on one or more of the variables, we multiply imputed our data using chained equations to create 20 datasets (mi impute; StataCorp 2023).[11] We considered observations with missing information on both, dependent and independent variables for the imputation models, but excluded observations with missing information on the dependent variables in our analyses ("multiple imputation, then deletion" [MID]; Von Hippel 2007).[12] Due to the dichotomous nature of all dependent variables, we ran binary logistic regression models and presented average marginal effects (AME).[13] For each model, we additionally report the baseline probabilities of a positive outcome.[14] To account for unequal inclusion probabilities in the initial sample, we applied sampling weights in all our analyses as well as in the imputation models. We apply clustered standard errors with the employment agency district as the cluster level.

Empirical results

Descriptive statistics

Table 1 shows descriptive results of the dependent and main independent variables for our sample. The first row shows that around 21 percent of apprenticeships were terminated prematurely. At the same time, a vast majority of around 80 percent of those who graduated from training received an employment offer from their company, which in turn was accepted by around 83 percent. Consequently, in our sample, around 66 percent of all graduates start working in their company after apprenticeship training.[15]

[10] RegioStar7 (Combined Regional Statistical Spatial Type codes 74 and 77).

[11] Due to low numbers of observations and resulting problems during the imputation process, we excluded cases without information on the unemployment agency district (N=2), the federal state of the training company (N=9), or on the occupational segment of the training position (N=43). The imputation models included all variables used in the analyses, except for occupational segment and federal state. We included three additional variables in the imputation models that are assumed to be related to the climate in the company: respondents' satisfaction with the training, the extent to which trainees work on everyday tasks of the company (both measured in the first interview of the training episode), and the extent to which employees in the company want to get ahead professionally as perceived by trainees.

[12] Excluding observations with missing information on the dependent variables reduces our final samples by 2040 cases (vocational training degree) and 256 cases (offer by training company; remaining in training company), respectively. The variable pertaining to accepting such an offer did not contain any missing values.

[13] Whenever we use the term "average marginal effects" throughout the results section, we do not imply a causal relationship but use the term in a technical manner to describe the empirical relationship of independent and dependent variables in our statistical models.

[14] For this, we calculated linear predictions of the MI estimates and then obtained the probabilities by applying an inverse-logit transformation (StataCorp 2023, p. 303).

[15] These numbers are similar to those from the national report on vocational training. In 2016 (up until this time, half of our sample graduated from vocational training) around 26 percent of contracts were terminated prematurely and

Table 1 Descriptive statistics

	Vocational degree			Employment offer			Offer accepted			Remaining in company		
	All	No	Yes	All	No	Yes	All	No	Yes	All	No	Yes
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(vii)	(viii)	(ix)
Outcome (row %)	100.0	20.8	79.2	100.0	20.4	79.6	100.0	17.3	82.7	100.0	34.2	65.8
Level of conflicts (column %)												
Low	63.1	44.6	68.0	67.5	62.2	68.9	68.7	69.1	68.7	67.5	65.1	68.8
Medium	26.7	36.0	24.3	24.4	24.8	24.3	24.4	23.0	24.7	24.4	24.0	24.5
High	10.2	19.4	7.7	8.1	13.0	6.8	6.9	7.9	6.7	8.1	10.9	6.7
Level of support (column %)												
Low	19.9	33.9	16.3	17.3	21.2	16.3	16.4	19.6	15.8	17.3	20.5	15.7
Medium	36.7	38.0	36.4	36.0	34.2	36.5	36.6	33.1	37.4	36.1	33.7	37.3
High	43.3	28.1	47.4	46.6	44.6	47.2	46.9	47.3	46.8	46.6	45.8	47.0
Number of observations	3,661	800	2,861	2,789	567	2,222	2,222	367	1,855	2,789	934	1,855

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted (Number of observations unweighted).

The remaining rows show the extend of conflicts with and support from colleagues as reported by apprentices (for a graphical representation see Figure 1). From column (i), it is apparent that frequent conflicts with colleagues were comparatively rare: only ten percent of all apprentices reported high levels of conflicts in their training company. In contrast, missing support from colleagues occurred more often. Around 20 percent reported low levels of support (i.e., at most partially agreed that their colleagues take time to explain new tasks to them). A closer look at these distributions by training outcome shows that training graduates (column (iii)) less often reported conflicts and more often support than their unsuccessful peers (column (ii)). Among apprenticeship graduates, we find a similar but less pronounced pattern when we compare those who received an employment offer from their company (column (vi)) with those who did not receive such an offer (column (v)). Finally, among those who received an employment offer, we do not find substantive differences in terms of conflicts or support between those who accepted and those who rejected this offer.

Overall, with every next analytical step and the associated restriction of the sample, differences between apprentices in their reporting of conflicts and support during training are further reduced. Consequently, differences in terms of conflicts and support between those who remain in the company after training graduation and those who do not are comparatively small.

Multivariate results

Table 2 presents average marginal effects of conflict and support in the company on the likelihood of successfully completing training, receiving a job offer after graduation from training, accepting the takeover offer, and remaining in the training company after graduation. Models 1a, 2a, 3a, and 4a, show results for the two independent variables from separate models, while in Models 1b, 2b, 3b, and 4b, both independent variables were included simultaneously in one model. This means that in Models b, the relation of one independent variable to the dependent variables was calculated while controlling for the other independent variable. All models include all control variables (all but the analyses pertaining to graduation after training include the grade from vocational training; full models can be found in Table 6, Table 7, and Table 8 in the Appendix). In Table 3, we show analogous models for the interaction of our independent variables that combines information on conflict and support (full models can be found in Table 9 in the Appendix).

From Models 1a and 1b in Table 2, we see that both conflict and a lack of support substantially reduce the likelihood of *successfully completing vocational training*. When including the two independent variables separately in Model 1a, we find that adolescents who indicated high levels of conflict with their colleagues and superiors have an eight percentage points higher probability to prematurely terminate their apprenticeship than those who report low levels of conflict. For those who reported medium levels of conflict, the termination probability is seven percentage points higher. For our support measure, we find similar results. Those who reported medium levels of support by superiors and colleagues have a five percentage points higher, those who reported low levels of support a ten percentage points higher probability to prematurely terminate

around 68 percent of apprenticeship graduates remained in their training company (BIBB–Bundesinstitut für Berufsbildung 2024).

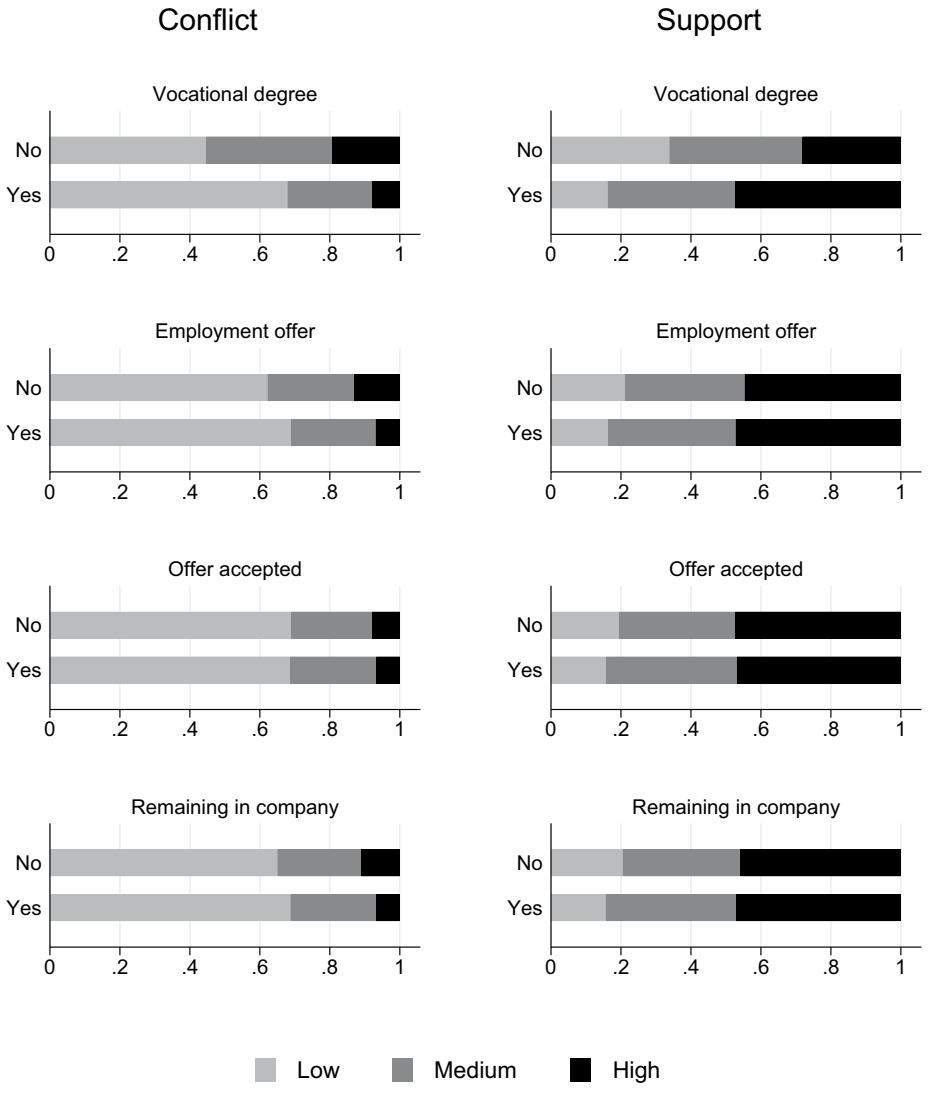

Fig. 1 Distributions of conflict and support across outcomes. Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations. Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted

training compared with those who reported high levels of support. When support and conflict were included simultaneously in Model 1b, point estimates are slightly reduced but still considerable for all categories but medium levels of support, ranging between five and seven percentage points. Discrete probability changes are statistically significant for medium levels of conflict and low levels of support. For high levels of conflict, the coefficient is of comparable to that of medium levels of conflict, however, statistically significant at the ten percent level only. Thus, it seems that while any levels of conflict are related to a lower likelihood of training graduation, the same is true especially for low levels of support. Nonetheless, the finding that both support and conflict are correlated with the dropout probability is in line with our Hypotheses 1a and 1b.[16]

[16] Not controlling for the extent to which the training occupation was desired by the apprentice increases estimate sizes in both, Model 1a and Model 1b substantively and renders them statistically significant at the 5 percent level (see Table 11 in the Appendix). Since we cannot rule out that apprentices' report about the extent to which the training occupation was desired was influenced by experiences of conflicts or support in the training company, we interpret our main results as conservative estimates.

Table 2 Relations of conflict and support to training outcomes (average marginal effects after logistic regression)

	Vocational degree		Employment offer		Offer accepted		Remaining in company	
	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3b	Model 4a	Model 4b
	Single IV	Both IV	Single IV	Both IV	Single IV	Both IV	Single IV	Both IV
Level of conflict (ref.: low)								
Medium	−0.068***	−0.053**	−0.008	−0.007	0.011	0.016	0.003	0.005
	(0.019)	(0.019)	(0.022)	(0.022)	(0.022)	(0.023)	(0.026)	(0.026)
High	−0.084**	−0.056	−0.066*	−0.060	−0.018	−0.008	−0.071	−0.060
	(0.031)	(0.031)	(0.033)	(0.035)	(0.038)	(0.040)	(0.039)	(0.041)
Level of support (ref.: high)								
Medium	−0.046*	−0.035	0.004	0.008	−0.002	−0.005	0.013	0.014
	(0.018)	(0.018)	(0.020)	(0.021)	(0.021)	(0.021)	(0.024)	(0.024)
Low	−0.096***	−0.072**	−0.029	−0.015	−0.022	−0.024	−0.039	−0.028
	(0.025)	(0.027)	(0.027)	(0.029)	(0.025)	(0.028)	(0.030)	(0.032)
Baseline probability	0.786		0.795		0.833		0.658	
Number of cases	3,661		2,789		2,222		2,789	

Source: German National Educational Panel Study (NEPS): Starting Cohort 4, authors' own calculations.

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted.

Cluster robust standard errors (in parentheses).

All Models include control variables and federal state fixed effects (final grade from vocational training was not included in Models pertaining to vocational degree). Baseline probabilities pertain to Models b (both independent variables included).

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

In Model 1 from Table 3, we find for our combined indicator that, compared with the theoretically most favorable combination of high levels of support and low levels of conflict, all other combinations of the two measures are related to a substantively lower probability of training success. With a reduction of 15 percentage points, this probability is lowest for those adolescents with high levels of conflict and low levels of support. Except for the combination of high levels of support and high levels of conflict as well as the combination of medium levels of support and high levels of conflict, all differences are statistically significant. However, when we compare the coefficients for different levels of conflicts *within* certain levels of support, we see that, contrary to Hypothesis 1c, high levels of support do not buffer the negative consequences of conflicts. Table 10 in the Appendix reports marginal effects of medium or high levels of conflict compared to low conflict, each at the three different levels of support. To visualize this support-specific relation of conflict and success probability, the upper-left graph in Figure 2 plots predictive margins of training success. In fact, it even becomes apparent that the correlation between increasing levels of conflict and lower training success is weakest when support is low, and strongest when support is high.

Models 2a and 2b from Table 2 indicate in line with hypothesis 2a that high levels of conflict reduce the probability to receive an *employment offer from the training company upon graduation*. Even though the discrete probability change is statistically significant only at the 10 percent level in Model 2b, its size of around six percentage points is of considerable magnitude. At the same time, it is noteworthy that the occurrence of high levels of conflict with colleagues or supervisors is far from being definite exclusion criterion. Furthermore, it seems that while any level of conflict is detrimental to training success, only high levels of conflict seem to lead companies to not offer graduates a

Table 3 Vocational degree and remain in training company: combined measure (average marginal effects after logistic regression)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
Combination of conflict and support (ref.: high support - low conflict)				
High support - medium conflict	−0.124**	−0.034	0.007	−0.020
	(0.039)	(0.039)	(0.039)	(0.044)
High support - high conflict	−0.065	−0.040	−0.009	−0.031
	(0.084)	(0.068)	(0.068)	(0.081)
Medium support - low conflict	−0.050*	−0.001	−0.009	−0.001
	(0.024)	(0.026)	(0.027)	(0.029)
Medium support - medium conflict	−0.099***	0.002	0.031	0.033
	(0.029)	(0.035)	(0.031)	(0.044)
Medium support - high conflict	−0.097	−0.059	0.034	−0.032
	(0.061)	(0.056)	(0.058)	(0.071)
Low support - low conflict	−0.124**	−0.036	0.008	−0.027
	(0.044)	(0.039)	(0.039)	(0.044)
Low support - medium conflict	−0.128***	0.000	−0.017	−0.024
	(0.037)	(0.038)	(0.039)	(0.049)
Low support - high conflict	−0.149**	−0.105*	−0.068	−0.132*
	(0.045)	(0.051)	(0.058)	(0.056)
Baseline probability	0.787	0.795	0.833	0.658
Number of cases	3,661	2,789	2,222	2,789

Source: German National Educational Panel Study (NEPS): Starting Cohort 4, authors' own calculations

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted

Cluster robust standard errors (in parentheses)

All Models include control variables and federal state fixed effects (final grade from vocational training was not included in Models pertaining to vocational degree)

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

subsequent employment position while the occurrence of some conflicts is not relevant if trainees proved to be generally capable (i.e., finished their training successfully). The level of support experienced by apprentices seems to play a minor role. Coefficients for both medium and low levels of support are small and not statistically significant. Thus, our findings corroborate Hypothesis 2b.

Results from Table 3 show again that those adolescents with many conflicts and little support are most disadvantaged: They are around 11 percentage points less likely to receive an employment offer than those with the highest level of support and the lowest level of conflict. With an about six percentage points smaller likelihood, those with medium levels of support and high levels of conflicts are also disadvantaged, but the discrete probability change is not statistically significant (see also the upper-right graph in Figure 2). All other point estimates are of a negligible magnitude and statistically not significant. This reflects the overall lower relevance of conflict and support for employment offers from the separate models in Table 3.

The subsequent stage of the analysis entails the examination of the average marginal effects of conflict and support within the company on the probability of graduates *accepting a job offered by the training company*. Models 3a and 3b of Table 2 reveal that all coefficients are statistically insignificant and of minuscule magnitude. This indicates that, contrary to our Hypotheses 3a and 3b, neither conflict nor support during apprenticeship training is associated with the likelihood of successful graduates accepting a job

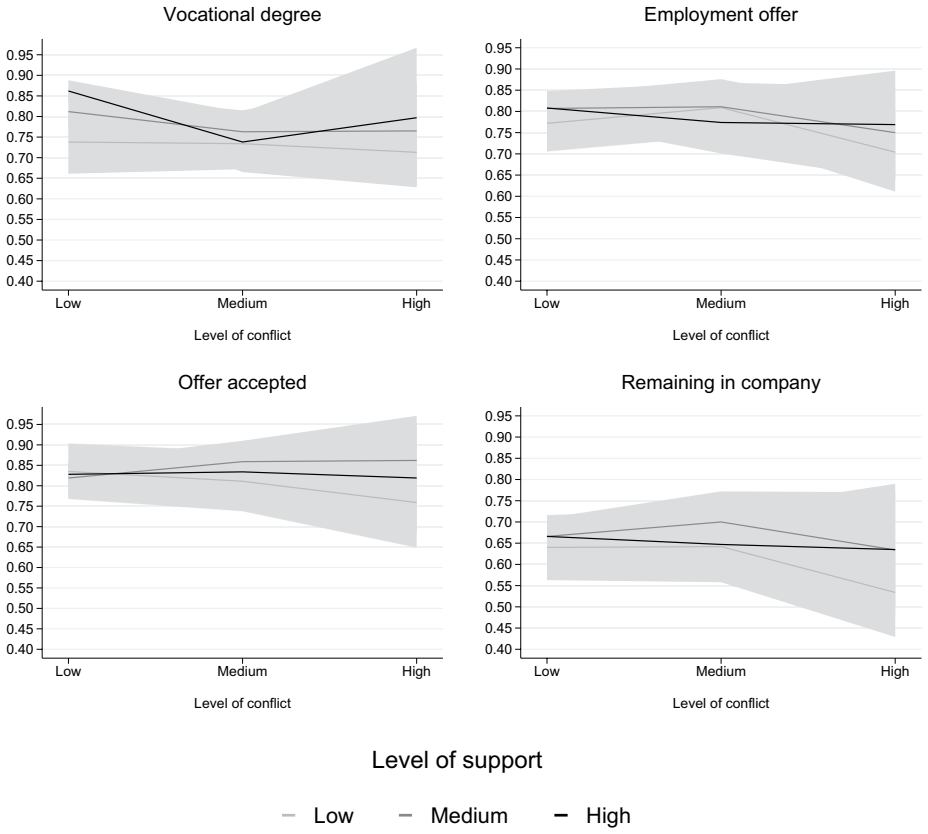

Fig. 2 Relation of levels of conflict to outcome variables by levels of support (predictive margins). Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations. Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted

offer from the training company. Thus, it seems that those who have completed their training successfully and received an employment offer are positively selected in certain aspects, such as ability or talent, or the fit of the apprentice with the organization or the supervisor.

In the final stage of our analysis, we remove the distinction between the offer of a position and the acceptance of that offer. We then investigate the overall relationship of conflict and support to the *probability of remaining with the training company as a regular employee after successful completion of the dual training*. The average marginal effects presented in Models 4a and 4b of Table 2 are similar to those from models 2a and 2b on employment offer, yet none of the estimates are statistically significant at the five percent level. Thus, it seems that in contrast to our Hypotheses 4a and 4b, neither conflicts nor lacking support alone are sufficient to substantively reduce the probability of graduates remaining with their training company. This conclusion is reinforced by the results presented in Model 4 of Table 3. At the same time this model suggests that graduates are clearly less likely to remain in their training company when both high levels of conflict and low levels of support occur during their dual training. The coefficient is statistically significant at the five percent level and with a value of 13 percentage points of pronounced size (see also the lower-right graph in Fig. 2).

Conclusion

Despite the importance of dual vocational training for the school-to-work transition in Germany, there is a lack of knowledge about the role of conflict and support within training companies during dual vocational training for successful completion of training and the employment relationship after graduation. This research gap is particularly noteworthy given that our descriptive results reveal considerable heterogeneity in trainees' experiences. Only 43 percent of trainees report high levels of support, leaving a substantial share of trainees with moderate or low support during their training. While conflicts are less frequent overall, 37 percent of trainees still report medium to high levels of conflict and one in ten even experience high levels of conflict. Against this background, we investigated the role of conflict and support during dual vocational training in the likelihood of successful training graduation, receiving a job offer after graduation, accepting the job offer, and, overall, remaining in the training company after completion of training. By distinguishing between the employment offer and the acceptance of this offer, we acknowledge that conflict and support may influence the decisions of graduates and training companies differently.

Our multivariate results indicate that apprentices are less likely to graduate from training when they report conflicts in the company and more likely when they report support. Trainees who report both high levels of conflict and low levels of support have the highest risk of premature training termination. And even if they successfully graduate, they are also least likely to receive a job offer from their training company and consequently to remain in their training company after graduation. However, against our expectations, it seems that for the decision of graduates to stay in their training company if offered employment, conflict and support during training are largely irrelevant. On the other hand, the likelihood of the training company making a job offer and of graduates starting a regular job in the training company is mainly associated with conflicts during training, while the level of support plays a minor role.

To our knowledge, this study is the first to prospectively analyze the consequences of support and conflicts in the company for training success and further employment in the company, using nationally representative panel data. While this provides important new insights, our study also has some limitations and remaining open questions.

For one, the research design of the study does not allow for causal claims. Thus, our results describe correlations between the variables in question rather than causal relationships. Moreover, as is common in longitudinal analyses, panel attrition is an issue, and it cannot be ruled out that young people dropping out of vocational training are more likely to leave the panel. However, since the distribution of our dependent variables does not differ substantially from official sources, we cautiously suggest that selective panel attrition is unlikely to substantively bias our results. Additionally, as the situation in the company is measured during the first interview during which an ongoing episode has been reported by respondents, thus capturing the situation in the company prior to success or failure for most adolescents and allowing a comparison between graduates and dropouts, some adolescents have already dropped out from their apprenticeship before this time point. For these episodes, information is not available and thus had to be imputed.

Furthermore, to reach a better understanding of how conflicts arise, further research should pay closer attention to the reasons for and types of conflicts or missing support.

Unfortunately, the data at hand does not entail more information, for instance, about conflicts with or support from different types of colleagues, such as superiors, supervisors, or other trainees, as well as the situations in which conflicts arise, which would improve our understanding about the underlying mechanisms. Our results also raise further questions about those who either did not finish their training or did not stay in the company. For instance, while current research suggests that trainees that reported conflicts as reasons for training termination are comparatively more likely to change to another training position (Michaelis and Findeisen 2024), the consequences of conflicts during training for the further careers of graduates who do not remain in the company deserves further attention.

Despite these limitations and remaining open questions, the findings are highly relevant for the German context, as little was previously known about the role of conflict and support in the company for the successful completion of dual training and the subsequent retention in the training company. This is despite the fact that more than 40 percent of young people between the ages 20 to 25 in Germany have acquired a vocational training qualification (Autor:innengruppe Bildungsberichterstattung 2022) and this transition does not proceed smoothly for all young people. Particularly in times of shortages of skilled labour, the high rates of training cancellation rates have attracted a great deal of attention (BIBB–Bundesinstitut für Berufsbildung 2024, p. 149): They are highlighted as an important current challenge for the German vocational education and training system, as they lead to uncertainty for companies and young people, a loss of invested time and resources and, in some circumstances, to a final dropout from training (BMBF–Federal Ministry of Education and Research 2024, p. 85f.).

Against this background, our findings have important practical and policy implications. They suggest that, given the shortage of skilled labour, improving interpersonal relationships during training and reducing conflicts can help to secure the long-term engagement of apprentices. Companies should therefore invest in conflict prevention and conflict resolution measures such as recurring feedback meetings, mentoring programs, or training for instructors. Also actors outside the company, such as vocational schools, could be involved stronger in conflict management and act as mediators. Moreover, policy programs aimed at ensuring a smooth school-to-work transition of adolescents and of securing a skilled labour force should place greater emphasis on soft factors such as workplace conflict and support culture.

Our results also provide interesting new insights for research on the topic beyond the German application case, as also internationally, little is known about the role of conflict and support in companies during the transition to the labour market. Particularly, there is a lack of differentiated longitudinal studies and studies that consider both trainees or labour market entrants and companies as relevant actors in the termination of the training or employment relationship.

Appendix

See Tables 4, 5, 6, 7, 8, 9, 10 and 11.

Table 4 Cross-tabulation of the original and combined categories of conflict and support

			Level of support					
			Low			**Medium**	**High**	
			Does not apply at all	**Does rather not apply**	**Does partly apply**	**Does rather apply**	**Does completely apply**	**Total**
Level of conflict	Low	Does not apply at all	6	25	149	546	897	1,623
	Medium	Does rather not apply	3	28	132	269	173	605
		Does partly apply	3	25	47	55	40	170
	High	Does rather apply	2	7	9	14	7	39
		Does completely apply	5	5	2	1	2	15
		Total	19	90	339	885	1,119	2,452

Source: NEPS SC4, own calculations

Cells contain number of observations from each combination of the original five-category variables

Observations from the estimation samples pertaining to the training completion models (N=2,452; N=1,209 cases with missing information on conflict and support variables)

Table 5 Distributions of independent variables across outcomes

	Vocational degree			Employment offer			Offer accepted			Remaining in company		
	All	No	Yes	All	No	Yes	All	No	Yes	All	No	Yes
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(vii)	(viii)	(ix)
Outcome variable (row percentage)	100.0	20.8	79.2	100.0	20.4	79.6	100.0	17.3	82.7	100.0	34.2	65.8
Independent variables (column percentages)												
Level of conflict												
Low	63.1	44.6	68.0	67.5	62.2	68.9	68.7	69.1	68.7	67.5	65.1	68.8
Medium	26.7	36.0	24.3	24.4	24.8	24.3	24.4	23.0	24.7	24.4	24.0	24.5
High	10.2	19.4	7.7	8.1	13.0	6.8	6.9	7.9	6.7	8.1	10.9	6.7
Level of support												
Low	19.9	33.9	16.3	17.3	21.2	16.3	16.4	19.6	15.8	17.3	20.5	15.7
Medium	36.7	38.0	36.4	36.0	34.2	36.5	36.6	33.1	37.4	36.1	33.7	37.3
High	43.3	28.1	47.4	46.6	44.6	47.2	46.9	47.3	46.8	46.6	45.8	47.0
Company size												
0-49 employees	54.3	71.4	49.8	49.9	67.2	45.5	45.5	56.2	43.3	49.9	62.8	43.2
50-249 employees	21.8	17.0	23.0	23.1	20.4	23.8	23.7	20.6	24.3	23.1	20.5	24.4
250+ employees	23.9	11.6	27.2	27.0	12.4	30.8	30.8	23.2	32.4	27.0	16.7	32.3
Occupation is desired occupation												
Not/rather not desired	10.4	30.6	5.0	5.1	5.8	5.0	5.0	7.2	4.5	5.1	6.3	4.5
Partly desired	17.2	22.1	15.9	16.2	19.9	15.2	15.2	15.8	15.1	16.2	18.2	15.1
Rather/completely desired	72.5	47.3	79.1	78.7	74.3	79.8	79.8	77.1	80.4	78.7	75.4	80.4
Previous training episode												
No	94.2	91.2	94.9	91.4	87.5	92.4	92.4	91.9	92.5	91.4	89.3	92.5
Yes	5.8	8.8	5.1	8.6	12.5	7.6	7.6	8.1	7.5	8.6	10.7	7.5
Occupational segment												
Agriculture, forestry and horticulture	2.5	2.2	2.6	2.5	5.4	1.8	1.8	3.3	1.5	2.5	4.5	1.5
Manufacturing occupations	10.1	9.9	10.1	9.7	11.0	9.3	9.3	7.2	9.8	9.7	9.5	9.8
Production engineering occupations	17.9	9.0	20.3	20.3	14.9	21.7	21.7	13.7	23.3	20.3	14.4	23.3
Building and finishing trades	7.1	9.5	6.5	6.8	8.4	6.4	6.4	7.9	6.1	6.8	8.2	6.1

Table 5 (continued)

	Vocational degree			Employment offer			Offer accepted			Remaining in company		
	All	No	Yes	All	No	Yes	All	No	Yes	All	No	Yes
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(vii)	(viii)	(ix)
Food and catering occupations	7.4	15.2	5.3	5.3	5.4	5.3	5.3	11.0	4.1	5.3	7.6	4.1
Medical and non-medical healthcare occupations	11.4	19.2	9.3	9.3	9.9	9.1	9.1	12.0	8.5	9.3	10.8	8.5
Social and cultural service occupations	2.2	2.7	2.1	1.3	2.8	0.9	0.9	0.9	0.9	1.3	2.0	0.9
Commercial occupations	12.1	14.4	11.5	12.1	11.7	12.2	12.2	14.5	11.7	12.1	12.9	11.7
Occupations in business management and organization	10.9	5.6	12.3	13.0	13.3	13.0	13.0	16.3	12.3	13.0	14.5	12.3
Business-related service occupations	9.7	5.4	10.8	10.6	7.0	11.5	11.5	7.1	12.4	10.6	7.0	12.4
IT and scientific service professions	4.4	2.7	4.8	4.7	5.7	4.5	4.5	2.7	4.8	4.7	4.5	4.8
Transport and logistics (incl. security and cleaning)	4.3	4.2	4.3	4.5	4.5	4.5	4.5	3.4	4.7	4.5	4.1	4.7
Highest education degree												
General secondary degree or below	22.8	36.7	19.2	18.9	28.2	16.5	16.5	14.1	17.0	18.9	22.6	17.0
Intermediate secondary degree	49.0	46.9	49.6	49.9	50.9	49.7	49.7	44.3	50.8	49.9	48.2	50.8
Upper secondary degree	28.1	16.4	31.2	31.2	20.9	33.8	33.8	41.6	32.2	31.2	29.2	32.2
Sampling school in Grade 9												
Basic secondary school	29.1	38.0	26.7	27.0	36.5	24.6	24.6	22.2	25.1	27.0	30.7	25.1
Combined tracks	10.2	17.5	8.3	8.3	10.9	7.7	7.7	6.3	8.0	8.3	9.1	8.0
Intermediate secondary school	33.6	22.5	36.5	36.4	29.1	38.3	38.3	42.3	37.4	36.4	34.4	37.4
Integrated comprehensive school	9.0	9.3	9.0	9.0	8.6	9.1	9.1	6.9	9.5	9.0	7.9	9.5
Upper secondary school	18.1	12.7	19.5	19.3	14.9	20.4	20.4	22.3	20.0	19.3	17.9	20.0
Parents' highest education												
General secondary degree or below	20.4	22.6	19.8	20.3	20.8	20.2	20.0	18.7	20.3	20.4	20.0	20.6
Intermediate secondary degree	47.1	49.7	46.4	46.3	46.6	46.2	46.3	47.5	46.1	46.3	46.9	45.9
Upper secondary degree	16.6	13.5	17.4	17.3	17.8	17.2	17.3	14.2	18.0	17.3	16.4	17.8
Tertiary degree	15.9	14.1	16.4	16.0	14.8	16.4	16.4	19.6	15.7	16.0	16.7	15.7
Parents' employment status												
No parent employed	2.9	5.1	2.3	2.5	3.7	2.2	2.3	2.1	2.4	2.5	3.1	2.3
One parent employed	23.1	27.2	22.1	22.1	22.9	21.9	21.9	22.6	21.7	22.1	22.7	21.8

Table 5 (continued)

	Vocational degree			Employment offer			Offer accepted			Remaining in company		
	All	No	Yes	All	No	Yes	All	No	Yes	All	No	Yes
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(vii)	(viii)	(ix)
Both parents employed	74.0	67.7	75.7	75.4	73.4	75.9	75.8	75.3	75.9	75.4	74.2	76.0
Two parents in household												
No	15.9	23.1	13.9	14.2	16.5	13.7	13.7	11.8	14.1	14.3	14.6	14.1
Yes	84.1	76.9	86.1	85.8	83.5	86.3	86.3	88.2	85.9	85.7	85.4	85.9
Number of books in household												
0-25	16.8	24.5	14.8	15.0	18.5	14.1	14.1	12.8	14.3	15.0	16.2	14.4
26-200	54.6	52.5	55.1	56.1	55.3	56.2	56.4	55.7	56.5	56.0	55.5	56.3
201-500	19.3	14.3	20.6	19.7	20.4	19.5	19.6	18.9	19.7	19.7	19.8	19.7
More than 500	9.3	8.7	9.5	9.2	5.8	10.1	10.0	12.6	9.4	9.2	8.5	9.6
Female												
No	58.4	52.4	60.0	60.4	63.6	59.6	59.5	49.1	61.7	60.4	57.9	61.7
Yes	41.6	47.6	40.0	39.6	36.4	40.4	40.5	50.9	38.3	39.6	42.1	38.3
Migration background												
No	79.8	72.3	81.8	81.5	81.3	81.5	81.5	82.5	81.3	81.5	81.8	81.3
Yes	20.2	27.7	18.2	18.5	18.7	18.5	18.5	17.5	18.7	18.5	18.2	18.7
Year of birth												
Before 1995	15.0	27.0	11.8	12.2	14.4	11.7	11.7	18.3	10.3	12.2	15.9	10.3
1995	49.2	46.9	49.9	49.9	48.4	50.3	50.3	44.1	51.6	49.9	46.8	51.6
After 1995	35.8	26.2	38.3	37.9	37.1	38.0	38.0	37.7	38.1	37.9	37.4	38.1
Lives in small town or village area												
No	67.2	72.4	65.8	66.4	67.3	66.1	66.1	72.4	64.8	66.4	69.4	64.8
Yes	32.8	27.6	34.2	33.6	32.7	33.9	33.9	27.6	35.2	33.6	30.6	35.2
Independent variables (mean values)												
Apprenticeship remuneration	518.1	452.0	535.5	534.4	481.7	548.0	548.0	532.0	551.3	534.4	501.9	551.3
Overall grade of highest education degree	2.7	2.9	2.6	2.7	2.8	2.6	2.6	2.5	2.6	2.7	2.7	2.6
Grades in math of highest education degree	3.0	3.2	2.9	2.9	3.1	2.9	2.9	3.0	2.9	2.9	3.1	2.9

Table 5 (continued)

	Vocational degree			Employment offer			Offer accepted			Remaining in company		
	All	No	Yes	All	No	Yes	All	No	Yes	All	No	Yes
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(vii)	(viii)	(ix)
Grades in German of highest education degree	2.8	3.0	2.8	2.8	2.9	2.8	2.8	2.6	2.8	2.8	2.8	2.8
Final grade in training	0.0	0.0	0.0	2.4	2.7	2.3	2.4	2.2	2.4	2.4	2.5	2.4
ICT literacy: WLE	-0.1	-0.3	0.0	0.0	-0.2	0.0	0.0	0.1	0.0	0.0	-0.1	0.0
Natural sciences: WLE	-0.1	-0.3	0.0	0.0	-0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Mathematics: WLE (corrected)	-0.2	-0.6	-0.1	-0.1	-0.3	0.0	0.0	0.0	0.0	-0.1	-0.2	0.0
Reading competence: WLE	-0.2	-0.4	-0.2	-0.2	-0.3	-0.1	-0.1	0.0	-0.1	-0.2	-0.2	-0.2
Vocabulary: sum score	56.5	54.7	57.0	57.0	56.6	57.2	57.1	57.6	57.0	57.0	57.0	57.1
Reading speed: sum score	32.7	31.9	32.9	32.9	31.9	33.2	33.1	34.1	32.9	32.9	32.8	33.0
Extraversion	3.4	3.5	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.4	3.4
Agreeableness	3.5	3.4	3.5	3.5	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Conscientiousness	3.1	3.1	3.2	3.2	3.1	3.2	3.2	3.3	3.2	3.2	3.2	3.2
Neuroticism	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.6	2.8	2.7	2.7	2.8
Openness	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.3	3.4	3.5	3.3
Parents' HISEI	47.2	44.6	47.9	47.7	46.5	48.0	48.0	49.4	47.7	47.7	47.7	47.7
Unemployment rate in employment agency district	5.5	6.4	5.2	5.2	5.6	5.1	5.1	5.0	5.1	5.2	5.4	5.1
Number of observations	3,661	800	2,861	2,789	567	2,222	2,222	367	1,855	2,789	934	1,855

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted (Number of observations unweighted)

WLE = weighted likelihood estimates; ICT = information and communication technology; HISEI= highest International Socio-Economic Index of Occupational Status (ISEI) score

Table 6 Relations of conflict to training outcomes (full models; average marginal effects after logistic regression)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
Level of conflict (ref.: low)				
Medium	-0.068***	-0.008	0.011	0.003
	(0.019)	(0.022)	(0.022)	(0.026)
High	-0.084**	-0.066*	-0.018	-0.071
	(0.031)	(0.033)	(0.038)	(0.039)
Company size (ref.: 0-49 employees)				
50-249 employees	0.046*	0.041	0.043	0.084**
	(0.018)	(0.025)	(0.022)	(0.027)
250+ employees	0.052*	0.111***	0.076***	0.157***
	(0.021)	(0.025)	(0.020)	(0.031)
Apprenticeship remuneration	0.000*	0.000*	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Occupation is desired occupation (ref.: rather/completely desired)				
Partly desired	-0.084***	-0.030	0.004	-0.026
	(0.018)	(0.023)	(0.022)	(0.026)
Not/rather not desired	-0.343***	-0.045	-0.034	-0.061
	(0.030)	(0.037)	(0.041)	(0.042)
Previous training episode	-0.064*	-0.056*	-0.008	-0.051
	(0.029)	(0.028)	(0.036)	(0.036)
Occupational segment (ref.: production engineering occupations)				
Agriculture, forestry and horticulture	-0.036	-0.170**	-0.142	-0.238***
	(0.043)	(0.061)	(0.080)	(0.071)
Manufacturing occupations	-0.032	-0.054	-0.014	-0.063
	(0.023)	(0.028)	(0.041)	(0.040)
Building and finishing trades	-0.042	-0.025	-0.109*	-0.095*
	(0.026)	(0.033)	(0.044)	(0.046)
Food and catering occupations	-0.159***	-0.025	-0.156**	-0.158**
	(0.034)	(0.037)	(0.048)	(0.050)
Medical and non-medical healthcare occupations	-0.105***	-0.021	-0.051	-0.048
	(0.027)	(0.037)	(0.040)	(0.039)
Social and cultural service occupations	-0.098*	-0.262**	0.032	-0.185*
	(0.049)	(0.087)	(0.060)	(0.084)
Commercial occupations	-0.019	-0.002	-0.049	-0.033
	(0.023)	(0.029)	(0.036)	(0.040)
Occupations in business management and organization	0.009	-0.107*	-0.030	-0.124*
	(0.030)	(0.046)	(0.039)	(0.054)
Business-related service occupations	-0.041	-0.066	0.057	0.014
	(0.029)	(0.037)	(0.030)	(0.042)
IT and scientific service professions	-0.069	-0.167***	0.031	-0.101
	(0.044)	(0.049)	(0.042)	(0.052)
Transport and logistics (incl. security and cleaning)	0.007	-0.040	-0.021	-0.048
	(0.032)	(0.036)	(0.044)	(0.046)
Female	-0.002	0.015	-0.026	-0.011
	(0.019)	(0.025)	(0.028)	(0.028)
Migration background	-0.019	0.021	0.010	0.031
	(0.018)	(0.025)	(0.024)	(0.028)
Year of birth (ref.: 1995)				

Table 6 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
before 1995	-0.082***	-0.002	-0.079	-0.076
	(0.017)	(0.026)	(0.043)	(0.052)
after 1995	0.012	-0.017	-0.012	-0.015
	(0.014)	(0.020)	(0.017)	(0.022)
Highest education (ref.: intermediate secondary degree)				
General secondary degree or below	-0.003	-0.041	-0.002	-0.048
	(0.020)	(0.027)	(0.028)	(0.035)
Upper secondary degree	0.062**	0.068**	-0.049	-0.001
	(0.019)	(0.026)	(0.027)	(0.038)
Sampling school in Grade 9 (ref.: intermediate secondary school)				
Basic secondary school	-0.055**	-0.048	0.025	-0.019
	(0.020)	(0.029)	(0.027)	(0.038)
Combined tracks	-0.064	-0.139**	0.067	-0.055
	(0.036)	(0.045)	(0.046)	(0.049)
Integrated comprehensive school	0.016	0.024	0.056	0.061
	(0.020)	(0.029)	(0.031)	(0.038)
Upper secondary school	-0.040	-0.033	0.037	0.010
	(0.023)	(0.033)	(0.030)	(0.039)
Overall grade of highest education degree	-0.040*	-0.017	0.051	0.037
	(0.018)	(0.022)	(0.030)	(0.032)
Grades in math of highest education degree	-0.003	-0.025	-0.035*	-0.050**
	(0.010)	(0.013)	(0.014)	(0.015)
Grades in German of highest education degree	-0.019	-0.003	0.032	0.023
	(0.010)	(0.014)	(0.017)	(0.019)
Final grade from training		-0.060***	0.047**	-0.013
		(0.016)	(0.016)	(0.019)
ICT literacy: WLE	-0.012	-0.002	-0.009	-0.018
	(0.011)	(0.016)	(0.017)	(0.020)
Natural sciences: WLE	0.009	-0.011	0.007	-0.002
	(0.011)	(0.015)	(0.014)	(0.018)
Mathematics: WLE (corrected)	0.032***	0.007	-0.003	0.004
	(0.009)	(0.012)	(0.013)	(0.015)
Reading competence: WLE	-0.018*	-0.002	-0.006	-0.005
	(0.008)	(0.011)	(0.012)	(0.013)
Vocabulary: sum score	-0.002	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
Reading speed: sum score	-0.000	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
Extraversion	-0.008	0.009	-0.006	0.007
	(0.008)	(0.011)	(0.013)	(0.014)
Agreeableness	0.000	0.025	0.000	0.023
	(0.010)	(0.016)	(0.017)	(0.021)
Conscientiousness	-0.003	-0.008	-0.008	-0.015
	(0.008)	(0.013)	(0.013)	(0.015)
Neuroticism	0.000	0.003	0.043**	0.035*
	(0.009)	(0.013)	(0.014)	(0.017)
Openness	-0.010	-0.015	-0.003	-0.017
	(0.007)	(0.011)	(0.012)	(0.013)
Parents' highest education (ref.: tertiary degree)				

Table 6 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
General secondary degree or below	0.008	0.061	0.012	0.058
	(0.028)	(0.037)	(0.040)	(0.046)
Intermediate secondary degree	-0.019	0.025	0.012	0.022
	(0.024)	(0.032)	(0.033)	(0.041)
Upper secondary degree	0.024	0.006	0.059	0.048
	(0.023)	(0.034)	(0.032)	(0.040)
Parents' employment status (ref.: no parent employed)				
One parent employed	0.022	0.063	-0.011	0.047
	(0.041)	(0.063)	(0.053)	(0.064)
Both parents employed	0.033	0.061	-0.002	0.049
	(0.038)	(0.059)	(0.053)	(0.064)
Parents' HISEI	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.001)	(0.001)	(0.001)
Two parents in household	0.033	-0.014	-0.025	-0.028
	(0.017)	(0.024)	(0.022)	(0.028)
Number of books in household (ref.: 0-25)				
26-200	0.034	0.035	0.008	0.038
	(0.018)	(0.032)	(0.028)	(0.041)
201-500	0.060**	0.017	0.015	0.038
	(0.021)	(0.042)	(0.031)	(0.050)
More than 500	0.023	0.104*	-0.019	0.074
	(0.029)	(0.041)	(0.043)	(0.057)
Unemployment rate in employment agency district	-0.025***	-0.011*	-0.001	-0.010
	(0.004)	(0.005)	(0.006)	(0.006)
Lives in small town or village area	0.002	-0.014	0.040	0.026
	(0.017)	(0.018)	(0.021)	(0.025)
Baseline probability	0.786	0.795	0.833	0.658
Number of cases	3,661	2,789	2,222	2,789

Source: German National Educational Panel Study (NEPS): Starting Cohort 4, authors' own calculations

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted

Cluster robust standard errors (in parentheses)

All Models include federal state fixed effects

WLE = weighted likelihood estimates; ICT = information and communication technology; HISEI = highest International Socio-Economic Index of Occupational Status (ISEI) score

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 7 Relations of support to training outcomes (full models; average marginal effects after logistic regression)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
Level of support (ref.: high)				
Medium	-0.046*	0.004	-0.002	0.013
	(0.018)	(0.020)	(0.021)	(0.024)
Low	-0.096***	-0.029	-0.022	-0.039
	(0.025)	(0.027)	(0.025)	(0.030)
Company size (ref.: 0-49 employees)				
50-249 employees	0.050**	0.044	0.043	0.085**
	(0.018)	(0.025)	(0.022)	(0.027)
250+ employees	0.053*	0.111***	0.074***	0.156***
	(0.021)	(0.025)	(0.021)	(0.031)
Apprenticeship remuneration	0.000**	0.000*	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Occupation is desired occupation (ref.: rather/completely desired)				
Partly desired	-0.077***	-0.028	0.007	-0.022
	(0.018)	(0.023)	(0.022)	(0.026)
Not/rather not desired	-0.337***	-0.047	-0.030	-0.060
	(0.029)	(0.037)	(0.041)	(0.043)
Previous training episode	-0.060*	-0.055	-0.006	-0.049
	(0.029)	(0.028)	(0.035)	(0.036)
Occupational segment (ref.: production engineering occupations)				
Agriculture, forestry and horticulture	-0.033	-0.164**	-0.140	-0.234**
	(0.043)	(0.061)	(0.080)	(0.071)
Manufacturing occupations	-0.029	-0.055	-0.016	-0.065
	(0.024)	(0.028)	(0.041)	(0.041)
Building and finishing trades	-0.042	-0.024	-0.109*	-0.094*
	(0.027)	(0.034)	(0.044)	(0.046)
Food and catering occupations	-0.160***	-0.026	-0.156**	-0.160**
	(0.034)	(0.037)	(0.048)	(0.050)
Medical and non-medical healthcare occupations	-0.104***	-0.024	-0.053	-0.053
	(0.027)	(0.038)	(0.040)	(0.039)
Social and cultural service occupations	-0.104*	-0.274**	0.029	-0.195*
	(0.049)	(0.087)	(0.060)	(0.084)
Commercial occupations	-0.019	-0.003	-0.051	-0.036
	(0.023)	(0.029)	(0.036)	(0.040)
Occupations in business management and organization	0.008	-0.108*	-0.031	-0.125*
	(0.029)	(0.046)	(0.038)	(0.054)
Business-related service occupations	-0.045	-0.066	0.056	0.013
	(0.029)	(0.037)	(0.030)	(0.042)
IT and scientific service professions	-0.078	-0.168***	0.029	-0.103
	(0.045)	(0.049)	(0.042)	(0.053)
Transport and logistics (incl. security and cleaning)	0.003	-0.040	-0.022	-0.049
	(0.032)	(0.037)	(0.044)	(0.046)
Female	-0.000	0.016	-0.026	-0.009
	(0.018)	(0.025)	(0.028)	(0.029)
Migration background	-0.013	0.023	0.011	0.033
	(0.018)	(0.025)	(0.024)	(0.028)
Year of birth (ref.: 1995)				

Table 7 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
before 1995	-0.078***	-0.003	-0.079	-0.077
	(0.017)	(0.026)	(0.044)	(0.053)
after 1995	0.013	-0.016	-0.012	-0.015
	(0.014)	(0.020)	(0.018)	(0.022)
Highest education (ref.: intermediate secondary degree)				
General secondary degree or below	-0.002	-0.042	-0.001	-0.047
	(0.020)	(0.027)	(0.028)	(0.035)
Upper secondary degree	0.066***	0.069**	-0.049	0.000
	(0.020)	(0.026)	(0.027)	(0.037)
Sampling school in Grade 9 (ref.: intermediate secondary school)				
Basic secondary school	-0.057**	-0.050	0.024	-0.022
	(0.020)	(0.029)	(0.027)	(0.038)
Combined tracks	-0.068	-0.143**	0.066	-0.061
	(0.037)	(0.045)	(0.047)	(0.050)
Integrated comprehensive school	0.015	0.021	0.055	0.058
	(0.021)	(0.029)	(0.031)	(0.038)
Upper secondary school	-0.038	-0.033	0.038	0.010
	(0.023)	(0.033)	(0.030)	(0.039)
Overall grade of highest education degree	-0.045*	-0.018	0.051	0.036
	(0.018)	(0.022)	(0.030)	(0.032)
Grades in math of highest education degree	-0.004	-0.025*	-0.035*	-0.051***
	(0.010)	(0.013)	(0.014)	(0.015)
Grades in German of highest education degree	-0.017	-0.002	0.032	0.024
	(0.011)	(0.015)	(0.017)	(0.019)
Final grade from training		-0.060***	0.048**	-0.014
		(0.017)	(0.016)	(0.020)
ICT literacy: WLE	-0.011	-0.001	-0.009	-0.017
	(0.011)	(0.016)	(0.017)	(0.020)
Natural sciences: WLE	0.011	-0.010	0.007	-0.001
	(0.011)	(0.015)	(0.014)	(0.018)
Mathematics: WLE (corrected)	0.033***	0.007	-0.003	0.004
	(0.009)	(0.012)	(0.013)	(0.015)
Reading competence: WLE	-0.019*	-0.003	-0.006	-0.006
	(0.008)	(0.011)	(0.012)	(0.013)
Vocabulary: sum score	-0.002	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
Reading speed: sum score	-0.000	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
Extraversion	-0.006	0.009	-0.006	0.007
	(0.008)	(0.011)	(0.013)	(0.014)
Agreeableness	0.002	0.027	-0.000	0.025
	(0.010)	(0.016)	(0.017)	(0.020)
Conscientiousness	-0.004	-0.008	-0.009	-0.015
	(0.008)	(0.013)	(0.013)	(0.015)
Neuroticism	0.001	0.002	0.043**	0.035*
	(0.009)	(0.013)	(0.014)	(0.017)
Openness	-0.010	-0.016	-0.003	-0.018
	(0.007)	(0.011)	(0.012)	(0.013)
Parents' highest education (ref.: tertiary degree)				

Table 7 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
General secondary degree or below	0.013	0.066	0.014	0.064
	(0.029)	(0.037)	(0.040)	(0.045)
Intermediate secondary degree	-0.015	0.029	0.013	0.026
	(0.024)	(0.032)	(0.034)	(0.040)
Upper secondary degree	0.030	0.010	0.059	0.051
	(0.024)	(0.034)	(0.032)	(0.040)
Parents' employment status (ref.: no parent employed)				
One parent employed	0.024	0.066	-0.010	0.049
	(0.041)	(0.061)	(0.053)	(0.063)
Both parents employed	0.039	0.065	-0.001	0.052
	(0.039)	(0.058)	(0.053)	(0.063)
Parents' HISEI	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.001)	(0.001)	(0.001)
Two parents in household	0.036*	-0.014	-0.025	-0.028
	(0.017)	(0.023)	(0.022)	(0.028)
Number of books in household (ref.: 0-25)				
26-200	0.039*	0.035	0.007	0.038
	(0.017)	(0.032)	(0.028)	(0.041)
201-500	0.061**	0.015	0.015	0.037
	(0.021)	(0.041)	(0.031)	(0.050)
More than 500	0.025	0.106*	-0.018	0.077
	(0.029)	(0.041)	(0.042)	(0.056)
Unemployment rate in employment agency district	-0.025***	-0.011*	-0.001	-0.010
	(0.004)	(0.005)	(0.006)	(0.006)
Lives in small town or village area	0.001	-0.015	0.040	0.025
	(0.017)	(0.019)	(0.021)	(0.024)
Baseline probability	0.786	0.795	0.833	0.658
Number of cases	3,661	2,789	2,222	2,789

Source: German National Educational Panel Study (NEPS): Starting Cohort 4, authors' own calculations

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted

Cluster robust standard errors (in parentheses)

All Models include federal state fixed effects

WLE = weighted likelihood estimates; ICT = information and communication technology; HISEI = highest International Socio-Economic Index of Occupational Status (ISEI) score

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 8 Relations of conflict and support to training outcomes (full models; average marginal effects after logistic regression)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
Level of conflict (ref.: low)				
Medium	-0.053**	-0.007	0.016	0.005
	(0.019)	(0.022)	(0.023)	(0.026)
High	-0.056	-0.060	-0.008	-0.060
	(0.031)	(0.035)	(0.040)	(0.041)
Level of support (ref.: high)				
Medium	-0.035	0.008	-0.005	0.014
	(0.018)	(0.021)	(0.021)	(0.024)
Low	-0.072**	-0.015	-0.024	-0.028
	(0.027)	(0.029)	(0.028)	(0.032)
Company size (ref.: 0-49 employees)				
50-249 employees	0.048**	0.042	0.044*	0.084**
	(0.018)	(0.025)	(0.022)	(0.027)
250+ employees	0.052*	0.110***	0.075***	0.156***
	(0.021)	(0.025)	(0.020)	(0.031)
Apprenticeship remuneration	0.000*	0.000*	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Occupation is desired occupation (ref.: rather/completely desired)				
Partly desired	-0.075***	-0.027	0.007	-0.022
	(0.018)	(0.024)	(0.022)	(0.026)
Not/rather not desired	-0.325***	-0.043	-0.031	-0.057
	(0.030)	(0.037)	(0.041)	(0.042)
Previous training episode	-0.060*	-0.053	-0.007	-0.048
	(0.029)	(0.028)	(0.035)	(0.036)
Occupational segment (ref.: production engineering occupations)				
Agriculture, forestry and horticulture	-0.037	-0.169**	-0.141	-0.237***
	(0.043)	(0.061)	(0.080)	(0.071)
Manufacturing occupations	-0.032	-0.055	-0.015	-0.065
	(0.023)	(0.028)	(0.041)	(0.041)
Building and finishing trades	-0.043	-0.024	-0.109*	-0.093*
	(0.026)	(0.033)	(0.044)	(0.045)
Food and catering occupations	-0.158***	-0.025	-0.154**	-0.157**
	(0.034)	(0.037)	(0.048)	(0.050)
Medical and non-medical healthcare occupations	-0.105***	-0.022	-0.052	-0.050
	(0.027)	(0.037)	(0.040)	(0.039)
Social and cultural service occupations	-0.101*	-0.263**	0.030	-0.186*
	(0.049)	(0.087)	(0.061)	(0.084)
Commercial occupations	-0.021	-0.002	-0.050	-0.034
	(0.023)	(0.029)	(0.036)	(0.040)
Occupations in business management and organization	0.006	-0.108*	-0.031	-0.125*
	(0.029)	(0.046)	(0.038)	(0.054)
Business-related service occupations	-0.046	-0.067	0.056	0.012
	(0.029)	(0.037)	(0.030)	(0.042)
IT and scientific service professions	-0.076	-0.168***	0.030	-0.102
	(0.045)	(0.049)	(0.042)	(0.053)
Transport and logistics (incl. security and cleaning)	0.003	-0.041	-0.021	-0.048
	(0.032)	(0.036)	(0.044)	(0.045)

Table 8 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
Female	-0.001	0.015	-0.026	-0.010
	(0.018)	(0.025)	(0.028)	(0.028)
Migration background	-0.016	0.021	0.011	0.032
	(0.018)	(0.025)	(0.024)	(0.028)
Year of birth (ref.: 1995)				
before 1995	-0.079***	-0.002	-0.079	-0.075
	(0.017)	(0.026)	(0.043)	(0.052)
after 1995	0.011	-0.017	-0.012	-0.015
	(0.014)	(0.020)	(0.017)	(0.022)
Highest education (ref.: intermediate secondary degree)				
General secondary degree or below	0.000	-0.041	-0.001	-0.047
	(0.020)	(0.027)	(0.028)	(0.035)
Upper secondary degree	0.064***	0.067**	-0.050	-0.002
	(0.020)	(0.026)	(0.027)	(0.037)
Sampling school in Grade 9 (ref.: intermediate secondary school)				
Basic secondary school	-0.056**	-0.049	0.024	-0.021
	(0.020)	(0.029)	(0.027)	(0.038)
Combined tracks	-0.066	-0.139**	0.066	-0.057
	(0.036)	(0.045)	(0.046)	(0.050)
Integrated comprehensive school	0.016	0.024	0.056	0.061
	(0.020)	(0.029)	(0.031)	(0.038)
Upper secondary school	-0.038	-0.033	0.038	0.011
	(0.023)	(0.033)	(0.030)	(0.039)
Overall grade of highest education degree	-0.042*	-0.017	0.051	0.036
	(0.017)	(0.022)	(0.030)	(0.032)
Grades in math of highest education degree	-0.003	-0.025	-0.035*	-0.050**
	(0.010)	(0.013)	(0.014)	(0.015)
Grades in German of highest education degree	-0.019	-0.003	0.032	0.023
	(0.011)	(0.014)	(0.017)	(0.019)
Final grade from training		-0.060***	0.047**	-0.013
		(0.016)	(0.016)	(0.019)
ICT literacy: WLE	-0.011	-0.002	-0.009	-0.018
	(0.011)	(0.016)	(0.017)	(0.020)
Natural sciences: WLE	0.010	-0.011	0.007	-0.002
	(0.011)	(0.015)	(0.014)	(0.018)
Mathematics: WLE (corrected)	0.033***	0.007	-0.003	0.004
	(0.009)	(0.012)	(0.013)	(0.015)
Reading competence: WLE	-0.019*	-0.003	-0.006	-0.005
	(0.008)	(0.011)	(0.012)	(0.013)
Vocabulary: sum score	-0.002	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
Reading speed: sum score	-0.000	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
Extraversion	-0.008	0.009	-0.006	0.007
	(0.008)	(0.011)	(0.013)	(0.014)
Agreeableness	0.000	0.025	0.000	0.023
	(0.010)	(0.016)	(0.017)	(0.021)
Conscientiousness	-0.004	-0.009	-0.009	-0.016
	(0.008)	(0.013)	(0.013)	(0.015)

Table 8 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
Neuroticism	0.001	0.003	0.043**	0.035*
	(0.008)	(0.013)	(0.014)	(0.017)
Openness	-0.010	-0.015	-0.003	-0.017
	(0.007)	(0.011)	(0.012)	(0.013)
Parents' highest education (ref.: tertiary degree)				
General secondary degree or below	0.010	0.062	0.013	0.060
	(0.028)	(0.037)	(0.040)	(0.046)
Intermediate secondary degree	-0.019	0.026	0.012	0.023
	(0.024)	(0.032)	(0.033)	(0.041)
Upper secondary degree	0.026	0.006	0.059	0.048
	(0.023)	(0.034)	(0.032)	(0.040)
Parents' employment status (ref.: no parent employed)				
One parent employed	0.026	0.064	-0.010	0.048
	(0.041)	(0.063)	(0.053)	(0.063)
Both parents employed	0.039	0.062	-0.000	0.050
	(0.039)	(0.059)	(0.053)	(0.064)
Parents' HISEI	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.001)	(0.001)	(0.001)
Two parents in household	0.034*	-0.014	-0.026	-0.029
	(0.017)	(0.024)	(0.022)	(0.029)
Number of books in household (ref.: 0-25)				
26-200	0.038*	0.036	0.008	0.039
	(0.017)	(0.032)	(0.028)	(0.040)
201-500	0.062**	0.018	0.015	0.040
	(0.021)	(0.041)	(0.032)	(0.050)
More than 500	0.027	0.105*	-0.018	0.076
	(0.029)	(0.041)	(0.042)	(0.056)
Unemployment rate in employment agency district	-0.024***	-0.011*	-0.001	-0.010
	(0.004)	(0.005)	(0.006)	(0.006)
Lives in small town or village area	0.002	-0.014	0.040	0.025
	(0.017)	(0.019)	(0.021)	(0.025)
Baseline probability	0.786	0.795	0.833	0.658
Number of cases	3,661	2,789	2,222	2,789

Source: German National Educational Panel Study (NEPS): Starting Cohort 4, authors' own calculations

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted

Cluster robust standard errors (in parentheses)

All Models include federal state fixed effects

WLE = weighted likelihood estimates; ICT = information and communication technology; HISEI = highest International Socio-Economic Index of Occupational Status (ISEI) score

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 9 Relations of the interaction of conflict and support to training outcomes (full models; average marginal effects after logistic regression)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
Combination of conflict and support (ref.: high support - low conflict)				
High support - medium conflict	-0.124**	-0.034	0.007	-0.020
	(0.039)	(0.039)	(0.039)	(0.044)
High support - high conflict	-0.065	-0.040	-0.009	-0.031
	(0.084)	(0.068)	(0.068)	(0.081)
Medium support - low conflict	-0.050*	-0.001	-0.009	-0.001
	(0.024)	(0.026)	(0.027)	(0.029)
Medium support - medium conflict	-0.099***	0.002	0.031	0.033
	(0.029)	(0.035)	(0.031)	(0.044)
Medium support - high conflict	-0.097	-0.059	0.034	-0.032
	(0.061)	(0.056)	(0.058)	(0.071)
Low support - low conflict	-0.124**	-0.036	0.008	-0.027
	(0.044)	(0.039)	(0.039)	(0.044)
Low support - medium conflict	-0.128***	0.000	-0.017	-0.024
	(0.037)	(0.038)	(0.039)	(0.049)
Low support - high conflict	-0.149**	-0.105*	-0.068	-0.132*
	(0.045)	(0.051)	(0.058)	(0.056)
Company size (ref.: 0-49 employees)				
50-249 employees	0.046**	0.041	0.044*	0.082**
	(0.018)	(0.025)	(0.022)	(0.027)
250+ employees	0.050*	0.109***	0.076***	0.154***
	(0.022)	(0.025)	(0.021)	(0.032)
Apprenticeship remuneration	0.000**	0.000*	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Occupation is desired occupation (ref.: rather/completely desired)				
Partly desired	-0.074***	-0.026	0.008	-0.020
	(0.018)	(0.024)	(0.022)	(0.026)
Not/rather not desired	-0.315***	-0.044	-0.031	-0.058
	(0.032)	(0.036)	(0.041)	(0.042)
Previous training episode	-0.061*	-0.051+	-0.006	-0.046
	(0.029)	(0.028)	(0.035)	(0.036)
Occupational segment (ref.: production engineering occupations)				
Agriculture, forestry and horticulture	-0.038	-0.168**	-0.141+	-0.231**
	(0.043)	(0.061)	(0.080)	(0.071)
Manufacturing occupations	-0.032	-0.053+	-0.015	-0.061
	(0.024)	(0.028)	(0.041)	(0.041)
Building and finishing trades	-0.044+	-0.024	-0.107*	-0.092*
	(0.026)	(0.033)	(0.043)	(0.045)
Food and catering occupations	-0.156***	-0.023	-0.154**	-0.153**
	(0.034)	(0.037)	(0.048)	(0.050)
Medical and non-medical healthcare occupations	-0.104***	-0.020	-0.049	-0.046
	(0.027)	(0.037)	(0.040)	(0.039)
Social and cultural service occupations	-0.101*	-0.260**	0.031	-0.186*
	(0.048)	(0.088)	(0.062)	(0.085)
Commercial occupations	-0.021	-0.000	-0.049	-0.031
	(0.023)	(0.028)	(0.036)	(0.040)

Table 9 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
Occupations in business management and organization	0.003	-0.105*	-0.031	-0.123*
	(0.028)	(0.045)	(0.039)	(0.054)
Business-related service occupations	-0.050+	-0.069+	0.057+	0.013
	(0.029)	(0.037)	(0.030)	(0.042)
IT and scientific service professions	-0.076+	-0.168***	0.032	-0.102+
	(0.044)	(0.049)	(0.042)	(0.053)
Transport and logistics (incl. security and cleaning)	0.003	-0.037	-0.021	-0.045
	(0.032)	(0.036)	(0.044)	(0.045)
Female	0.001	0.019	-0.023	-0.007
	(0.018)	(0.026)	(0.027)	(0.029)
Migration background	-0.017	0.021	0.011	0.033
	(0.018)	(0.026)	(0.023)	(0.028)
Year of birth (ref.: 1995)				
before 1995	-0.079***	-0.004	-0.080+	-0.078
	(0.018)	(0.026)	(0.042)	(0.053)
after 1995	0.010	-0.016	-0.011	-0.013
	(0.014)	(0.020)	(0.018)	(0.022)
Highest education (ref.: intermediate secondary degree)				
General secondary degree or below	0.001	-0.043+	-0.004	-0.053
	(0.020)	(0.026)	(0.029)	(0.034)
Upper secondary degree	0.061**	0.066*	-0.049+	-0.002
	(0.019)	(0.026)	(0.027)	(0.037)
Sampling school in Grade 9 (ref.: intermediate secondary school)				
Basic secondary school	-0.057**	-0.050+	0.023	-0.023
	(0.020)	(0.028)	(0.027)	(0.037)
Combined tracks	-0.066+	-0.136**	0.064	-0.054
	(0.037)	(0.044)	(0.046)	(0.049)
Integrated comprehensive school	0.016	0.024	0.056+	0.062
	(0.020)	(0.029)	(0.031)	(0.038)
Upper secondary school	-0.035	-0.031	0.034	0.011
	(0.022)	(0.033)	(0.029)	(0.039)
Overall grade of highest education degree	-0.042*	-0.022	0.053+	0.032
	(0.017)	(0.022)	(0.031)	(0.033)
Grades in math of highest education degree	-0.002	-0.022+	-0.038*	-0.049**
	(0.010)	(0.012)	(0.015)	(0.016)
Grades in German of highest education degree	-0.018	-0.002	0.032*	0.026
	(0.011)	(0.014)	(0.016)	(0.019)
Final grade from training		-0.060***	0.047**	-0.014
		(0.016)	(0.016)	(0.020)
ICT literacy: WLE	-0.013	-0.000	-0.011	-0.013
	(0.011)	(0.016)	(0.017)	(0.020)
Natural sciences: WLE	0.009	-0.013	0.007	-0.003
	(0.011)	(0.017)	(0.015)	(0.020)
Mathematics: WLE (corrected)	0.034***	0.008	-0.004	0.004
	(0.009)	(0.012)	(0.013)	(0.015)
Reading competence: WLE	-0.018*	-0.005	-0.007	-0.008
	(0.008)	(0.010)	(0.012)	(0.012)
Vocabulary: sum score	-0.002+	-0.001	0.000	-0.001

Table 9 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
	(0.001)	(0.001)	(0.001)	(0.002)
Reading speed: sum score	-0.001	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
Extraversion	-0.008	0.009	-0.004	0.008
	(0.008)	(0.011)	(0.011)	(0.015)
Agreeableness	-0.001	0.021	0.001	0.021
	(0.010)	(0.017)	(0.018)	(0.023)
Conscientiousness	-0.005	-0.010	-0.011	-0.017
	(0.008)	(0.013)	(0.013)	(0.015)
Neuroticism	0.002	0.001	0.040**	0.034*
	(0.008)	(0.012)	(0.013)	(0.015)
Openness	-0.012+	-0.017	-0.003	-0.020
	(0.007)	(0.011)	(0.012)	(0.013)
Parents' highest education (ref.: tertiary degree)				
General secondary degree or below	0.009	0.064+	0.017	0.065
	(0.029)	(0.036)	(0.041)	(0.047)
Intermediate secondary degree	-0.018	0.024	0.014	0.027
	(0.024)	(0.030)	(0.035)	(0.039)
Upper secondary degree	0.029	0.007	0.064*	0.053
	(0.024)	(0.031)	(0.032)	(0.038)
Parents' employment status (ref.: no parent employed)				
One parent employed	0.025	0.063	-0.014	0.042
	(0.038)	(0.066)	(0.054)	(0.070)
Both parents employed	0.039	0.067	-0.005	0.052
	(0.037)	(0.063)	(0.054)	(0.070)
Parents' HISEI	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.001)	(0.001)	(0.001)
Two parents in household	0.033+	-0.014	-0.024	-0.028
	(0.017)	(0.023)	(0.022)	(0.029)
Number of books in household (ref.: 0-25)				
26-200	0.035*	0.038	0.013	0.043
	(0.017)	(0.030)	(0.029)	(0.038)
201-500	0.058**	0.020	0.020	0.042
	(0.022)	(0.037)	(0.032)	(0.044)
More than 500	0.023	0.099*	-0.015	0.073
	(0.028)	(0.040)	(0.044)	(0.052)
Unemployment rate in employment agency district	-0.024***	-0.011*	-0.001	-0.010+
	(0.004)	(0.005)	(0.006)	(0.006)
Lives in small town or village area	-0.001	-0.014	0.039+	0.024
	(0.017)	(0.018)	(0.021)	(0.025)
Baseline probability	0.787	0.795	0.833	0.658
Number of cases	3,661	2,789	2,222	2,789

Source: German National Educational Panel Study (NEPS): Starting Cohort 4, authors' own calculations

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted

Cluster robust standard errors (in parentheses)

All Models include federal state fixed effects. WLE = weighted likelihood estimates; ICT = information and communication technology; HISEI= highest International Socio-Economic Index of Occupational Status (ISEI) score

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 10 Relations of conflict to training outcomes at different levels of support (marginal effects at representative values after logistic regression)

	Model 1 Vocational degree	**Model 2 Employment offer**	**Model 3 Offer accepted**	**Model 4 Remaining in company**
Levels of conflict at different levels of support (ref.: low conflict)				
Low support				
Medium conflict	-0.004	0.037	-0.024	0.003
	(0.048)	(0.045)	(0.050)	(0.056)
High conflict	-0.025	-0.068	-0.076	-0.105
	(0.056)	(0.058)	(0.069)	(0.070)
Medium support				
Medium conflict	-0.049	0.004	0.040	0.034
	(0.033)	(0.038)	(0.033)	(0.043)
High conflict	-0.047	-0.057	0.043	-0.032
	(0.066)	(0.061)	(0.058)	(0.074)
High support				
Medium conflict	-0.124**	-0.034	0.007	-0.020
	(0.039)	(0.039)	(0.039)	(0.044)
High conflict	-0.065	-0.040	-0.009	-0.031
	(0.084)	(0.068)	(0.068)	(0.081)
Baseline probability	0.787	0.795	0.833	0.658
Number of cases	3,661	2,789	2,222	2,789

Source: German National Educational Panel Study (NEPS): Starting Cohort 4, authors' own calculations

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted. Cluster robust standard errors (in parentheses)

All Models include all control variables and federal state fixed effects (final grade from vocational training was not included in Model 1)

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 11 Relations of conflict and support to training outcomes without controlling for desired occupation (full models; average marginal effects after logistic regression)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
Level of conflict (ref.: low)				
Medium	-0.072***	-0.009	0.015	0.003
	(0.021)	(0.022)	(0.022)	(0.026)
High	-0.085**	-0.062	-0.010	-0.063
	(0.032)	(0.035)	(0.040)	(0.041)
Level of support (ref.: high)				
Medium	-0.048*	0.007	-0.005	0.013
	(0.020)	(0.021)	(0.021)	(0.024)
Low	-0.118***	-0.020	-0.025	-0.034
	(0.028)	(0.029)	(0.027)	(0.031)
Company size (ref.: 0-49 employees)				
50-249 employees	0.056**	0.043	0.045*	0.086**
	(0.019)	(0.025)	(0.022)	(0.027)
250+ employees	0.059**	0.112***	0.076***	0.158***
	(0.022)	(0.025)	(0.020)	(0.032)
Apprenticeship remuneration	0.000**	0.000*	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Previous training episode	-0.061	-0.052	-0.006	-0.047
	(0.031)	(0.028)	(0.035)	(0.036)
Occupational segment (ref.: production engineering occupations)				
Agriculture, forestry and horticulture	-0.035	-0.167**	-0.143	-0.236***
	(0.044)	(0.061)	(0.080)	(0.071)
Manufacturing occupations	-0.051*	-0.056*	-0.016	-0.067
	(0.025)	(0.028)	(0.041)	(0.041)
Building and finishing trades	-0.073*	-0.026	-0.109*	-0.095*
	(0.030)	(0.033)	(0.044)	(0.045)
Food and catering occupations	-0.200***	-0.028	-0.156**	-0.161**
	(0.035)	(0.037)	(0.048)	(0.050)
Medical and non-medical healthcare occupations	-0.128***	-0.025	-0.054	-0.054
	(0.028)	(0.037)	(0.040)	(0.039)
Social and cultural service occupations	-0.084	-0.258**	0.029	-0.183*
	(0.046)	(0.086)	(0.061)	(0.084)
Commercial occupations	-0.065**	-0.008	-0.052	-0.041
	(0.024)	(0.028)	(0.036)	(0.040)
Occupations in business management and organization	-0.025	-0.114*	-0.032	-0.130*
	(0.030)	(0.047)	(0.038)	(0.055)
Business-related service occupations	-0.076*	-0.070	0.055	0.010
	(0.034)	(0.037)	(0.030)	(0.042)
IT and scientific service professions	-0.079	-0.166***	0.029	-0.101
	(0.045)	(0.049)	(0.043)	(0.053)
Transport and logistics (incl. security and cleaning)	-0.044	-0.047	-0.023	-0.055
	(0.035)	(0.037)	(0.044)	(0.046)
Female	0.001	0.017	-0.025	-0.008
	(0.018)	(0.026)	(0.028)	(0.028)
Migration background	-0.024	0.021	0.010	0.031
	(0.019)	(0.025)	(0.024)	(0.028)
Year of birth (ref.: 1995)				
before 1995	-0.084***	-0.002	-0.080	-0.076

Table 11 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
	(0.019)	(0.026)	(0.044)	(0.052)
after 1995	0.011	-0.017	-0.011	-0.015
	(0.014)	(0.020)	(0.018)	(0.022)
Highest education (ref.: intermediate secondary degree)				
General secondary degree or below	0.005	-0.040	-0.001	-0.046
	(0.021)	(0.027)	(0.028)	(0.035)
Upper secondary degree	0.049*	0.067**	-0.050	-0.003
	(0.023)	(0.026)	(0.028)	(0.038)
Sampling school in Grade 9 (ref.: intermediate secondary school)				
Basic secondary school	-0.067**	-0.052	0.024	-0.024
	(0.022)	(0.029)	(0.027)	(0.038)
Combined tracks	-0.065	-0.138**	0.066	-0.056
	(0.034)	(0.044)	(0.046)	(0.050)
Integrated comprehensive school	0.017	0.023	0.056	0.060
	(0.021)	(0.029)	(0.031)	(0.039)
Upper secondary school	-0.039	-0.034	0.038	0.010
	(0.025)	(0.033)	(0.030)	(0.039)
Overall grade of highest education degree	-0.055**	-0.017	0.050	0.036
	(0.018)	(0.022)	(0.030)	(0.032)
Grades in math of highest education degree	-0.004	-0.026*	-0.035*	-0.051***
	(0.011)	(0.013)	(0.014)	(0.015)
Grades in German of highest education degree	-0.017	-0.003	0.032	0.024
	(0.011)	(0.015)	(0.017)	(0.019)
Final grade from training		-0.059***	0.048**	-0.012
		(0.017)	(0.016)	(0.020)
ICT literacy: WLE	-0.016	-0.002	-0.008	-0.018
	(0.012)	(0.016)	(0.017)	(0.020)
Natural sciences: WLE	0.012	-0.012	0.007	-0.003
	(0.012)	(0.015)	(0.014)	(0.018)
Mathematics: WLE (corrected)	0.039***	0.008	-0.003	0.004
	(0.010)	(0.012)	(0.013)	(0.015)
Reading competence: WLE	-0.022*	-0.003	-0.006	-0.006
	(0.009)	(0.011)	(0.012)	(0.013)
Vocabulary: sum score	-0.001	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
Reading speed: sum score	-0.001	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
Extraversion	-0.009	0.009	-0.005	0.007
	(0.009)	(0.011)	(0.013)	(0.014)
Agreeableness	-0.004	0.025	-0.000	0.023
	(0.011)	(0.016)	(0.017)	(0.021)
Conscientiousness	0.001	-0.008	-0.009	-0.015
	(0.008)	(0.014)	(0.013)	(0.015)
Neuroticism	-0.001	0.002	0.043**	0.035*
	(0.009)	(0.013)	(0.014)	(0.017)
Openness	-0.012	-0.015	-0.003	-0.017
	(0.008)	(0.011)	(0.012)	(0.013)
Parents' highest education (ref.: tertiary degree)				
General secondary degree or below	0.029	0.063	0.013	0.060

Table 11 (continued)

	Model 1 Vocational degree	Model 2 Employment offer	Model 3 Offer accepted	Model 4 Remaining in company
	(0.030)	(0.038)	(0.040)	(0.046)
Intermediate secondary degree	-0.002	0.027	0.013	0.025
	(0.025)	(0.033)	(0.034)	(0.041)
Upper secondary degree	0.042	0.008	0.059	0.050
	(0.025)	(0.034)	(0.032)	(0.040)
Parents' employment status (ref.: no parent employed)				
One parent employed	0.029	0.065	-0.012	0.047
	(0.046)	(0.063)	(0.053)	(0.064)
Both parents employed	0.044	0.063	-0.003	0.049
	(0.043)	(0.060)	(0.052)	(0.064)
Parents' HISEI	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.001)	(0.001)	(0.001)
Two parents in household	0.039*	-0.014	-0.025	-0.028
	(0.017)	(0.024)	(0.022)	(0.029)
Number of books in household (ref.: 0-25)				
26-200	0.034	0.035	0.007	0.038
	(0.019)	(0.032)	(0.028)	(0.041)
201-500	0.057*	0.017	0.014	0.037
	(0.022)	(0.042)	(0.031)	(0.050)
More than 500	0.024	0.105*	-0.020	0.074
	(0.032)	(0.041)	(0.042)	(0.056)
Unemployment rate in employment agency district	-0.028***	-0.011*	-0.001	-0.010
	(0.004)	(0.005)	(0.006)	(0.006)
Lives in small town or village area	0.008	-0.012	0.040	0.027
	(0.019)	(0.019)	(0.021)	(0.024)
Baseline probability	0.787	0.795	0.833	0.658
Number of cases	3,661	2,789	2,222	2,789

Source: German National Educational Panel Study (NEPS): Starting Cohort 4, authors' own calculations

Missing data were multiply imputed ("multiple imputation, then deletion" [MID]); results were design-weighted.Cluster robust standard errors (in parentheses)

All Models include federal state fixed effects. WLE = weighted likelihood estimates; ICT = information and communication technology; HISEI = highest International Socio-Economic Index of Occupational Status (ISEI) score

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Abbreviations

BIBB	Budesinstitut für Berufsbildung (Federal Institute for VocationalEducation and Training)
NEPS SC4	Starting Cohort 4 of the German National Educational Panel Study
MID	Multiple imputation, then deletion
AME	Average Marginal Effects

Acknowledgements
We would like to thank editor and the two anonymous reviewers for their valuable comments that greatly improved the paper. We would also like to thank the participants of the 31 st annual workshop 'Transitions in Youth' 2024 at the University of Warsaw for their valuable feedback. We are also greatly thankful to Tobias Koberg from LIfBi for merging the regional information as well as the information on unemployment rates to the NEPS SC4 data.

Author contributions
The corresponding author devised the initial manuscript, prepared the data, and executed the statistical analyses. Both authors drafted the concept of the manuscript as well as the research design, edited the manuscript, and interpreted the results.

Funding
This work was supported by the German Research Foundation (DFG) (Grant Number: RO 4929/2-1)

Data availability
This paper uses data from the German National Educational Panel Study (NEPS; Blossfeld and Roßbach, 2019). NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi) in cooperation with a nationwide network. The data was accessed via remote desktop access (RemoteNEPS) which requires the conclusion of a Data Use Agreement with

the Leibniz Institute for Educational Trajectories (LIfBi) as well as the signing of supplemental agreements (https://www.neps-data.de/Data-Center/Data-Access/Data-Use-Agreements). The NEPS study is conducted under the supervision of the German Federal Commissioner for Data Protection and Freedom of Information (BfDI) and in coordination with the German Standing Conference of the Ministers of Education and Cultural Affairs (KMK) and – in the case of surveys at schools – the Educational Ministries of the respective Federal States. All data collection procedures, instruments and documents were checked by the data protection unit of the Leibniz Institute for Educational Trajectories (LIfBi). The necessary steps are taken to protect participants' confidentiality according to national and international regulations of data security. Participation in the NEPS study is voluntary and based on the informed consent of participants. This consent to participate in the NEPS study can be revoked at any time. This paper also uses publicly available data on unemployment rates that were obtained from the German Federal Employment Agency's statistics web site: (https://statistik.arbeitsagentur.de/DE/Navigation/Statistiken/Interaktive-Statistiken/Zeitreihen/Lange-Zeitreihen-Nav.html. Moreover, the paper uses publicly available data on the rurality of the respondents' residence that were obtained from the Website of the Federal Ministry for Digital and Transport: https://bmdv.bund.de/SharedDocs/DE/Anlage/G/regiostar-referenzdateien.html. Files for data preparation and analyses can be found here: https://osf.io/fn5jm/

Declarations

Competing interests
The authors declare that they have no competing interests.

Received: 13 November 2024 / Accepted: 22 September 2025
Published online: 25 October 2025

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