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Young people's job-search strategies in the German apprenticeship market, Who relies on referrals by strong ties and why?

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Abstract

Social capital is often regarded as an important resource when searching for a job. However, unlike in the general labor market, in youth labor markets, leveraging network contacts does not necessarily enhance young people's chances compared to formal job-search methods. Who then uses referrals by strong ties to support their school-to-work transitions? Drawing on the German National Educational Panel Study (NEPS), we focus on noncollege-bound students searching for apprenticeship places. We investigate whether parental referrals are more likely to be used as a compensation strategy for limited opportunities due to regional conditions and lower-levels of schooling and whether this search strategy entails a trade-off in terms of higher dropout risks. Our results indicate that in regions with poor regional labor market conditions, young people use parental referrals more often and also increasingly find apprenticeship places via referrals. Moreover, using referrals does not result in higher dropout risks. Lower-educated school leavers are also more likely to use referrals but they do not benefit from this search channel more than higher-educated youth. We conclude that social contacts can at least partly compensate for poor opportunities due to regional market conditions.

Keywords

Apprenticeships, job-search strategies, referrals, regional inequality, school-to-work transitions, social networks, strong ties, youth labor market

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Introduction

The transition from school to work is a critical phase in a young person's life, setting the course for their future career. For noncollege-bound students, this transition period takes place at a relatively young age. Young people searching for their first job or apprenticeship may decide to apply directly to employers, who advertise their vacancies through a number of formal channels such as on their websites or via public employment agencies. In addition, job seekers often use informal search methods, including referrals by network contacts (Marsden and Gormann, 2001; Topa, 2011).

Social capital is generally an important resource for getting ahead in the labor market (Bourdieu, 1973). A well-established finding is that those individuals who have more favorable social networks will be more likely to rely on them when searching for a job (Marsden and Gorman, 2001; Lin, 2001b). Furthermore, having specific network resources for the labor market segment in question can be beneficial for (early) labor market transitions (O'Regan and Quigley, 1993; Roth 2014b, 2018).

For young people, support from parents, other relatives, and close friends appears to be a particularly relevant network resource (Hällsten et al., 2017; Kramarz and Skans, 2014; Verhaeghe et al., 2015). These individuals, called strong ties, are typically said to be more helpful social contacts for young people than the more loosely connected weak ties, which are seen as the more helpful resource in the general labor market (Granovetter, 1995; Roth, 2014b, 2018). Relatives may refer young people to their own employers or close friends, but they may also support young job seekers by getting information about jobs and training opportunities from their weak-tie acquaintances and put in a good word for the young job-seekers there. Accordingly, young people may indirectly gain from their parents' and other family members' weak ties.

Based on what we know about job-search processes in the general labor market, we would thus expect that using network contacts should positively impact on young people's job-

search outcomes. Previous research does not support this expectation. More specifically, using these informal search methods does not generally enhance young people's chances of finding their first job or training place compared to using formal job-seeking channels (Hoenig, 2019; Flap and Boxman, 2001; Roth 2014a). To understand this puzzling finding, we ask: who relies on referrals by strong ties in order to support their school-to-work transitions? Previous research assumed that young people would more frequently rely on informal search methods if they anticipated difficulties during job or apprenticeship search. But this has hardly been investigated. Picking up where previous research left off, we take a closer look at two types of difficult circumstances in which young job seekers or their parents might choose referrals as a means for supporting their school-to-work transitions. We argue that young people rely on such job-search strategies because referrals might help to compensate for otherwise poor opportunities due to lower schooling levels or in regions with high unemployment. We further investigate whether using referrals under these circumstances involves a trade-off. Network contacts might help young people to secure a training place or first job but the opportunities generated via social networks might not always match young people's best occupational preferences and thus lead to higher dropout rates

We analyze data from Starting Cohort 4 of the German National Educational Panel Study (NEPS) to which we add regional labor market indicators. We make use of the considerable regional variation in labor market conditions across Germany to investigate the influence of different regional contexts on the importance of referrals by strong ties. We focus on noncollege-bound students in Germany, who typically enter the labor market by searching for apprenticeship places. We only investigate referrals by parents due to data availability but also because parents are much more frequently involved in referral processes during apprenticeship search than other strong ties. Since we only consider employer-based training positions, this renders the job-matching processes comparable to those in other youth labor markets, meaning our findings are transferrable to other country contexts beyond our case.

Previous research and theoretical background

Referrals as a job-search strategy and recruitment channel

Job seekers and employers alike frequently use network contacts to find a job or to find promising job candidates. (Bentolila et al., 2010; Marsden and Gorman, 2001; Topa, 2011).

Employers may find it appealing to recruit via informal networks because it is a low-cost measure. Additionally, referrals may lead to a larger applicant pool and provide information on hard-to-observe applicant characteristics through the mechanism of homophily (Brown et al., 2016; Fernandez et al., 2000). For instance, employers may expect referrers to make sure that young employees try hard at work (cf. Fernandez et al., 2000). Nevertheless, not all employers use referrals as a recruitment strategy. They seem to be more common when recruiting for lower-status jobs (Flap and Boxman, 2001; Lin, 1999; Marsden and Gorman, 2001; Topa, 2011).

Job seekers are more likely to use referrals when their network resources are particularly strong (Lin, 2001a: 21; Mouw, 2003). Similarly, having a larger network should enhance a job-seeker's chances of getting helpful information and support (Lai et al., 1998; Roth, 2018). In the general labor market, weak ties are more decisive for getting a job than strong ties, because they serve as a bridge to other job opportunities that are not accessible via an individual's closer network (Granovetter, 1973; Lin, 1999). In youth labor markets, however, family members and sometimes close friends, typically defined as strong ties, may be more relevant (Hoenig, 2019; Kogan et al., 2013; Roth, 2014b, 2018). Kramarz and Skans (2014) have even found that the probability of working at a particular company site increases considerably if a parent works there. For noncollege-bound students, their strong ties' and in particular their parents' social contacts can be a valuable resource, especially in working-class occupations or occupations requiring vocational qualifications. Young people may both profit from their strong ties' closer

and more loosely connected network contacts (e.g., Hällsten et al., 2017; Roth, 2014b, 2018, Verhaeghe et al., 2015).

Altogether, job seekers are more likely to rely on their network resources if these resources are potentially helpful for getting a job and if employers in the respective occupational fields engage in referral-based hiring. The question, then, is whether referrals actually increase job seekers' labor market chances. The answer to this question differs according to the type of labor market. In the general labor market, referred job candidates are more likely to be hired, have higher initial wages, and face lower initial job turnover rates than employees hired through formal channels (Brown et al., 2016; Dustmann et al., 2016; Fernandez et al., 2000). There is, however, little evidence that this applies to youth labor markets. For instance, Hoenig (2019) found no positive effect of referral use on finding a training place in the German apprenticeship market. Similarly, Flap and Boxman (2001) did not confirm the hypothesis that referrals help individuals to get a first job with a higher occupational prestige or income in the Netherlands. As has been hypothesized, these (non-)findings might be due to the fact that young people more frequently rely on informal search methods if they anticipate or experience difficulties during school-to-work transitions (cf. Hoenig, 2019; Kogan et al., 2013; Roth, 2014a). Against this backdrop, we discuss in the following section why young people should be more likely to use referrals by parents and (potentially other strong ties) when they need to compensate for otherwise poor opportunities.

Referrals by strong ties: a compensation strategy for those with otherwise poor opportunities?

For young people who are anticipating difficulties at school-to-work transitions, relying on referrals by strong ties as a job-search strategy may be appealing because the competition for jobs and training places that are filled by referral-based recruitment might be lower. Early work by Boorman (1975) suggested that employees first distribute information about vacancies to their strong social ties. Consistent with this notion, Kramarz and Skans (2014) showed that

young people were indeed more likely to work in the same company as their parents if unemployment was high and if they had lower levels of schooling. Similarly, Kogan et al. (2013) found that low-educated young people have the highest probability of using social contacts when searching for their first job.

Thus, if young people and their parents want to maximize search efforts when they anticipate or face challenges due to poor regional labor market conditions or their lower levels of schooling, they should be more likely than others to choose referrals as a way of compensating for their otherwise poor opportunities. Of course, parents and other strong ties might only be able to refer young people to a limited number of occupations, which might not always be the preferred ones. However, when opportunities are poor, students should be more willing to accept jobs and training places that yield less attractive working and training conditions.

While we assume that referrals might be a valuable compensation strategy in the cases of poor regional labor market conditions or lower levels of schooling, we expect that this should not be true for disadvantages related to gender, ethnicity, or social class (Hillmert and Weßling, 2014; Granato and Ulrich, 2014). If at all, referrals might be useful for the very small subgroup of young women who would like to pursue a career in difficult-to-access male-dominated occupations. For first- and second-generation migrants, however, referrals by strong ties should be a less meaningful strategy for compensating for their lower opportunities. Their parents and other relatives should have, on average, less relevant network resources in the labor market and less institutional knowledge regarding the vocational education and training system in the host country (cf. Kalter and Kogan, 2006; Kristen et al., 2011). Regarding social background, lower-class parents too can be expected to have less of the network resources that are helpful for getting ahead in the labor market (Lin, 1999).

If we return to the case of poor labor market conditions, previous research has shown that regional differences in labor market conditions have a marked impact on young people's occupational aspirations (Flohr et al., 2020; Hartung et al., 2019) and their school-to-work

transitions (Hillmert et al., 2017; Weßling et al., 2015). One important reason for why the regional labor market has such impact on young job seekers is that their regional mobility is rather restricted. They often need to stay close to their family home. Since poor regional labor conditions should result in intensified competition, young people should especially benefit from access to referral-based recruitment processes with fewer competitors. We expect that young people looking for apprenticeships will adapt their search behavior in light of intensified competition and will be more willing to accept that their strong ties can only refer them to a limited number of occupations, which might not always be their preferred ones. Against this backdrop and by focusing on parental referrals, we propose the following hypothesis:

H-1: Young job seekers are more likely to rely on parental referrals if they live in regions with poor labor market conditions than if they live in regions with good labor market conditions.

In the case of job seekers with lower levels of schooling, we expect them to more frequently use parental referrals for two reasons. First, low-educated school leavers should apply more frequently for apprenticeships in lower-status occupations. In these lower labor market segments, employers more frequently engage in referral-based recruitment (Kramarz and Skans, 2014; Marsden and Gorman, 2001; Topa, 2011). Second, if these job seekers nevertheless apply in higher labor market segments, they will be competing against their higher-educated peers. Following the job-competition model by Thurow (1975), lower-educated job applicants should typically be ranked at the bottom of proposed employers' labor queues. Provided that relevant network resources are available, referrals by strong ties might give access to recruitment processes with fewer competitors. Referrals might also counteract lower-educated applicants' low trainability signals. Strong ties could testify to applicants' actual cognitive abilities and skills (Holtmann et al., 2017). Hence, our second hypothesis is:

H-2: Young people with lower levels of schooling are more likely to use parental referrals than young people with higher levels of schooling.

Yet, even if we can confirm hypotheses 1 and 2, this would not necessarily indicate that referrals are actually a way of compensating for poor opportunities due to lower levels of schooling or poor regional labor market conditions. In regions with high unemployment, there should be a limited number of job vacancies. In this scenario, employers might engage to a lesser degree in referral-based recruitment because they would likely receive many good applications for only a few vacancies. If that were true, young people would indeed use parental referrals more frequently during job or apprenticeship search, but this would not have any consequences for matching processes at labor market entry.

To investigate if parental referrals are a valuable compensation strategy, we would expect that the likelihood of having found an apprenticeship position via referrals would be higher in regions with poor conditions and for those with lower schooling. Thus, we test the following hypotheses for the subgroup of young people who got an apprenticeship place:

H-3.1: Apprentices living in regions with poor labor market conditions are more likely to have found their training places through referrals than those living in regions with good conditions.

H-3.2: Apprentices with lower levels of schooling are more likely to have found their training places through referrals than those with higher levels of schooling.

If referrals are used to compensate poor opportunities either due to the regional labor market conditions or lower levels of schooling, there might be a trade-off involved. Under these difficult circumstances, young people might be more willing to compromise when their choice is between accepting less attractive options and becoming job less. They might, however, later decide that they would rather drop out from an unpleasant training program. The apprenticeship-dropout risk differs markedly between occupations with more and less favorable working conditions (Rohrbach-Schmidt and Uhly, 2015). If referrals are associated with higher dropout risks, they would only temporarily serve as a compensating job-search strategy. By contrast, if apprenticeship seekers found a training place despite their difficult circumstances, they might also be more willing to continue in less attractive training programs. Hence, there

might be no difference in dropout rates between young people who found their first job through referrals and young people who did not find their training place through referrals. To scrutinize this trade-off, we again focus on the subgroup of those who found an apprenticeship place and test the following hypotheses:

H-4.1: Apprentices living in regions with poor labor market conditions who used referrals as a job-search strategy have a higher apprenticeship-dropout risk than apprentices living in regions with equally poor conditions who found their training place through formal channels.

H-4.2: Apprentices with lower levels of schooling who used referrals as a job-search strategy have a higher apprenticeship-dropout risk than apprentices with equal levels of schooling who found their training place through formal channels.

The institutional setting

In country comparison, educational credentials in Germany are tightly linked to occupational careers and labor market outcomes in general (DiPrete et al., 2017). Students completing general upper-secondary schooling can decide to follow academic education or enter the vocational education and training system (VET). By contrast, students graduating after grade 9 or 10 with either a lower or intermediate secondary school-leaving certificate are not eligible for college. These noncollege-bound students may enter one of the multiple training programs in the VET system in order to access the occupationally structured labor market. Obtaining a tertiary degree or a vocational qualification is tremendously important since entering the labor market without any further qualification is rarely an option. More than 300 different occupation-specific training programs are available in the federal dual apprenticeship system. These apprenticeship programs are employer-based, combined with courses at vocational schools. The usual training duration is three years. Training programs in the health and education sector are not part of the dual system. Nevertheless, they are mostly employer-based too. Young people have to apply directly to employers for apprenticeship places while they are still in school, approximately one year before the start. Those who do not manage to get a training place right

away enter prevocational programs instead, which do not lead to proper qualifications. This typically applies to young people with lower levels of schooling and to those living in regions with poor labor market conditions (Autorengruppe Bildungsberichterstattung, 2018).

The recruitment and selection procedures are comparable to those on the general labor market. Employers advertise their vacancies on their websites, in newspapers, in online databases and via the public employment agencies. In addition to these formal recruitment channels, more than 50% of employers tell their employees about the vacancies (Gerhards and Ebbinghaus, 2014: 5). Employers require young people to submit standard application documents including a cover letter, curriculum vitae, and their last school report cards. Candidates are then invited to participate in job interviews and further selection stages (Protsch and Solga, 2015). As part of informal recruitment procedures, employees' children may get a favorable treatment in the selection processes (Hunkler, 2014).

Data and sample

For our empirical analysis we combined individual-level data from Starting Cohort 4 of the German National Educational Panel Study (NEPS) (Blossfeld and Roßbach, 2019) with statistics on regional unemployment rates provided by the “INKAR” database of the Federal Institute for Research on Building, Urban Affairs and Spatial Development. The panel started in fall 2010, meaning that all respondents were first interviewed as ninth graders at secondary school and were surveyed repeatedly during their transition from school to work.

We focused on students who left the general secondary school system after grade 9 or 10 and indicated that they had either applied for or searched for an apprenticeship place that would directly start in fall after they graduated.¹ Furthermore, we restricted our sample to young people who were searching for VET programs in which employers primarily undertake selection and recruitment. This includes all dual VET programs, because in the dual system all apprenticeships are firm-based. But there are also other VET programs, such as those in the

education and health care sector, in which employers primarily undertake selection and recruitment. They are included too. We used additional information from the NEPS data to identify these programs. We further had to exclude students who received referrals from strong ties other than their parents from the sample. It would have been interesting to also consider these referrals. However, NEPS does not offer information on the education, occupational status, and network resources of these other strong ties, which are important control variables. To tackle the issue of item nonresponse bias, we multiply imputed the data using the chained equation approach and created 20 data sets (MICE algorithm in Stata, MID method, see von Hippel (2007)). After imputation, we obtained a sample of 3,194 individuals.

Variables

Dependent und independent variables

To test our hypotheses 1 and 2, we operationalized the binary dependent variable “parental referral” indicating whether or not young people’s parents recommended them for an apprenticeship position in general (if their search was not successful) or that they got their current apprenticeship position through this informal job-search channel (if their search was successful). The dependent variable was retrospectively surveyed between two and eight months after school graduation. We chose to focus on parental referrals because of data availability (see above), but also because parents appear to be the most important strong ties for informal apprenticeship search. In more than 80% of the cases, parents were involved in the referral process. Regarding hypotheses 3.1 und 3.2, we only focused on the subsample of successful apprenticeship seekers. Here, the binary dependent variable indicated whether young people’s parents recommended them for their current apprenticeship position. In the analysis on apprenticeship-dropout risks (hypotheses 4.1 and 4.2), the “parental referral” variable served as an independent variable used to investigate whether dropout risks differ with regard to the

job-search method. In this part of the analysis, the dependent “dropout” variable indicated whether young people continued their training program within the first year or not. We considered this period rather than the whole training duration because the panel attrition after this first year was quite substantial and probably highly selective. Moreover, about two-thirds of apprenticeship dropouts typically happen within the first year (Rohrbach-Schmidt and Uhly, 2015).

At the regional level, the independent variable of interest for testing hypotheses 1 and 3.1 was the regional unemployment rate. We regarded this as the best indicator for perceived training opportunities (cf. Weßling et al., 2015) because it is best observable by themselves and their strong ties. We aggregated the information provided at the level of the administrative districts up to the level of the employment agency districts. Our sample captured 159 out of 178 employment agency districts (before the restructuring reform in 2012). The three employment agency districts in Berlin were summarized into one unit. Since the first application period always starts in September the year before graduation, we used the 2010 unemployment rates for 2011 graduates (grade 9) and the 2011 unemployment rates for the 2012 graduates. Although Germany had one of the lowest unemployment rates in the European Union during our observation period (OECD, 2020), there were striking regional differences (between 2 and 15% in 2011).

At the individual level, the independent variable of interest for testing hypotheses 2 and 3.2 is the level of schooling students expected to attain. We differentiated between lower level of schooling (no or lower secondary school-leaving certificate) and a higher level of schooling (intermediate secondary school-leaving certificates or students who had expected to attain an Abitur but left school with an intermediate school-leaving certificate after grade 10).

Control variables

Since other factors might be associated with the use of parental referrals and the explanatory variables, we controlled for average grades in mathematics and German. We added a combined indicator with a reversed scale of the German grading scheme for ease of interpretation—the worst possible grade is 1 and the best 6. As noncognitive characteristics, we considered students' conscientiousness and global self-esteem. Conscientiousness is one of the factors in the Big Five personality model (John and Srivastava, 1999) and should be the personality factor most relevant for job search (Holtmann et al., 2017; Protsch and Dieckhoff, 2011). To measure global self-esteem, NEPS uses an adaptation of Rosenberg's self-esteem scale (von Collani and Herzberg, 2003).

As sociodemographic characteristics, we included age, gender, migration background, and a number of covariates measuring the family situation and socio-economic status. These variables are single-parent household, parents' highest socio-economic status (ISEI-08), and parents' education and further qualifications. The latter three variables can also be regarded as proxies for the quality of parental network resources. To control for the extensiveness of social networks, we used information from the position generator (Lin and Dumin, 1986) in which respondents indicated on a list of 13 occupations whether they knew someone who works in the respective occupations. Since social capital is goal and labor-market-segment specific (Chen and Volker, 2016), we followed the approach by Roth (2018) and differentiated the number of higher-status occupations requiring tertiary qualifications and lower-status occupations requiring vocational qualifications in the parental network.

To account for further regional differences, we added variables on whether the student lived in East or West Germany. For hypotheses 1, 3.1, and 4.1, we also took account of occupation-specific recruitment practices and apprenticeship-dropout risks by applying occupation fixed effects based on the 4-digit level of the German Classification of Occupations

2010 (see “Analytical Strategy”). See Table 1 for descriptive analysis of the variables and controls.

Analytical strategy

To investigate whether using referrals by strong ties as a job-search strategy helps to compensate for poor opportunities related to regional labor market conditions and the individual’s level of schooling, we analyzed how these factors relate to the likelihood of using parental referrals during job search (H-1; H-2), the likelihood of having found a training place via referrals (H-3.1; H-3.2), and the risk of dropping out of apprenticeship training which was found via referrals (H-4.1; H-4.2).

Since the hypotheses related to regional labor market conditions (H-1, H-3.1, and H-4.1) follow a different logic of identification than those related to the educational level (H-2, H-3.2, and H-4.2), we tested them with different analytical models. However, in both cases we decided to apply linear probability models for the binary outcomes. Odds ratios and logit coefficients derived from logistic regressions are affected by unobserved heterogeneity, which varies across different model specifications and therefore does not allow a straightforward interpretation. Following Mood (2010), we choose linear probability models as the simplest way to obtain the average effects we are interested in.

With regard to the regional labor market conditions, we applied hierarchical linear probability regression models with random intercepts to investigate the effects of the regional unemployment rate (Gelman and Hill, 2007). To test H-4.1 on apprenticeship dropout risks, we also included a random slope for the cross-level interaction. The multilevel models, account for the clustering of the data, that is, the statistical dependencies between individuals (level 1) within the same regions (level 2) and to control for compositional effects at the regional level. We further added occupation fixed effects to control for occupation-specific recruitment practices and working conditions. Adding the occupation fixed effects enabled us to analyze

the variation *within* occupations, that is, between students who initially applied to training places for the same occupation (H-1, Model 1) or that a training place has been found in the same occupation (H-3.1, Model 3; H-4.1 Model 5). Furthermore, the problem of self-selection into regions is not a major concern for this analysis, since our sample predominantly consists of 15- to 17-year-old students, whose regional mobility is very restricted. Although we cannot rule out the possibility that unobserved parental characteristics may influence both parental choice of residence and young people's use of referrals by strong ties, we added a number of parental characteristics to reasonably control for any such selection effects.

We applied linear probability models, to test the proposed relationships between the individual's level of education and the likelihood of referral use (H-2, Model 2), the likelihood of having found a training place via referrals (H-3.2, Model 4), and the likelihood of apprenticeship-dropout under such conditions (H-4.2; Model 6). Additionally, we added region fixed effects so we could only compare young people with different levels of education living within the same region. By doing so, we made sure that the relationship between our dependent variables and the individuals' level of education would not be confounded by any structural and institutional differences across regions. We did not include occupation fixed effects because occupational-level differences in employers' recruitment practices are now part of a mechanism leading us to expect this set of hypotheses. Low-educated school leavers tend to apply more frequently to lower-status occupations in which recruitment via referrals is more frequently applied. Furthermore, we estimated cluster-robust standard errors at the regional level, to account for likely statistical dependencies between individuals living within the same regions.

Empirical Results

Relying on informal search channels is very common in the German apprenticeship market. In our sample, about half of the students used parental referrals during their first application period (see Table 1). Additionally, looking only at those students who found an apprenticeship place,

we found that 46% benefited from referrals by parents in general and 9% even got a training place at the company that employed their father or mother.

- **Table 1 about here**

Despite this generally high prevalence, Table 2 depicts multivariate regression results showing significant variations in the likelihood of using parental referral across regions and educational groups. Model 1 examines the relationship between the use of parental referrals and the regional unemployment rate as a measure of labor market conditions. A one percentage point increase in the regional unemployment rate is associated with a one percentage point increase in the likelihood of using parental referrals, which we regard as substantial. This significant effect supports H-1. To assess the full extent to which the regional unemployment rate impacts on job-search strategies, we compared the likelihood of using parental referrals for a student living in a region with the highest unemployment rate (14.7%) with the likelihood of using parental referrals for a student living in a region with the lowest unemployment rate (2.1%). To that end, we calculated the difference in predicted probabilities for these two students, which is 12.6 percentage points ($12.6 [= \text{percentage point difference in unemployment rates between the two regions}] * 1.0 [= \text{coefficient for the unemployment rate in Model 1}] = 12.6$).

Model 2 in Table 2 assesses whether young people expecting to graduate with lower school-leaving certificates had a higher likelihood of using parental referrals as a job-search strategy compared to those with intermediate school-leaving certificates. The coefficient for the individual-level education variable represents the estimated difference in referral use between the two education groups within a given employment agency district. Students with lower levels of schooling had a 5.6 percentage point higher likelihood of using referrals than their higher educated peers. Thus, both hypotheses 1 and 2 are confirmed. When apprenticeship seekers face poor opportunities due to the regional labor market conditions or lower levels of schooling, they rely to a greater extent on referrals by parents as a job-search strategy.

- **Table 2 and 3 about here** -

Nevertheless, using this search strategy might still not have the intended consequences of compensating for these poorer opportunities. To scrutinize whether social capital is more important under such conditions, we restricted our sample to successful apprenticeship seekers and estimated the likelihood that a successful apprenticeship seeker had found his or her apprenticeship place via a referral. Model 3 in Table 3 focuses on the relationship between referral use and the regional unemployment rate. The coefficient for the unemployment rate resembles the coefficient in Model 1. This implies that apprenticeship seekers – when facing poor regional labor market conditions – do not only use parental referrals more frequently, but that they also find apprenticeship positions via parental referrals more often. This supports hypothesis 3.1. More generally speaking, parental referrals are more important for matching processes in regions with poor labor market conditions. It should be noted that the p-value for the coefficient for the regional unemployment rate is 0.9. However, the number of cases in Model 3 is significantly lower than in Model 1 (1,884 cases vs 3,194 cases), which consequently results in higher standard errors.

In Model 4 we tested the relationship between education and the likelihood that a successful apprenticeship seeker had found his or her training place via referral. We reject hypothesis 3.2, because the point estimate of the education variable is not statistically different from zero and the magnitude of the effect is also lower than in Model 2. While lower-educated apprenticeship seekers use parental referrals as a search strategy more often than their higher-educated counterparts, they do not have a higher likelihood of finding their training places via referrals. This means that parental referrals do not represent a more important search channel for lower-educated youths than for higher educated ones and thus has a limited potential to compensate for their competitive disadvantages in hiring processes.

In Table 4, we scrutinized whether apprentices who used referrals as a job-search strategy had a higher apprenticeship drop-out risk than apprentices who found their training place through formal channels when they were exposed to poor labor market conditions or have lower levels of schooling. Model 5 shows that the interaction term parental referral * regional unemployment rate is negative, which indicates the opposite direction of the relationship regarding hypothesis 4.1. A negative sign implies that the likelihood of dropping-out is lower if the regional unemployment rate increases. Model 6 tests the interaction parental referral*education. Since the coefficient for the interaction term (estimated difference between the two education groups) is not statistically different from 0, we rejected both H-4.1 and H-4.2. Thus, using parental referrals as a compensation strategy is not associated with the trade-off of having a higher apprenticeship-dropout risk.

As noted above, we only considered apprenticeship dropouts within the first year of the training program, since panel attrition in later observation periods would be a substantial issue. For Models 5 and 6, the remaining sample consists of 1,581 individuals, which represents 84% of all successful apprenticeship seekers considered in Model 3 and 4. It should be noted that panel attrition could theoretically be a concern for this sample. However, since there is no strong positive association between referral use and dropout risks, we are quite confident that our results would also hold for the full sample. We also reran Models 5 and 6 with panel weights, which confirmed the results presented in Table 4 (see Table 5 in the Appendix).

- **Table 4 about here**

Conclusion and Discussion

Social capital is an important resource in generating and reinforcing labor market inequalities (Bourdieu, 1973; Lin, 2001). For young people, the quality of network resources provided by parents and other strong ties is relevant when they are searching for their first job, which may be an employer-based apprenticeship (Hällsten et. al, 2017; Roth, 2018; Verhaeghe et al., 2015).

Unlike in the general labor market, in youth labor markets, using referrals does not lead to higher transition rates compared to formal job-search methods (Hoenig, 2019, Flap and Boxman, 2001, Roth, 2014a). Previous research hypothesized that young people especially rely on support from social contacts if they face poor opportunities at labor market entry. By putting these assumptions to the test, our study has offered key insights about two types of circumstances under which referrals may be an important job-search strategy for young people and the likely implications in terms of social inequalities.

The present study considered noncollege-bound students searching for apprenticeship places in Germany. Using the German National Educational Panel Study (NEPS), we showed that young people are more likely to use referrals by parents if they are searching in regions with higher unemployment and if they are at a competitive disadvantage because of lower schooling levels. In regions with high unemployment, young people do not only use parental referrals more frequently but also increasingly find apprenticeship places via referrals. This implies that having relevant parental network resources is especially important if young people need to compensate for otherwise poor regional opportunities. Young people who cannot avail of these network resources under such circumstances are at an additional disadvantage.

Regarding lower-educated school leavers, we found that, even though they are more likely to use parental referrals, they do not appear to benefit considerably more from parental referrals in their matching processes than their higher-educated counterparts. Thus, contrary to our hypothesis, young people with lower levels of schooling are not more likely to have found their apprenticeship place via parental referrals than those with higher levels of schooling. We might thus conclude that even if lower-educated young people hope to increase their chances by using parental referrals, this does not help them to counteract their comparably lower trainability signals. One possibility is that employers may regard referrals for lower-educated applicants as less reliable. An alternative explanation, however, is that the parents of lower-educated job seekers may provide their children with less valuable referrals than the parents of

higher-educated job seekers. Although we aimed to proxy the quality of parental network resources in our analyses, this was only partly possible. An important question in that regard might be whether the referral was made by a person working for the employer in question.

We further examined whether using referrals as a job-search method only served as a temporary strategy to compensate for otherwise poor opportunities because it might lead to higher apprenticeship-dropout risks. Our analyses do not support this concern. Apprentices facing poor labor market conditions or with lower levels of schooling who used referrals as a job-search strategy did not have a higher apprenticeship-dropout risk than apprentices who found their training place through formal channels.

In our analysis, we benefitted from having a rather large sample. We also had rich information on young people's education and occupational choices, their noncognitive characteristics, family background, and parental social network contacts. This rendered NEPS very suitable for analyzing the effects of regional labor market conditions on referral-based job search and the transition from school to work. However, our study also had limitations due to some of the measurements in NEPS. Most importantly, we only had very general information on referrals: We did not know how and to whom parents referred their children. In addition, we had to exclude those individuals who used referrals by siblings and other relatives rather than referrals by parents. The reason is that the NEPS does not offer information on the education, occupational status, and network resources of these other strong ties. More concrete information on the different types of referrals and the characteristics of the other strong ties would have allowed us to undertake a better specified and more detailed investigation. A further measurement issue regarding the dependent variable, namely referral use, is that successful apprenticeship seekers were only asked about the job-search method that led them to their current position. This led to an underreporting of referral use and might induce selection bias, since it ignores the possibility that successful apprenticeship seekers may have used parental referrals during their job search but ultimately found their training place via formal job-search

methods. We consider this a minor issue, as our calculations are rather conservative estimates. Since overall apprenticeship market chances are higher in regions with good labor market conditions, selection into unsuccessful referral use should be stronger in regions with high unemployment than in regions with lower unemployment. If this is true, then we likely underestimated the positive relationship between regional unemployment and parental referral use (the same logic applies to the level of schooling).

With these caveats in mind, we believe our findings yield relevant implications for understanding social inequalities during the transition from school to work and the role of stratified parental network resources. In general, applying network-based job search in youth labor markets does not lead to better outcomes than formal job-search methods. Yet, our results suggest that parental social capital endowment is especially important if young people are facing poor regional labor market conditions. Under such circumstances, parental referrals appear to compensate for otherwise limited opportunities. This has implications for the reproduction of socioeconomic inequality since network resources are socially stratified (Lin, 2001b). Furthermore, the greater importance of informal search channels likely leads to the exclusion of disadvantaged social groups from certain labor queues in contexts with poor labor market conditions (cf. Kmec, 2005; Reskin and Branch McBrier, 2000).

We focused on job search in the German apprenticeship market. However, while education systems and labor market institutions differ greatly across European countries and beyond (DiPrete et al., 2017; Shavit and Müller, 1998; Wolbers, 2007), the use of referrals appears to be an important job-search strategy in other labor markets too (Behtoui 2016; Bentolila et al., 2010; Topa, 2011). We expect our finding with regard to poor regional labor market conditions to hold for school-to-work transitions in other countries as well (see also Kramarz and Skans, 2014 on the Swedish youth labor market). Non-college-bound young people typically have to search for their first job or apprenticeship at comparably young ages and thus face limited regional mobility. Furthermore, we expect the long-term consequences

for labor market outcomes to be particularly strong in occupationally structured labor markets, in which early labor-market transitions set the path for future careers.

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The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article

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Note

¹ There is no data for students who looked for an apprenticeship but did not find one and thus decided to stay in the general school system. However, this missing information does not lead to a selective sample. Additional analysis shows that only 5.6% of students who planned to search for an apprenticeship position in grade 10 but stayed in the general school system (own calculations, weighted data). If students want to earn a higher education certificate than they were originally awarded, they typically do so in schools outside the general school system.

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Appendix

- **Table 5 about here** -

Note to editors:

Tables to be included in the manuscript and the appendix on the following pages

Table 1. Variables and descriptive statistics
(Percentages or means [standard deviations])

	<i>Percentages</i>
Parental referral used (ref.: no parental referral used)	49%
Expected level of schooling: no/lower secondary school-leaving certificates (ref.: Intermediate secondary school-leaving certificates)	30%
Migration background (ref.: no)	15%
Gender, female (ref.: male)	44%
Highest parental qualification	
1) lower level of schooling with vocational qualification or less	30%
2) intermediate school-leaving certificate with vocational qualification	38%
3) at least upper secondary school-leaving certificate	31%
Household composition: two-parent family (ref.: single-parent family)	81%
East Germany (ref.: West Germany)	13%
	<i>Mean</i>
Regional unemployment rate in %	7 [2.88]
Age in months	183 [7.73]
Average grade (math and German, 1=worst, 6=best)	4 [0.68]
Big Five factor “Conscientiousness”	3 [0.85]
Global self-esteem	39 [6.28]
Number of lower-status occupations in parental network (max. 7 occupations)	5 [2.00]
Number of higher-status occupations in parental network (max. 6 occupations)	3 [1.84]
Highest parental occupational status (ISEI-08)	43 [17.91]
Number of individuals	3,194

Sources: NEPS SC4 SUF 10.0.0., regional unemployment rates derived from “INKAR” database/Federal Institute for Research on Building, Urban Affairs and Spatial Development, own calculations.

Table 2. Likelihood of using parental referrals during apprenticeship search

	Hierarchical linear probability model	Linear probability model
	M1	M2
Regional unemployment rate in %	0.010** (0.004)	
Expected level of schooling: no/lower secondary school-leaving certificate (ref.: intermediate secondary school-leaving certificate)	0.046** (0.024)	0.057*** (0.026)
Average grade (math and German, z-std.)	-0.005 (0.010)	-0.009** (0.010)
Conscientiousness (z-std.)	0.006 (0.010)	0.008 (0.011)
Global self-esteem (z-std.)	-0.001 (0.010)	-0.005 (0.009)
Age in months (z-std.)	-0.008 (0.010)	-0.005 (0.009)
Gender, female (ref.: male)	-0.040 (0.027)	-0.041** (0.017)
Migration background (ref.: no)	-0.127*** (0.027)	-0.126*** (0.030)
Two-parent household (ref: single-parent household)	0.073*** (0.024)	0.060** (0.024)
Highest parental ISEI (z-std.)	-0.004 (0.010)	-0.002 (0.011)
Highest parental qualification (ref.: 1) lower level of schooling with vocational qualification or less 2) intermediate school-leaving certificate with vocational qualification 3) at least upper secondary school-leaving certificate	0.067*** (0.025) 0.064** (0.027)	0.064** (0.025) 0.063** (0.028)
Number of higher status occupations in parental network	0.008 (0.008)	0.007 (0.008)
Number of lower status occupations in parental network	0.002 (0.006)	0.002 (0.006)
East Germany (ref.: West Germany)	-0.024 (0.037)	
Occupation fixed effects	Yes	No
Employment agency district fixed effects	No	Yes
Constant	0.521*** (0.100)	0.427*** (0.049)
Number of individuals	3,194	3,194
Number of regions (employment agency districts)	159	159
Random intercept	0.026	

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.10. M2: cluster-robust standard errors (clustered at the regional level). Sources: NEPS SC4 SUF 10.0.0., "INKAR" database/Federal Institute for Research on Building, Urban Affairs and Spatial Development, own calculations.

Table 3. Likelihood of having found a training place via parental referral

	Hierarchical linear probability model	Linear probability model
	M3	M4
Regional unemployment rate in %	0.010* (0.006)	
Expected level of schooling: no/lower secondary school-leaving certificate (ref.: intermediate secondary school-leaving certificate)	0.035 (0.030)	0.040 (0.038)
Average grade (math and German, z-std.)	0.012 (0.013)	0.004 (0.014)
Conscientiousness (z-std.)	-0.012 (0.013)	-0.005 (0.016)
Global self-esteem (z-std.)	-0.000 (0.013)	-0.006 (0.013)
Age in months (z-std.)	-0.017 (0.013)	-0.011 (0.013)
Gender, female (ref.: male)	-0.005 (0.037)	-0.032 (0.025)
Migration background (ref.: no)	-0.134*** (0.039)	-0.128*** (0.044)
Two-parent household (ref: single-parent household)	0.062* (0.033)	0.045 (0.033)
Highest parental ISEI (z-std.)	-0.011 (0.014)	-0.012 (0.015)
Highest parental qualification (ref.: 1) lower level of schooling with vocational qualification or less 2) intermediate school-leaving certificate with vocational qualification 3) at least upper secondary school-leaving certificate	0.054* (0.032) 0.032 (0.035)	0.052 (0.036) 0.048 (0.040)
Number of higher status occupations in parental network	0.008 (0.010)	0.007 (0.010)
Number of lower status occupations in parental network	0.001 (0.008)	0.000 (0.008)
East Germany (ref.: West Germany)	-0.029 (0.047)	
Occupation fixed effects	Yes	No
Employment agency district fixed effects	No	Yes
Constant	0.606*** (0.124)	0.525*** (0.056)
Number of individuals	1,884	1,884
Number of regions (employment agency districts)	155	155
Random intercept	0.000	

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.10. M4: cluster-robust standard errors (clustered at the regional level). Sources: NEPS SC4 SUF 10.0.0., "INKAR" database/Federal Institute for Research on Building, Urban Affairs and Spatial Development, own calculations.

Table 4. Likelihood of apprenticeship dropout

	Hierarchical linear probability model	Linear probability model
	M5	M6
Successful search channel:		
parental referral (ref.: formal search strategy)	0.032 (0.030)	-0.012 (0.017)
Regional unemployment rate in %	0.007* (0.004)	0.043*** (0.012)
Parental referral * regional unemployment rate	-0.007* (0.004)	
Expected level of schooling: no/lower secondary school-leaving certificate (ref.: intermediate secondary school-leaving certificate)	-0.034 (0.017)	-0.034 (0.026)
Parental referral * no/lower secondary school-leaving certificate		0.019 (0.036)
Average grade (math and German, z-std.)	-0.010 (0.007)	-0.017** (0.008)
Conscientiousness (z-std.)	-0.005 (0.006)	-0.003 (0.009)
Global self-esteem (z-std.)		-0.003 (0.008)
Age in months (z-std.)	0.016** (0.007)	0.013 (0.009)
Gender, female (ref.: male)	-0.045** (0.020)	0.022 (0.016)
Migration background (ref.: no)	-0.018 (0.021)	-0.008 (0.023)
Two-parent household (ref: single-parent household)	-0.029 (0.019)	-0.038 (0.029)
Highest parental ISEI (z-std.)	0.014* (0.007)	0.017* (0.010)
Highest parental qualification (ref.: 1) lower level of schooling with vocational qualification or less 2) intermediate school-leaving certificate with vocational qualification	0.006 (0.016)	0.002 (0.017)
3) at least upper secondary school-leaving certificate	0.025 (0.020)	0.014 (0.022)
Number of higher status occupations in parental network	0.003 (0.005)	0.003 (0.006)
Number of lower status occupations in parental network	0.001 (0.004)	0.001 (0.005)
East Germany (ref.: West Germany)	-0.002 (0.026)	
Occupation fixed effects	Yes	No
Employment agency district fixed effects	No	Yes
Constant	0.125* (0.071)	0.033 (0.037)

Number of individuals	1,581	1,581
Number of regions (employment agency districts)	151	151
Random intercept	0.000	
Slope for “successful search channel”	0.000	
Intercept-slope covariance	-1	

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.10. M6: cluster-robust standard errors (clustered at the regional level). Sources: NEPS SC4 SUF 10.0.0., “INKAR” database/Federal Institute for Research on Building, Urban Affairs and Spatial Development, own calculations.

Table to be included in Appendix

Table 5. Models on likelihood of dropping out of an apprenticeship with panel weights (linear probability regression models with cluster-robust standard errors)

	M7	M8
Successful search channel:		
parental referral (ref.: formal search strategy)	0.015 (0.043)	-0.009 (0.026)
Regional unemployment rate in %	0.009 (0.006)	
Parental referral * regional unemployment rate in %	-0.003 (0.006)	
Expected level of schooling:		
no/lower secondary school-leaving certificate (ref.: intermediate secondary school-leaving certificate)	-0.043 (0.029)	-0.024 (0.023)
Parental referral * no/lower secondary school-leaving certificate		0.025 (0.039)
Average grade (math and German, z-std.)	-0.009 (0.010)	-0.010 (0.012)
Conscientiousness (z-std.)	-0.005 (0.012)	-0.005 (0.010)
Global self-esteem (z-std.)	-0.017 (0.014)	-0.013 (0.014)
Age in months (z-std.)	0.004 (0.010)	0.006 (0.010)
Gender, female (ref.: male)	-0.029 (0.023)	0.037* (0.022)
Migration background (ref.: no)	-0.009 (0.018)	-0.023 (0.023)
Two-parent household (ref: single-parent household)	0.015 (0.023)	0.003 (0.021)
Highest parental ISEI (z-std.)	0.018 (0.012)	0.023* (0.013)
Highest parental qualification (ref.: 1) lower level of schooling with vocational qualification or less 2) intermediate school-leaving certificate with vocational qualification		
	0.011 (0.021)	-0.008 (0.022)
3) at least upper secondary school-leaving certificate	0.045* (0.024)	0.018 (0.026)
Number of higher status occupations in parental network	0.000 (0.007)	-0.002 (0.007)

Number of lower status occupations in parental network	0.006 (0.007)	0.005 (0.006)
East Germany (ref.: West Germany)	-0.050 (0.039)	
Occupation fixed effects	Yes	No
Employment agency district fixed effects	No	Yes
Constant	-0.051 (0.087)	-0.008 (0.039)
Number of individuals	1,581	1,581
Number of regions (employment agency districts)	151	151

Cluster-robust standard errors in parentheses (clustered at the regional level), *** p<0.01, ** p<0.05, * p<0.10.
Regressions based on weighted data. Sources: NEPS SC4 SUF 10.0.0., “INKAR” database/Federal Institute for
Research on Building, Urban Affairs and Spatial Development, own calculations.