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EMPIRICAL RESEARCH

Persistent Disadvantages or New Opportunities? The Role of Agency and Structural Constraints for Low-Achieving Adolescents' School-to-Work Transitions

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Abstract School leavers with low educational attainment face great difficulties in their school-to-work transitions. They are, however, quite heterogeneous in terms of their personal and social resources. These within-group differences may influence who shows initiative during the school-to-work transition period and thereby helps employers recognize their learning potential at labor market entry. Yet this recognition also depends on the ways employers select applicants, which may prevent them from discovering such within-group differences. We therefore investigate the interplay between agency and its constraints, that is, whether higher cognitive and noncognitive skills and more parental resources provide low-achieving school leavers with new opportunities in the school-to-work transition period or whether their low school attainment causes the persistency of their disadvantages. We use panel data from the German National Educational Panel Study (NEPS), which started in grade 9. The NEPS also includes school leavers from special-needs schools. Our sample consists of 3417 low-achieving adolescents (42% female), defined as adolescents who leave school with no or only a lower secondary school-leaving certificate. Their average school-leaving age is 16 to 17 years. Our key findings are that the transition period opens up new opportunities only for those low-achieving adolescents with better vocational orientation and higher career aspirations, leading them to make stronger application efforts. The success of youth's initiative varies considerably by school-leaving certificate and school type but not by competences, noncognitive characteristics, and parental background. Thus, the label of "having low qualifications" is a major obstacle in this transition period—especially for the least educated subgroup. Their poor school attainment strongly disadvantages them when accessing the required training to become economically independent and hence in their general transition to adulthood. Our results are also of interest internationally, because participation in firm-based training programs functions as the entry labor market in Germany. Thus, similar explanations may apply to low-achieving adolescents' difficulties in finding a job.

Keywords Agency · Low-achieving adolescents · Competencies · Vocational education and training · Entry into the labor market · Germany

Introduction

Entry into the labor market is an important part of adolescents' transitions to adulthood (Buchmann and Kriesi 2011). Success or discontinuities in school-to-work transitions strongly affect occupational careers and behavior later in life (Bynner and Parsons 2002; Caspi et al. 1998; Hogan and Astone 1986; Kerckhoff 1993; Shanahan 2000; Sweeting and West 1994). From a developmental perspective, transitions to work are influenced by both "young people's active efforts to shape their biographies and the structured set of opportunities and limitations that define pathways into adulthood" (Shanahan 2000, p. 668).

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Quite a number of studies have shown that, over and above educational attainment, young people's cognitive and noncognitive skills, as well as their family resources, influence both their continuation of education and occupational career (e.g., Almlund et al. 2011; Carneiro et al. 2007; Caspi et al. 1998; Fletcher 2013; Heckman et al. 2006; Lindqvist and Vestman 2011; Lleras 2008). Moreover, high aspirations have been shown to increase success in labor market entry, even for early school leavers (Schoon and Duckworth 2010; see also review in Gutman and Schoon 2013). Existing studies predominantly focused on the US and UK—both characterized by comprehensive school systems and general upper secondary education systems (Bol and van de Werfhorst 2013; Müller and Shavit 1998). Their findings may not apply to countries like Germany or Switzerland, because qualifications are known to be a stronger signal in labor markets in tracked school systems, which sort students early by cognitive skills and social origin (Bol and van de Werfhorst 2011; Heisig and Solga 2015), and apprenticeship systems or occupational labor markets (Müller and Shavit 1998). Moreover, existing research mainly looked at between-group differences and did not pay particular attention to individuals with similar school attainment. Furthermore, they looked at entry into jobs as a dependent variable but did not differentiate between adolescents' agency, that is, their application behavior, and employer selection as constraints. Thus, the interplay between agentic resources, structural constraints, and later outcomes is not well understood (Diewald and Mayer 2009; Gutman and Schoon 2013).

We therefore investigate the *role of agentic resources, application efforts (agency), and structural constraints on low-achieving school leavers' success in the period of school-to-work transitions*. We thereby examine whether positive characteristics and active efforts can create new opportunities for them in this transition period (Alexander et al. 2001; Canny 2004; Miller and Rosenbaum 1997; Sacker and Schoon 2007)—supporting the integration of low-achieving school leavers into the labor market—or whether they face persistent disadvantage because of their low qualifications. Low-achieving adolescents are quite heterogeneous in terms of their personal (cognitive and noncognitive skills) and parental resources (e.g., Gasquet 2004; Uhlig et al. 2009; Steedman 2004). These within-group differences may be associated with differences in adolescents' application effort. On the other hand, we know that low-achieving school leavers face great difficulties in their school-to-work transitions (e.g., Breen 2005; Brzinsky-Fay and Solga 2016). Thus, agency may not matter for them because, for example, their early school experiences as "low-achievers" may result in generally low(er) aspirations, despite differences in cognitive or noncognitive characteristics, and thereby in less active application efforts. Moreover, the label of "having low qualifications" may strongly restrict the success of adolescents' job application efforts owing to employers' screening of applicants based on school certificates (Spence 1974; Thurow 1975). As a consequence, low-achieving adolescents may have only few or no opportunities to demonstrate their productive cognitive or noncognitive potential (that is not visible in certificates and grades) in job interviews (e.g., Newton et al. 2005).

We study Germany and look at entry into regular training positions. Our German study enables us to investigate how heterogeneous the group of low-achieving school leavers is in a highly tracked school system. At the same time, the German vocational educational and training system offers valuable opportunities for adolescents to continue their education and to learn an occupation below the level of higher education. In this respect, the German education system seems to be rather inclusive for low-achieving school leavers (e.g., Breen 2005; Brzinsky-Fay and Solga 2016; Ryan 2001). However, the German training market is highly competitive and serves as entry into the labor market (Protsch and Solga 2016). Hence, low-achieving adolescents who failed to enroll in apprenticeships bear a higher risk of being marginalized not only at the beginning but also throughout their entire work-life (Solga 2008).

The German Vocational Education System

The German school system is highly stratified. Students are tracked into different school types as early as age 10–12. In addition, the vast majority of students with disabilities attend special-needs schools (National Education Report 2014, p. 178). The German school system is also stratified in terms of the school-leaving certificates that students can obtain at the end of lower secondary education (after grade 9 or 10): the lower secondary certificate, the extended lower secondary certificate, and the intermediate certificate. Students may also leave the general school system without a secondary school qualification (hereafter: "no certificate"). These school-leaving certificates do not correspond precisely to the school types but can be formally obtained at all secondary school types. In Germany, the group of low-achieving school leavers is therefore defined by school-leaving certificates: those who leave the general school system without or with only a lower or extended lower secondary school certificate. According to this definition, about 25% of the school leavers were classified as low-achieving school leavers in 2012 (the year in which the respondents of our study left school after grade 10).[1]

[1] This share ranged from 20% in Thuringia to 32% in Bremen—indicating that low-achieving school leavers are a minority in all German states.

After leaving the general school system, low-achieving school leavers are legally eligible (by Vocational Training Act) to enroll in vocational education and training programs, though they are not entitled to enroll in higher education. They may enter: (1) regular firm-based training programs combined with school-based education (apprenticeships), (2) regular school-based programs, or (3) prevocational training programs (for details, see Protsch and Solga 2016). Only apprenticeship and regular school-based training programs lead to nationally recognized, occupation-specific certificates (usually after 3 years), whereas the various prevocational programs do not (most of them last 1 year).

Low-achieving adolescents are free to apply to regular training programs. Firms and vocational schools (as providers of school-based programs), however, are likewise free to select candidates for their training places. School leavers unable to find a regular training place usually contact the Federal Employment Agency and are channeled into prevocational training programs. Seeking regular employment instead of training is usually not an option for them, because vocational education is compulsory until at least the age of 18 in all German states. In 2012, 27% of the students enrolling in the training system entered prevocational programs; the majority of them were low-achieving school leavers (National Education Report 2014, p. 98).

Theoretical Considerations on Agency and Constraints

Studies for Germany provided inconsistent findings on the impact of low-achieving adolescents' cognitive and noncognitive skills on their chances to enter regular training positions: Protsch and Dieckhoff (2011) found that for adolescents with lower secondary school certificates, only differences in school grades but not in noncognitive skills (conscientiousness) influenced their likelihood of entering regular training, whereas for adolescents with intermediate secondary school certificates, conscientiousness but not grades produced within-group variability. In contrast, Solga and Kohlrausch (2013) observed that, beyond school grades, it was conscientiousness and teachers' reports on students' work behavior that influenced the training opportunities of low-achieving school leavers. Both studies found that differences in cognitive abilities (measured as fluid intelligence) did not matter, in contrast to a Swiss study by Mueller and Wolter (2014). They found that below-average math test scores reduced the chances of getting an apprenticeship, whereas above-average scores did not matter, that is, they did not increase these chances.

These studies did not however differentiate between the impact of these agentic resources on adolescents' application behavior and the recruitment decisions of employers or vocational schools (as providers of training places). Yet, both sides together influence the chances to enter regular training programs. In this section, we will therefore provide theoretical considerations on why adolescents' efforts may vary by agentic resources, how this variation may matter for low-achieving adolescents' success in their transitions into vocational training, and why their low qualification may constrain the success of such effort.

Adolescents' agency

Search and application activities depend on applicants' initiative in terms of where to apply, how many times to apply, for what occupation to apply—all are based on adolescents' abilities to make such decisions. Thus, application efforts of low-achieving adolescents may differ by their *decision-making abilities and resources*—such as cognitive and noncognitive skills, aspirations, and parental support.

A substantial number of these school leavers are underachievers—that is, they underperform in terms of grades and school-leaving certificates compared to their cognitive abilities (e.g., Uhlig et al. 2009). This learning potential may become advantageous during the transition period. Research has demonstrated that higher levels of competence and noncognitive skills (e.g., self-esteem or conscientiousness) are predictors of lower risks of educational dropout and higher early occupational attainment (e.g., Jaik and Wolter 2016; Lleras 2008; Rumberger and Lim 2008). Thus, underachievers among those with low school attainment may experience new opportunities for using their cognitive potential in the job search and in subsequent training/work. Moreover, career aspirations and plans have been shown to promote more successful transitions (e.g., Schoon and Duckworth 2010; Schoon and Lyons-Amos 2016)—probably because of more frequent application efforts and more effective application decisions.

Furthermore, *network resources* are known to influence individuals' job search behavior (Aguilera 2002; Franzen and Hangartner 2006; Granovetter 1974; Lin 1999). Supply networks provide information on vacant apprenticeship positions and give second-hand accounts of experiences with job requirements. The group of low-achieving adolescents is not random but socially selective. Their family members and friends are more likely to be less educated, non-employed, or only employed in low-skilled jobs, compared to their higher-educated peers (e.g., Gasquet 2004; Solga 2008). As a result, many low-achieving adolescents know less about "where, when, and how to apply" (Wial 1991, p. 412). Besides this informational dimension of networks, poor parental resources may be associated with a lack of parental guidance, engagement, support, and monitoring (Elffers 2013), which may result in fewer

application efforts. At the same time, however, those low-achieving adolescents who do possess better network and parental resources may be more active and systematic in their job search.

Network resources may not only support adolescents' search for training positions but also the success of their efforts (see review in Lin 1999). Networks help improve their reputation if network members are employed in firms with vacant job or training positions (e.g., Bayer et al. 2008; Protsch 2014). Such recruitment networks would be particularly important for low-achieving adolescents, because network members could testify to these applicants' actual cognitive abilities, practical skills, or motivational potential irrespective of missing credentials or poor school attainment. Correspondingly, a study by Seyfried (2006, p. 35) revealed that recommendations by family members, neighbors, and friends play a major role for German firms when hiring low-skilled persons. Thus, adolescents' application effort and its success may vary by their network (and parental) resources.

But agency may be less developed among low-achieving school leavers in general, regardless of their decision-making abilities and resources. *Stigmatization* owing to their mostly negative school experiences and biographies may reduce low-achieving adolescents' application effort. They may have learned about their "inferior status" in society—their stigma of having "low education" (Goffman 1963). This may lead to dis-identification with educational goals and a voluntary withdrawal from the apprenticeship market to avoid possible humiliation and negative reactions from others (Jones et al. 1984, p. 34, 111; see also Dumont et al. 2017; Elffers 2011; Solga 2004). Low-achieving adolescents may not permanently but only temporarily withdraw from training markets and choose to first attend prevocational programs as an educational investment to increase their future training opportunities (e.g., Skrobanek et al. 2011). No matter whether that withdrawal is permanent or temporary, stigmatization would result in the phenomenon that a substantial part of low-achieving adolescents select themselves out of the applicant pool—even those who possess higher cognitive and noncognitive skills and parental resources.

Constraints for adolescents' agency

The success of low-achieving adolescents' application efforts may be constrained, however, by the selection practices of employers and vocational schools. One important source of restriction is *competition*. According to human capital theory (Becker 1964), signaling theory (Spence 1974), and job competition theories (Sørensen and Kalleberg 1981; Thurow 1975), educational attainment is viewed as an observable proxy for adolescents' trainability and therefore serves as an important selection criterion in recruitment processes. School type, certificates, and grades can be observed from school reports. Given that applicants successfully pass the first selection stage (based on written documents) and are invited for tests and interviews, competences and noncognitive skills can be observed by employers and vocational schools (Protsch and Solga 2015). Based on these theories, applicants with lower educational attainment (in terms of school certificates, types, and grades) and skills (including competences and noncognitive skills) may be placed at lower ranks in the applicant queue—leading to lower probabilities of being selected for a vacant regular training position. Moreover, the study by Seibert and colleagues (2009) has shown that low-achieving adolescents' ranks in the applicant queue vary by regional differences in the supply of, and demand for, training places—because competition is stronger in more constrained training markets.[2]

However, in a study conducted in the German state of Lower Saxony, Solga and Kohlrausch (2013) found that the training opportunities of school leavers from lower secondary schools (*Hauptschule*) did not vary by regional economic conditions. Moreover, the cohort studies by Kleinert and Jacob (2012) and Solga (2002) demonstrated that, regardless of the respective supply-demand relationship, low-achieving adolescents in younger cohorts had lower chances to access regular training programs than their counterparts in older cohorts. This suggests that low-achieving applicants may not only be ranked lower in applicant queues but that employers exclude them from the applicant pool altogether (Thurow 1975, p. 174). Employers and vocational schools may view low-achieving adolescents as not (yet) capable of successfully completing training programs. Several studies demonstrated that employers increasingly complain about low-achieving school leavers' low or even non-employability (e.g., Murnane and Levy 1996; Rosenbaum and Binder 1997; Sehringer 1989). In Germany, this view of low-achieving adolescents has been evident in the discussion on "training maturity" (*Ausbildungreife*) over the last two decades (Eberhard 2006; Kohlrausch and Solga 2012). Today, employers and vocational schools are less willing to choose low-achieving adolescents for their training places—even if there is a shortage of higher-achieving applicants (Gericke et al. 2009). This phenomenon of sorting individuals with low formal qualifications out of the applicant pool because of their supposed "incapability" is called the *discrediting*

[2] It is important to note that the German state-financed school-based training sector has a rather fixed number of places (like the firm-sponsored apprenticeship market) and does not adjust the provision of places to the number of applicants.

mechanism (Solga 2008). It is an extreme form of statistical discrimination by school-leaving certificate.

In sum, students' resources acquired in school and at home may enhance their application behaviour and success of their school to work transition. At the same time, the usefulness of these resources and the success of adolescents' efforts may be constrained by gatekeepers' (employers and vocational schools) recruitment decisions.

The Current Study

The main goal of this study is to better understand the interplay between agency and constraints in the school-to-work transition period of low-achieving school leavers. In Germany, entry into regular training programs is an important step in this transition not only in terms of continuing with upper secondary education but also in terms of entering the labor market.

Most previous research compared educational groups by looking at "entry to jobs or training" as the dependent variable without differentiating between adolescents' application efforts and employers' recruitment preferences. Moreover, existing research has paid only little attention to within-group differences in agentic resources and adolescents' activities. Hence, the group of low-achieving adolescents has mostly been viewed as a homogenous group. In contrast, we focus on the variability in school-to-work transitions within the low-achieving group. From a developmental perspective, we explicitly investigate both the impact of agentic resources acquired during schooling and at home on their application efforts and the constraints that may limit the success of their agency in the transitions to work.

The sample size of the data we use—the German National Education Panel Study—enables us to explore the impact of within-group heterogeneity. This data set also provides rich information on adolescents' school attainment (school-leaving certificate, school type, and grades), cognitive and noncognitive competencies, educational aspirations and vocational orientation, and family background. Moreover, information on local differences in youth unemployment allows for exploring the influence of economic conditions on their success in entering regular training.

Based on the theoretical considerations presented in the previous section, we derive the following hypotheses about why low-achieving adolescents' agency during the transition period may open up *new opportunities despite their low qualification*: First, we expect that low-achieving school leavers with advantageous decision-making abilities and resources are more likely to apply for regular training places than those with poor(er) abilities and resources (Hypothesis 1). Higher decision-making abilities and resources are defined as higher levels of cognitive and noncognitive skills, higher career aspirations and better vocational orientation, and better network resources. Second, we expect that better network resources also directly improve adolescents' chances to access regular training programs, controlled for application behavior (Hypothesis 2). That is, school leavers may enter regular firm-based training programs through informal contacts or prior internships. In this case, they may not report having formally applied, because they were not selected through a formal recruitment procedure.

We also developed some theoretical explanations of the factors limiting the success of their application efforts and hence causing them to experience *persistent disadvantages because of their low school attainment*. Low-achieving school leavers may withdraw from the training market because they feel stigmatized owing to their prior school experience. We therefore expect that low-achieving adolescents with especially inferior prior school experiences (i.e., those who left school without a certificate and those from special-needs schools) apply less often for training places than low-achieving school leavers with a lower or extended lower secondary school certificate (Hypothesis 3).

Moreover, the success of their application efforts is highly dependent on gatekeepers' selection (firms and vocational schools). Whether or not low-achieving adolescents actually apply may not matter for their training opportunities, because they may simply not be selected by firms and vocational schools. One reason might be *competition*: Applicants are ranked in applicant queues during the screening process based on their educational attainment and cognitive and noncognitive skills. The ranking place may also depend on regional training market conditions: Low-achieving applicants may be ranked lower in more competitive contexts than in less competitive contexts. We therefore expect to find that the lower the school attainment and the lower the competences and noncognitive skills, the lower their chances of entering regular training programs (Hypothesis 4). We also expect that low-achieving adolescents are less likely to enter regular training in regions with more competition (Hypothesis 5).

In contrast to competition, the discrediting mechanism states that low-achieving adolescents are not only ranked lower in applicant queues but also excluded from applicant queues because they are viewed as "not being trainable." This mechanism is supported if low-achieving adolescents' training chances do *not* vary by their application efforts and regional training market conditions (i.e., if Hypothesis 5 cannot be confirmed). Additional support is provided if their training chances do not vary by cognitive and noncognitive skills—indicating that low-achieving applicants are not

invited to job interviews, in which they could demonstrate their skills.

Methods

Data and Sample

We use data from the so-called starting cohort 4 of the German National Educational Panel Study (NEPS) (Blossfeld et al. 2011). In this cohort, all respondents attended grade 9 at German secondary schools in fall 2010 (Leuze et al. 2011). The sample design followed a stratified two-stage sampling strategy, sampling first schools and then classes within schools (Steinhauer and Zinn 2016).

The students were surveyed once or twice each year. As long as they were still in the general school system, they were interviewed in the classroom context via paper-and-pencil interviews (PAPI). Afterwards, they were surveyed individually with computer-assisted-telephone interviews (CATI) or computer-assisted-personal interviews (CAPI). We use the Scientific Use File SUF SC4 7.0.0 (doi: http://dx.doi.org/10.5157/NEPS:SC4:7.0.0), which includes the first seven waves for this cohort (conducted between fall 2010 and fall 2013).[3]

The total sample of students who agreed to participate in the study consists of 16,425 students (49.5% female); 16,379 of these students participated in at least one wave. 23% of the respondents attended lower secondary schools (*Hauptschule*), 20% intermediate secondary schools (*Realschule*), 18% comprehensive schools or schools with multiple tracks, 32% university-preparatory schools (*Gymnasium*), and about 7% special-needs schools for learning disabilities. This distribution is not the actual distribution of 9th graders in 2010, because students from three school types were oversampled: students from lower secondary schools and from special-needs schools (to reach a meaningful number of observations of potentially low-achieving adolescents) and students from comprehensive schools (to reach a larger number of observations of students with a migrant background, as this is a preferred school type among this population) (Steinhauer and Zinn 2016, p. 4). In our descriptive analyses, we account for this oversampling design by using corresponding design weights that adjust for both the sampling design and panel attrition (Steinhauer and Zinn 2016). The incorporation and oversampling of students from special-needs schools makes the NEPS one of the very few (German) data sets that includes a large group of students with learning disabilities.[4] This is particularly important for our study, as these students constitute a substantial part of school leavers without a school certificate.

Among the respondents were 31% low-achieving school leavers (who left school with less than an intermediate school certificate), 32% respondents who left school also after grade 9 or 10 but with a higher certificate (an intermediate school certificate), and 37% respondents who stayed in the general school system after grade 10 (attending a university-preparatory track/school). For our study, we only used the subsample of low-achieving school leavers, that is, those who left school with less than an intermediate school certificate after grade 9 and 10. We restricted this sub-sample to those for whom we have valid information on their status in October after they left school (for defining our dependent variables). These restrictions left us with a sample size of 3417 low-achieving school leavers, with a slightly lower share of females (42%) than in the total sample (49.5%)—in line with the literature, because boys are often found to be overrepresented among low-achievers. Our respondents were on average 16.7 years old (with a standard deviation of 0.82) at the time they left general school. This corresponds to official statistics (National Education Report 2014, p. 275).

Panel attrition was quite low in the first seven waves: A total of 1289 students from the original sample (of 16,425) dropped out of the panel permanently (i.e., 7.8%; own calculations). It is not possible to state how many of the dropouts belong to the group of low-achieving adolescents because being classified as low-achieving school leavers requires that we can observe respondents until they leave school in order to know about their school-leaving certificate. By definition, this is not the case for those who dropped out of the NEPS earlier. Taking the school types they attended in grade 9 (first wave) as a proxy, attrition analyses found that students who attended lower secondary schools (*Hauptschule*) and special-needs schools had a significantly higher propensity of panel attrition than students from higher school types (Steinhauer and Zinn 2016). This selective panel attrition is another reason why we use nonresponse-adjusted design weights in our descriptive analyses (Steinhauer and Zinn 2016).

[3] The SUF SC 7.0.0 accidentally does not include some respondents' school biography (see release notes for version 7.0.0). We retrieved these episodes from the previous version SUF SC4 6.0.0.

[4] In 2010/11 (i.e., the time of the first wave), about 80% of the students classified as disabled attended a special-needs school (of these, about 50% were schools for learning disabilities) (Klemm 2015, p. 57). Students attending integrative school settings are also in our sample (mostly attending lower secondary schools) but difficult to detect. They often do not know about their classification if they do not attend special-needs schools (and teachers were not allowed to report this to NEPS). Thus, comparisons between adolescents with learning disabilities from special-needs schools and regular schools are not possible.

Dependent Variables

In our analyses, we used two dependent variables: whether low-achieving adolescents applied for regular training places (testing Hypotheses 1 and 3) and whether they were able to directly enter regular training programs, controlled for their application effort (testing Hypotheses 2, 4, and 5).

Application to regular training programs

Students were asked whether they applied for a training position in the first wave after they left school (coded as 0 = no, 1 = yes). 59% of our sample applied. We have no indication of potential underreporting by students who applied unsuccessfully because the percentage of respondents with applications is much higher than the percentage of those who entered regular training programs (39%).

Entry into a regular training position

Our second dependent variable is defined as entry into regular training programs (1) or not (0) in fall directly after leaving school. We classified respondents in two groups, as follows: In each wave of the NEPS, respondents were asked to report all episodes of school, regular training, and prevocational program attendance, and other kinds of activities until the interview. As many prevocational programs and some regular training programs are school-based, respondents sometimes had difficulties differentiating between school, prevocational, and training episodes when reporting their activities. We therefore inspected and edited the reported school episodes in the following way: First, we prioritized vocational and prevocational programs over school episodes if they were reported concurrently. Second, we defined school episodes at vocational schools as regular training programs when students reported pursuing a vocational certificate, and as a route to obtaining the *Abitur* when students reported seeking a university entrance qualification.[5] If students reported neither of these two options, school episodes at vocational schools were classified as prevocational programs. Some students reported an internship or being on parental leave, working, or unemployed. These activities are classified as "others." In our sample, 39% of the respondents started a regular training program and 51% a prevocational program; only 10% ($n = 335$) belonged to the "other" category. The latter group is small because most of our students were under age 18 when leaving general school and thus had to remain in education (at least part time). For the sake of simplicity and because of the small numbers, we grouped prevocational participation and the "other" category together for our multivariate analyses. In many characteristics, the subgroup "others" resembles those who started prevocational programs (see Table 2). We also re-estimated all models with entry into training (1) instead of prevocational participation (0), excluding the "other" group. The results were very similar and substantially the same as reported in the article.

Among those who started a regular training program, 72% entered firm-based training programs (apprenticeships) and 28% school-based programs. In our analyses, we did not differentiate between the two types because of the rather small number of observations for the latter. The robustness check, in which we re-estimated our models only including those with apprenticeships, showed that the results were robust.

Independent Variables

In the following, we provide information on the independent variables of our analyses. Distributions and descriptive statistics (weighted in order to account for the sampling design and panel attrition) of our independent and control variables are presented in Table 1.

School-leaving certificates

The school-leaving certificate was reported by the respondents in the first wave after leaving school. In vertical order, we differentiated between extended lower secondary (31.5% of our sample), lower secondary certificate (51%), and no school-leaving certificate (17.5%, including the school-leaving certificate from special-needs schools).

School types

We differentiated between lower secondary schools (50% of our sample), special-needs schools (13%), and other types of schools (including comprehensive, intermediate, and university-preparatory schools; 37%) at the time of leaving school. This information is available from the sampling plan for respondents who did not change school after grade 9 (i.e., the start of the panel study; 85% of our sample); otherwise it was reported by the respondents in the first wave after leaving school.

The share of those who attended lower secondary schools in our study is very similar to the 52% reported in official statistics (own calculations based on National Education Report 2014, table D7-7web). However, the share of those

[5] Low-achieving school leavers are not entitled to pursue a university entrance qualification directly. We therefore included these unclear episodes in the "others" category.

Table 1 Distribution of independent and control variables, by students' school-leaving certificates (column percentages or means [standard deviations])

Variables	All low-achieving youth	No certificate	Lower secondary certificate	Extended lower sec. certificate	Intermediate certificate	% missing for low-achieving youth (incl. SEN)
School type						0%
Special-needs school	13%	59%	6%	0%	0%	
Lower secondary school	50%	16%	58%	55%	12%	
Other (comprehensive, intermediate, or university-preparatory school)	37%	25%	36%	45%	88%	
GPA on school-leaving certificate (1 = lowest, 6 = highest)	4.0 [0.69]	3.6 [0.93]	4.0 [0.60]	4.2 [0.59]	4.4 [0.55]	1.3%
Combined math and reading score[a]	−.87 [.77]	−.93 [.84]	−.90 [.78]	−.83 [.75]	−.16 [.83]	2.7% (11.0%)
Conscientiousness[a]	3.1 [0.89]	2.7 [0.83]	3.1 [0.90]	3.2 [0.86]	3.2 [0.85]	8.2% (16.0%)
Global self-esteem[a]	37.9 [6.6]	38.0 [6.8]	37.7 [6.5]	38.1 [6.5]	39.2 [6.3]	13.1% (20.5%)
Parental education						19.2%
No certificate	4%	7%	4%	3%	2%	
Lower secondary certificate	34%	36%	35%	32%	18%	
Intermediate certificate	43%	43%	43%	44%	47%	
A levels/equivalent	10%	7%	9%	12%	14%	
Tertiary certificate	9%	7%	9%	9%	19%	
Parental employment						15.4%
No parent employed	6%	11%	5%	5%	3%	
One parent employed	29%	39%	28%	26%	20%	
Two parents employed	65%	50%	67%	69%	77%	
ISEI of parents' highest job	39.5 [17.8]	36.3 [17.0]	39.6 [17.9]	41.1 [17.9]	47.4 [19.1]	14.3%
Applied for a regular training position	59%	36%	62%	67%	59%	4.5%
Originally planned to do a regular training program	75%	73%	77%	73%	62%	1.1%
Reports a desired occupation	74%	68%	73%	79%	76%	11.2%
ISEI of the desired occupation[b]	37.2 [15.5]	31.6 [12.0]	36.8 [15.0]	40.0 [16.7]	48.5 [17.5]	32.8%
Local youth unemployment rate (age 16 to below 20)	5.3% [5.2]	6.3% [5.6]	5.1% [4.7]	5.0% [5.7]	4.4% [4.7]	0%
Sex (% female)	42%	41%	41%	44%	48%	0.1%
Migration background (% yes)	22%	20%	22%	23%	15%	6.9%
N sample (not weighted)	3417	591	1748	1078	4301	

[a] not including school leavers from special-needs schools, for which these information were not collected

[b] weighted but not imputed data

Source: NEPS SC4 SUF 7.0.0, weighted percentages or means of imputed data, authors' calculations

who attended special-needs schools is considerably lower in our study than in the official statistics (19%)—resulting also in a lower share of those who left school without a certificate (about 24%; own calculations based on National Education Report 2014, table D7-7web).[6] These lower shares in our sample at least partly result from the fact that the NEPS only includes students at special-needs schools for learning disabilities, whereas official statistics include students at all types of special-needs schools. Thus, our shares may be representative of this subgroup.

Grades (GPA)

The final grades and grade point average (GPA) on students' school-leaving certificate were reported by respondents (teachers' or parents' reports on grades are not available in NEPS). We used the GPA, on a scale from 1 (lowest grade,

[6] Official statistics do not differentiate between lower and extended lower secondary certificate.

Table 2 Distribution of the independent variables for low achieving school leavers by activity status in October after leaving school (column percentages or means [standard deviations])

	Regular training programs	Prevocational programs	Other
% of firm-based training programs	72%	–	–
School leaving certificate			
No certificate	4%	26%	18%
Lower secondary	54%	54%	49%
Extended lower secondary	42%	20%	33%
School type			
Special-needs school	5%	21%	10%
Lower secondary school	60%	45%	41%
Other (comprehensive, intermediate, or university-preparatory school)	35%	34%	49%
GPA on school-leaving certificate (1 = lowest, 6 = highest)	4.1 [.58]	3.9 [.71]	3.8 [.83]
Combined math and reading score[a]	−.89 [.76]	−.92 [.72]	−.68 [.93]
Conscientiousness[a]	3.2 [.86]	3.0 [.89]	3.0 [.95]
Global self-esteem[a]	38.3 [6.49]	37.6 [6.52]	37.3 [6.73]
Parental education			
No certificate	3%	5%	4%
Lower secondary certificate	35%	35%	29%
Intermediate certificate	43%	44%	41%
A levels/equivalent	10%	9%	11%
Tertiary certificate	9%	7%	15%
Parental employment			
No parent employed	4%	8%	7%
One parent employed	26%	31%	32%
Two parents employed	70%	61%	61%
ISEI of parents' highest job	40.0 [17.28]	38.1 [17.20]	43.3 [20.78]
Applied for regular training positions	76%	46%	56%
Originally planned to do a regular training program	84%	72%	59%
Reports a desired occupation	79%	71%	67%
ISEI of the desired occupation[b]	36.8 [15.0]	31.6 [12.0]	40.0 [16.7]
Local youth unemployment rate (age 16 to below 20)	4.3% [4.65]	5.6% [5.04]	7.1% [6.32]
Reasons for participating in prevocational programs[b]			
Wanted to get a better qualification	–	78%	–
Wanted to improve chances of getting a regular training position	–	84%	–
Didn't get a regular training position	–	52%	–
Didn't know which training program to choose	–	41%	–
Control variables			
Gender (% female)	38%	44%	46%
Migration background	21%	23%	24%
N sample (not weighted)	1336	1746	335

[a] without school leavers from special-needs schools

[b] weighted but not imputed data

Source: NEPS SC4 SUF 7.0.0, weighted percentages or means of imputed data, authors' calculations

equal to failed) to 6 (best grade) (i.e., in reverse to the German grading scheme). If the final GPA is missing, the average of the grades in mathematics and German on earlier report cards was used instead (2.1% of the cases)—resulting in a very low item-nonresponse of less than 2%. The mean GPA is 4.0 and understandably lower than the mean GPA of those who left school with an intermediate certificate (4.4). The differences within the low-achieving group are also

plausible: it is lowest for those without a certificate (3.6) and highest for those with an extended lower secondary certificate (4.2).

Cognitive competences

The NEPS administered competence tests in starting cohort 4, except for special-needs school students. The NEPS consortium has developed competence tests for different domains, scaled by using models of Item Response Theory (IRT) (Pohl and Carstensen 2012). The competence tests used four different response formats: simple multiple choice, complex multiple choice, matching items, and short-constructed responses. The NEPS provides the weighted maximum likelihood estimator (WLE), which is a typical point estimate expressing the most likely competence score for each single person given the item responses of that person (the WLE were scaled to have a mean of zero and a non-restricted standard deviation in the first wave). We used the tests administered in grade nine. In our analyses, we employed the average of the z-standardized mathematics and reading WLE scores. We z-standardized this average (based on the entire NEPS sample of starting cohort 4) with a mean of zero and a standard deviation of one. On average, the competences of low-achieving adolescents were quite low, as one would expect: nearly one standard deviation lower than the competence mean of the entire sample of the NEPS starting cohort 4. School leavers with an intermediate certificate, by comparison, scored near the mean. However, variation within the low-achieving group is quite remarkable.

Noncognitive characteristics

We used a measurement of *conscientiousness*, one dimension of the common five factor model of personality, which also includes extraversion, agreeableness, neuroticism, and openness (McCrae and Costa 1991; John and Srivastava 1999). The NEPS used a 10-item short version (called BFI-10) of the well-known Big Five inventory (NEO-FFI), developed by Rammstedt and John (2007). As we need many independent variables for testing our hypotheses, we decided not to use all five dimensions but only conscientiousness. Our choice was driven by the idea that this dimension is "closest" to what is needed for successful job search and application behavior (De Raad and Schouwenburg 1996). We also tested this empirically and found the correlation between conscientiousness and our dependent variables to be higher than for the other four dimensions. Conscientiousness was measured by two items in grade 9 on a scale of 1 (does not apply at all) to 5 (applies completely). Students had to assess the extent to which the following statements apply to them: "I am easy-going and tend to be a bit lazy" (reversed) and "I am thorough." Given the two-item measurement, the Cronbach's α of 0.53 is low in conventional terms (the same applies to the other dimensions). Lacking an alternative better measure of personality traits, we still used it although we may not best capture conscientiousness.

We also included students' *global self-esteem*. Here, the NEPS uses a revised version of the German adaptation of Rosenberg's self-esteem scale, consisting of 10 items and using a scale of 1 (does not apply at all) to 5 (applies completely) (von Collani and Herzberg 2003). The Cronbach's α is 0.85 for our sample (and thus good). For example, students had to assess the extent to which the following statements apply to them: "I have found a positive attitude towards myself" or "I can do many things just as well as most other people."

For both measures we used z-standardized measures (mean of zero and a standard deviation of one) in our multivariate analyses. A limitation is that neither conscientiousness nor self-esteem were assessed for special-needs school students.

Network resources

We could not study the quality of network resources directly.[7] We know that parents play an important role in their children's search for training (Beicht and Granato 2010). We therefore used parents' employment status, highest socio-economic status, and education as proxies for respondents' potential network resources, also in view of whom they know in their broader radius, like relatives and friends. To define *parental employment*, we used students' reports in grade 9 on whether their parents were working (full or part time), looking for a job, or inactive at the time of survey. We distinguished between no employed parent (6%), one employed parent (29%), or two employed parents (65%)—by comparison, about 77% of adolescents with an intermediate certificate had two employed parents. As students had to apply to regular training programs one year in advance in order to enter training programs directly after leaving school (i.e., at the beginning of grade 9 when leaving after grade 9, and at the beginning of grade 10 when leaving after grade 10), the information in grade 9 is still reasonably valid for our analysis.

The *occupational status of parents* was measured by the International Socio-Economic Index of Occupational Status (ISEI, using the 2008 coding scheme). The ISEI is based on an optimal scaling procedure, assigning scores to

[7] The NEPS data provide information on the question: "How likely is it that somebody will support you to get an apprenticeship?" However, about 80% of the respondents answered this question positively—without information on potential differences in the quality of this support, which is however essential for the very idea of networks.

occupations "in such a way as to maximize the role of occupation as an intervening variable between education and income" (Ganzeboom et al. 1992, p. 1). The ISEI-08 scale ranges from 11 to 89. The information on occupations, collected in grade 9, is based on parents' reports when available (67%) and on students' reports otherwise (33%). If both parents were employed, we used the higher ISEI of the two jobs. The mean parental ISEI of low-achieving adolescents' parents was 39.5—almost 8 ISEI points lower than the mean for adolescents with intermediate certificates. Variation within the group of low-achieving adolescents is quite considerable, as indicated by a standard deviation of about 18 ISEI points.

We used information on highest *parental education* based on parents' reports if available (69%) and based on students' reports otherwise (31%). We used the level of education of the higher educated parent and differentiated between no school-leaving certificate (4%), lower secondary certificate (34%), intermediate certificate, including completed regular vocational training (43%), university-entrance qualification (*Abitur*; 10%), and tertiary certificate (9%).

In our sample, the highest correlation between the three parental background variables is .45 for the detailed parental education and parental ISEI, which is very reasonable for the German labor market. The correlations between parental education and employment and between employment and ISEI are only .15 and .16, respectively. For our multivariate analysis, we therefore used a less detailed education scale, only differentiating between the highest educated parent holding at least an intermediate certificate (1) and less than an intermediate certificate (0)—with a correlation of only .34 with parental ISEI.

Career plans

As a first indicator of adolescents' occupational orientation, we looked at whether students were able to *report a desired occupation*. In grades 9 and 10, students were asked: "Considering everything you know right now, what occupation will you most likely pursue in the future?" We coded 1 if students reported a desired occupation and 0 if students did not report one in the last wave before leaving school (at about age 15 and 16 for those who left school after grade 9 and grade 10, respectively). On average, 74% of the low-achieving school leavers were able to report a desired occupation—ranging from only 68% of those who left school without a school certificate to 79% of those holding an extended lower secondary certificate. The desired occupations seem to be quite realistic, as the mean ISEI of the reported occupations is only 37 on average—ranging from only 32 for those without a certificate to 40 for those with an extended lower secondary certificate—and thus in the lower half of the ISEI scale, as well as considerably lower than the mean ISEI for school leavers with an intermediate certificate (48.5).

Our second indicator is *adolescents' training aspirations*. We used the information on whether respondents originally planned to do vocational training right after school, collected in the first wave after leaving school. One could argue that this retrospective response might be biased by the success of adolescents' applications. The high proportion of 75% who reported such a plan compared to only 39 % who entered regular training programs suggests that, if such a bias existed, it should be very small. NEPS also provides a prospective measure with a different wording and thereby associated with a slightly different meaning. Here, students were asked what they *expected* to do after leaving school, not what they *wanted* to do. The retrospective question is more suitable for capturing students' aspirations for doing a regular training program (what we wanted to capture)—indicated by the fact that 70% of those who prospectively expected to enter prevocational education did not "aspire" to it, as their response to the (retrospective) question was that they planned to pursue regular training after leaving school.

Local training market situation

The provision of firm-based training places correlates with the local economic situation (Protsch and Solga 2016). We therefore used the local youth unemployment rate among young people under 20 years old as a proxy for the local apprenticeship market situation. We linked the NEPS data to this unemployment rate at the municipality level (*Gemeindekennziffer*) based on respondents' residential address. The information was provided by the Institute for Employment Research (IAB). We used data for the year of leaving school; that is, for the 3rd quarter of 2011 and 2012, respectively. The local unemployment rates ranged from zero to 21.8%. For our multivariate analyses, we used z-standardized rates (with a mean of zero and a standard deviation of one).

Reasons for participation in prevocational programs

To better assess why low-achieving adolescents did not enter regular training programs (because of withdrawal or unsuccessful application), we used the following information in our descriptive analyses: Respondents who entered prevocational programs were asked about their reasons and provided with the following response options: (1) I wanted a better qualification; (2) I wanted to improve my chances of getting a regular training position; (3) I did not get a training position; (4) I did not know which training program to choose. Multiple answers were possible.

Control Variables

We included gender, migration background, and German state as control variables. Gender was taken from school records in grade 9 (42% female). Based on students' self-reports, we defined students as having a migration background if they themselves or both parents were born outside Germany (22%). In addition, we included dummies for the 16 German states in which a student attended school. This way, we accounted for differences between states (e.g., in the share of low-achieving school leavers) and took the sampling design into account. We are not allowed to report the estimates of the states' dummies owing to NEPS regulations. In the analyses of adolescents' application effort, we used the local youth unemployment rate (see above) as a further control variable.

Plan of Analyses

To test our hypotheses regarding the impact of agentic resources on low-achieving school leavers' application efforts and their eventual success in entering regular training programs, we estimated a series of logistic regressions, first, on their application efforts (Hypotheses 1 and 3) and, second, on the odds of entering regular training programs instead of prevocational programs or other activities, controlling for whether they applied or not (Hypotheses 2, 4, and 5).

For methodological reasons and for easier interpretation, we will report average marginal effects, so-called AMEs (Mood 2010). The AMEs display the percentage-point change in the probability of the dependent variable for a one-unit change in the respective independent variable. In contrast to odds ratios (see Mood 2010), AMEs are comparable across different model specifications. Continuous variables were z-standardized based on our subsample of low-achieving respondents to provide meaningful comparisons of the sizes of the AMEs (in our descriptive analyses, we used z-standardization based on the entire NEPS sample of starting cohort 4). Because of the sampling design, we estimated survey logit models (Kreuter and Valliant 2007) and included dummies for the German states. We used nonresponse-adjusted design weights in our descriptive but not in our multivariate analyses, as suggested by Steinhauer and Zinn (2016). We dealt with item nonresponse by imputing the data using the MICE algorithm in Stata 14.

School-leaving certificates, school types, GPA, competences, and noncognitive skills were expected to have an effect on both dependent variables (see Hypotheses 1 and 4). The same applies to the parental background variables (see Hypotheses 1 and 2). By including information on whether school leavers applied for training places into the regression on the odds of entering regular training, we assume to control for the influence of adolescents' application efforts and thus to observe the influence of these independent variables on the employer/vocational school selection side.

We faced some restrictions in our analyses. First, competences and noncognitive characteristics were not assessed for special-needs-school respondents. Thus, the test of our hypotheses is limited for these respondents. We therefore estimated the final regression models twice—with the full set of independent variables for the sample without special-needs-school students and with the limited set of variables including these respondents.

Second, we could not test directly the discrediting mechanism. This would require an experimental design (e.g., sending out fictitious applications that vary only by school attainment), controlling for all other potential sources of disadvantage on the applicant's side and at the local level. We therefore argue that it is fair to assume their applications were not considered if we find that respondents' training opportunities are not higher when they applied and if they do not vary by cognitive and noncognitive skills and the local market situation. This interpretation presumes that all other mechanisms that might be at work here have been considered and measured in a way that accounts for the entire variance, besides potential measurement errors. Although we certainly cannot rule out these potential error sources, we would like to point out that we did much more than most other studies by allowing not only one but multiple individual characteristics to affect the training opportunities and by including competition at a fine-graded local level.

We conducted several robustness checks with different specifications of variables, models, and subsamples (reported in the Results section). Overall, the results proved to be robust.

Results

Descriptive Results

Only 39 % of the low-achieving school leavers were able to enter regular training programs directly after school. Figure 1 shows that the training opportunities differ strongly by school-leaving certificate—ranging from 55 % of the school leavers holding an extended lower secondary certificate to only 10% of those without a school-leaving certificate.[8] Correspondingly, the proportion of those who enrolled in prevocational programs ranged from 30 to 77%, and is much higher than the proportion among school

[8] These figures are very similar to official statistics (National Education Report 2014, p. 277).

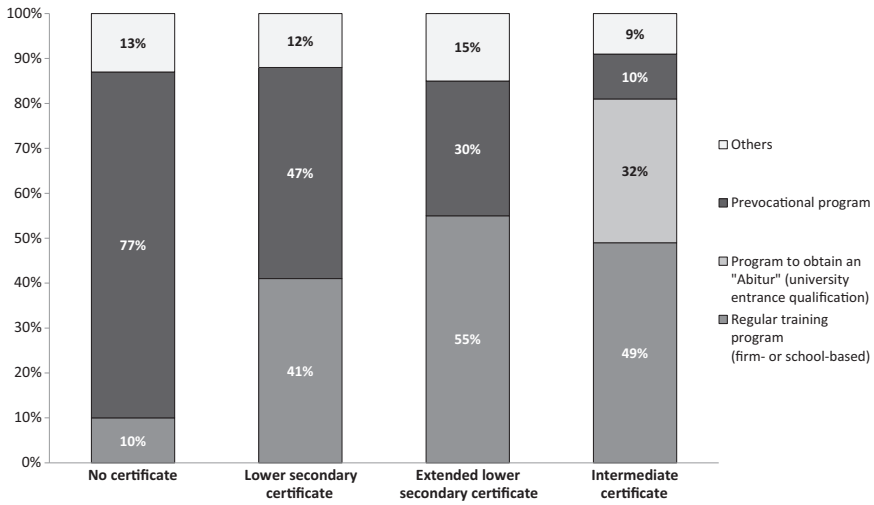

Fig. 1 Activity of school leavers in the fall after leaving school, by school-leaving certificate *Source*: NEPS SUF 7.0.0, weighted percentages, authors' calculations

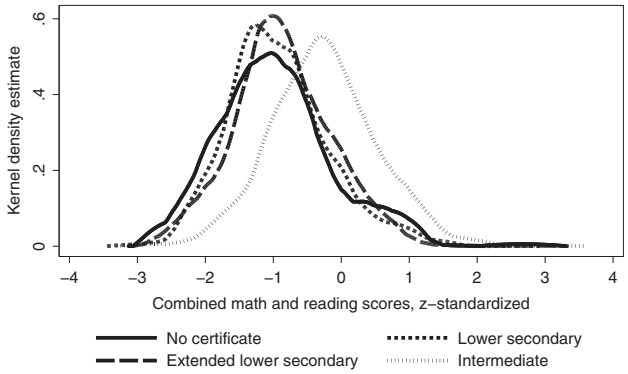

Fig. 2 Distribution of respondents' combined mathematics and reading competences, by school−leaving certificate. *Source*: NEPS SC4 SUF 7.0.0, not including school leavers from special−needs schools, weighted but not imputed data, authors' calculations

leavers with an intermediate certificate (10%), who in turn more often continued with general education to pursue a university entrance qualification, which low-achieving adolescents cannot do directly. Their application rates were much higher than their rates of successful entry on average and for all subgroups: 59% of low-achieving school leavers applied, ranging from 67 to 36% (see Table 1 above).

Figure 2 displays the distributions of combined mathematics and reading competences. Although the distributions differ by school-leaving certificate in the expected way, we see a considerable variation within each subgroup as well as substantial overlaps in the competence distributions of low-achieving adolescents and school leavers with an intermediate certificate. These overlaps indicate that quite a substantial share of school leavers with low formal qualifications are underachievers—that is, they left school with lower qualifications compared to their relatively high levels of competences.

Table 2 presents first descriptive findings on the importance of differences in agentic resources for low-achieving adolescents' training opportunities. We differentiated between low-achieving adolescents who entered regular training programs (trainees), who started prevocational programs (prevocational participants), or who pursued other activities. We focus on the comparison of the first two groups. Trainees had considerably higher educational attainment in terms of level of school-leaving certificate and school type attended than prevocational participants. They also more often had two employed parents. In contrast, the differences between the two groups in terms of grades (GPA), mean levels of math and reading competences and of noncognitive skills, and parental occupational status (ISEI) were very small. The subgroups did not even differ in parental education.

We see that those who entered regular training applied much more often than prevocational participants (76 vs. 46%). Yet we also observe that about 24% of trainees did not report that they applied for training; most probably they got their training places by referrals or after internships. The application difference between trainees and prevocational participants does not mirror differences in their aspirations: The proportion of prevocational participants who planned to do a regular training program is high (72%) and not much lower than the proportion among the trainees (84%). The same is true for career orientation: The proportion of prevocational participants who reported a desired training occupation (at the beginning of their final school year) is only slightly lower than the one of trainees (71% compared to 79%). Compared to trainees, prevocational participants reported occupations with lower occupational status, expressed as the mean ISEI score, indicating that their occupational aspirations were not unrealistically high.

The mean local youth unemployment rate was higher in the regions of those who started a prevocational program

(5.6 %) compared to those who entered regular training programs (4.3%)—though the mean unemployment rate was quite low for both groups.

Finally, prevocational participants reported the following reasons for starting a prevocational program (multiple answers possible): 52 % wanted but did not get a regular training position. The majority of prevocational participants hoped to improve their educational qualification and thereby their future training opportunities. But 41 % of prevocational participants lacked career guidance, reporting they did not know which training program to choose.

Application Efforts

Table 3 reports the average marginal effects based on a logistic regression analysis on the odds of applying to regular training programs. Adolescents' application efforts differed strongly by school-leaving certificate: Those without a school-leaving certificate were about 20 to 25 percentage points less likely to apply than those with lower secondary certificates, while those with an extended lower secondary certificate were 4 to 5 percentage points more likely to apply (Models 1–5). These differences are independent of the GPA on the school-leaving certificate. The effect of GPA is close to zero and not significant.

In contrast, the school type attended had an additional and substantial impact on adolescents' application effort: School-leavers from special-needs schools were 16 percentage points less likely to apply than those who attended a lower secondary school (*Hauptschule*), even when they had the same school-leaving certificate, GPA, career orientation, and parental resources (Model 5). Given that the majority of them left school without a certificate (77% compared to only 5.6% of those who attended lower secondary schools), the typical special-needs-school student had a 36 (20 + 16) percentage-point lower application rate than the typical school leaver from a lower secondary school.

Interestingly, school leavers from other school types (e.g., comprehensive schools or schools with multiple tracks) showed a 5 to 7 percentage-point lower (and not higher) application rate than those from lower secondary schools (Models 1 and 2). This higher likelihood is partly explained by the fact that school leavers with higher math and reading competences were less likely to apply (Models 3 and 4). This result indicates that some of the better performing low-achieving students decided more often to attend a prevocational program; most probably to improve their educational attainment before entering regular training.

Concerning the noncognitive characteristics, more conscientious school leavers applied significantly more often (Model 3)—controlled for parental background, the effect is not significant (Model 4). In general, the effect size is rather small: An increase of one standard deviation in conscientiousness increased the application rate by only 2 percentage points. The effect for self-esteem was not significant (and close to zero; Models 3 and 4).

Career orientation had a strong influence on adolescents' application activities (Models 2 to 5): Those who planned to do regular training applied substantially more often—indicated by an increase in the application rate of 31 to 32 percentage points, net of other potential factors. This is the largest effect on application behavior (also visible in the large increase in the Pseudo R^2 in Model 2 compared to Model 1). In addition, those who reported a desired occupation were 5 to 6 percentage points more likely to apply.

Finally, parental resources played a minor role for adolescents' application efforts (Models 4 and 5): Parental education and employment were not significant; for the ISEI of the highest parental occupation, we observe a significant and very small effect. Similar to higher competence levels, the effect is negative: an increase of one standard deviation in parental ISEI decreased the likelihood to apply by 2 percentage points.

Entry into Regular Training Positions

Table 4 reports the results of a logistic regression on the odds of entering regular training positions (again as average marginal effects). School leavers who applied were 16 to 20 percentage points more likely to enter regular training programs than those who did not apply (Models 1–5). Net of application, the ability to report a desired occupation increased the training chances additionally by 7 to 11 percentage points (Models 1–5).

Net of application effort, adolescents' school-leaving certificate strongly affected the likelihood of entering regular training programs: school leavers with an extended lower secondary certificate were 7 to 8 percentage points more likely to enter regular training than those with a lower secondary certificate (Models 2–5); in contrast, adolescents with no certificate were about 21 to 22 percentage points less likely than those with a lower secondary certificate (Models 2–4). The inclusion of respondents from special-needs schools (in Model 5) reduced this effect size only a little bit (to −.20).

Figure 3 reports the interaction between application effort and school-leaving certificate. Applying is associated with higher training chances for all three groups, but the effect sizes differ remarkably between the groups. That is, applying paid off more for school leavers with a (extended) lower secondary certificate than for adolescents without a certificate: for the former, their application effort increased their training chances by about 30 percentage points; for the latter, that increase was only about 14 percentage points.

Training chances did not differ by regular school type (Models 2–4); however low-achieving adolescents from

Table 3 Who applied to a regular training program? (logistic regressions, average marginal effects AME, [95% confidence intervals])

	(1) Educational attainment	(2) +career plans	(3) +cognitive and noncognitive skills	(4) +family background	(5) Including special-needs schools
School-leaving certificate (Ref.: lower secondary)					
No certificate	−0.25*** [−0.38,−0.12]	−0.23*** [−0.34,−0.11]	−0.21*** [−0.33,−0.09]	−0.21*** [−0.32,−0.09]	−0.20*** [−0.27,−0.13]
Extended lower secondary	0.04 [−0.01,0.08]	0.04* [0.00,0.09]	0.05* [0.01,0.09]	0.05* [0.01,0.09]	0.05* [0.01,0.09]
GPA on school-leaving certificate (mean centered)	0.00 [−0.04,0.03]	0.01 [−0.03,0.04]	0.01 [−0.02,0.04]	0.01 [−0.02,0.04]	0.01 [−0.01,0.04]
School type (Ref.: lower secondary schools)					
Other school types	−0.07** [−0.12,−0.02]	−0.05* [−0.10,−0.01]	−0.04 [−0.08,0.01]	−0.03 [−0.08,0.01]	−0.05* [−0.09,−0.00]
Special needs schools					−0.16*** [−0.24,−0.09]
Reports a desired occupation		0.06** [0.02,0.10]	0.06** [0.02,0.10]	0.06** [0.02,0.10]	0.05** [0.01,0.09]
Originally planned to do a regular training program		0.32*** [0.29,0.36]	0.31*** [0.28,0.35]	0.31*** [0.27,0.34]	0.32*** [0.29,0.36]
Combined math and reading score (z-standardized)			−0.04** [−0.06,−0.01]	−0.03** [−0.06,−0.01]	
Conscientiousness (z-standardized)			0.02* [0.00,0.04]	0.02 [−0.00,0.04]	
Self-esteem (z-standardized)			0.01 [−0.01,0.03]	0.01 [−0.01,0.03]	
Parental employment (Ref.: two parents employed)					
No parent employed				−0.05 [−0.17,0.06]	−0.03 [−0.12,0.05]
One parent employed				−0.03 [−0.07,0.02]	−0.02 [−0.05,0.02]
Parents at least intermediate education				−0.04 [−0.08,0.00]	−0.03 [−0.07,0.00]
Parental ISEI (z-standardized)				−0.02* [−0.05,−0.00]	−0.02* [−0.04,−0.00]
Control variables					
Local youth unemployment rate (z-standardized)	−0.02 [−0.05,0.01]	−0.02 [−0.05,0.01]	−0.02 [−0.05,0.00]	−0.02 [−0.05,0.01]	−0.02 [−0.04,0.01]
Sex: female	−0.13*** [−0.17,−0.09]	−0.10*** [−0.14,−0.06]	−0.11*** [−0.15,−0.08]	−0.12*** [−0.15,−0.08]	−0.10*** [−0.13,−0.07]
Migration background	−0.01 [−0.06,0.03]	0.03 [−0.01,0.07]	0.01 [−0.03,0.05]	0.00 [−0.04,0.05]	0.01 [−0.03,0.05]
N	2662	2662	2662	2662	3417
Pseudo R^2	8.57	18.34	19.08	19.69	20.59

All models are controlled for German states (not allowed to be reported by the NEPS regulations) and take the clustered sampling design into account

Source: NEPS SC4 SUF 7.0.0, authors' calculations

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 4 Who entered regular training programs? (logistic regressions, average marginal effects AME, [95% confidence intervals])

	(1) Application behavior	(2) +attainment, skills	(3) +local youth unemployment	(4) +family background	(5) Including special-needs schools
Applied for regular training program	0.20*** [0.15,0.25]	0.17*** [0.12,0.22]	0.16*** [0.11,0.22]	0.16*** [0.11,0.22]	0.17*** [0.13,0.22]
Reports a desired occupation	0.11*** [0.04,0.19]	0.08** [0.01,0.15]	0.08** [0.01,0.15]	0.08** [0.01,0.15]	0.07** [0.01,0.14]
School-leaving certificate (Ref.: lower secondary)					
No certificate		−0.22*** [−0.35,−0.09]	−0.22*** [−0.35,−0.08]	−0.21*** [−0.35,−0.08]	−0.20*** [−0.29,−0.10]
Extended lower secondary		0.08* [0.01,0.14]	0.08* [0.01,0.14]	0.08* [0.01,0.14]	0.07* [0.01,0.14]
School type (Ref.: lower secondary school)					
Other school type		0.00 [−0.09,0.05]	0.00 [−0.08,0.05]	−0.01 [−0.08,0.05]	0.01 [−0.08,0.04]
Special needs schools					−0.16*** [−0.27,−0.04]
GPA (mean centered)		0.10*** [0.06,0.14]	0.10*** [0.06,0.14]	0.09*** [0.05,0.14]	0.09*** [0.05,0.12]
Combined math and reading score (z-stand.)		−0.02 [−0.05,0.02]	−0.02 [−0.05,0.01]	−0.02 [−0.05,0.01]	
Conscientiousness (z-stand.)		0.03 [−0.00,0.06]	0.03 [−0.01,0.06]	0.03 [−0.01,0.06]	
Self-esteem (z-stand.)		0.01 [−0.02,0.04]	0.01 [−0.02,0.04]	0.01 [−0.02,0.04]	
Local youth unemployment rate (z-stand.)			−0.05** [−0.08,−0.02]	−0.05** [−0.08,−0.01]	−0.04** [−0.07,−0.01]
Parental employment (Ref.: two parents employed)					
No parent employed				−0.13* [−0.26,−0.01]	−0.07 [−0.18,0.04]
One parent employed				−0.03 [−0.09,0.04]	−0.03 [−0.09,0.03]
Parents at least intermediate education				0.01 [−0.05,0.06]	0.00 [−0.05,0.05]
Parental ISEI (z-stand.)				0.01 [−0.02,0.04]	0.00 [−0.02,0.03]
Control variables					
Sex: female	−0.06* [−0.12,−0.01]	−0.09* [−0.14,−0.03]	−0.08* [−0.14,−0.03]	−0.08* [−0.14,−0.02]	−0.06* [−0.10,−0.01]
Migration background	−0.04 [−0.11,0.03]	−0.05 [−0.12,0.02]	−0.04 [−0.11,0.03]	−0.04 [−0.10,0.03]	−0.01 [−0.07,0.04]
N	2662	2662	2662	2662	3417
Pseudo R^2	11.27	13.87	14.14	14.15	19.41

All models are controlled for German states (not allowed to be reported by the NEPS regulations) and take the clustered sampling design into account

Source: NEPS SC4 SUF 7.0.0, authors' calculations

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

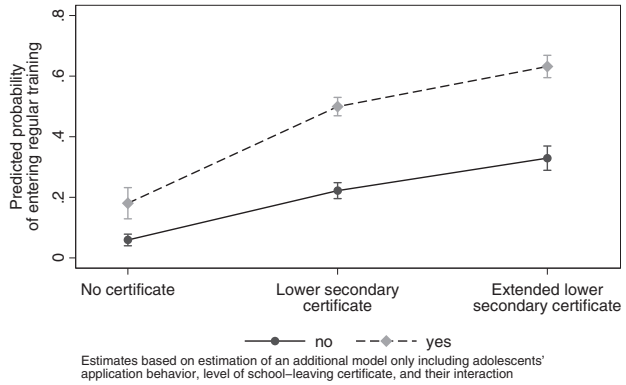

Fig. 3 Predicted probabilities of entering regular training program, by respondent's application behavior and school−leaving certificate. Estimates based on estimation of an additional model only including adolescents' application behavior, level of school−leaving certificate, and their interaction *Source*: NEPS SC4 SUF 7.0.0, authors' calculations

special-needs schools were 16 percentage points less likely to enter regular training (Model 5).

GPA significantly affected training chances, even when controlled for school-leaving certificate and other variables: an increase of one grade (which is more than a standard deviation) was related to a 9 to 10 percentage-point higher probability of entering regular training (Models 2–5). In contrast, Models 2–4 show that the effect size of competences, conscientiousness, and self-esteem were small and not significant—though low-achieving school leavers differed quite remarkably in these characteristics (see Table 1 and Fig. 2 above). We tested whether the effects of competences were already taken up by school-leaving certificate, school type, or GPA by re-estimating Model 2 adding *only* math and reading competences: Again, the effect size was zero (not presented in the article).[9]

Labor market conditions positively influenced training opportunities: One standard deviation of increase in the local youth unemployment rate (which is about 5%) reduced the odds to enter regular training by 4 to 5 percentage points, net of other characteristics (Models 2–5).

Parental education and occupational status (ISEI) did not affect low-achieving adolescents' training chances (Models 4 and 5), whereas parental employment did: Those with no employed parent were 13 percentage points less likely to enter regular training (Model 4). When including school leavers from special-needs schools (Model 5), the effect size decreased to 7 percentage points and lost its significance. We re-estimated Model 5 separately for school leavers from special-needs schools and for those from regular schools (not presented in the article). For the latter, we found a negative effect of "no parent employed" as in Model 4 (−0.11, significant at the 5% level), while the effect for those from special-needs schools was 0.01 (not significant). In other words, parental employment only mattered for low-achieving adolescents from regular schools.

In sum, career plans and vocational orientation as decision-making resources influenced adolescents' application efforts; however, skills and parental resources did not (partially supporting Hypothesis 1). A positive association between parental resources and entry into training was only found for low-achieving adolescents from regular schools but not for those from special-needs schools (partial confirmation of Hypothesis 2). Moreover, the results provide strong empirical support for withdrawal because of stigmatization, on the one hand (confirming Hypotheses 3), and for job competition restricting the success of application efforts owing to gatekeepers' selection, on the other (supporting Hypotheses 4 and 5). We observed, however, considerable differences in the impact of application on training chances by school-leaving certificate—ranging from "only" 14 percentage points for those without a certificate to 30 to 31 percentage points for those with a (extended) lower secondary certificate.

Robustness Checks

Besides the robustness checks reported above (concerning competences and parental employment), we re-estimated several other model specifications, variable definitions, and subsamples (results not presented in the article). The results for application efforts and odds to enter training were robust for all robustness checks conducted.

We only compared respondents who entered (firm-based) apprenticeships (excluding respondents who entered school-based training) to those who started prevocational education or other activities. The results were also robust when excluding respondents with "other activities" after leaving school. We included parental education in a more differentiated way. We also tested a nonlinear relationship between application effort and conscientiousness and self-esteem, respectively, by including also quadratic terms for the two latter variables—because moderate levels of these two personality characteristics may be better than the two extreme points (see Wiggins and Pincus 1989). The quadratic terms were not significant and the main effects did not change. We did the same for the odds of entry into regular vocational training; the results were the same.

We tested alternative indicators for the local labor market situation (such as the share of new apprentices with no more than lower secondary education). We also included school-leaving age (as higher ages might be associated with more maturity). In all these specifications, the results reported in

[9] The AME is −.01 (not significant), when only including the control variables and the combined competence score.

Tables 3 and 4 (above) proved to be robust. We additionally re-estimated Model 3 of Table 4 by including an interaction term of the local unemployment rate with respondents' school-leaving certificate. In doing so, we explored whether the influence of the local unemployment rate on the odds of entry into regular training programs differed by school-leaving certificate. The coefficients of the interaction term were not significant.

Discussion

In this article, we investigated whether the school-to-work transition period provided low-achieving school leavers with new opportunities or whether they still faced persistent disadvantage owing to their low qualification, regardless of their agentic resources and efforts. Existing research has demonstrated that cognitive and noncognitive skills, aspirations, and parental resources shape individuals' continuing enrollment in education as well as their early occupational career and later work life (e.g., Carneiro et al 2007; Caspi et al. 1998; Heckman et al. 2006; Lleras 2008; Schoon and Duckworth 2010). In our study, we investigated whether adolescents' efforts and initiatives to search and to apply for a regular training position were influenced by these decision-making abilities and resources. We also looked at the success of their application efforts, given that employers use educational certificates in their first screening of applicants. We studied the entry of low-achieving adolescents into regular vocational training (mostly apprenticeships) in Germany, which can be regarded as the equivalent to entering the labor market (Protsch and Solga 2016).

The results of our analyses show that low-achieving adolescents with better decision-making abilities made stronger application efforts. However, only higher aspirations, career plans, and vocational orientation predicted a higher likelihood to apply for training places. In contrast to existing population studies (not focusing on low-achievers), we found that neither cognitive and noncognitive skills nor parental resources had an effect on adolescents' application efforts and the success of these applications. The reason for these findings is not that low-achieving adolescents' competence levels and noncognitive skills are too low—after all, there is considerable overlap in their competence distributions with those of school leavers with intermediate certificates and quite similar mean levels of noncognitive characteristics. The findings rather indicate that the existing underachievers (i.e., those who possess similar levels of competences as adolescents with intermediate secondary school certificates) had little opportunity that employers discovered their learning potential—because of employers' screening of applications based on school attainment.

School-leaving certificate and school type had the strongest impact on low-achieving adolescents' application effort and the success of this effort: The most vulnerable low-achieving school leavers among them—those who left school without a certificate and/or attended a special-needs school—applied much less frequently compared to their better performing peers, and submitting applications improved their chances to enter regular training programs only to a small extent. In contrast, applications of those with a (extended) lower secondary school certificate strongly increased their training chances. Thus, the success of low-achieving school leavers' application efforts seems to be strongly restricted by competition; and those with the lowest attainment (without a school certificate and/or from special-needs schools) even seem to suffer from discrediting processes.

In terms of parental resources, only parental employment status—but not parental education and occupational status—proved to be a somewhat valuable resource for access to regular training, albeit only for school leavers from regular schools. Thus, it is not just that low-achieving adolescents usually lack better parental resources— even when they do have access to better resources, these resources do not seem to have the power to compensate for disadvantages resulting from the negative signal of low school achievement.

Taken together, our results indicate that the transition period gives adolescents with better career orientation and relatively higher (though still low) educational attainment new opportunities to enter regular training. They have better capacities and resources to actively search for jobs or training positions (agency) and, if there is less job competition, the opportunity to achieve successful school-to-work transitions. But even for that group, not all agentic resources (like parental education and occupational status, or cognitive and noncognitive skills) are related to more agency and success. In contrast, low-achieving adolescents with the lowest educational attainment and/or those labeled as "learning disabled"—because they come from special-needs schools (Richardson and Powell 2011)—experience persistent disadvantage. To account for the persistent disadvantage in the transition period for this most vulnerable subgroup, we found some indication of both lack of agency (or withdrawal from the training market) owing to stigmatization and a high extent of unsuccessful applications owing to discrediting processes by gatekeepers.

These differences in the timing and chances to enter the labor market have been shown to have long-lasting effects on later labor market attainments (e.g., DiPrete and McManus 1996; Kerckhoff 1993; Settersten and Ray 2010; Shanahan 2000)—and this might be even more the case in Germany, where the "normal" life course requires completion of vocational education and training or higher education before starting to work (Brzinsky-Fay and Solga 2016;

Mortimer et al. 2005; Solga 2004). Moreover, although our study showed that career guidance at German lower-track schools seems to be quite effective in terms of helping low-achieving adolescents develop career aspirations and plans, those who are forced to continue with pre-vocational programs may see these unfulfilled expectations translate into frustration, possibly leading to higher risks of educational cooling-out processes and less agency later on (e.g., Fitzenberger and Lickleder 2015; Walther 2015).

Our study contributes to the existing literature in several ways: Ours is one of the few studies capable of differentiating the respective impact of adolescents' agency and structural constraints on the success/failure in transitions into work—still a largely underresearched area (see Diewald and Mayer 2009; Schoon and Lyons-Amos 2016). We extended existing research by not only relying on school-leaving certificates as a proxy for adolescents' skills but also considering grades, cognitive competences, and non-cognitive characteristics. Moreover, family background was measured in a comprehensive manner by including three dimensions (parental education, socio-economic status based on their occupation, and employment). We addressed structural constraints of low-achieving adolescents' training chances by including fine-graded regional differences in youth unemployment. We thereby added new insights into whether the "low qualification" label *per se* results in lower training chances, irrespective (or net) of differences in individual resources.

Finally, this is one of the very few German studies to include school leavers from special-needs schools. This is important because most students classified as disabled are still not integrated into mainstream schools, and the vast majority of them leave school without a certificate or a lower secondary certificate. Including these students makes our study useful at the international level as well, because studies for countries with inclusive school settings for special-needs students may not adequately cover the population of disabled adolescents when relying on voluntary survey participation (as individuals with lower educational attainment and competences are known to be less likely to participate in such surveys).

Our study has some limitations. The discrediting mechanism could only be studied indirectly (see section on Plan of Analyses). Experimental designs would be required to validate and strengthen our findings in this respect. Moreover, stigmatization was examined via observed application behavior but not directly as an identity construct. Further studies should try to measure stigmatization more directly. The NEPS data do not provide measures of competences and noncognitive characteristics for respondents from special-needs schools, meaning we do not know whether their lower application rates and training chances are owing to very low skills. This may not be the case, however, because competences and noncognitive characteristics were not related to the differences in training chances of low-achieving adolescents from mainstream schools. Moreover, the NEPS data do not allow for reliably detecting integrated students with learning disabilities. We were therefore not able to study the extent to which the very low training chances of respondents from schools for learning disabilities are caused by their classification as being "learning disabled" and the fact that they attended special schools. Once data are available, future research should intend to disentangle the impact of these different dimensions of "labeling." Moreover, to fully cover the group of low-achieving adolescents, including students with other types of disability would be preferable as well.

Finally, our study addressed the difficulties of low-achieving adolescents in a country with a strong vocational education and training system and a highly stratified education system—associated with the fact that educational credentials are very important in both training and labor markets (Allmendinger 1989; Solga and Konietzka 1999). Given that low educational attainment is associated with very different levels of competences across countries (Heisig and Solga 2015) as well as different meanings (Solga 2008), research for countries with different institutional configurations should replicate our study to broaden further our understanding of the impact of educational credentials and agentic resources on new opportunities or persistent disadvantages of low-achieving adolescents in the school-to-work transition period.

Conclusion

Educational attainment and skills are known to be important for successful school-to-work transitions in particular and transitions to adulthood in general (Buchmann and Kriesi 2011). Hence, preventing students from dropping out of education before achieving the recognized level of educational attainment is an important societal task. In this respect, vocational education and training are perceived as a means to reduce educational dropout. Research has shown, however, that low-achieving school leavers have a high risk of not entering or dropping out of vocational training as well (Elffers 2011; Steedman 2004). Many reasons have been proposed for this—ranging from employer discrimination, lack of competences and skills to withdrawal because of stigmatization. In our study, we investigated to which extent transitions to work are influenced by both low-achieving adolescents' application efforts (agency) and the success of their efforts (constraints).

Agentic resources—like competences, noncognitive characteristics and parental resources—did not, or only to a

very limited extent, influence adolescents' application efforts and the recruitment decisions of firms and vocational schools, despite the fact that low-achieving school leavers vary considerably in these resources. We demonstrated that the main disadvantage of low-achieving adolescents in Germany's training markets—which serve as entry labor markets—is their low school attainment (school-leaving certificate and school type). Career aspirations and a good occupational orientation developed during school, however, opened up new opportunities in the transition period: They increased adolescents' application efforts, which in turn promoted entry into regular training. However, for those who left school without a certificate and those from special schools for learning disabilities, the label of "having low qualifications" is the major obstacle to leveraging agency in this transition period. They are exposed to persistent disadvantages in the transition period and most likely throughout their work life.

The findings of our study also have important policy implications for promoting apprenticeships as a means to prevent early educational dropout among low-achieving adolescents (see European Commission 2013). Steedman (2012, p. 2) stated that apprenticeships are "not a sufficient solution to improving the labour market situation of young people with poor school achievements or other disadvantages." She argues that many of these young people "have failed to find places. Employers now discriminate much more than in the past in favor of apprentices with good or very good school achievements." (Steedman 2012, p. 19) Low-achieving school leavers are, therefore, forced to enroll in remedial, or prevocational, education programs after compulsory general education (see also Solga 2004). Our results support her considerations. We found that a major source of low-achieving adolescents' disadvantage in access to regular training is competition. Policies should therefore aim at providing a sufficient number of training places corresponding to the size of the applicant pool. Second, policies should also aim to improve employers' opportunities for detecting the competences and skills these young people possess despite their low school-leaving certificate. Doing internships prior to application, for example, might be beneficial for enhancing their training (and labor market entry) opportunities (see also Solga and Kohlrausch 2013). Finally, prevocational programs should be evaluated in terms of how effectively they improve low-achieving adolescents' training and labor market entry chances—an area where we still lack research.

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Compliance with Ethical Standards This study uses data conducted by the NEPS consortium. The data collected followed the ethical regulations of the German states and was approved by their data protection officers.

Conflict of Interest The authors declare that they have no competing interests.

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