

16 Vocational education and training and transitions into the labor market

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Abstract: Stage 6 of the German National Educational Panel Study is devoted to youth's transitions from school into the labor market. In all Western societies, vocational education and training (VET) systems face a number of challenges, including the need to adapt to increasing skill requirements across the economy and handle the danger of producing an "underclass" of low-skilled youth. This chapter presents the life-course approach for investigating school-leavers' pathways from school into the labor market within the National Educational Panel Study. Several factors shape young people's school-to-work transitions: their motivation and competence endowment, their decisions concerning further course of education, the constraints they face both concerning opportunities for VET and gatekeepers' recruitment behavior, the information and support youths may or may not receive from social networks, and the learning environments they

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encounter in firms and schools. We shall outline the basic theories that will guide our research concerning these influences and discuss how they are taken into account within stage 6 of the National Educational Panel Study. Thus, we will give a picture of the study's research potential in the area of VET.

Keywords: Vocational Education and Training (VET) · School-to-work transition · Life-course approach · Panel study · Germany

Berufliche Bildung und Übergänge in den Arbeitsmarkt

Zusammenfassung: Wie andere westliche Länder steht auch Deutschland vor zahlreichen Herausforderungen im Bereich der beruflichen Bildung. Dazu gehören der demografische Wandel, das Schrithalten mit den steigenden Qualifikationsanforderungen der Arbeitswelt sowie die Verringerung von Bildungsarmut, d.h. die Reduzierung der Zahl ausbildungsloser und schlecht ausgebildeter Jugendlicher. Etappe 6 des Nationalen Bildungspanels widmet sich diesen Themen und untersucht die Übergänge Jugendlicher von der Schule in die berufliche Bildung und in den Arbeitsmarkt. Das Kapitel stellt den zugrunde liegenden Lebensverlaufsansatz dieser Etappe des Nationalen Bildungspanels vor. In kumulativer Hinsicht werden diese Übergänge durch zahlreiche Faktoren beeinflusst: die Motivation und die Kompetenzausstattung der Jugendlichen, ihre Bildungsentscheidungen, durch die Einschränkungen, die aus dem Ausbildungsplatzangebot und dem Einstellungsverhalten von Gatekeepern resultieren, die Information und Unterstützung, die Jugendliche durch ihre sozialen Netzwerke erhalten oder nicht, und durch die Lernumwelten in Betrieben und Schulen. Wir skizzieren die wichtigsten Theorien, die die Wirkungsweise dieser Faktoren definieren, und diskutieren, wie sie im Rahmen der Datenerhebung von Etappe 6 berücksichtigt werden. Dies ermöglicht einen Überblick über das Potenzial der so erhobenen Längsschnittdaten für die Berufsbildungsforschung.

Schlüsselwörter: Berufsbildung · Übergänge in den Arbeitsmarkt · Lebensverlaufsansatz · Panelstudie · Deutschland

16.1 Introduction

A national economy's competitiveness and performance is inherently linked to the productivity of its workforce. Changes in labor markets and the world of work imply an increase in the average level of skill and competence requirements and fast turnovers in the nature of skills. As many studies have shown, schooling and initial vocational and professional training remain of primary importance for occupational careers and social integration (see Mayer and Solga 2008). The content, duration, and frequency of individuals' skills and competence acquisition phases, however, are under pressure to change in accordance with ongoing transformations of work. Nonetheless, initial training, educational participation, and decisions made in earlier life periods are particularly important, because they influence the resources and opportunities available in later periods of individuals' skills and competence acquisition and work life (Elder and Johnson 2003; Mayer 1991). Therefore, stage 6 of the National Educational Panel Study (NEPS), "Vocational Education and Training and Transitions into the Labor Market," is devoted to educational biographies in youth's transition from school into the German labor market.

In this chapter, we shall present the main research questions to be addressed by stage 6 of NEPS and discuss the most important theoretical perspectives guiding our research.

Although NEPS will produce a German database, most of these research questions are of general relevance for research on school-to-work transitions from a theoretical point of view or a comparative perspective (by combining these detailed data with other national datasets available).

The chapter starts with a short summary of the unique features and challenges of the German vocational education and training (VET) system (Sect. 16.2). In Sect. 16.3, we outline the theoretical approaches and research potential of stage 6. We shall conclude (Sect. 16.4) with a few remarks on the interplay of stage 6 with other NEPS stages.

16.2 The German VET system

For a full understanding of the German VET system, it is essential to consider the German “educational schism” (Baethge et al. 2007), that is, the quite unique and enduring institutional division of academic general education versus practical vocational training. Concerning the latter, the so-called dual system of vocational training (apprenticeship in a firm plus partly general and partly occupation-specific theoretical education in vocational schools) has attracted much attention in international debates and research. The dual system has been seen as one of the skill formation systems capable of not only reconciling high wages with high productivity via high skills and high value-added production, but also of integrating less-educated youths into enhancing skill formation processes (Culpepper and Finegold 1999; Culpepper and Thelen 2008; Streeck 1989). However, the ability of the German dual system to adapt to new technological and market conditions is increasingly called into question regarding, for example, its applicability to the knowledge and service society and its ability to provide general basic competencies or life-long learning (cf. Baethge et al. 2007).

The dual system has often been portrayed incorrectly as the only form of VET in Germany (e.g., Shackleton 1995). In fact, the German VET system features a number of different tracks or educational pathways. Besides the firm-based dual system, there are school-based VET programs; and both firm and school-based programs lead to nationally recognized occupation-specific VET certificates. The dual system trains youth for manufacturing and industry occupations and some of the white-collar occupations (such as commercial, retail, and administrative occupations), whereas full-time school-based VET programs prepare trainees for personal service occupations (such as nurses, midwives, medium-level care professionals, Kindergarten teachers, and social workers) and medium-level technical occupations (such as the German *Meister* [master craftsmen] or technicians). From these examples, it is clear that firm- and school-based VET programs are not alternative pathways leading to the same occupations, but pathways segmented by occupations. Moreover, this differentiation between firm- and school-based training tracks is gendered: Whereas the dual system mainly trains young men, school-based VET programs are attended primarily by young women (Krüger 2003).

The various VET programs are quite diverse in terms of the skill level to be achieved. They range from comparatively simple manual and retail occupations (e.g., bricklayer, painter, or shop assistant) to rather complex white-collar occupations in banking, insurance, and IT, or even personal service occupations (e.g., speech therapist or midwife).

Training programs are further diversified by trainee's different levels of prior education: Whereas the majority of trainees in the latter occupations hold a Realschule or even Gymnasium degree (the Abitur which also entitles them to enter university), many trainees in the former occupations hold only a Hauptschule degree.

Beginning in the 1980s and increasingly since the mid-1990s, there has been an excessive shortage of available apprenticeship positions (Baethge et al. 2007). At the same time, skill requirements in regular VET programs have been upgraded significantly. Both developments have left those who dropped out of school or graduated with only a lower school certificate with fewer training opportunities (Solga 2004). One result of these developments is the rapid expansion of the so-called prevocational transition system that provides prevocational programs usually lasting one year. These programs, however, neither lead to a regular occupational training credential nor do they guarantee trainees' successful transition into fully qualifying (firm or school-based) VET programs. At the current stage of research, we know little about the efficacy of these prevocational programs and the factors that impact positively on participants' school-to-work transitions. We only know that the majority of participants are low-educated young men, often with a migrant family background (Baethge et al. 2007). In 2008, about 400,000 young people entered such prevocational programs, compared to about 560,000 entering firm-based VET programs (dual system) and about 211,000 starting school-based VET programs (Autorengruppe Bildungsberichterstattung 2010). As a consequence of this distribution, approximately every sixth 20- to 25-year-old in Germany has not completed a (regular) VET degree—a trend that increases the danger of producing an “underclass” of low-skilled, unqualified youth (cf. Gesthuizen et al. 2010; Solga 2008).

The problems of the German VET system also emerge when considering the transitions into the labor market of those young people who successfully graduated from fully qualifying VET programs. About one-fifth of them enter the labor market in occupations that do not match the ones they were trained for, a trend that has increased for men (mainly trained in the dual system) since the 1970s. This sort of occupational mobility is related to jobseekers' employment below their level of vocational training, and it is accompanied by periods of unemployment after completing VET (Konietzka 2002). Thus, even for eventually successful VET graduates, school-to-work transitions often take longer, become more uncertain, and involve higher risks in terms of participation in prevocational measures, unemployment, and lower economic returns to education.

16.3 Research approaches and potential of stage 6

Investigating youth's school-to-work transitions requires a life-course approach. The transition period from school to work is a cumulative—though not always sequential—and highly sensitive phase in an individual's life course. It is shaped by the interplay of institutional regulations, social environments, and individual abilities, competencies, and resources—all of them facilitating or hindering success (cf. Mayer and Müller 1986). For these reasons, we are interested in educational decision-making processes in constrained situations that differ for various educational and social groups of young adults. Within the school-to-work transition, we need to distinguish, at least analytically, between different,

but interrelated status passages. These status passages are: (a) educational decision-making at the end of compulsory education (based on occupational preferences and goals formed while at school), (b) transitions from school into the VET system, (c) pathways through the VET system and completion of VET programs, and (d) entry into the labor market. In all of these status passages, we are interested in the impact of learning environments, individuals' prior educational biographies, competence endowment, and social resources on the patterns, determinants, and outcomes of their transition pathways and skill and competence acquisition.

To gain a full theoretical and empirical understanding, we also have to take into account that school-to-work transitions are not single-agent decisions, but socially embedded social interactions that include the outcomes, choices, preferences, values, and experiences of other persons. Furthermore, VET research frequently assumes a steady accumulation of competencies during the transition from school to work regardless of differences in young people's transition pathways. It also tends to overemphasize the aspect of "choice" (cf. Leggatt-Cook 2005). With the NEPS data, we shall be able to take a closer look at the constraining influence of demand-side factors and at the impact of supply-side factors on individuals' educational decision-making processes, access to VET programs, and competence acquisition in young adulthood.

For these status passages, we shall now specify the main theoretical concepts used in developing the NEPS data collection along with important research questions that can be addressed by analyzing the NEPS data in the future. Both our theoretical concepts and our research questions fit into the general framework of NEPS. We shall focus on decision-making and the shaping of decisions by opportunities and constraints, on competencies both as a pre-condition and a result of successful VET, on the learning environments young people may encounter during VET, and shall discuss the challenges that arise particularly for young migrants.

16.3.1 Educational decision-making at the end of compulsory education

At the end of compulsory education in Grade 9 or 10 (depending on the federal state/*Bundesland*), young people face two related decisions: whether or not to continue school (provided their academic performance entitles them to continue general schooling after reaching the end of compulsory education), and, if leaving school, which type of occupation and VET program to choose. Decision theories are relevant for both types of decisions. At this point, such theories are much more developed for the decision whether or not to continue school; we know much less about the factors and mechanisms underlying occupational choices or decisions and their interplay with the "first" decision on continuing schooling. Moreover, most decision theories lead to competing rather than compensatory hypotheses regarding the crucial factors in individual decision-making behavior. What is more, due to a shortage of data to test these hypotheses simultaneously, we also lack knowledge about the relevance of different decision-making factors for different social groups (such as class, gender, ethnicity) and for different decision issues. Within stage 6, we shall therefore generate data for different decision theories and the two decision issues mentioned above (see also Chap. 7, this volume).

One of the relevant theories in this context is the rational choice approach (cf. Breen and Goldthorpe 1997). According to this theory, educational decisions depend on the so-called secondary effects, that is, on the economic resources of parents (or other family members), the estimated probabilities of a child's success in completing higher levels of schooling or the VET programs at hand, and expectations of returns to education. The costs of training in different fields are assessed in terms of the effort required and the risk of failure. Status maintenance and risk aversion are the two factors that, taken together, explain class differences in decision-making on educational alternatives—also while controlling for educational performance. NEPS measures educational performance through a variety of different indicators: individuals' school degrees and school grades at the end of schooling as well as their cognitive and noncognitive competencies in 9th grade (i.e., at the end of compulsory education).

Social cognitive theory (Bandura 1986) provides a different explanation for youths' educational decisions at this stage in life (see also Chap. 10, this volume). Self-efficacy beliefs—subjective beliefs about what one is able to accomplish—are considered to be more important than “objective” indicators of abilities or competencies such as grades. Social cognitive theory also emphasizes internal rewards: Individuals may choose to continue school or to enter VET programs not only because of their expectation to succeed economically but also because they may find it inherently satisfying to perform certain tasks skillfully (Bandura 1986). Self-efficacy beliefs are not seen as the only determinant of youths' decisions, however. If labor market prospects are perceived as bad, youths may change their educational and occupational preferences in spite of having low self-efficacy beliefs regarding their ability to continue school successfully or high self-efficacy beliefs regarding their occupational (VET) choice. Interests are also seen as an important motivational base of educational and occupational choices. For vocational training and occupational choice, Holland (1997) differentiates six domains of interests or occupational orientations: realistic, investigative, artistic, social, enterprising, and conventional (RIASEC). Whether or not individuals may realize these interests is connected closely to their educational decision about continuing general schooling, given the connection of these interests to different occupations, different training institutions (firm/school-based VET programs or study programs at universities), and different requirements regarding prior education. Generally speaking, whereas expectations regarding the return to education play an important role, self-efficacy beliefs are assumed to have the strongest influence on youths' educational and occupational choices.

Decisions about continuing general education or entering the VET system at age 15 or 16 are among the first important decisions in youths' lives in which they have a substantial degree of autonomy from their parents. Yet their preferences are also influenced by their social background as well as by other social and institutional factors. Parents are important not only because they provide financial support or serve as network resources for the VET search (see below), but also because they shape young people's aspirations during childhood (Schoon and Parsons 2002). Furthermore, teachers can influence youths' further educational biographies both directly (by awarding grades that either permit or do not permit them to continue higher secondary school) and indirectly (through their opinions about young people's aptitudes for certain occupations and by providing occupation-related information). Finally, peers are influential, because young people may adapt their

preferences to those of their friends (Riegle-Crumb et al. 2006). The NEPS data allow us to also take into account these factors of youth's decision-making processes at the end of compulsory education.

16.3.2 Determinants of youth's placement within the VET system

Youth's success or failure in accessing and being placed within the VET system result from their decisions about investment in education and their related application behavior and activities on the one hand, and the available opportunities along with the recruitment behavior of VET gatekeepers on the other.

Constraints on access to VET positions in terms of opportunities and recruitment behavior are predominantly explained by referring to microeconomic theories—such as human capital theory (Becker 1964), signaling theory (Spence 1974), and job competition/vacancy chains (Sørensen 1977; Thurow 1975). With the help of these theories, interindividual differences in young people's chances of gaining access to VET positions are explained as follows: Educational attainment is used by employers as an indicator of future productivity and trainability: the lower an individual's educational degree, the lower his or her rank in the applicants' queue and the lower his or her chances of being recruited for a vacant regular VET position (or job). According to this view, individual opportunity is defined by the individual's investment in schooling, the supply of higher-educated persons, and the amount of vacant VET positions (typically in the local geographical region). As a result, school leavers' training opportunities are determined to a considerable degree by their relative (as opposed to their absolute) competence endowment and educational certificates (Solga 2005).

Second, gatekeepers in the VET system make recruitment decisions under uncertainty, as it is difficult to directly observe an individual's productivity and trainability. Recruitment tests would increase transaction costs and would run the risk of being considered illegitimate. Hence, employers use individual characteristics such as prior educational attainment, but also gender, ethnicity, age, or disability/overt health status—deemed to be related to learning behavior and competence endowment—as indicators of individual productivity. One common mechanism for doing so is “statistical discrimination,” according to which judgments about an individual's potential productivity are based on their group membership in certain social categories and on a probabilistic belief regarding the group's trainability and productivity. Concerning ethnicity, a German study has shown for the city of Hamburg that even when school performance is controlled for, youths without migration background are twice as likely to enter regular VET programs as migrant youth (Lehmann et al. 2004, p. 108). This migrant youths' lower participation in regular VET programs is predominantly caused by the recruitment practices of gatekeepers in the dual system (Lehmann et al. 2006, pp. 183–185; cf. also Ulrich et al. 2006).

Little is known, however, about the specific role that school certificates, school grades, and noncognitive competencies play in gatekeepers' decisions, and how strongly formal certificates function as “signals” shaping gatekeepers' assessments of a candidate's competencies in VET recruitment processes (cf. Borghans et al. 2007; Protsch and Dieckhoff 2011). Empirical research based on appropriate data—like NEPS—could arbitrate this

ongoing theoretical and highly policy-relevant debate on the importance of certificates and competencies.

We now turn to factors that may explain youths' behavior in seeking and applying for positions in the VET system. Network theorists (e.g., Burt 1997; Elliott and Smith 2004) have shown that individuals' job search is determined significantly by socially stratified recruitment and supply networks. Networks provide information on vacant job positions, give second-hand accounts of employment experiences, and explain job requirements. They may also increase an applicant's reputation, because having employed persons in one's network is valuable (in terms of borrowed social capital). Network resources have been shown to be gendered, and that they contribute to channel women more often into female and men into male occupations (Straits 1998). Hence, networks entail structural differences in available contacts, in the base of experiences, as well as in assistance or resistance from others that youth can count on in their VET search (see also Chap. 7, this volume).

The role of network resources for VET search behavior and access to VET programs is completely underinvestigated, however. Based on common sense and a few research findings (e.g., Eberhard and Krewerth 2006), we might expect networks to be important for access to firm-based VET positions as well. According to Granovetter (1974), weak ties in particular should provide favorable resources for accessing jobs (or here, apprenticeships). However, as Boxman et al. (1991) and Wegener (1989) have shown, this weak-ties mechanism applies only to upward mobility, especially among high-qualified individuals. In contrast, resources provided by strong ties could be particularly relevant for low-educated individuals, because strong ties (like parents, siblings, or best friends) provide more reliable information on applicants' competencies than weak ties. A survey of German firms has shown, for instance, that small companies in particular rely on "recommendations by others (especially parents and neighbors)" when recruiting low-educated youths for apprenticeships (Seyfried 2006, p. 35). In addition to migrant youth's limited chances of accessing firm-based VET programs due to disadvantageous recruitment practices, the fact that they are concentrated in fewer occupations within the VET system than German youth (Damelang and Haas 2006) could also partially be a result of the more restricted range of their network resources.

Moreover, motivational, cognitive, and personality factors may influence youths' VET search behavior (see also Chap. 10, this volume). For Britain, Schoon and Parsons (2002) found a strong influence of parents' social class position on adolescents' aspirations, mediated to a large extent by parental occupational aspirations. Youths' VET search intensity and activities should also be influenced by their motivation to continue their education in VET programs or to withdraw from educational institutions because of a low identification with educational goals as a result of unfavorable "cooling-out" processes (Clark 1960) and the fear of possible humiliation and further negative reactions (Jones et al. 1984, p. 111). According to social-psychological research on stereotypes and intergroup relations (cf. Brewer and Brown 1998), prior experiences in school and/or in prevocational programs should therefore affect youths' motivation in their initial and further VET search.

Here, career guidance offices (a department of the Federal Employment Agency) play an important role. They often channel low-educated applicants into prevocational pro-

grams. As a prerequisite for being entitled to enter such programs, the youths in question have to be declared as not yet “mature enough for VET” (*ausbildungsreif*), a procedure that exposes them to processes of (self)stigmatization, which may affect their self-efficacy beliefs and self-concepts. Low-achieving school graduates, therefore, may face a higher risk of withdrawal or self-exclusion from competition over (scarce) regular VET positions. However, this risk might differ in terms of individuals’ cognitive and noncognitive competencies (even given equal school certificates). NEPS can deliver appropriate data for investigating the VET search behavior of young adults and the role that network, life-course, and educational performance factors play for inter- and intraindividual variation in search behavior and outcomes.

16.3.3 Successful completion of VET programs

School-to-work transitions are not always defined by a single entrance into one VET program, but are often sequences of multiple VET episodes—both completed and uncompleted. Whereas young people’s search for and access to subsequent VET positions is structured by the mechanisms elaborated above (Sect. 16.3.1 and 16.3.2), their prior VET biography, their search experiences within the VET system, possible “adaptations” of occupational aspirations (often made involuntarily), and the competencies acquired during previous VET episodes should also impact on gatekeepers’ perception of their skills on the one hand and their own motivation, search strategies, and resources on the other. The finding that individuals “correct” their occupational plans because of success or failure in accessing VET positions indicates the plasticity of how people navigate into and through the VET system (Heinz 2002). We have little knowledge, however, about the determinants of this intraindividual plasticity of educational/occupational goals and of the interindividual differences in the pathways through the VET system and their outcomes. NEPS will enable us to fill this knowledge gap.

There are two types of outcomes that, while related to each other, have to be clearly distinguished. Young people may leave the VET system with very different outcomes in terms of *certificates*: They may finish a VET episode (a) without a completed recognized certificate because of enrolling in a prevocational program or having dropped out of fully qualifying VET programs once or several times; (b) with a recognized certificate after having completed one VET program or reentered further programs (with different companies and/or in different occupations); (c) with a recognized certificate after having upgraded their school degree and then (re)entered programs (e.g., a sizable number of youths reenter school in order to increase their comparative advantage in competition for VET positions); or (d) with multiple certificates for different occupations after having reentered and completed several programs.

In terms of *competencies*, we can distinguish between (a) general competencies such as literacy and mathematical literacy (see Chap. 5, this volume), (b) occupation-specific competencies (connected with firm-specific competencies, when attending firm-based VET programs), and (c) cross-occupational competencies. With respect to the latter, there is little consensus about what constitutes such competencies. Some consider general competencies to be an important, or perhaps even the most decisive, part of cross-occupational competencies.

We know comparatively little about the factors that influence both the successful acquisition of certificates and the development of competencies. According to constructivist learning theories (e.g., Lanahan et al. 2005), learning is rooted in the learner's activities, through which they make use of the opportunities for learning provided by teachers/trainers (i.e., specific learning tasks, learning materials, etc.). The NEPS data will enable us to analyze motivational factors in particular depth. For example, how do learning environments have to be designed to arouse trainees' curiosity and challenge their capabilities without discouraging them? Can teachers or trainers enhance learners' motivation (see Chap. 6, this volume)? Given the longitudinal design of NEPS, we shall also be able to investigate the impact of cognitive and noncognitive competencies acquired during school on taking advantage of learning opportunities during the transition from school to work.

In addition, there is no systematic knowledge about how learning settings and their specific properties contribute to the development of cognitive and noncognitive competencies. The same holds true for the effects of prevocational programs. Many researchers argue that these programs neither improve young people's skill level and general competencies nor their future employability.

NEPS will make some efforts to provide data to study these issues in more depth. Collecting comprehensive objective information on learning environments in the very different VET programs attended by young persons (i.e., information obtained from their teachers and trainers) is not feasible within a large-scale longitudinal survey such as NEPS. We shall therefore collect subjective information, that is, standardized information from the trainees' perspective. This information includes type of training attended, profile of VET program activities, extent of actual involvement in work processes in the workplace, weekly distribution of theoretical/school and practical/firm instruction, and class size and composition in vocational school. For participants in firm-based VET programs (apprentices), we shall supplement this subjective information with regional data on the supply and demand for apprenticeship positions (by occupations) and the sectoral structure of regional labor markets, as well as with structural data on their training firms such as firm size and composition of employees and apprentices by sex, ethnicity, or qualification. All of these data are available from the Federal Employment Agency's Research Department. Given that the German VET system is more diverse than is often assumed, collecting information within NEPS about these basic features of youths' learning environments from a large and representative sample of participants in a wide array of VET programs will be an important step toward a deeper understanding of the impact of learning environments on individuals' success in the VET systems.

Furthermore, it is surprising how little is known about the influence of cognitive competencies and motivational factors on the odds of completing a VET program successfully. It is unknown to which degree class-biased assessments (known from school research) occur in VET programs, and what the consequences are in terms of youths' efforts during VET. Although competencies may be the most important determinants of completing a training program successfully (as measured by successful graduation or by the grades obtained in the final examinations), assessments biased by social class, ethnicity, gender, or other factors affecting motivation may also play an important role. This can be studied with the NEPS data.

Even though occupational competencies are not one of its main research areas, NEPS attempts to provide some new insights for the assessment of these competencies as well. Despite some encouraging efforts for a few selected occupations during the past few years (cf. Baethge et al. 2008), there is currently not a single instrument available for measuring occupation-specific competencies that has been widely tested, that possesses well-known psychometric properties, and that has been designed for large-scale longitudinal surveys. This is not surprising given the wide range of occupations that makes it impossible to apply one instrument to all occupations. We shall therefore not be able to investigate the *development* of occupational competencies during VET, but hope to provide a few measures to assess *outcomes* at the end of VET programs.

Whereas some developments for computer-based assessments of occupation-specific competencies do exist, they are geared toward only a very small number of occupations (e.g., Winther and Achtenhagen 2009). We shall explore the possibilities of incorporating these occupations (electrician and business occupations, such as bank clerk), and possibly a few others, into the NEPS design. For later NEPS cohorts, we shall then be able to decide: (a) if and how to include instruments for measuring occupational competencies within the NEPS, (b) if it is possible to expand the number of occupations included, and (c) if it is feasible to include two timepoints of measurement in order to assess competence growth. In terms of cross-occupational competencies, the situation is even worse, as there is no theoretical concept indicating their relevant dimensions. The NEPS approach, therefore, is to measure a selected number of capabilities that define individuals' "employability." These should include general competencies (reading and mathematical literacy, ICT/information and communication technology literacy) and more directly work-related constructs such as pursuit of occupational goals, self-efficacy, and occupational self-concept. We shall also try to adapt measurement concepts of job tasks (cf. Autor et al. 2003) to VET programs in order to find out to which degree VET programs with different learning environments (e.g., firm- and school-based, in small and large firms) use youth's cognitive or noncognitive competencies and prepare them for more complex tasks.

Finally, we should emphasize that participation in VET programs is not only related to the acquisition of skills, competencies, or certificates relevant for success in the labor market and at the workplace, but also constitutes an important step toward adulthood. NEPS's longitudinal design allows us to investigate the extent to which successfully mastering the challenges of VET contributes positively to young peoples' self-esteem, self-efficacy beliefs, and their feelings of having a "place in society." Conversely, youths' feelings of not being able to master these challenges can have negative outcomes, including delayed or no family formation and early unemployment that can cause long-lasting "scarring" effects on young people's behavior and attitudes (Barklamb 2001).

16.3.4 Pathways from the VET system into the labor market

Research has shown that firm-based and occupation-specific VET systems like that in Germany produce less turbulence in the school-to-work transition than systems that focus on general education like those in the United Kingdom and the United States (Allmendinger 1989; Buchmann 2002). However, over the last decades, entry into the labor market has become increasingly difficult in Germany as well. In times of recession, delayed

entries occur more frequently because firms increasingly choose not to offer their trainees continued employment after their apprenticeship (Dietrich and Gerner 2007; Konietzka 1999; Pollmann-Schult and Mayer 2004). As a result, the advantage traditionally enjoyed by trainees completing a firm-based VET program over graduates of school-based VET programs (and thus by young men over young women), namely a smooth transition into employment, is fading. In addition, some research literature suggests that a strong work ethic, ICT competencies, and so-called soft skills or personal styles should play an accentuated role in recruitment in times of high job competition (see, for the role of psychological factors, e.g., Diewald 2006), technological progress, and a growing service sector industry (cf. also Buchmann 2002; Murnane and Levy 1996). NEPS will provide outstanding opportunities to investigate this assumed accentuation and its underlying processes in much more detail than ever before by taking advantage of the large regional and occupational differences in labor market competition within Germany and the manifold sources of information on educational and VET performance, noncognitive characteristics, and young adults' social environment factors.

As with VET placement, initial job placement and post-VET unemployment risks should result from the interplay of supply- and demand-side factors, or, in other words, from individuals' application behavior, gatekeepers' recruitment decisions, and structural labor market conditions. In addition, VET certificates are of crucial importance for both employers' recruitment decisions and young adults' job search because of German *credentialism* and the strong link between the VET system and the labor market (Blossfeld 1989; Solga and Konietzka 1999). This is why in Germany, school certificates used to have less influence on job placements than VET certificates. However, at least in public debates, employers seem to be increasingly demanding multiskilled "knowledge workers" who possess good vocational skills and general competencies (like mathematical literacy, reading and ICT literacy, and language skills) supplemented with problem-solving competencies and interpersonal and teamwork skills (Murnane and Levy 1996). However, it is still unknown why and to what extent cognitive and noncognitive competencies and school and VET certificates determine initial labor market placement. Some studies show that the effects of one's abilities differ by job complexity: the higher the complexity of jobs, the higher the influence of general cognitive abilities (the so-called g factor) on occupational success (Gottfredson 1986). On the other hand, research by Schoon and Parsons (2002) has revealed that the importance of educational credentials for occupational attainment varies by economic and labor market conditions. This suggests that the relative influence of individuals' abilities and their educational certificates might depend on individuals' labor market context. The (absolute and relative) effect of cognitive competencies (like reading or mathematical literacy) on individuals' first job placement is still entirely unknown (the Swiss TREE project might provide first analyses on this issue in the near future). With the NEPS data, we are able to investigate the influence and (inter)relationship of school and VET certificates, educational biographies, cognitive and noncognitive competencies, and structural factors on patterns and outcomes of youth's labor market placements (see Chap. 9, this volume).

Finally, it should be added that NEPS will provide excellent opportunities to study migrant youths' transition pathways and their outcomes, especially those of Turks and ethnic German youth who have emigrated from Eastern Europe (see Chap. 8, this vol-

ume). Research has found that young migrants—especially male Turks—have poorer labor market opportunities after having successfully completed regular VET program(s) than native German apprentices (Damelang and Haas 2006; Seibert & Solga 2005). They face higher risks of unemployment after leaving VET and, if employed, of entering only unskilled jobs. The explanations given by different researchers to account for this inequality are controversial. Some stress employers' discrimination based on an ethnically biased signaling value of VET certificates (Seibert 2005; Seibert and Solga 2005). Others, such as Kalter (2006), emphasize poorer job search resources, poorer human capital, and Turks' limited "social assimilation." There are good reasons to believe that supply- as well as demand-side factors are at work in producing these ethnic differences. So far no data are available that allow us to simultaneously investigate the influence of demand-side and supply-side factors, but NEPS will provide them.

16.4 Concluding remarks

The paper has outlined some important research potentials of the longitudinal NEPS data in the area of transitions from school to work and the German VET system. The opportunity to study the interplay of demand and supply-side factors in explaining intraindividual plasticity in educational and occupational decisions as well as interindividual differences in successful and unsuccessful transitions will be a particular strength of the NEPS data. This potential is further increased when considering the interrelations of NEPS stage 6 with stage 5 (on participation in the *Gymnasium*, see Chap. 15, this volume), stage 7 (on university attendance, see Chap. 17, this volume), and stage 8 (on further education and work histories, see Chap. 18, this volume). Due to space limitations, we can only sketch a few of the interesting research issues here.

In connection with stage 5, we shall be able to investigate differences in competence acquisition and transition patterns among youth holding an upper secondary school degree awarded by *Gymnasiums* or other school types (such as vocational schools or evening classes). Concerning stage 7, the replacement of traditional German university programs and degrees (i.e. *Diplom* and *Magister*) with 3-year bachelor's and 2-year master's programs and certificates at universities and universities of applied sciences may well impact on the VET system in the near future. These two sectors may increasingly compete directly with one another—not only in terms of student recruitment but also in terms of graduates' labor market opportunities (e.g., in commercial or technical occupations). We shall be able to analyze whether these changes in tertiary education influence young people's decisions to participate in either VET or tertiary education, if and how these decisions differ by social groups, and what this means in terms of educational and social inequality. Finally with regard to stage 8, we shall provide manifold educational measurements for the school-to-work transition period, measurements that can be used in causal analyses of interindividual differences in participation in further adult education, occupational success in later life, and patterns of employment careers. Moreover, we shall be able to compare the relationships of different supply-side and demand-side factors and their group-specific impact on VET and later job placement processes. All of this could help us understand the underlying social mechanisms that produce different outcomes in

terms of VET and labor-market placement—and eventually enable us to support policy interventions on an empirically sound base.

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