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NEP 2020 : Adult Education and Lifelong Learning

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Abstract: *The adult stage (Stage 8) of the German National Educational Panel Study (NEPS) focuses on the adult working age population in Germany and serves, in many respects, as a capstone for the NEPS structure. Its main purpose is to collect data from Starting Cohort 6 (SC6, adults) on adult education, specifically on formal, non formal, and informal further training; on competence endowment and its development over the life course; and on monetary and nonmonetary returns to initial and adult education in a life-course perspective. The data include a large number of theoretically derived determinants of adult education and competencies, as well as information on returns within and outside of the labor market. Detailed information on the learning environments at a workplace or in a household makes it possible to contextualize the returns to education. On the one hand, the SC6 data contain detailed retrospective information on education, labor market participation, and households; on the other hand, they provide yearly panel information from currently ten waves (as of May 2018). These rich data allow numerous analyses from a life-course perspective pertaining to sociological, economic, psychological, and developmental theories.*

Keywords: Adult education, Further training, Competence development, Life-course Labor market, Panel study

I. INTRODUCTION

Both political and scientific debates have been stressing the growing societal importance of adult education and lifelong learning (European Commission 2017; German Council of Economic Experts 2017). This discussion is motivated by ongoing globalization, skill biased technological change, digitalization, and the development of a knowledge society. As these structural changes are of crucial importance for the working lives of the population in (post-) industrialized countries, education is no longer an asset achieved in youth that remains of constant value during a long and stable employment career. Today, adults have to learn continuously to keep up with flexible requirements at the workplace and to be able to find employment in different and rapidly changing fields. Additionally, because the aging population in Germany is leading to a lack of skilled employees, lifelong learning becomes more important due to demographic changes. One way to meet this demand for skilled employees is through further education of adults. Thus, adult education and lifelong learning have become an integral part of current and future educational careers. The first objective of Stage 8 of the National Educational Panel Study (NEPS) is to collect comprehensive high-quality data on adult education and lifelong learning— including data on the learning environments and decision-making processes leading to learning participation of adults. The NEPS adult stage is responsible for collecting data from Starting Cohort 6 (SC6, adults).1 Due to the complexity of the research fields associated with lifelong learning, several choices had to be made: What kind of adult education should be covered—only job-related learning or private learning as well? What kind of training courses should be considered—only courses with physical attendance offered by certified providers or courses offered by any provider through any medium or platform? And what kinds of contents need to be covered—training of cognitive and/or non-cognitive competencies or training of specific skills? The main topics chosen for the NEPS adult stage are presented in the following sections. Lifelong learning is embedded in educational and occupational careers. On the one hand, participation in adult education depends, for example, on specific family arrangements, time constraints, and well-being; on the other hand, initial and adult education form occupational careers, family arrangements, well-being, and political participation later in life. Thus, the second objective of the NEPS adult stage is to collect complete and detailed data on

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the education, employment, and family histories of adults along with data on their subjective well-being, health, and political participation. SC6 data on the life-courses of individuals serve as background information for adult education and—equally importantly—as an outcome of educational investments at any previous point in the life-course. As the final stage in the overall study design, the NEPS adult stage provides information on the outcome of all educational efforts as well as information on continuing educational efforts during adulthood. The third objective of the NEPS adult stage is to collect data on domain-specific and domain-general cognitive competencies during adulthood. So far, little is known about how competencies are acquired, distributed, and changed over the life-course (Allmendinger and von den Driesch 2015; Allmendinger and Leibfried 2003). SC6 data allow researchers to close this gap by gathering information not only on reading literacy and mathematical, natural sciences and computer skills but also on a person's interests, self concept, and motivation. This enables analyses of the development of cognitive competencies over the life course combined with a simultaneous evaluation of returns to formal qualifications, competencies, and employment experiences. The SC6 data collected in the NEPS adult stage enable researchers to study participation in adult education, including effects of learning environments, prior educational activities, migration backgrounds, and psychological aspects, as well as the decision-making processes that lead to participation in adult education. Moreover, this can be used to analyze effects of initial and adult education on various outcomes, such as labor market participation and performance, well-being, and health. Finally, the development and the effects of competencies over the life course can be described and researchers can elaborate on this interrelation. Adopting a dynamic life course perspective enables researchers to assess the extent to which previous competencies, learning environments, educational decisions, a person's migration background, and socioemotional traits (e.g., personality) reinforce educational participation, the development of competencies, and educational outcomes over time. In order to achieve these objectives and to address more specific research questions from the six pillars of NEPS, the adult stage covers the population of all adults of working age regardless of their actual employment status. It introduces a number of innovative and unique elements to a large-scale panel study by:

- Combining economic, sociological, psychological, and educational sciences theories for a truly interdisciplinary approach to adult education and returns to education in a life-course perspective
- Developing and adjusting measures of various theoretical constructs for adult interviews—for example, measures of learning environments, social and cultural resources, migration-specific factors, and returns to education
- Introducing modularized measures of all dimensions of educational activities (formal, non formal, and informal learning) and detailed measures of employment activities, job tasks, partnerships, and children over the entire life course
- Applying measures of various educational outcomes, including detailed information on labor market returns, subjective well-being, health, and social and political participation
- Repeatedly assessing the individual development of cognitive competencies in a representative adult sample, including various domain-specific assessments that can be compared with competence endowments in earlier stages of NEPS
- Introducing elements of data editing to the interview situation by applying the latest computer-assisted interview techniques in order to raise the quality and consistency of life-course data
- Enriching survey data with longitudinal administrative employment information from social security records—for example, data on earnings, labor market participation, and frm characteristics as well as on unemployment and participation in active labor market policy measures (for details, see Antoni et al. 2018)

II. Conceptual Framework and Research Questions

The research questions for the NEPS adult stage are based mainly on sociological and economic individual-level theories on education and labor market participation such as human capital theory, signaling theory, and a rational choice theory of educational decisions. These theoretical foundations are extended by approaches from educational sciences and developmental psychology. The latter are particularly important for understanding competence endowment and development over adulthood. The possibility of combining information on competence endowment and development

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with not only detailed schooling, training and employment trajectories but also personality traits, motivation, and attitudes makes the SC6 data a unique source for research in the social sciences. Moreover, it allows for the development of theoretical models explaining competence endowment.

This perspective perceives an individual's life course as a sequence of activities and events in various life domains and spheres (for examples, see Aisenbrey and Fasang 2017; Brehm and Buchholz 2014; Struffolino et al. 2016).

2 Life courses are understood as rule-based, dynamic characteristics of the social structure that affect numerous individuals and their social positions. Life courses are influenced by institutions in which individuals are embedded. Thus, life courses depend partly on individual decisions and intentional behavior and partly on unintentional outcomes of the individual's actions (for applications, see, e.g., Bächmann and Gatermann 2017; Hägglund and Bächmann 2017). Research on the life course theoretically and empirically analyzes the dynamics of the distribution of positions and the resources held by individuals in a society. This perspective allows for the simultaneous analysis of age, cohort, and period effects and thus accounts for "local interdependencies" of events and conditions (Becker and Blossfeld 2017; Mayer and Huinink 1990). In particular, the timing and sequencing of education and training in occupational careers can be explored and linked with parallel activities in other life domains. With a life-course perspective, an adult's education embedded in that individual's life course can be analyzed in both work and private contexts. This makes it possible to explore the influence of employers and other (labor market) institutions, regional disparities, or the gender-specific impact of partners, children, and family arrangements in general. Moreover the effects of these factors on participation rates in adult education can be identified (for employer-specific effects, see Ehlert 2017; for regional-specific effects, see Görlitz and Rzepka 2017; Rzepka and Tamm 2016). Further, research questions on decision-making processes regarding participation in educational activities can be analyzed, including the importance of previous educational and occupational attainment and potential path dependencies (e.g., Kramer and Tamm 2018). Cumulative returns of adult education over the life course for various labor market and non-labor-market-related outcomes can also be studied with the SC6 data. The questionnaire is also based on concepts that capture salient historical changes in life-course patterns. The most comprehensive approach, individualization theory (Beck 1986), assumes that individuals are gaining greater control over their lives due to the process of modernization. Accordingly, they pursue a wider variety of life choices and life trajectories. This concept can be contrasted to various other, partly contradicting approaches to life course development such as pluralization (Zapf 1991), institutionalization (Kohli 1985), deinstitutionalization (Shanahan 2000), standardization (Kohli 1985), and destandardization (Modell et al. 1976). These concepts offer powerful and theoretically derived models for comparing the educational pathways of different cohorts. SC6 data from the NEPS adult stage enable researchers to empirically test these partially contradicting theories and compare the development of life-course patterns to overall developments in the labor market (for examples, see Brzinsky-Fay and Solga 2016; Zimmermann and Konietzka 2018). Several changes in life-course patterns are already apparent. For example, the notion of "standard biographies" has lost empirical relevance (Buchmann 1989; Heinz 2003; Mayer et al. 2010). The traditional sequence of life stages—from education to work and from work to retirement—is gradually being expanded by more diverse patterns: Individuals may reenter education after periods of work, take sabbaticals, change occupations during their careers, or combine work and other activities in prolonged transitions into retirement (Jacob 2004). The social sciences' view of life courses is supplemented by approaches from educational sciences and developmental psychology in which lifelong learning and competence development are central for understanding educational trajectories. These approaches imply that the development of competencies is subject to stage-specific dynamics. Thus for example, reading literacy is a domain-specific competence during school age, but it becomes a cross-curricular basic skill in vocational training, higher education, and an individual's career (Arnold et al. 2012). Therefore, an important open question is how basic competencies develop during adolescence and adulthood and how they influence the acquisition of domain-specific competencies in later life stages. With the SC6 data, it is also possible to explore research questions focusing on, for example, educational participation, returns to education, changes in the importance of adult learning, and competence development during adulthood. To collect information on the different educational activities in which respondents have been engaged over their life courses, it is useful to distinguish these activities (for a detailed discussion, see Kleinert and Matthes 2009; Chap. 5, this volume). Education taking place in formal learning environments is institutionalized and often includes recognized certificates that strongly determine labor market chances in Germany (Damelang et al. 2015).

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Such formal educational activities are collected in the NEPS adult stage by applying retrospective questions covering the respondent's entire schooling and vocational training history. In order to cover educational activities in non formal learning environments in adulthood—institutionalized shorter training courses not leading to certification—it is important to develop and implement a clear working definition of relevant non formal education. It would be insufficient to include only courses that may be of importance for some projected return in later life. Instead, the strategy applied in NEPS is threefold: frst, to ask for all forms of training in non formal learning environments; second, to ask for the exact subject area; and third, to ask for the initial intention for participating in such a course (Janik et al. 2016). Beyond participation rates in different population segments, little is known about informal learning, defined as learning processes that are organized by the individuals themselves (for a recent exception using NEPS SC6 data, see Rüber and Bol 2017). This is particularly true regarding the decisions that lead to these learning processes or their (cumulative) returns. Therefore, the NEPS adult stage collects information on informal educational activities in a standardized way. Because formal education programs are typically organized by an external provider and take a substantial amount of time, recall is comparatively easy. Non Formal and especially informal learning activities, however, may be rather short. Most importantly, informal learning activities maybe unintentional. Therefore, individuals have more diffculties in recalling non formal learning over a longer time span (Dürnberger et al. 2011; Janik et al. 2016)—and we assume the same to be true for informal learning. Because the time span for recall is limited to the time between two panel waves, the panel structure of the survey is crucial to the collection of data on all forms of learning—be it formal, nonformal, or informal. Unintentional learning is very important for several life-course outcomes and happens not only on the job but also while volunteering or during political engagement. Unfortunately, surveys cannot measure this form of learning directly. Therefore, the NEPS adult stage repeatedly asks respondents about their job tasks and their social and political participation to allow for the approximation of the effects of unintentional learning. In particular, changes in job tasks can be helpful to measure unintentional learning because they refect a career development. 17.2.2 Competence Endowment and Development A central aim of the NEPS project is to increase knowledge about competence endowment, development, distribution, and change over the course of an adult's life in Germany. The SC6 data enables a description of the distribution of competence endowments in different groups of the adult population (Wölfel et al. 2011) and an analysis of the developments and the factors triggering the acquisition of new skills (Kramer and Tamm 2018). Cognitive and noncognitive competencies are important determinants of labor market outcomes such as wages, job satisfaction, and unemployment (Gnambs 2017). Moreover, they are an important tool to cope with new challenges such as digitalization. Determinants of the decline and loss of skills and competencies during adulthood can be detected with the SC6 data. Domain-specifc cognitive competencies such as reading literacy and mathematics and their importance for educational success are wellresearched in school, training, or higher education settings. However, little is known about these domain-specifc competencies in combination with other employmentrelated skills that are acquired continuously beyond initial education. Thus, the questions whether domain-specifc competencies remain relevant in occupational careers and how they interact with other skills remain to be answered. Moreover, it is not yet clear how different competencies cause various outcomes in adult life courses. For example, competence endowment is expected to infuence an adult's educational decisions and it may contribute to the returns to education beyond educational credentials—particularly with respect to employment-related returns. Repeated comprehensive measures of competencies, educational attainment, and vocational qualifcations over the life course provide data not only on the importance of these constructs with respect to labor market returns, but also on how these constructs relate to each other. Moreover, the data enable the assessment of the changing relevance and interaction of competencies, credentials, and qualifcations throughout an adult's career. Prior to designing the measures of competencies in the NEPS adult stage, it was necessary to select competence domains that should be followed during adulthood. Three selection criteria were applied: First, the competencies should be relevant for a major part of the adult population and labor force. This frst selection criterion is especially diffcult with regard to the highly heterogeneous target group covered in the NEPS adult stage. Second, assessment of competencies should be valid and reliable (Kleinert 2005). Third, because it is impossible to select competencies in the NEPS adult stage independently of the other stages, the decision had to be based on a design overarching all stages of NEPS. As illustrated in Chap. 4 of this volume, the NEPS adult stage (as well as the earlier educational stages) focuses on cognitive competencies that are domain-specifc during schooling but basic in adulthood. It is undisputed that competencies such as reading, mathematical, scientifc, and

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foreign-language literacy are necessary prerequisites for successful employment and active participation in society (Rychen and Salganik 2003). Taking the heterogeneous target group into account, it is important to adapt the existing student assessments to cover functional literacy. Thus, it is necessary frst, to assess potential problems in adult daily life; second, to build tests measuring the full range of competence domains in the adult population; and third, to cover the dynamics of these competence domains over the adult life span. The NEPS adult stage also focuses on measuring skills connected to the employability of adults. These skills are competencies that help adults fnd and maintain employment in different occupational felds under changing conditions. Due to these changes, different key competencies or metadisciplinary skills play an increasingly important role during adulthood. Therefore, the questionnaire inquiries about selected noncognitive competencies indirectly by self-assessment scales (see Chap. 9, this volume). Because educational processes throughout adulthood are mostly self-directed by specifc interests, self-effcacy, self-regulation, and motivation, these concepts are included in the instrument—in addition to more stable personality traits such as the Big Five. Because social behavior and cooperation are considered important in adulthood, especially in occupational contexts, certain facets of social competencies, such as assertiveness or confict-solving skills (Arnold et al. 2012), are included in the NEPS adult stage survey program. The cognitive skill literacy in information and communication technologies (ICT) seems to be particularly important for many tasks in the employment context and in private life. On the one hand, ICT literacy has unique cognitive and technical aspects; on the other hand, it serves as a "tool" for applying other cognitive and social competencies (e.g., writing texts or communicating with others). Most important for the NEPS adult stage is the relevance of ICT skills for employment chances beyond specialized occupational felds. Finally, because these skills are highly relevant for lifelong learning processes, measures of metacognition are included in the survey. Metacognition includes knowledge, skills, and attitudes that enable strategic decision making when learning or thinking, as well as the ability to initiate, organize, and control active realization. 17.2.3 Learning Environments Learning environments differ substantially for respondents in the NEPS adult stage, especially when compared to students and children in earlier educational stages. Whereas learning in all lower stages of NEPS takes place in the same predefned formal institutional contexts for the survey respondents (Chap. 5, this volume), the learning processes of adults occur in a multitude of different learning environments. In Germany, numerous providers offer trainings or courses for adults in formal and nonformal environments. Examples for such providers are frms, state-founded institutions (e.g., adult education centers), state agencies (e.g., the Federal Employment Agency), chambers of commerce and crafts, higher education institutions, and a wide range of nongovernmental organizations (Kleinert and Matthes 2009). It is diffcult to gain a complete picture of the relevant adult learning providers, particularly due to the country's federal structure. Programs vary considerably across federal states, and it is impossible to identify a coherent top-down approach to adult learning policy. Hence, because learning environments in the NEPS adult stage differ in their settings, standardized information from the adult learner's perspective needs to be collected to answer questions on the effects of the learning environment's structural characteristics on different educational outcomes. The most important learning environment for adults is the frm or workplace. First, employers provide a substantial part of further education and training for employed adults in Germany (Görlitz and Rzepka 2017; Rosenbladt and Bilger 2008; Rzepka and Tamm 2016). Therefore they play a role in educational decision making, because they either encourage further training, hinder participation, or deny access. In general, large frms provide more training than small and medium-sized enterprises (SME). Whereas large frms often provide training themselves, SMEs turn to external providers. Furthermore, participation in formal adult training is strongly related to different types of employment (Ehlert 2017). Thus, individuals who are employed in small frms, in temporary jobs, or part-time are less likely to enroll in training. Second, an important part of adult learning is learning on the job. This form of learning has received increasing attention from researchers because skill-biased technological change is altering the overall structure of a frm's organization and the composition of its workforce. These changes impact on an individual's need to invest in further training and to continue learning over the entire life span. Therefore, describing jobs in more detail than by mere job titles has become more relevant. The growing diversifcation of occupations makes it necessary to perform a proper identifcation of meaningful tasks profles for occupations. Consequently, the NEPS adult stage developed a survey instrument on job tasks that provides detailed information on skill demands, learning possibilities, and learning conditions (Matthes et al. 2014). This instrument is based mainly on the theoretical considerations of Autor et al. (2003) who defne a task as a unit that directly produces output either as

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goods or services. The authors distinguish between routine and nonroutine tasks, and between cognitive and manual tasks. In combination with the longitudinal data, the instrument provides a unique opportunity to answer a broad range of questions such as: How are job tasks, formal education, and competencies distributed in the adult population? Which factors determine under- and overqualifcation? How do job tasks change in changing labor markets, and what skills will be required in the future to guarantee stable employment careers? Besides frms, households serve as an important learning environment for adults. Other household members, particularly the partner, may provide economic, cultural, social, or time resources for the investment in education or they may hinder participation by denying them. In this context, the analysis of family and household effects on adult learning participation can be particularly promising from a gender perspective. For example, research has shown that women, particularly mothers, participate less often in further training compared to men or women without children, but the dynamics leading to these differences have not yet been fully understood (Dieckhoff and Steiber 2011). Alongside the structural information on adult education providers, frms, and households, an important feature of the NEPS adult stage is the provision of information on specifc characteristics of adult learning courses. Based on a general model of how courses are conducted, including their atmosphere and the cognitive activation it triggers (see Chap. 5, this volume), data on three dimensions are collected for selected courses: First, the structure dimension measures the setting of a course and its internal design; second, the support dimension measures both the interaction patterns between participants and instructors and the interaction patterns among the participants themselves; and third, the cognitive challenge dimension measures the challenges participants face when taking the course. This detailed information about course characteristics can be used to analyze their effects on successful participation, on increases in skills or competencies, and on returns to adult educational investments. 17.2.4 Social Inequality and Educational Decisions Over the Life Course As previously described, respondents of the NEPS adult stage are not institutionally required to make educational decisions at any specifc point in time. Therefore research questions such as why adults engage in education and what types of education they choose or why adults refrain from education, are particularly interesting. Educational decisions can be based on rational decision-making processes, on heuristics taking limited information into account, or a mixture of the two. The SC6 data allow for tests of various theoretical approaches on educational decisions, the most prominent being rational choice theory (Erikson and Jonsson 1996), satisfcing (Simon 1993), models of frame selection (Esser 2001), simple heuristics (Gigerenzer and Todd 1999), and further approaches such as bounded rationality (e.g., Brewer 1988; Chaiken and Trope 1999; for more details on these approaches, see Chaps. 6 and 8, this volume). Besides explaining educational decisions during adult age, retrospective educational data of SC6 is also well suited to study decisions earlier in life (for examples, see Blossfeld et al. 2015; Buchholz and Schier 2015; Biewen and Tapalaga 2017; Weiss and Schindler 2017). To understand educational decisions, data on adults' work-related and non-workrelated aspirations are crucial. For the analysis of work-related aspirations, information on attitudes toward labor force participation, working hours, workloads, family role models, division of domestic labor, and occupational career aspirations is essential. Likewise, for the understanding of education investments, information unrelated to the labor market, such as attitudes and aspirations regarding leisure activities, or measures of self-concept are needed. Predominantly, participation in adult education is understood as a means to meet aspirations or to live up to specifc attitudes. Thus, theoretical models explaining educational participation of adults focus mainly on attitudes, benefts, and probabilities related to the expected returns to adult investment such as labor market returns (e.g., career outcomes) or returns to private interests. Because the reasons behind educational decisions vary between different social groups (Boudon 1974; Breen and Goldthorpe 1997), the infuence of relevant others is meaningful for the learning participation of adults. Members of different social groups have different attitudes and information, and their behaviors are affected by different economic, cultural, and social resources (for examples of earlier educational decisions, see Braun and Stuhler 2018; Bukodi et al. 2017; Minello and Blossfeld 2016). First, a lack of fnancial resources, for example to pay course fees or to offset opportunity costs, impacts on the likelihood of engaging in further education. Second, cultural resources, for example, previous educational achievements and competencies, signifcantly infuence educational decisions. Third, social resources are needed to learn about educational offers, to gain active support from other course members, to acquire fnancial support, and to gain support within the household (e.g., to be able to allocate time to the course instead of the household). They also shape educational aspirations in general. Because of the competing explanations for the declining effect of social origin (Hillmert and Jacob 2005), studies on the social background of adults

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and the interplay of primary and secondary effects are valuable. Optimal and actual timing of training participation throughout the life course are another important aspect of educational decisions. Information on time preferences gathered in NEPS allows investigations of decision making going beyond mere cost–beneft analyses. Unlike the lower stages covered in NEPS, the respondents of the NEPS adult stage do not necessarily participate in or prepare for imminent educational activities at the time they are being surveyed. Nevertheless, several indicators, measured for all respondents independent of the planning status of education or training activities, allow an analysis of processes leading to educational decisions. Therefore information is gathered on independent indicators such as educational aims, attitudes, and expectations; information on the motive of avoiding downward social mobility; and information on and knowledge of educational opportunities. Likewise, data is collected on the perceived benefts of educational investments, the perceived probabilities for a successful investment, and on the expected costs of participation in adult learning. Additionally, respondents are asked about their overall fnancial, cultural, and social resources, so that these determinants can be evaluated against possible educational decisions and their outcomes. 17.2.5 Special Target Groups: Migrants Detailed knowledge of further education among adults with a migration background is scarce in Germany. At the same time, migrants and their descendants are a group that is often more in need of adult education because their educational background may be inadequate and/or their certifcates are not transferable to the German education system or labor market. Thus, important objectives are to allow empirical investigations frst, on migrants' competencies and their literacy in the German language; second, on their fnancial, educational, and ethnic resources; third, on their participation in further education; and fourth, on the returns to their educational and occupational investments. For this purpose, the survey gathers detailed information on migration backgrounds up to the third generation. Respondents with a migration background are assessed in German language literacy like all respondents in the NEPS adult stage. In addition, they are asked about their native language, the languages used in the households where respondents grew up and in their current households, as well as the languages used at the workplace and during leisure time. Furthermore, the respondents' complete migration history, including what kind of legal status they had when they came to Germany, is surveyed. Additionally, migration-specifc cultural and social capital, the effects of ethnically homogeneous or heterogeneous networks on the likelihood of participating in adult education, and the chances to succeed in different labor market segments are assessed. For example, SC6 data reveal that migrants commonly participate in formal and nonformal full-time education programs (Söhn 2016). Moreover, migrants have a higher risk of being overqualifed, especially female migrants from an educationally disadvantaged family background (Kracke 2016). For a valid measure of human capital, respondents with a migration background are not merely asked to translate their educational degrees into equivalent German degrees. Rather, the two largest groups of migrants (migrants from Turkey and from the former Soviet Union) are invited to state their original degree's name (in Turkish or Russian), and asked whether this degree has been recognized by the German authorities. Furthermore, a translated questionnaire in Turkish or Russian is provided so that these two migration groups can be interviewed entirely in their mother tongue (for more details, see Chap. 7, this volume). 17.2.6 Returns to Education Collecting information on returns to education is a main objective of the NEPS adult stage. Researchers are interested in the effects of education on wages or unemployment risks (e.g., Lauer and Steiner 2001), or on class outcomes, job prestige, or occupational mobility (e.g., Shavit and Müller 1998; Scherer 2005). For example, some studies focus on the effects of further training on wages or unemployment risks (Jenkins et al. 2003; Kracke et al. 2017; Kuckulenz 2007; Rüber and Bol 2017), whereas others address the infuence on vertical or horizontal occupational mobility (Dieckhoff 2007; Wolter and Schiener 2009). These returns can be observed only after individuals have left initial education and belong to the active or passive labor force population. To address research questions on returns to education, it is essential to extend NEPS beyond student cohorts to the adult population. For a number of reasons, SC6 data are better suited to analyze economic and occupational returns to education compared to data from most other existing adult surveys. First, the returns to different educational activities in different life periods can be analyzed, thus enabling clear temporal modeling. Second, detailed measures of educational degrees, felds of study, and adult education in formal, nonformal, and informal learning environments are provided, thereby surpassing the measures of existing data on education. Third, the data allow for a differentiation between returns to educational credentials and returns to competencies. Human capital theory (Becker 1964; Mincer 1974), signaling theory (Spence 1973), screening theory (Arrow 1973), and the job competition model (Thurow 1975) make different statements on the relevance of certifcates

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and competencies for labor market success. However, because applications are usually based on the same limited qualifcation indicators, and competence measures are usually lacking (for exceptions, see Green and Riddell 2003; Tyler 2004), it has hardly been possible until now to compare these theories empirically. Fourth, with the respondent's informed consent, administrative social security information from the Institute for Employment Research (IAB) can be linked to the survey data (NEPS-SC6-ADIAB, see Antoni et al. 2018). Linking survey and administrative data has several advantages, specifcally because administrative information on complete employment biographies and earnings as well as on establishment characteristics is available in the combined data, making more exhaustive analyses possible. Finally, the survey data contains detailed information on social origins, migration backgrounds, age, and gender that allows returns to educational degrees and competencies to be analyzed specifcally for various well-defned subgroups of the population. Educational achievement also contributes to explaining disparities in several life domains apart from work. For this reason, the concepts applied in NEPS to measure the returns to education go beyond questions of pure economic applicability. For example, the data allow the investigation of how education shapes competencies later in life, and how education and competencies affect social inclusion (Jusri and Kleinert 2018), political engagement, health, and subjective well-being. Analyzing social and political participation permits inferences not only on private but also on social returns to education. By including these external effects, a more comprehensive utility function underlying the decision to invest in human capital can be derived. Subjective well-being is included specifcally because this measure contributes to a more holistic concept of social welfare returns to education compared to purely economic aspects of wealth (see Chapt. 8, this volume). Moreover, these dimensions are selected because they fulfll additional functions in the context of the NEPS adult stage. Whereas knowledge on social participation helps explain individual competence endowment, because competencies (in particular, social and personal) may be acquired in the context of voluntary activities (Gerzer-Sass et al. 2006; Kirchhöfer 2000), well-being is an important determinant of motivation and aspirations.

III. Conclusion

This short overview has hopefully sparked the reader's interest in the theoretical approaches of the NEPS adult stage, the data generated within NEPS Starting Cohort 6, and the empirical studies that have analyzed these data so far. The three main objectives of Stage 8 are to provide rich data from a life-course perspective on adult education, on competencies, and on labor market and non-labor-market-related returns to educational investments. The data collected enable the testing of different theoretical models, and researchers of different disciplines and different research paradigms are invited to develop research questions that may be analyzed with the rich NEPS adult stage data on retrospective life courses. Furthermore, the design of the NEPS adult stage allows for the assessment of long-term developments because life-course data have been collected for a large range of birth cohorts. Thus, the data collection program provides detailed highquality information on numerous aspects of the educational and employment trajectories and the transition between different stages of the life course and for specifc population groups. This has already generated numerous empirical results and will certainly continue to do so in the future.

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