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Working and Learning in a Changing World

Part 1: Overview of the Study

March 2011 (Second, updated version)

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Abstract

“Working and Learning in a Changing World”, or ALWA (the acronym being derived from the study’s German name “Arbeiten und Lernen im Wandel”), is a dataset which was collected as part of the research-project “Qualifications, Competencies and Working Life” carried out by the department “Education and Employment over the Life Course” of the Institute for Employment Research (IAB), Nuremberg. It is due to Jutta Allmendinger, the former director of the IAB, that it was possible to pursue the core idea of this survey: to combine a retrospective life course module with tests of the basic cognitive competencies of the 1956-1988 birth cohorts in Germany. The survey was conducted by infas Sozialforschung, Bonn. The ALWA dataset contains information about more than 10,400 life courses and allows detailed longitudinal analyses in particular concerning schooling and training, labour market entry and occupational trajectories, as well as family formation and regional mobility. After an extensive data editing phase, this overview as well as the associated documents and data (ranging from the project description to the provision of the data as a Scientific Use File) provide detailed documentation of the data.

Zusammenfassung

„Arbeiten und Lernen im Wandel“, kurz ALWA, ist ein Datensatz, der im Rahmen des Projektes „Qualifikationen, Kompetenzen und Erwerbsverläufe“ am Forschungsbereich „Bildung und Erwerbsverläufe“ (FB E1) des Instituts für Arbeitsmarkt- und Berufsforschung, Nürnberg, erhoben worden ist. Jutta Allmendinger, der damaligen Leiterin des IAB, ist es zu verdanken, dass die in dieser Befragung verfolgte Idee der Kombination einer retrospektiven Lebensverlaufsbefragung mit einer Messung kognitiver Grundkompetenzen der in Deutschland lebenden Geburtsjahrgänge 1956-1988 realisiert werden konnte. Die Erhebung der Daten übernahm infas Sozialforschung, Bonn. Die ALWA-Daten enthalten Informationen über mehr als 10.400 Lebensverläufe und erlauben detaillierte Längsschnittanalysen insbesondere zum Schul- und Ausbildungsverhalten, zum Erwerbseinstieg und –verlauf sowie zu Prozessen der Familienbildung und regionalen Mobilität. Nach einer Phase der umfangreichen Datenedition steht mit diesem Überblick und den dazugehörigen Dokumenten – angefangen von der Projektkonzeption bis hin zur Bereitstellung der Daten als Scientific Use File – eine ausführliche Dokumentation zur Verfügung.

Keywords: ALWA, life course, event history, longitudinal data, migration history, schooling, training, employment history, partnership history, children and household, social background

At this point we would like to express our thanks to the many colleagues who ensured the success of the project. Special thanks are due to Margot-Anna Valentin, who made a large contribution to the success of the editing and coding work; to Wolfgang Biersack and Wiebke Paulus, who supported us with the tasks involved in encoding the occupation data; to Ralf Künster and Klaudia Erhardt, who programmed the data editing tool; and to all of our student assistants and interns: Barbara Büttner, Katharina Derr, Andrea Dürnberger, Maria Fleischmann, Melanie Götz, Christina Grabinger, Marcel Haferkorn, Kerstin Hecker, Veronika Hübner, Nancy Kracke, Stefanie Jung, Georg Kowal Przemyslaw, Anna Kronhöfer, Alexander Kuppinger, Manuel Munz, Erika Schlichenmaier, Michael Schottenhammer, Karina Stühler, Claudia Swinnes, Thomas Ullherr and Julia Würth. For proof-reading of this translation we would like to thank Bernhard Christoph.

1 Introduction

"Working and Learning in a Changing World", or ALWA (the acronym being derived from the study's German name "Arbeiten und Lernen im Wandel"), , is a dataset which was as part of the research-project "Qualifications, Competencies and Working Life" carried out by the department "Education and Employment over the Life Course" (FB E1) of the Institute for Employment Research (IAB), Nuremberg. The main objective of this project is to look into the extent to which competencies – beyond the educational and vocational qualifications attained – constitute additional individual resources which facilitate successful careers. As this dataset can provide answers to many other research-questions, which will not be dealt with in the context of this project, this overview gives all interested researchers a summary of the basic information necessary for analysing the ALWA data.

ALWA was conceived in order to analyse the interplay between educational processes (in the broadest sense) and basic cognitive competencies during various phases and situations of the employment trajectory (Kleinert et al. 2008). The project therefore comprises three central dimensions of analysis: the employment situation, the qualifications attained and basic cognitive competencies. All three dimensions were to be observed long-term in an individual life-course perspective.

The survey consisted of two parts. In the first part (the CATI survey) the life courses were recorded during telephone interviews. The main priority was to depict in detail the education, training and employment histories. After the telephone interview, in the second part of the survey (administered in PAPI-mode), literacy and numeracy tests were conducted with respondents who had agreed on the telephone to participate in such tests. This overview concentrates on describing the CATI survey as the data on competencies will not be included in the scientific use file provided by the Research Data Centre (FDZ) of the Federal Employment Agency (BA).

Sample: the population consists of all individuals living in Germany who were born between 1956 and 1988, irrespective of the language they speak, their nationality or their employment status. The sample was drawn in two stages: from municipality data provided by the Federal and the State Statistical Offices 281 sample points (representing 250 municipalities) were drawn. In July 2007 the local registration offices (Einwohnermeldeamt) of these sample points were asked to compile a list of addresses of individuals born between 1956 and 1988 from the registers using a systematic random sampling procedure (interval sampling). For the field work a simple random sample was drawn from this stock of addresses for each sample point. A total of 152 addresses were drawn per sample point, i.e. 42,712 addresses from the total stock. For 22,656 of these addresses it was possible to identify a telephone number.

Data collection: after two tests had been successfully carried out it was possible to begin the main survey in August 2007. The first test had been a pilot study to assess the feasibility of applying competence tests in the context of personal interviews of the adult population. The second was a field pre-test in which the entire course of the main interview was moni-

tored regarding its duration, its acceptability to respondents and its feasibility. All target persons for whom a telephone number had been obtained (N=22,656) were sent an advance letter containing information regarding the selection of addresses, data protection legislation and the voluntary nature of participation in the survey. This was done in order to comply with data protection regulations for studies based on a sample transmitted by the residents' registration offices and also in order to inform the target persons about the objectives and the importance of the study. As an incentive for the CATI interview, all of the participants were entered in a lottery with 60 prizes (notebooks, travel vouchers, iPods).

The telephone interviews were carried out from August 2007 until April 2008. It was possible to conduct a total of 10,404 interviews, 10,177 of them in German, 77 in Turkish and 150 in Russian. The response rate is therefore 24.4 percent with reference to the address sample, and 45.9 percent with reference to the gross sample (the addresses for which it was possible to research a telephone number). On average, the interviews in German lasted 76.5 minutes, those in the other languages 36.6 minutes. The main reason for the shorter duration of the interviews conducted in languages other than German is that they did not comprise the full set of questions on the entire life course, but only information on respondents' current status. As a measure of refusal avoidance, reluctant target persons who initially refused to participate in the CATI interview were contacted again by specially trained interviewers in order to persuade them to take part after all. Those target persons who were absolutely unwilling to participate and reluctant target persons who still could not be persuaded to participate the second time that they were contacted were asked to answer some questions for the analysis of selectivity due to non-participation. Of the 5,946 individuals who were asked to answer these questions, 1,767 completed this brief questionnaire.

The second part of the study, the testing of basic cognitive competencies, began in September 2007 and lasted until May 2008. At the end of the German language version of the CATI interview all of the respondents were asked to participate in this part of the study. As an incentive to participate in the personal interview, the target persons were offered a payment of 15 Euros. A total of 3,980 personal interviews were conducted in which the respondents were asked to complete two test booklets independently to test their basic cognitive competencies.

Data structure: closely following the German Life History Study (Deutsche Lebensverlaufsstudie), which was conducted under the leadership of Karl Ulrich Mayer, the data were collected in modules that are differentiated according to individual life domains. Data collection procedures incorporate developments in methodology, which make it possible to monitor and correct the temporal consistency of all events while the interview is being conducted.

The data were filed in one cross-sectional dataset and several longitudinal datasets. While the cross-sectional dataset contains time-invariant variables or summary information about the individual life courses, the longitudinal datasets comprise similar information on individual episodes of one type. This allows a precise description of life courses with regard to their temporal and substantive complexity. It is also possible to identify links between events in

different life domains. In order to facilitate data usage, the codebook contains detailed information on the data structure and on individual variables (including generated variables) as well as the detailed questionnaire. The scientific use file is now available to interested researchers at the Research Data Centre (FDZ) of the Federal Employment Agency (BA). As part of of the necessary anonymisation procedures, all responses to open-ended questions were removed and the respondents' IDs were changed.

Data preparation: Following the data collection phase, the data underwent a complex three-step editing process. A data editing program was used that had been developed especially for this purpose (PatchTales) and which aided to perform the three steps of this process. In the first step, the cases that needed to be edited had to be identified. Second, in simple cases amendments were made according to clearly defined data editing rules; and third, individual solutions were found for the remaining problematic cases. In this process, not all the details were checked but in particular the correct allocation of the events to the relevant module and the temporal consistency across the life history. Furthermore, various texts that were recorded in response to open-ended questions were coded.

Selectivity and weighting: In order to find out how representative the sample is, selected distributions that were obtained from the edited ALWA data were compared to distributions resulting from the German Microcensus for the birth cohorts included in the survey. When comparing simple distributions, some differences are found which are characteristic for surveys in which respondents have no obligation to provide personal information. For instance, in the ALWA data younger age groups, individuals with no education or only a low level of education, and individuals with a migration background are under-represented. Based on the marginal distributions of the 2007 Microcensus, design weighting factors and calibration weights were determined which can be used to calculate a weighting factor.

2 Qualifications, Competencies, and Employment Histories – the Project

In view of the current debate about the importance of basic cognitive competencies such as literacy and numeracy for children and young adults, it is surprising how few empirical studies have been conducted that deal with the importance of such competencies for adults' careers and employment trajectories. Recent publications about the PISA and TIMSS studies (Baumert et al. 2000a; 2000b; Deutsches PISA-Konsortium 2001) have drawn attention to young people's deficits in the fields of numeracy and literacy, resulting in a considerable media response. These empirical results are consistent with the dissatisfaction expressed repeatedly by training establishments according to which many applicants for apprenticeships are inadequately prepared with regard to numeracy, reading, and spelling skills and would therefore fail in assessment procedures. Similar complaints can be heard with regard to the competences necessary for successfully completing university studies (see Köller & Baumert 2002 for an overview). Since there is an imbalance between formal qualifications on the one hand and basic cognitive competencies and their utilisation possibilities on the labour market

at the other already when young people switch from school to the vocational training system, it seems likely that this might also have consequences when people reach the more difficult transition from training to employment, i.e. it might additionally reduce career opportunities later on in the employment trajectory.

However, up until now extensive studies on the literacy of adults are rare in Germany. According to estimates by the German Federal Association for Literacy (Bundesverbandes Alphabetisierung e.V.) approximately four million adults are regarded as "functionally illiterate". Due to their considerable deficits in reading and writing they have difficulties coping with everyday life and participating on an equal footing in social, political and economic life. In view of these discussions it is surprising how few empirical studies have been conducted in Germany that deal with the importance of such basic competencies for careers and for employment trajectories in general.

The importance of basic cognitive competencies for working life is discussed in particular against the background of the advancing development towards a "knowledge society". Today more than ever adequate literacy and numeracy skills are considered essential for successful participation in the labour market and for keeping pace with the ever increasing complexity of labour demands. Labour market segments with high demands regarding workers' cognitive skills are growing, whilst especially traditional industrial and manufacturing-oriented fields with low demands are declining. There are also authors, however, who disagree and assume that the importance of such skills is declining due to technological change, in particular in the area of low-skilled jobs. Tyler (2004), for instance, gives the example of a counter clerk, who today requires skills such as friendliness and empathy more than (mental) arithmetic skills (see also Autor et al. 2002). Empirical findings as to which of the two theses applies best – that of the increasing complexity or that of the decreasing importance of cognitive skills in certain fields of employment – are scarce to date.

A relevance in terms social inequality results from the more general questions regarding the mechanisms and principles of allocation in the labour market. A yet unanswered question is whether access to certain positions follows a meritocratic principle, in other words according to "achievements", or a credentialist principle, i.e. based on formal qualifications, whereby they serve less as a measurement of performance and more as a "social" criterion of exclusion. The issue of whether actual skills or certified qualifications determine the access and allocation process on the labour market is of particular importance here.

Depending on how these questions are answered, there are different conclusions with regard to education and labour market policies: if competencies are only rewarded if accompanied by certificates, then such certificates would have to be created (at gateways that have yet to be identified) and it should be made easier to catch up on qualifications later in life. If cognitive competencies can be used on the labour market even without corresponding certification, informal forms of learning are considerably more important than in the first case, and it is worthwhile investing in such informal learning processes, too. By analyzing those data certain social groups and transitions or critical events in the life course of adults can be iden-

tified, in which deficits in basic education become visible and that are relevant for the future employment trajectory. On this basis it is possible to identifyindividuals that should be supported. Moreover, one might also infer which education or training programme would be suited best to do so, in order to facilitate their re-entry into employment or to ensure their employment stability. Finally, basic conditions under which it is possible to learn or brush up basic cognitive skills at a (comparatively) late age can be identified as well as conditions that constitute barriers to doing so.

The educational policy and labour market policy scenarios mentioned here, which can result from different interactions between basic cognitive competencies, certificates and employment trajectories, are of importance especially in practical terms. For the IAB as a research institute with the main task of examining the effects of employment promotion, in particular the effects that education, training and employment measures have on placement prospects, employability and occupational trajectories (§ 282 (3) Social Code Book III (SGB III)), these conclusions are of particular relevance in order to be able to derive recommendations for the range of measures offered by the Federal Employment Agency.

The aim of the IAB ALWA study is to use these new data to examine relationships between formal qualifications, basic cognitive competencies and employment trajectories of adults in a longitudinal perspective. From a sociological perspective we are particularly interested in the interactions between certified qualifications and basic cognitive competencies as well as their respective importance in different phases and situations in the employment trajectory. While various studies support the influence of formal educational and vocational qualifications on occupational trajectories (Müller et al. 1998; Konietzka 1999; Allmendinger 1989; Blossfeld 1989), the exact relation between particular occupational qualifications and or educational certificates on the one hand and cognitive competencies on the other remains unexplained so far. Up until now the question as to whether competencies (independent of formal qualifications and grades) constitute additional individual resources that initiate or continue successful employment-careers remains largely unanswered. Equally little empirical research has been conducted how cognitive competencies can change in different employment situations even in adults.

Our project covers three key research questions: first the relation between basic cognitive competencies and formal qualifications in different labour market groups, second the importance of basic competencies for career success as compared to formal qualifications, and their respective impact on the employment trajectory, and third the interplay between the employment situation, participation in education and training, and changes in basic competencies.

We are first interested in the relationship between formal qualifications, educational achievements and basic cognitive competencies in adults who have already completed their schooling. To what extend do these dimensions correspond and for which groups is this the case? And to what extent do they diverge? It is a well-known fact from the PISA study that there are already substantial overlaps in literacy and numeracy among 15-year-olds at differ-

ent types of schools (Artelt et al. 2001: 44). If we look at adults, who followed different educational tracks after leaving school, who participated in different training measures and whose occupational trajectories have been differing as well, these discrepancies can be assumed to become larger with age.

The second basic research question is: do basic cognitive competencies such as literacy and numeracy provide an independent explanation for occupational trajectories and career success in different dimensions beyond formal qualifications and work experience? Given the current, inadequate state of research we are unable to answer this question precisely. We simply do not know whether cognitive competencies have an impact on occupational success beyond the effects of qualifications, certificates and occupational experience or whether by incorporating these competencies into statistical models we would merely be able to describe the actual situation somewhat more precisely than it could be done before. Most likely it would be possible to break down the variance of employment conditions and trajectories within otherwise equivalent educational groups, if basic cognitive competencies are taken into account. Such an extension can also help to clarify inadequate employment, in other words employment relationships in which the vocational qualification held by the worker does not correspond to the qualification formally required to perform the job. From a life course perspective it appears to be necessary to expand this research question: how do the relationship between and the importance of general competencies, educational achievements and vocational qualifications change (Allmendinger & Leibfried 2003; Bolder 2002)? Results could reflect either cohort-, period-, or age effcts: in different labour market situations or depending on the educational level of the respective competitors, educational qualifications or competencies may be more important. Different criteria may be decisive in various phases and at various points in the employment trajectory, such as the first regular job, entry in or return to the labour market following a period of unemployment, or for getting a promotion. One of the questions that we wish to answer in this context is whether formal qualifications are a decisive factor in particular for new hires, i.e. especially for the first regular job and when changing one's employer, whilst in the case of promotion within the same establishment other criteria such as basic cognitive competencies are more important. Moreover, from a sociological life course perspective aspects of social inequality that are associated with education are of interest, too. The question thus arises as to which criteria generate inequality at various junctures in the life course and how inequality consolidates to become permanent. Thus it is conceivable that, for example, experiencing unemployment may influence the mechanisms governing subsequent mobility, because the negative effect created by unemployment interferes with the positive influence of education.

The third research question takes up the hypothesis that not only the usability of qualifications and competencies but also the qualifications and competencies themselves may change over time. It is plausible that they may change considerably during and depending on the employment trajectory. In principle, processes of formal and informal education might take place at any time: further vocational qualifications and certificates can still be gained

even after initially leaving the education system; in everyday working life, existing skills are "trained", and sometimes entirely new skills are learnt. However, existing knowledge and certain skills may also be lost over time. The changes in qualifications and competencies depend in turn on the individual employment position: various studies reveal a positive correlation between advantageous employment situations and positions and participation in education and further training (Büchel & Pannenberg 2004; Schömann & Becker 1995; Jacob 2004). Other studies examine the loss of such qualifications, for example due to unemployment (Mincer & Ofek 1993; Coles & Masters 2000). However, these studies do not provide a more precise and comprehensive analysis of which cognitive competencies actually change in which employment situations. It presumably applies that the more often a certain skill is used in everyday working life, the better it is maintained – the more seldom it is used, the more quickly it is (at least temporarily) lost.

From a theoretical point of view the project is based on human capital and signalling theory and is taking up on their conceptual and empirical gaps. In methodological terms it follows the concept of competence as it was developed in the research tradition on students' achievements, in which competency is understood to be a basic form of education, in other words primarily as cognitive skills and knowledge that are imparted at school. In this field of research substantial findings from empirical research are available, for instance from the international comparisons of student achievement PISA, TIMSS and IGLU. With IALS and ALL there are also two internationally comparative studies on adults. The existing research into adults' competencies therefore draws strongly on these two data sources. Germany did only participate in the IALS study. However, the data from this study up until now have been insufficiently analysed. To this day there are no studies, from any country, that explicitly examine relationships between basic competencies and aspects of the employment situation, and which take up a rigorous ongitudinal perspective.

3 Data Collection

A survey in which only current information is collected (cross-sectional design) is unable to record the interaction between educational processes, the acquisition of competencies and employment trajectories in their temporal succession. To do this properly, a longitudinal design is required which displays all of these dimensions and is at the same time reflecting the correct course of events. Whilst individual education and employment trajectories are well recorded in retrospective longitudinal studies (Mayer & Brückner 1989), the procedures used in these studies are not suitable for recording changes in competencies over the life course. For this, repeated measurements are required. This results in the necessity to combine a retrospective survey of the education and employment history with a panel design that includes repeated tests of key competencies.

The ALWA data documented here comprise the life courses that were recorded retrospectively in the telephone interview (CATI survey). The main priority was to collect detailed information on education and employment trajectories, as well as on the respondents' residen-

tial and family history (see Chapter 4). In the context of retrospective longitudinal studies, computer-assisted interviews have proven to be very suitable for recording complex life histories. The questionnaire can be tailored flexibly to the individual life courses, filter questions are routed automatically and response and data checks are implemented directly into the survey. The interviewers can refer to information provided earlier during the interview in order to assist the respondents' memory (Matthes et al. 2005). These tools make it possible to minimise the work involved in editing life course data. Telephone interviews permit a realisation of representative samples despite cost restrictions. Moreover, they allow systematic monitoring and supervision of interviewers with clear cost advantages compared to face-to-face interviews.

One of the focuses of the CATI survey was the acquisition of qualifications in the context of formal education and training activities. One aim of the survey was to depict all of the respondents' education and training activities retrospectively as fully and precisely as possible. This involved having to record the entire education and training history, starting with attendance at general-education schools, through completion of vocational training, to periods when general school qualifications were gained after regular schooling or when further training courses are attended. This was all recorded irrespective of how long the periods of education or training lasted or whether a certificate was gained or not.

A further focus was the detailed recording of the employment history. Here we were interested in all periods of employment, even if some of the jobs were held simultaneously, all periods of unemployment, even if the respondents did not receive benefits, periods of parental leave, periods of military or alternative civilian service, as well as what respondents did in the remaining periods.

In the second part of the survey, competency tests of reading comprehension and numeracy skills were conducted in personal interviews. These data are not included in the scientific use file and are therefore not dealt with in more detail here.

3.1 Rigorous Modularisation

Due to the increasing complexity of education and employment histories, e.g. participating in education while in employment, or employment in the context of parental leave, it is no longer possible to record them as virtually continuous histories that are only interrupted, if at all, by periods of unemployment or economic inactivity. In order to prevent parallel education or employment activities and short periods of unemployment from not being reported or the education and employment trajectory from being smoothed out, the data collection procedure was systematically modularised. This means that all parts of the education and employment history that are of interest are treated as separate longitudinal modules, so that the respondent has to go through his life again in each of these modules. The individual modules are employment, education and training activities, periods of unemployment, military and alternative civilian service, and periods when the respondents were economically inactive. Within

these modules information is gathered about individual episodes in chronological order, i.e. sequentially.

One problem that arises with this modularised survey form is the positioning of individual episodes in time, as the chronological order of the entire life course is lost. To assist the respondents' recall ability it had to be possible to refer to selected responses made in other modules of the interview and to obtain an overview of the entire life history reported. This problem was tackled by two strategies: first, within the modules the interviewers were provided with tools to enable the respondents to support their information about one particular episode with other events, also from other life domains. During the interview previously collected autobiographical data on the respondent was used and inserted into questions in the form of adjusted question wording. In addition, if necessary the interviewer was able to provide details about events that had already been recorded in the interview as context for other information that was to be recalled.

Second, after the collection of data, a data revision module was used to check, and if necesssary correct, the dates for temporal consistency. This was done in collaboration with the respondent. This immediate editing of the data was integrated into the survey to clarify any inconsistencies with the respondent already during the interview and not after the interview has been concluded. It is structured as a biographical calendar as these are suitable for checking data with regard to their overall temporal and content-related consistency. When all of the episode details have been merged, the result is shown to the interviewer on the screen in both graphical and tabular form. All gaps, parallel states and overlaps between the individual episodes which were defined by us prior to the survey are indicated and marked in colour. This makes it easier for the interviewer to recognise the temporal inconsistencies that need to be checked and to identify the type of problem clearly so that he can explain the necessary corrections precisely to the respondent.

3.2 Sample Design

The population consists of all individuals living in Germany who were born between 1956 and 1988, irrespective of the language they speak, their nationality or their employment status. It does not include people living in institutions (old people's homes, prisons etc.), however.

The choice of this survey group and the size of the sample may at first sight appear unusual for employment research. However, on closer inspection it becomes clear that a representative picture of Germany's population was essential for the study design. First, it avoids the personal addresses being conditioned on the employment status at the time when the sample was drawn. Analyses referring to retrospective events or sequences are therefore not affected by certain groups being left-truncated: individuals who were previously employed but are no longer economically active when the sample is drawn (in particular pensioners and mothers with small children) would otherwise not be recorded. This selectivity does not occur in a general population sample as the current target group corresponds to the target group in the past – apart from deaths and in-migration and out-migration. Second, a general popula-

tion sample permits a control group design for all conceivable research questions. If instead a sampling procedure would be preferred that is based solely on employees that are subject to social security contributions, control groups such as civil servants, the self-employed or economically inactive individuals would be systematically excluded from the sample. Third, in addition to the methodological reasons there are also content-related aspects which favour a sample that is representative of the general population. For instance, throughout the world no analyses have been conducted to this day into the impact of employment interruptions on the development of competencies. Findings on this issue could provide valuable ideas for the adequate reintegration into the labour market of people who are temporarily inactive – a task which is of elementary importance in particular for the Federal Employment Agency.

The reason why only individuals of the birth cohorts from 1956 to 1988 were taken into consideration for sampling is mainly associated with content-related aspects. Those born before 1956 gained their school and training qualifications before the expansion of the education system in the 1970s. The systematically different life courses of people who completed their schooling and vocational training before the educational expansion and those who did so later can at first glance be attributed to the different institutional conditions. In addition, it would be necessary to develop a special questionnaire for older individuals that dealt with the education and employment biography in less detail and would more strongly focus on the phase of transition into retirement. These considerations for the over-50-year-olds apply to the respondents below the age of 18 in the opposite direction: in this case a questionnaire would have to be developed which concentrated more on the phases of schooling, training, and labour market entry.

The sample was drawn in two stages: first a sample of municipalities (Gemeinden) was drawn from the municipality data made available by the Federal and State (Länder) Statistical Offices. The sample of municipalities (primary sampling units or PSUs) was drawn using the pps (probability proportional to size) technique, i.e. the selection probability of the municipalities was proportionate to the extrapolated resident population in the target group. 281 sample points were drawn, which represent 250 municipalities. Owing to the comparatively large number of PSUs, the expected design effect is very small due to cluster sampling, i.e. there can be assumed to be intracluster correlation coefficients (ICC) that are small on average, and consequently a clustering factor that is small on average.

The addresses of the target persons (secondary sampling units or SSUs) in the 250 local authority districts selected were drawn from the registers of the residents' registration offices using a systematic random sampling procedure (interval sampling). Taking a random address as the starting point, the other addresses were systematically sampled at set intervals. All of the registered residents of the age cohorts from 1956 to 1988 whose primary residence was in one of the selected municipalities on the sampling date were included in the selection. A total of 152 addresses were drawn randomly per sample point, i.e. the entire gross sample comprised 42,712 addresses.

After the addresses had been transmitted by the municipalities, telephone numbers were researched for the entire address sample using up-to-date digital telephone directories. Older editions of digital telephone directories were also used. In this way it was possible to identify the telephone numbers for 52.6 percent of the addresses, so that the gross sample to be used included 22,656 individuals. These addresses were entered successively into fieldwork in three separate tranches.

3.3 Pilot Study and Pre-test

The main survey was preceded by a pilot study and a field pre-test in order to identify any possible problems beforehand. In 2004, the pilot study was used to test whether it was possible to administer competency tests to adults in the context of a personal interview. The pilot study revealed that if the interviewers are given clear rules of conduct, it is possible to administer competency tests in personal interviews and that they are met with broad acceptance among adults.

In addition to the pilot study, a field pre-test was conducted from October 2006 until March 2007. Here the entire course of the main study was tested (first a telephone interview comprising the life course survey, followed by a face-to-face interview whose key function was to test basic cognitive competencies). Special attention was paid first, to the acceptance and duration of the telephone interviews on the life course and second, to the selectivity created by agreeing or not agreeing to participate in the subsequent test of basic cognitive competencies. It was also tested whether offering a prepaid incentive can offset the expected lower willingness to participate among individuals with low educational levels.

3.4 Survey of Non-telephone Households

In order to test selectivity effects of the addresses for which no telephone number could be obtained, a sample of 4,205 individuals were asked to complete a short written questionnaire. Unfortunately only 375 of these individuals responded. It is therefore not possible to draw reliable conclusions about selectivity effects resulting from telephone numbers that could not be identified.

3.5 Cover Letter and Incentive

In the run-up to the survey all of the target persons were sent a cover letter explaining the selection of addresses, information on legal grounds for drawing the sample and on the voluntary nature of participation in the survey. A leaflet regarding data protection regulations was also enclosed.

The letter briefly informed the target persons about the background of the study and announced that a member of staff from infas would soon contact them by telephone. This letter did not inform the target persons about the second component of the survey, the tests of competencies, for which they would be expected to work through some test booklets. No information about this was provided until the end of the telephone interview. The target per-

sons were given the name and telephone number of a contact person involved in the project management at infas whom they could contact if they had any questions.

The personal letters for each of the address tranches were sent shortly before the target persons were contacted. A second letter was sent on request.

As an incentive for the CATI interview, all participants were entered into a lottery with 60 prizes (notebooks, travel vouchers, iPods).

3.6 Training and Supervision of Interviewers

A total of 216 interviewers were involved in conducting the CATI interviews. The selected interviewers have extensive experience in conducting studies with retrospective longitudinal designs. The interviewer training courses were held in the training rooms of the infas telephone studio. The full-day courses focused on introducing the survey instrument and the methodological features of the study. After an introduction to the project background and the objectives of the study, the sample and the special issues regarding the processing of addresses were explained. By going through the telephone questionnaire, the individual questionnaire modules were then presented. For each module the content-related aspects of the questions and specific issues were explained first. Then the trainers went through the module with the interviewers using practical exercises. Particular emphasis was placed on the data revision module, in which the biographical events that were recorded according to event types beforehand were then integrated into a chronological sequence. The adequate use of the data revision module was trained intensively, especially with respect to events with missing dates, and to asking questions about overlapping events and gaps in the life course. Importance was attached both to the content-related features and also to familiarising the interviewers with the technical handling of the survey instrument. Following this joint introduction, the interviewers familiarised themselves with the instrument individually using a test version of the questionnaire. In a joint feedback session the entire interviewer team was given answers to all of the questions that have come up. In addition to the oral training course, each interviewer was given a copy of the comprehensive study-specific interviewer manual, which was written jointly by infas and the IAB. The objective of the interviewer manual was to equip the interviewers with all of the necessary standardised information on the project and its implementation.

Three issues were guaranteed by means of supervision: a) continuous follow-up training in the telephone studio, b) monitoring of the input data by listening in on interviews on a random basis and comparing them with the supervision mask and c) direct intervention in interviews if problems arose which threatened to lead to incorrect filtering and gaps. Every day the project managers were given quality figures about all of the interviewers deployed, which included among other things the average duration of the interviews, the gross contact time, the proportion of interviews conducted and rates for neutral non-response and refusals. In order to provide additional incentives for improving the quality of the data, a bonus system was used for the interviewers.

3.7 Fieldwork Management

The precondition for achieving an optimal response rate from a sample is that the target persons are contacted intensively. In principle there was no restriction on the number of contact attempts made when working through the addresses. The basis for the fieldwork management in the telephone studio was the telephone number file, which manages the addresses systematically according to the respective contact status and distributes them to the interviewers. The target persons were contacted from the telephone studio between 9.00 a.m. and 9.00 p.m. on working days and between 10.00 a.m. and 6.00 p.m. at the weekends. All contact attempts were stored in a data file. On average 10 contact attempts were necessary before an interview could be conducted. In the case of individuals who were at first refusing to participate, 14 contact attempts were needed. In total 301,632 contact attempts were made, which reflects the large amount of effort invested to achieve the highest possible response rate.

3.8 Foreign Language Interviews

For target persons who, when contacted, were found not to be able to speak German well enough to take part in a telephone interview and who spoke Russian or Turkish, shorter foreign language versions of the German questionnaire were programmed. In the shorter foreign version the biographical sequence of the education and employment history was not surveyed, but cross-sectional questions about these subject areas were asked instead. The telephone interviews in foreign languages were conducted by interviewers from the infas interviewer team who spoke the respective language as their mother tongue.

3.9 Refusal Conversion

All individuals who had not conclusively refused to participate or who did not wish to participate for data protection reasons were classified as soft refusals. The German-speaking target persons among these, who were not willing to take part in an interview when they were first contacted, were approached again in order to persuade them to participate in the study. The second contact attempt and, if this was successful, the subsequent interview were carried out by especially trained interviewers using the German CATI questionnaire. Soft refusals who could still not be persuaded to take part the second time they were contacted were asked to answer the non-response questionnaire.

3.10 Non-Response Questionnaire

If a target person did not wish to participate in the survey despite all persuasion attempts and information, he or she was first asked to state the exact reason for non-participation. If it was not a case of absolute refusal to participate then the respondent was asked to answer a few non-response questions in order to permit statistical statements about those people who decided not to take part in the survey.

3.11 Interview Duration

The average duration of the interview conducted in German (including the questions asked by the interviewer) was 62 minutes, with a minimum of 17 minutes and a maximum of 293 minutes. The interview duration increased with the respondents' age, as the survey instrument used was a questionnaire with a retrospective longitudinal part. Younger respondents generally have a smaller number of biographical events to report. Accordingly the interview duration is shortest in the group aged 17-20, at 41 minutes, whilst the longest interviews can be found in the group aged 46-51, with an average duration of approximately 70 minutes.

The foreign-language interviews lasted 20 minutes on average (minimum 11 minutes, maximum 65 minutes).

3.12 Consent for Merging Data and Willingness to Take Part in the Panel

During the interview the respondents were asked for their consent for their social security data to be merged with the survey data. The question was positioned between the module on employment and the shorter module on unemployment as these are the two modules to which the question refers in terms of contents. The result was that 92 percent of the respondents of the 10,177 interviews conducted in German gave their consent. During the interviews conducted in foreign languages the proportion of respondents who gave their consent for the merging of social security data was considerable lower, at 79 percent.

When asked at the end of the telephone interview, 93 percent of the German-speaking respondents agreed to their address data being stored for the purpose of a follow-up survey. The willingness to participate in a panel survey is lower in the foreign-language interviews, at 82 percent, than in those conducted in German.

4 Data Structure

The survey was conducted in modular form, i.e. the questions on particular life domains were asked one after the other, successively. Each module was self-contained. The data in the cross-sectional modules and the cross-cutting questions in the longitudinal modules are filed in ALWA1_QS. The episode data in the longitudinal modules are filed line by line as spells containing start and end dates, whereby each line can be assigned to one specific questionnaire module. This means that one person can report several episodes per module. The questionnaire for the telephone interview consists of eight blocks of questions:

Overview of modules

Question block	Module	Dataset
Cross-section 1	Personal data	ALWA1_QS
Residential history	Residential history	ALWA2_WG
	Residential history data revision module	
Education, training and employment history	Schooling history	ALWA3_AS
	Vocational preparation	ALWA4_BV
	Vocational training	ALWA5_AB
	Military / alternative civilian service	ALWA6_WD
	Periods of employment	ALWA7_ET
	Periods of unemployment	ALWA8_AL
Family	Partnerships	ALWA9_FP
	Children	ALWA10_KI
	Parental leave	ALWA10_EZ
Data revision module	Gap activities	ALWA11_LUE
Cross-section 2	General information about the individual	ALWA1_QS

After a few personal questions (date of birth, gender, born in western Germany, eastern Germany or abroad, nationality etc.) have been answered, the entire residential history is traced. This is followed by a large block of questions in which the entire education, training and employment history is recorded. In the next block regarding the family, questions are asked about the current partnership and all previous partnerships as well as about all children. Finally, in the "general" question block some cross-sectional data (e.g. about parents) are recorded. The amendments and corrections made during the checks of the residential history and the education, training and employment histories are entered directly into the respective module. Regarding activities that cannot be assigned to one of the longitudinal modules, the respondents are asked about the activities in the gaps in the education, training and employment history check.

4.1 Cross-Section 1

The questionnaire begins with basic sociodemographic information about the respondent, such as gender, date of birth, country of birth, date of immigration in the case of individuals born abroad, and questions on nationality.

4.2 Residential History

For the residential history all the places of residence (municipalities) in which the respondent had lived since his/her birth were recorded. In addition to changes in the place of residence that were due to relocation, secondary residences were also recorded, at which the respondent might have lived in addition to the place of residence of his/her household, e.g. for employment-related reasons, due to vocational training or while working as an au-pair, were also recorded.

A residence episode lasts from the date when the respondent moved to a place of residence until the date when he or she gave up the home in that place of residence. Periods when the

respondent was resident in more than one location were recorded as several separate episodes. They simply overlap temporally.

When recording the residential history, a distinction was made between places of residence in Germany and places of residence located abroad. For places of residence located in Germany respondents were asked to name the municipality (Gemeinde) to which this place of residence belongs. For foreign places of residence respondents were asked to name the country. For the questions about the municipality and the country names, the survey instrument had lists to facilitate the proper classification of municipality or country details. As in Germany some community names might occur more than once, we added further information such as the administrative district (Landkreis) or the federal state in addition to the name, if necessary, in order to make an unambiguous identification possible. The interviewers were instructed to take care when selecting the place names that occurred more than once in the list and if necessary to repeat the relevant questions. If the place name was not listed, the interviewers were to ask the respondents to spell it. If the place name still could not be found it was possible to record it as an open-ended response. If the place name was recorded as an open-ended response, the federal state to which it belongs also had to be reported. For individuals who had a place of residence abroad, the country was recorded in the same way. If the country was not in the list, it was also recorded as an open-ended response.

After the places of residence had been recorded, the temporal consistency of the residential history was checked using the data revision module for residential histories. In this module episodes could be added, dates could be corrected and overlaps were checked.

At the end of the module on the residential history we wanted to know when the respondent set up his or her first own household. The autonomy of the housekeeping (such as cooking, washing up, cleaning) and the individual's independent control of financial matters (e.g. the respondent had a certain amount of money at his/her disposal, irrespective of its source, and had sole responsibility for this money) were regarded as criteria for the existence of a person's own household. Under this definition an individual setting up his/her own household in his/her parents' house is also conceivable.

4.3 Educational History

In the schooling module data were collected on all periods of education that led to a general school-leaving certificate or – if the period of schooling was not completed – would have ended in such a qualification. The module began with the first day at school and went as far as the actual or planned qualification.

The module began by asking the respondent whether he/she had attended any school of general education- in Germany or abroad. There was also an option for respondents who had never attended school, since it is not always the case that a person has attended a school of general education. A respondent may, for example, have been taught at home or may not have attended a school for another reason. In the case of foreign school types and

qualifications, the respondent was asked to report the equivalent school type or qualification in the German education system.

Only a change to a different type of school was recorded as a new episode, i.e. a switch from one grammar school to another was not recorded. Even if the two grammar schools were located in different places, changing from one to the other was not recorded as a new episode. A change to a different type of school was recorded, however, even if the two schools lead to the same qualifications (e.g. a change from a grammar school to a comprehensive school with the “Abitur” as the school-leaving certificate, or a change to a specialist sports school). School certificates which are automatically awarded together with a certain vocational qualification (e.g. a certificate of aptitude for attending a master craftmens’ or technicians’ school is attained automatically on completion of an apprenticeship) were not recorded as separate episodes. General school certificates which were gained after the end of full-time schooling were recorded as separate periods of schooling and the date when the qualification was gained was also recorded.

When recording school episodes, a distinction was drawn between periods of schooling as a main activity and periods of schooling completed alongside another main activity. There may also be parallel full-time activities: for instance in the former GDR there was a special programme integrating a vocational training certificate and an upper secondary school leaving certificate (Berufsausbildung mit Abitur). Thus students would leave school with both, a general education certificate, qualifying them for university entrance and a vocational qualification. If a respondent had gained a degree while attending a school abroad, the interviewer asked whether he/she had applied for this qualification to be recognised in Germany and if so, whether it was actually recognised.If a respondent had completed a period of schooling in Germany after the age of 14 he/she was asked whether he/she had spent at least one month abroad during this period, e.g. on a school exchange. Short periods of attendance at partner schools or school trips abroad were not regarded as periods of residence abroad, however.

After the schooling episodes had been recorded, there were some additional cross-sectional questions. The respondents were asked whether they had been among the best or the weakest pupils in the school subjects German and maths at the end of their schooling and what their desired occupation had been when they left school. Finally, the respondents were asked to assess their own current reading and maths skills.

4.4 Vocational Preparation

After the schooling episodes it was recorded whether the respondent had taken part in a vocational preparation scheme and, if so, from when and until when they did so. It was assumed that the respondent would know whether he or she had completed such a scheme and if so, which one. The types that could be reported were participation in a vocational preparation year (Berufsvorbereitungsjahr - BVJ), which helps school-leavers who were unable or unwilling to find an apprenticeship position to make career decisions and to choose a vocational education later on; participation in a basic vocational training year (Berufsgrund-

bildungsjahr - BGJ), which is intended for school-leavers who were unable to obtain an apprenticeship position in their desired field; the programme comprises attendance at a full-time basic vocational school (Berufsfachschule) for one year in order to gain basic vocational skills that are not equivalent to a (full) vocational qualification; participation in a compulsory internship programme (Berufsvorbereitendes Pflichtpraktikum), which gives young people the opportunity to test whether the occupation they wish to choose really fits their needs; and participation in one of the vocational preparation schemes (Berufsvorbereitende Bildungsmaßnahme - BvB) run by the Federal Employment Agency (Bundesagentur für Arbeit), for example schemes to improve occupational training and integration opportunities (BBE), basic training courses (Grundausbildungslehrgänge - GAL), so-called TIP courses, integration support courses for young people with disabilities, integration training for young people (Eingliederungsqualifizierung Jugendlicher - EQJ), employment and training for young people (Arbeit und Qualifizierung Jugendlicher - AQJ), whose aim is to prepare young people for training, occupation or the career choice.

4.5 Vocational Education and Training History

In this module all initial and further vocational training and academic courses that a person had ever begun were recorded. The following types of vocational education and training were recorded:

- apprenticeship (training as a skilled worker/vocational education in the dual system), including courses of retraining
- training at a full-time vocational school / training at a school for health care occupations
- training at a school for advanced vocational education (also training as an instructor)
- training as a master craftsman or technician
- studies at a professional college (Berufsakademie), including colleges of advanced administrative and commercial studies (Verwaltungs- und Wirtschaftsakademie), at a university of applied sciences, or at a university
- postgraduate studies (doctorate/postdoctoral thesis)
- specialist medical training
- career examinations for the civil service
- courses run by professional associations and chambers
- courses for the acquisition of a licence

Short work-related further training courses, such as computer courses, were not recorded here if they did not lead at least to the acquisition of a licence, like e.g. a license as network administrator.

Periods of on-the-job training, traineeships and ecclesiastical preparatory training, periods of voluntary service, probationary years, time as a first-year resident doctor, pharmaceutical internships, and internships as a precondition for a degree course (e.g. preliminary internships for degree courses in engineering) or internships after completing training or gaining a

degree were not recorded as training but as employment. As the questionnaire module on employment does not contain any questions about qualifications that may be associated with these periods of employment, for example the second or third state examination following a traineeship, these qualifications were recorded in the module on training in a special follow-up section. In these cases the training phase was not recorded but simply the date when the qualification was attained and the type of the qualification were noted.

All periods of training during which the respondent received a wage or salary (not a training allowance) and had a contract of employment (not a training contract) with the establishment providing the training were recorded as training while in employment. This includes training courses which are integrated into a civil service career and in which the civil servant status is retained (at colleges of administrative studies, police colleges or military universities, in training courses in the diplomatic service or postgraduate courses such as criminology).

The questions about the type of training were followed by questions about the occupation or the field in which this training was completed. As with the schooling episodes, for the training episodes the interviewer asked whether the training was the main activity performed at the time or whether it was performed alongside another activity. Further questions dealt with the establishment providing the training, whether it was a firm or an external training establishment, the economic sector of the training establishment and how many people were employed there.

At the end of the training episodes, for each training course completed abroad the interviewer asked whether the respondent had applied for the certificate to be recognised in Germany and, if so, whether it was recognised as equivalent to a German qualification. In the case of training courses completed in Germany, it was asked whether at least one month had been spent abroad as part of the training.

4.6 Military Service, Civilian Service, Alternative National Service, and Voluntary Service

In this module all periods of military service, alternative civilian service, alternative national service, voluntary social service, voluntary ecological service and voluntary European service were recorded. Both men and women were asked about periods of military service as some countries, e.g. Israel, have introduced compulsory military service for women as well. Periods spent as an active reservist, i.e. periods of time when an individual was enlisted for a military exercise or another military service event in the German armed forces or other armed forces were also recorded as military service.

Recognised conscientious objectors perform civilian service as an alternative to military service. Alternatively, other services such as a year of voluntary social service (Freiwilliges Soziales Jahr - FSJ), a year of voluntary ecological service (Freiwilliges Ökologisches Jahr - FÖJ), a year of voluntary European service (Freiwilliges Europäisches Jahr - FEJ) or another service abroad are also possible. These latter services might also be performed by women on a voluntary basis, so women were also asked questions about them.

Alternative national service is another alternative to military service. Instead of performing military service, in Germany it is possible to enlist with various organisations to work in civil defence or emergency services. This service is generally performed with the volunteer fire service, the “Technisches Hilfswerk” (the federal agency for technical relief) or charitable associations (e.g. in the ambulance service) alongside a regular job.

If any of the services listed above lasted more than two months, then questions were also asked about further training activities.

Activities as a regular or professional soldier were not recorded in this module as these activities were regarded as periods of employment and were recorded in the employment module. If a respondent had switched from compulsory military service to service as a regular or professional soldier, only the compulsory military service was recorded here. The time as a regular or professional soldier was recorded later in the employment module.

4.7 Employment History

In this module all periods of employment were recorded, irrespective of the number of working hours per week. A new employment episode was defined by a change of employer, a change in the task performed or by an employment interruption (e.g. due to unemployment, parental leave or military/alternative service).

First all “regular” jobs and jobs performed parallel to vocational training were recorded. In order to prevent any jobs to be forgotten, follow-up questions were asked about jobs that provided the first experience of work following vocational training or higher education. Questions were also asked about secondary activities such as second jobs, marginal employment, activities performed part-time alongside another job and unpaid family work. Pupils’ work placements and internships which are components of vocational training or degree courses (for example obligatory internships as part of a university education), voluntary activities or holiday jobs were not recorded as periods of employment.

For each employment episode there was a set of questions that was larger or smaller depending on the filters. The occupational tasks performed were to be described precisely in two open-ended questions. Respondents who were neither self-employed nor freelancers were asked whether their job was permanent or fixed-term in the particular episode. The 6-month probationary period which is common in German firms and the induction period for a new activity are not regarded as fixed-term jobs. Employment episodes which are automatically regarded as fixed-term are: periods of voluntary service, traineeships, ecclesiastical preparatory training, probationary years, pharmaceutical internships, first-year resident doctor, student assistant, internships, job-creation measures (Arbeitsbeschaffungsmaßnahmen – ABM), and so-called one-euro jobs or work opportunities.

The respondents were asked to classify their occupational status in the employment episode as one of the following categories: blue-collar workers, i.e. people who perform physical or mental work and are often paid on a piecework or an hourly rate; white-collar workers, i.e.

employees who perform mainly mental work and are paid a fixed monthly salary; civil servants, i.e. individuals who are appointed by an employer in the civil service; regular/professional soldiers, i.e. people who have enlisted voluntarily for service in the German armed forces or another army for life or for a certain period beyond the duration of mandatory military service; unpaid family workers, i.e. members of a household who work without pay and without statutory social security contributions in the firm of another household member or of a relative who does not live in the same household. The survey also asks whether the respondent is a temporary agency worker, i.e. a worker who is hired out by an employer (usually a temporary work agency or a personnel service agency attached to the local employment office) to work for a third party (lessee), or a seasonal worker, i.e. a person who only performs a job on a seasonal basis. Further questions in the employment module concern the regular or contracted working hours at the beginning and the end of the activity (or at present), and the training required for the activity. Another block of questions which were asked for some of the activities included questions about non-formal vocational training and about changes in working time. Interns were asked special questions about pay and activities performed during the internship.

Data about the establishment were also recorded. These included whether the place of work is located in Germany or abroad and the name of the municipality or the country in which the establishment was located. Other establishment variables are affiliation to the civil service and the industry or economic sector to which the company belongs. The economic sector or industry was asked as an open-ended question and therefore had to be recorded as precisely as possible. The size of the establishment was also asked.

In the case of fixed-term contracts which had already ended, the respondent was asked whether he/she entered into a permanent employment relationship after the fixed period or whether the firm offered to take on the respondent on a permanent basis and, if so, whether this offer was taken up. The interviewer also asked whether the employment relationship was terminated by the respondent him/herself or by the firm. This question is also asked of employees with fixed-term contracts as they, too, may terminate their employment contract prematurely. With regard to his/her current job the respondent is asked about current net earnings (for those in dependent employment) or about the profit after tax (for the self-employed).

After the employment episodes have been surveyed, some general questions are asked about career plans, about work in general, about occupational success and about everyday working life. At the end of the employment module the respondents are asked whether they agree that the administrative data of the Federal Employment Agency (BA) might be merged with their survey data.

4.8 Unemployment History

Here the phases when a respondent was unemployed were recorded, irrespective of whether he or she was registered as unemployed at the employment office or not. Throughout this

study we use the term employment office to cover all the different types of publicly run job centres (i.e. also Jobcenter, ARGE etc.). We did not differentiate between periods of unemployment with receipt of benefits from unemploymernt insurance, the old or new unemployment assistance scheme (Arbeitslosenhilfe/Arbeitslosengeld II), social assistance, another benefit scheme or with no income at all. During the course of an episode of unemployment a respondent may therefore, for example, be unemployed at first but not registered as such and then registered as unemployed and vice versa.

If a respondent took part in formal training while unemployed and received “maintenance allowance” from the employment office during this time, a period of unemployment and a parallel period of training were recorded. This does not include the cases where the employment office or any other institution only paid or subsidised the costs of non-formal training.

4.9 Partnership History

In contrast to the other modules of the questionnaire, the partnership history was surveyed starting with the current partnership and working backwards from there, i.e. the respondent first reported about his/her current partnership (if there was one) and then moved on to partnerships further in the past. To do so, the respondent was first asked about his/her current marital status as well as whether he or she was currently cohabiting with the/a partner.

In order to make the interview process easier the interviewer asked the respondent for the respective partner’s first name. The partner’s sex, which is not always clear from the name, was also recorded in order to be able to ask follow-up questions correctly also for people living in same-sex relationships. Then specific follow-up questions were asked depending on the type of partnership, e.g. in the case of married people the date of their marriage (before the law) was recorded and in the case of individuals who were separated from their partner, the date when one of the two moved out of the common household. They were filtered automatically by the computer program. The respondent could also be asked whether the partner was deceased in order to avoid routing to inappropriate questions. In addition the highest general education and vocational qualification held by the respective partner were recorded.

In subsequent loops the same questions were asked about previous partners with whom the respondent had cohabited.

4.10 Children and Parental Leaves

In this module all of the respondent’s children were recorded. These include the respondent’s own natural children (even if they have never lived in the respondent’s household), the partner’s children (only if they live or used to live in the respondent’s household), previous partner’s children (if they live or used to live in the respondent’s household) and foster children or adopted children and any other children who live or used to live in the same household as the respondent and for whom the respondent took on the role of father or mother. Twins (in general: multiples) were recorded separately, i.e. a separate episode is begun for each child.

The first questions concerned the child's name, his/her date of birth and sex, and whether the child is the respondent's natural child or a foster or adopted child. The question as to whether the child is still alive or is deceased was generally unproblematic even in cases where the child was deceased. This question was important in order to avoid being routed to inappropriate questions in the remaining interview.

For all children the periods when the respondent and the child lived together in one household were recorded. In addition the respondent was asked whether he or she currently was or had been entitled to maternity leave or parental leave or to a foreign form of parental leave and, if so, whether this was taken up. Questions were also asked regarding any non-formal training completed during periods of parental leave.

Periods before a birth when a woman is not allowed to work and is accordingly exempt from working (the so-called period of maternity protection) were not recorded as parental or maternity leave. The periods of maternity protection were added on to the respective employment episode. This also means that the employment episode continued without interruption if the mother only took advantage of the statutory protection periods and did not take parental leave, and if nothing changed in her job during this protection period.

4.11 Data Revision Module

In order to check for and correct temporal inconsistencies, during the interview, a special data revision module was developed. This module enabled the interviewer first to check temporal overlaps and gaps and to correct any incorrect details immediately together with the respondent. Second, the interviewer was able to record what the respondents had done during the periods for which up until now no information was available. In the previous modules of the questionnaire there was no possibility, for example, to record periods when the respondent had taken an extended holiday or had been ill. The data revision module now allowed to record these periods by filling the gaps between existing episodes.

If respondents reported having been "employed", "in training", "in school", "unemployed" or "doing military or civilian service" in the periods that had not yet been recorded, the interviewer returned to the relevant module and was subsequently able to add these episodes there. In all other cases gap episodes were recorded by the interviewer asking about the type of activity performed during the gap as well as its start and end dates. The respondent was also asked whether he or she had taken any non-formal training courses during gap periods.

4.12 Participation in short trainings and courses

Not only the acquisition of qualifications in the context of formal educational activities (those were collected in the vocational education and training history) was central to the data collection but also the data collection concerning shorter and less salient further education activities. With the help of a preparatory cognitive pretest, it was shown that context related memory strategies are suitable to improve the retrospective data collection of activities of further

education (Dürnberger et al. 2011). Consequently, for the various longitudinal modules (more precisely for the military service, civilian service, alternative national service, and voluntary service module, in the employment and unemployment histories, in parental leave and the data revision module) it was asked whether a respondent underwent short trainings or courses during the just reported episode and has not reported them yet. In case the respondent approves this, the respondent was asked how many trainings or courses he took part in and how long the duration of those activities was altogether.Not only the aquistion of qualifications in the context of formal educational activities.

4.13 Cross-section 2

The concluding cross-sectional part of the questionnaire dealt with the following areas: the importance of different life domains, leisure activities, the number of books at home, informal learning in the past two years, the mother tongue, foreign language skills, religious affiliation and religiousness, current personal and household income, the language spoken in the household (at present and when the respondent was 15 years old), household composition (number of members, relationship between members), type of family until the age of 15, date and place of birth (Germany or abroad) of parents, parents' educational and vocational qualifications, parents' employment status and occupational status at the time when the respondent was 15 years old, immigration of grandparents to Germany after 1950.

At the end of the interview the respondents were asked whether they would be willing to take part in the face-to-face interview (test booklet) and whether they would be willing to participate in a panel.

4.14 Anonymisation Procedures

In order to make the data of the ALWA study available to the scientific community while at the same time guaranteeing the respondents' privacy rights, an anonymisation strategy is pursued which has to do justice to both interests. Section 16, subsection 6 of the Federal Statistics Law (Bundesstatistikgesetz) allows the scientific community privileged use of research data. This section permits the transmission of individual data to members of the scientific community as long as the individuals can only be re-identified with a disproportionate amount of time, expense and labour. A "disproportionate amount" means that the costs involved in re-identifying individuals in terms of time, expense and labour exceed the benefits of using the data obtained. This type of anonymisation is also defined as factual anonymisation. The main aim of factual anonymisation is to diminish the possibilities for relating variable values to the corresponding individuals by carefully reducing and altering information, but at the same time maintaining the statistical information. In order to do this, the costs and benefits of re-identification have to be analysed for every single survey. According to the Federal Statistics Law, however, factually anonymized data may only be made available to scientific institutions and only for the purpose of conducting scientific projects.

With the ALWA study, the IAB wishes to offer the scientific user a data basis that permits the broadest possible spectrum of scientific research and can also be used off-site. On the other

hand, it is of the utmost importance to the IAB to ensure compliance with the data protection regulations stipulated by the government and to guarantee respondents' anonymous participation in the survey. For this reason the IAB offers the scientific community a scientific use file as part of the ALWA study, which demonstrates a high degree of factual anonymity. In this file certain variables have been deleted and some data have been aggregated or classified. This concerns the following variables:

- adress data (deleted)
- details in plain text (deleted)
- regional data (aggregated to federal state)
- nationality (aggregated)
- country of origin (aggregated)
- occupation data (aggregated to 3-digit code)

In practice this anonymisation strategy has proved its worth for some time, for example in the Microcensus as well as in other scientific use files, such as that of the German Life History Study (Deutsche Lebensverlaufsstudie - GLHS) or the German Socio-Economic Panel Study (SOEP). The fact that survey data can only be de-anonymised with great difficulty – as long as there is no detailed regional information in the dataset – is substantiated by the "de-anonymisation experiment" conducted by Walter Müller in collaboration with the Federal Statistical Office (Müller et al. 1991). If data are transmitted without small-scale regional information, it is usually sufficient to remove personal data in order to establish factual anonymity (Wirth 2006).

5 Data Editing

In a complex three-step data editing process the ALWA data were checked for inconsistencies and, if necessary, corrected. A data editing program known as PatchTales was specially developed for this purpose. This program was intended to make it easier for the editors to obtain an overview of individual cases, to indicate or identify inconsistencies and to correct them in the data directly. After the editors had been carefully selected and thoroughly trained, all interviews conducted in German were checked. While these checks were performed, the editors were under constant supervision. However, not every aspect of the data was verified: the major focus of the checking procedure was on the correct allocation of events to the corresponding module and on temporal consistency over the entire life course.

5.1 Selection, Training, and Supervision of the Editors

The ten editors assigned assessed the education, training and employment histories of all 10,177 interviews conducted in German. In order to ensure the quality of the data editing process, the requirement for the editing work was that the editor had at least completed their first two years of university studies in the humanitiesor the social sciences or held a comparable qualification. Therefore, all of the editors were familiar with handling and processing data using SPSS as a result of their studies.

Before the data editing process began, a first detailed training course was held. In this course the objectives and contents of the ALWA study were defined, the survey design of the study was explained and the questionnaire that was used in the telephone interview was demonstrated. The terms “episode” and “module” were also explained. After that, the data editing tool PatchTales was explained and the editors were taught how to use it. The training materials used included a presentation of the interviewer questionnaire and the data editing manual. The editors were also informed about data protection and had to sign a data protection statement. This was followed by an exercise to introduce the editors to their job and to improve their knowledge of the questionnaire. During this excercise the editors were given the task of entering their own life course data into PatchTales using the interviewer questionnaire. The exercise was conducted in pairs: one editor recorded his/her partner’s life course data in PatchTales using the questionnaire and then the roles were reversed. After this the technical concepts of the different modules were examined in more detail. Here the contents of the modules, the separation of the episodes, the checking and completion module and the procedure to be followed for changing the type of an episode were explained. Then the data editing manual was presented in more detail, the practical task completed on the previous day was corrected, and problems and unanswered questions were clarified.

After this the editors worked on the first step of the editing process. At the same time, they were given test-tasks in order to ensure that they had internalised the contents of the training. After the solutions had been handed in, the head editors discussed them with each editor individually and went through and explained any mistakes. Cases that the editors had flagged as ‘solved’ were randomly selected and checked on a weekly basis. In much the same manner as was done in case of the test-tasksmistakes were discussed and clarified individually. During the initial period a regular weekly meeting was held in which rules were established for problems that had arisen throughout the past week and in which other problems could be discussed. The minutes were taken at each meeting and these were made available to all of the editors so that everyone had the same knowledge.

Before the third step of the editing process started, a reliability test was carried out in order to ensure that all of the editors were working at the same level even in very difficult cases. The editors were given four cases to solve. The solutions were compared and the results summarised in a spreadsheet. In total a reliability of 94% was achieved. After the reliability test the editors formed pairs for the third step of the data editing process.

5.2 The Data Editing Program PatchTales

The data editing tool that was developed for editing the ALWA data, PatchTales, is essentially based on the TrueTales survey instrument developed by Ralf Künster together with Britta Matthes and Maike Reimer for surveying retrospective life history data (see Matthes et al. 2005). Many of the ideas that were developed at that time for the specific demands of a life history survey with a panel design were used in a similar form for new tasks in the new editing tool. The key task of the editing program was to permit a comprehensive assessment of the life history data recorded. The program was intended to point out gaps in the data,

problematic transitions between episodes and errors in establishing the start and end of episodes, and to make it possible to alter the data immediately. The editors were to be provided with a number of different tools to facilitate the data editing process and to help to avoid errors.

The data editing program PatchTales is a database-supported program that was developed using Visual Basic for Applications (VBA) in the programming environment of MS Access. The original ALWA data were available as SPSS files, so they had to be modified slightly before being imported into the Access database. Essentially, the data editing program works as follows: after the case to be edited has been selected in the first mask, the central checking module opens. This first provides an overview of the episodes of the selected case and of any existing plausibility problems and, second, permits the application of all tools for editing the life histories. Thus, for instance, when the button “process marked episode” is activated, the appropriate editing mask for the type of episode marked in the table opens. When the button “insert episode freely” is activated, a form for selecting a type of episode is opened and after the corresponding episode type has been selected, the program branches into the relevant editing mask. A precise description of all functions of the data editing program can be found in Teil IV: Editionsbericht (Matthes & Valentin forthcoming).

5.3 Editing Procedure

The data editing process was conducted in three steps. In the first step the cases that did not require any corrections were identified. In the second step straightforward cases were edited, for example cases in which a period of training had been recorded as a period of employment. In the third editing step the editors worked in pairs to deal with the remaining “difficult” cases where, for example, there were gaps in the data. The main advantage of this step-by-step procedure is that the editors were able to gradually adapt to the growing difficulty of cases and to apply the increasingly complex editing rules reliably.

5.3.1 First Step: Identifying Unproblematic Cases

The main task in the first step of the data editing process was to identify the unproblematic cases.

When a case was opened, the editor was first supposed to look at the memo field. During the entire interview the interviewer had the option to enter free text or other non-standardised information in the memo field. Sometimes the memo field was used to correct details provided by the respondent at an earlier stage, to supplement comments or to add entirely new facts. It was possible, for example, to record in the memo field that a period of unemployment could not be inserted correctly. The editor’s task was then to schedule the case for the second editing step. In many cases, however, there were no comments in the memo field, or the comments supplied were not relevant for the editing process, such as “children screaming in the background”.

The next task was to check the dates. A case went into the second editing step if it contained only one episode or if episodes had not been given complete dates (-7 or -8 in the month or year). If the editing program automatically indicated that there was at least one episode whose end date preceded its start date, the case was also scheduled for the second editing step. In addition the editors checked whether there were any gaps. If it was possible to fill a gap by postponing the end of the episode before the gap by one month then this was done and the case was closed. If the gaps were longer than one month, however, the case was scheduled for the second editing step.

A further step was the episode-related check. This involved first checking the schooling episodes. The editors checked whether every case contained a period of primary school education or a period of schooling lasting at least 9 years which could be understood as an episode of basic schooling. If this was not so, then the case was scheduled for the second editing step. Cases in which two consecutive schooling episodes of the same type in Germany were reported were also marked for second editing. If school qualifications were reported that were gained after the end of full-time schooling and lasted longer than one month, or if the plain text information indicated that an episode had been incorrectly reported as a period of general schooling (e.g. while in fact a vocational school was attended), this case was also scheduled for the second step of editing. If a vocational preparation scheme, full-time vocational training, full-time employment, unemployment with receipt of unemployment benefit, parental leave or an episode of military service or alternative civilian service was reported parallel to a period of full-time schooling, the case was passed on for second editing. When checking vocational preparation schemes, cases were scheduled for the second editing step in the following situations: if they did not begin until the respondent was 24 years old; if several parallel vocational preparation schemes had been reported; if vocational training, full-time employment, unemployment with receipt of unemployment benefit or military or civilian service had been reported parallel to a vocational preparation scheme; or if the respondent had allegedly taken part in a vocational preparation scheme after completing vocational training.

When checking the details regarding vocational training, cases were passed on to the second editing step in the following situations: if two consecutive periods of the same type of vocational training had been reported; if during one period of full-time vocational training further periods of full-time vocational training had been reported; if open-ended information indicated that an episode had been recorded incorrectly as vocational training (e.g. internships); if the case concerned a combined track for vocational training and an upper secondary school leaving certificate (Abitur), a vocational institute (Berufskolleg) or a similar combination of general education and vocational training but no corresponding schooling episode had been reported or if the vocational training took place while the trainee was employed (e.g. during training as a civil servant) but no corresponding employment episode had been reported. If external examinations lasted longer than one month, the cases were also scheduled for the second editing step.

In the case of details regarding employment the editors checked whether two consecutive employment episodes of the same type with the same employer were listed, whether during one period of full-time employment further periods of full-time employment had been reported or whether open-ended information indicated that the episode had been recorded incorrectly as an employment episode. If one of these aspects applied to a case, then this case was scheduled for second editing.

The details regarding unemployment were checked next. If there were two consecutive periods of unemployment or if a period of parental leave or military service had been reported during a period of unemployment, these cases were marked for second editing. Then the editors checked whether an episode of military service was listed during a period of parental leave and whether episodes of parental leave lasted longer than three years for the last child. In individual cases the respondents had not taken their parental leave as one uninterrupted period but split into several episodes. All of these cases were to be examined again more closely in the second editing step. If a period of military service lasted longer than 23 months or if there were two consecutive periods of military service, these cases were marked for second editing. Finally, the responses to open-ended questions in the gap episodes were checked as to whether the episode could be assigned to a different episode type. If these were also correct, the case could be marked as error-free.

5.3.2 Second Step: Editing Problematic Cases

As in the first step, the editors were first to open the memo field of previously identified cases and check whether editing was required according to the instructions provided there. If these instructions demanded specific changes to the details, these changes were made. If, however, the instructions in the memo field were not clear, the case was not to be edited until the third editing step.

Via a special error message in the data editing program, the editors were asked first to process episodes in which the end date preceded the start date. As this error was caused by the start and end dates being mixed up in the CATI program, the two dates were interchanged before the editors proceeded with the second editing step. This applied to both date variables, month and year, respectively.

When checking the **schooling history** the editors first examined whether there was a schooling episode that began between the respondent's 5th and 8th birthday. If there was no schooling episode and the person had not been abroad at that time, an episode of basic schooling was added. The procedure for adding such data was laid down precisely in the editing manual. If the person had been abroad at the time in question, however, the case was scheduled for the third editing step.

It frequently occurred that two consecutive schooling episodes of the same type taking place in Germany were reported. However, as a new episode was only started if the respondent had changed to a different type of school, the two schooling episodes were combined. This

was done by changing the later schooling episode according to strict guidelines and deleting the preceding schooling episode.

One of the interviewer instructions contained that for the case school leaving certificates were awarded or gained in examinations later on only the date of award or examination should be recorded. However, there were cases where such episodes lasted longer than a month. For those cases the editors had to check whether the episode was indeed an awarded or gained certificate and not in fact a schooling episode. If there was no vocational training episode parallel to the corresponding period, it was assumed to be an incorrectly declared schooling episode. The data were amended in accordance with the guidelines laid down in the editing manual. If, however, a school qualification was gained after full-time schooling, e.g. during vocational training, the start date had to be set to the end date of the school qualification.

There were some cases in which it was obvious from the open-ended responses that participation in a vocational preparation scheme or a period of vocational training had been reported as a schooling episode. In these cases the schooling episode was transferred to the correct module in accordance with the editing steps laid down in the editing manual.

If a period of work experience as vocational preparation was reported parallel to full-time school attendance, it was assumed that the term “work experience as vocational preparation” (Berufsvorbereitendes Praktikum) had been misunderstood and this episode was deleted. If vocational training was reported parallel to attendance at a full-time school the editors were to check whether the full-time school attendance concerned a special vocational training course in which both, a general-education qualification and a vocational qualification could be attained simultaneously. In this case the data remained unchanged. If, however, it was a school qualification that is caught up on during vocational training, the start date of the schooling episode was set to its end date. If a period of full-time employment was reported duringschool holidays and parallel to attendance at a full-time school, the holiday job was deleted. If full-time school attendance was reported parallel to a period of unemployment with receipt of unemployment benefit, parental leave, military service or full-time employment, it was assumed that the term “main activity” had been misunderstood and that the school attendance was the secondary activity, so the schooling episode was accordingly coded as a secondary activity.

It often occurred that there was an actual gap or a gap episode lasting a maximum of two months between two schooling episodes in the summer of the particular year. In such cases the gaps were assumed to be school holidays. In order to be able to calculate comparable durations of education for all respondents, the end date of the schooling episode was postponed by a maximum of two months and the corresponding gap episodes were deleted.

If there was a **vocational preparation scheme** that began after the respondent had turned 24, took place parallel to a period of vocational training, and lasted a maximum of three months, the vocational preparation scheme was deleted. The reason for this is that it can be

assumed that the episode was actually a practical component of the vocational training. All other vocational preparation schemes that began after the respondent had turned 24 were converted to employment episodes according to the guidelines in the editing manual, and the corresponding vocational preparation scheme was deleted.

A vocational preparation scheme cannot occur parallel to another vocational preparation scheme. If such a case did occur, the data were amended in accordance with the guidelines set out in the editing manual.

If there was a vocational preparation scheme parallel to a period of employment, the editors first had to check whether the period of employment recorded was actually a period of work experience that had mistakenly been recorded twice. If this was the case, the employment episode was deleted. If the period of employment was not a period of work experience then no changes were made.

If a vocational preparation scheme had been recorded as fully parallel to a period of unemployment, it was assumed that unemployment benefit and the allowances paid during the vocational preparation scheme had simply been confused, and the unemployment episode was deleted. If, however, the vocational preparation scheme began after and ended before the unemployment episode, all of the details remained unchanged. If the vocational preparation scheme ended after the unemployment episode that adjoined it began, the start date of the unemployment episode was set to the end date of the vocational preparation scheme plus one month.

In cases where a vocational preparation scheme ran parallel to an episode of military service, the vocational preparation scheme was deleted. If the military service episode and the vocational preparation scheme overlapped, the overlapping period was cut from the vocational preparation scheme.

There were also cases in which vocational preparation schemes were recorded as occurring after completion of vocational training. Vocational preparation schemes can by law no longer be granted after completion of vocational training. The episode recorded as a vocational preparation scheme was therefore recoded into an employment episode in accordance with the guidelines in the editing manual.

In the **vocational training module** the editors checked whether there were two consecutive episodes of the same type of vocational training. Vocational training episodes in which the contents were identical apart from the title of the qualification were combined according to the procedures laid down in the editing manual. This was done by amending the later training episode and deleting the preceding one.

If during one episode of full-time vocational training further periods of full-time vocational training had been recorded, the editors first checked whether the case concerned a period of vocational training that had mistakenly been reported twice. If this was the case, then the episode with the lower qualification was deleted. If detailed information indicated that the

episodes did not refer to the same period of vocational training they were assumed to indeed represent two different episodes of vocational training. The details remained unchanged.

Vocational qualifications that were awarded or gained later on and lasted longer than one month were assumed to be episodes of vocational training. If no further information about this vocational training could be gained from the responses to open-ended questions, the vocational qualification was simply recoded into an episode of vocational training.

It occasionally occurred that a period of school attendance or an employment episode was reported as an episode of vocational training. In such cases the procedure set out in the editing manual was followed: the vocational training episode was converted into the appropriate episode and the vocational training episode was deleted.

If the open-ended responses indicated that an episode of vocational training was part of a combined track for vocational training and upper secondary, of education at a vocational institute (Berufskolleg) or a similar combination of general education and vocational training but there was no corresponding schooling episode, a corresponding schooling episode was added.

If the open-ended responses indicated that it was a case in which the vocational training took place while the trainee had a contract of employment, but there was no corresponding employment episode, the employment episode was added.

Frequently, **episodes of military service** in Germany were reported that lasted longer than 23 months. As only times of compulsory military service were supposed to be recorded here and compulsory military service had probably been confused with a period of employment as a regular soldier, this episode was moved to the employment module in accordance with the guidelines in the editing manual and the corresponding military service episode was deleted. If the episode of military service took place abroad, the case was passed on to the third editing step.

There were often two consecutive episodes of compulsory military service. No editing was required if two episodes of different types adjoined each other, for example because a person had begun basic military service, had later refused to serve in the army and had then performed civilian service instead. If the adjoining episodes of national service added up to a maximum of 24 months, the later episode was amended in accordance with the guidelines in the editing manual and the preceding military service episode was deleted. If the military service episodes added up to more than 24 months, the later episode was converted into an employment episode. The same procedure was used for episodes of alternative civilian service.

If two consecutive employment episodes of the same type for the same employer were reported in the **employment module,** the editors only had to check whether an employment episode had mistakenly been recorded twice. If a significant number of variables corre-

sponded in the two employment episodes, either the shorter episode was deleted, or, if they were equally long, the one that was recorded later.

It occasionally happened that an episode of schooling or vocational training was incorrectly recorded as an employment episode. If the open-ended responses indicated that the episode was in fact a schooling or vocational training episode, it was recoded into the appropriate episode type in accordance with the guidelines in the editing manual and the employment episode was deleted.

In ALWA there should not be any consecutive **episodes of unemployment** because no distinction was to be made in the interview between different episodes of unemployment (registered as unemployed or not, with or without unemployment benefit etc.). Two consecutive episodes of unemployment were therefore merged. The start date of the second episode of unemployment was altered and the first episode was deleted.

If there was a period of parental leave, military or alternative civilianservice, or a year of voluntary service parallel to a period of unemployment with receipt of unemployment benefit, the information about the episode of unemployment was altered in accordance with the guidelines in the editing manual. Since periods of some kind of alternative service and periods of unemployment may overlap, these remained unaffected by these rules.

From the **children module** only the details regarding parental leave were used for editing the schooling, training and employment histories. If there was an episode of military or alternative civilian service or a year of voluntary service parallel to a period of parental leave, the details on the period of parental leave were assumed to be highly accurate due to the link with the child's date of birth. Errors were assumed to be more likely in the dates of military service, alternative civilian service or voluntary service. If there was a possibility to shift the periods of military service, alternative civilian service or voluntary service plausibly, this shift was to be made after consulting the head of the editorial team. If this was not possible, the case was to be scheduled for the third step of editing. Periods of alternative national service and periods of parental leave may overlap and were thus unaffected by these rules.

If another child was born during the period of parental leave, the parental leave ended with the birth of the next child.

It was often the case that parental leave episodes were reported for longer than three years. Although this is possible in exceptional cases, e.g. if the child has a disability or is a foster child, in most cases it can be assumed that the respondent simply did not return to work following the period of parental leave. Accordingly it was decided that episodes of parental leave were allowed to last no longer than three years and two months after the birth of the last child. Gaps that emerged as a result of this reduction were filled with a gap episode as "homemaker". It is not necessary, however, to take all 36 months of parental leave in a single, uninterrupted block. Instead, they might as well be split into several periods. Accordingly, periods of parental leave which added up to more than 38 months were edited in accordance with the guidelines in the editing manual.

Cases which could be identified from open-ended responses as exceptions were scheduled for the third step of the editing process.

In the checking and completion module, episodes were very often recorded as **gap episodes** although they could be assigned to a different episode type. These episodes had to be converted to the correct episode type. After the correction the gap episode was deleted. If it was a period of parental leave, the editors first had to check whether there was a corresponding child. If the person had a child of the corresponding age, the parental leave was entered into the correct module and the gap episode was deleted. If there was not a corresponding child, the case was scheduled for the third step of editing.

5.3.3 Third Step: Editing Individual Cases

When the second step of editing was completed the only cases remaining should have been those generally requiring reference to additional data sources in order to make consistent decisions regarding implausibilities or inconsistencies. In order to achieve in this instance, too, the highest possible level of reliability in the data editing process, the following procedure was applied:

Using the additional information (original data files), two editors working in parallel attempted to find plausible solutions for the individual cases. The respective solutions were stored in a corresponding file via the “print” button. The two solutions were then compared with each other via the menu item “compare and merge documents” under “extras” in Word.

If the two solutions were the same, the case could be marked as edited. If the solutions were different, in a first step an attempt was made to reach an agreement among the group members. This agreement was entered into the database of the main person responsible and then the case was marked as edited in the third step. Only if the two editors could not reach an agreement the case was passed on to the management of the editorial team for discussion and it then finally underwent third-step editing there. In a few cases, however, the editorial team managers were also unable to find a plausible solution for the inconsistencies. These cases were marked in the variable vls in ALWA1_QS.

5.4 Coding Responses to Open-ended Questions

In the following paragraphs only the coding of the data on occupations and economic sector is documented. In the coding process, all open-ended responses were checked to see whether they could be recoded using the available codes. Therefore, in many cases no open-ended responses remain, e.g. in the country-listings. For other open-ended responses, such as the most important events in the respondent’s life, lists and allocation rules have yet to be developed, so these data cannot be made available in the SUF.

5.4.1 Occupation Data

The aim of coding the occupation data was to encode as precisely and in as much detail as possible the responses to open-ended questions about the respondent’s desired occupation,

the occupation in which he/she had been trained and his/her occupational activities since then into the documentation codes (Dokumentationskennziffer - DKZ) used by the Federal Employment Agency. The documentation code is used in job-placement and career services provided by the Federal Employment Agency. There it is used for example for encoding the occupational information in job vacancies and applicant profiles published in the online job portal, JOBBÖRSE, and provides the basis for matching occupations and job openings (see Paulus et al. 2010). This database can be accessed by the general public on the internet at http://www.berufenet.arbeitsagentur.de/dkz/.

For the documentation codes there are very precise transformation rules for converting them into the KldB88, the “Classification of Occupations of the Federal Statistical Office 1992” (“Klassifizierung der Berufe des Statistischen Bundesamtes 1992 - KldB92)” and the “International Standard Classification of Occupations 1988 (ISCO88)”. Moreover, there will also be a unique transformation code for the “Classification of Occupations 2010 (KldB2010, cf. Paulus et al. 2010).

In previous studies the occupational information wase mainly coded in ISCO88 or KldB92. Coding was usually carried out by the German Social Science Infrastructure Services (Gesellschaft Sozialwissenschaftlicher Infrastruktureinrichtungen - GESIS). When coding data on occupational activities the ZUMA uses a procedure based on both computer-assisted coding and manual coding by trained specialists (Geis 2009). An alternative to this is to have Infratest Sozialforschung do the occupational coding, who for example re-coded the data on occupational activities for the 1984 to 2001 waves of the Socio-Economic Panel (SOEP) in order to improve the comparability between the panel waves. Infratest uses both an alphabetical version of the KldB92 and a data file provided by the IAB (see Hartmann & Schütz 2002).

Following these procedures we, too, automatic coding procedures as a first step for transfering plain-text information on occupations into occupational codes. The database listing all current and obsolete occupations known at the Federal Employment Agency was used as the basis for the automatic coding.

Occupations that could not be identified automatically were coded by trained coders. The coders entered the job title into the DKZ database, compared the occupational position with the occupational group listed there, and if they corresponded, allocated the corresponding DKZ. If the occupational position did not correspond to the occupational group, the coder looked for a DKZ in which both the job title and the occupational group corresponded. If more than one job title was reported, the one that describes the occupation more precisely was coded (e.g. if “teacher, grammar school teacher” was reported, the occupation “grammar school teacher” was coded). If it was possible to use two different DKZs for coding an occupation and if there was no other information available for identifying the occupation, information on the economic sector was taken as an additional criterion for the decision process. One example for this is a case where the occupational title was “clerical worker” (Kaufmann) and the economic sector was “industry”. Such a case was coded as “industrial clerk” (Industriekaufmann). If a case could not be clarified, it was passed on to the supervisors. In the rare

cases when two very different occupations had been recorded, e.g. joiner and cook, both of the occupations were coded and passed on to the supervisors for clarification.

In the third step these difficult cases were coded by supervisors. For this, the supervisors referred to further information, such as the vocational training history or employment history, in order to ensure that the occupation was classified unambigously.

During the coding of the information on the training occupation it turned out that it is virtually impossible to categorise non-formal courses into DKZ codes. As there is no standardised national or international classification for courses, we again referred to a database held by the Federal Employment Agency. During the job placement process at the Federal Employment Agency a so-called catalogue of competencies is used (http://infobub.arbeitsagentur.de/download/public/dkz_daten/kompetenzen/Kompetenzkatalog.xls), which makes it possible to encode the details provided by job-seekers or employers. This catalogue of competencies is not based on a standardised classification, however, and is not structured hierarchically. The codes for the courses are thus to be seen merely as "translations" of the open-ended responses.

The coders who were given the task of coding the occupational activities and courses of vocational training were students of or had graduated in subjects that are closely related to empirical social research (e.g. sociology or the social sciences). The coders took part in a one-day training course in which the theoretical foundations of the classifications of occupations and the practical approach to coding were explained.

In the theoretical part of the course the coders were given an introduction to the DKZ database of the Federal Employment Agency and to the –KldB88 in order to explain the aim of the coding process. In a further step the tools to be used, the DKZ information and the database of occupations held by the Federal Employment Agency, Berufenet, were presented and the basic coding rules were explained. Finally the specific procedure to be followed was illustrated using several examples. The training course paid particular attention to the coding of so-called "auxiliary occupations", in other words activities that are accomplished by unskilled or semi-skilled workers.

Several measures were conducted to ensure the quality of the coded occupation data. As a first measure the first 300 responses that a coder had coded during the second coding step – the manual coding - were checked by supervisors. This was done in order to see whether the basic coding rules had been observed. After this the coder received feedback. These first 300 responses were then discarded entirely and were processed again by a different coder at the end of the coding work. As a second measure, additional rules that were developed in the course of the coding work were put down in writing and passed on to all of the coders. The cases affected by the additional rules were then checked again. In the third step problematic cases were discussed at regular meetings and then decisions were made following the four-eyes principle. These results were also recorded in writing. Fourth, 20 % of the responses that could not be coded automatically were double-coded (blind) in order to analyse

intercoder reliability, i.e. open-ended responses were selected on a random basis and were coded again by coders who had no information about the previous coding. Intercoder reliabilities were calculated on the basis of these measured values. This reliability therefore defines the degree of correspondence between the results obtained by two coders who coded the data separately.

The intercoder reliability was calculated at different levels. At the level with the most complex differentiation, the DKZ 7-digit code, this reliability is just over 50 %. At first sight this value appears very low, but it only refers to a total of 53 % of all of the coded data. The other responses were coded automatically or using the four-eyes principle, so the probability of error can be assessed to be lower in those cases. At the 4-digit level the reliability is already 65 % and at the level of the 2-digit codes it is 79 %. If the ISCO classification is used, a reliability of 70 % is obtained.

This example illustrates the problems these classifications have to deal with in general: quite often it is not possible to assign data unambigously to a specific category even with the aid of all the information available. This applies in particular to new occupational fields, especially service occupations. To take one example: the response “call-centre (telephone) operator” can be coded either as call-centre agent (7032-101) or as (telephone) operator (7341-100). Both of the coding possibilities are right if it is not possible to clarify or ask in detail what exactly the person does. However, there is no correspondence at any of the levels if the first coder coded according to the first possibility and the second coder selected the second option.

5.4.2 Coding Data on Industrial Sector

Information about the industry or the economic sector was recorded in two places in ALWA: first for all occupational activities and second for all vocational training undertaken in the context of an apprenticeship (training as a skilled worker or vocational training in the dual-system). Both the information about the economic sector of the occupation and about the sector in which the respondent had trained were coded uniformly in accordance with the industrial classification officially used in Germany, the German Classification of Economic Activities (Klassifikation der Wirtschaftszweige, Ausgabe 2008 – WZ08).

The WZ08 is the official scheme for classifying economic activities, which is also used by official statistics in Germany. This classification covers all current industries and economic sectors that are of economic relevance in Germany. The WZ08 is based on the International Standard Industrial Classification (ISIC 4.1) and the adaptation of this classification at European level, the Statistical Classification of Economic Activities in the European Community (NACE). This facilitates the national and international comparability of the data, as all three classifications are identical at the level of the 2-digit codes.

As an automatic coding procedure that was tested in the run-up to the survey did not yield satisfactory results, the open-ended responses regarding the economic sector were first coded to the 2-digit level of the WZ08 without drawing on any further information. The search

machine of the Bavarian State Office for Statistics and Data Processing (Landesamt für Statistik und Datenverarbeitung) in Munich (http://w3gewan.bayern.testa-de.net/wz2008/wz0801.htm) was used as basis for the coding procedure. In a second step the remaining uncoded responses regarding the economic sector were compared with the respondents' education, training and employment histories. This made it possible for example to categorise details such as "service sector" or "mining" or to distinguish between an activity in a trade and one in production.

6 Nonresponse and weighting

The following section provides a short overview of the representativeness of the ALWA data and the associated selectivity of the willingness to participate, and describes the weighting procedure used. Despite intensive research of telephone numbers and various strategies to reduce selective non-participation, selectivity cannot be avoided in particular in voluntary telephone surveys.

6.1 Comparison of ALWA with Distributions from the German Microcensus

In order to be able to assess sample selectivity, the distributions of various variables of the ALWA respondents were compared with those in the Microcensus 2007. The different analyses showed that participation in the study was associated first and foremost with the respondent's age, migration background and the highest qualification attained.

6.1.1 Age

Compared with the Microcensus, considerably fewer individuals aged between 25 and 34 participated in the ALWA survey while considerably more respondents aged between 45 and 50 did so.

ALWA-Microcensus Comparison: Age, Aggregated

Age, aggregated	Percentage Share	
	Microcensus 2007	ALWA
Up to 24 Years of Age	16.9	17.4
25 to 34 Years of Age	25.7	17.5
35 to 44 Years of Age	35.8	33.7
Over 45 Years of Age	21.6	31.4

Source: ALWA; German Microcensus 2007; own calculations

This is a phenomenon that is frequently found in survey research, in particular in telephone surveys, as the former group (25-34 years of age) tends to be rather mobile and therefore is hard to reach. It may also be presumed that conventional landlines are being increasingly replaced by mobile telephones in this group in particular, making telephone contact for surveys substantially more difficult. In contrast, the 45-50-year-olds, who participated with disproportionate frequency, can be assumed to be less mobile and to be generally more willing to participate in surveys than younger age groups.

6.1.2 Migration Background

Besides the selective participation with regard to age, another group that is also clearly underrepresented, which can be identified using the ALWA-Microcensus comparison are first generation migrants. This concerns in particular people who were born in Turkey or one of the other countries in which foreign workers used to be recruited for the German labour market, with people from former Yugoslavia being the exception.

ALWA-microcensus comparison: migration background

Migration Experience	Percentage Share	
	Microcensus 2007	ALWA
Non-Migrants	83.4	91.7
Migrants	16.3	8.5

Source: ALWA; German Microcensus 2007; own calculations

This bias in respondents' willingness to participate may not so much be attributed to their poor language skills, but rather relies on the fact that this group is difficult to reach due to its' members' frequent changes of address and due to the difficulties occurring, when researching their telephone numbers (which come about e.g. by different transcriptions of foreign names in residential and telephone registers).

6.1.3 Education

The comparisons with the microcensus showed that the respondent's highest qualification, as a third key variable, had a selective effect on participation in the ALWA survey. Compared with the 2007 microcensus, clearly fewer people with a lower secondary school leaving certificate (irrespective of any additional vocational qualification) and a disproportionately large number of individuals with a tertiary degree participated in the study.

ALWA-Microcensus Comparison: Highest School Qualification

Educational Level	Percentage Share	
	Microcensus 2007	ALWA
No School or Vocational Qualifications	3.1	1.7
Lower/Intermediate Secondary School Leaving Certificate without Vocational Training	14.3	7.2
Upper Secondary School Leaving Certificate without Vocational Training	7.8	9.7
Lower Secondary School Leaving Ccertificate plus Vocational Training	18.0	12.1
Intermediate Secondary School Leaving Certificate plus Vocational Training	16.9	28.2
Upper Secondary School Leaving Certificate plus Vocational Training	8.4	11.5
Master Craftsman's / Rechnician's Certificate / Technical College Certificate	7.7	6.3
Degree from a University or a University of Applied Sciences	12.9	21.4
Doctorate	1.0	1.9

Source: ALWA; Microcensus 2007; own calculations

This, too, is a well-known phenomenon and may be associated with the motivation to take part in surveys. In particular people with low qualification levels are considerably more difficult to motivate compared with the highly qualified, especially when one of the central topics of the survey is education.

6.2 Weighting

The sample design ensures that the anticipated design effect is supposed to be very low (cf. ch. 3.2). Consequently a design weight is not necessary. To offset selectivity infas constructed in agreement with the IAB a calibration weight that is based on the marginal distributions of the Microcensus 2007. The following variables were used to adjust the marginal distributions of the sample obtained to those of the Microcensus:

- gender in interaction with education
- age groups in interaction with education
- education (in interaction with age groups and gender)
- federal state (Bundesland)
- BIK municipality size classes
- migration experience

These distributions were adjusted iteratively using the IPF (Iterative Proportional Fitting) algorithm.

7 Conclusion and Data Access

The ALWA data allow research into a number of questions that had to remain unanswered so far. The special strength of the data is found first in the level of detail in the data, which make event-history or longitudinal analyses possible for a multitude of variables. Surveying all birth cohorts between 1956 and 1988 makes it possible for the first time to examine with an adequate number of cases the life-courses of relevant cohort-types other than age cohorts, such as, for example, labour market entry cohorts or school-leaver cohorts. Second, the high data quality should be emphasised. This was ensured via the extensive preparation, surveying and editing of the data.

Although basic numerical and reading competencies were tested for a sub-group of the respondents after the telephone interviews, these data are not available to external researchers.

We also plan to merge the biographical, process-generated register data with the ALWA data via the social security numberfor those respondents that have given us permission to do so. However, since doing so will result in the more restrictive data protection regulations for official social security data to apply to our survey data, they, as well cannot be made available to external researchers.

The ALWA data of the CATI survey is made available to researchers in the form of a scientific use file following a successful application (see http://fdz.iab.de/de/FDZ_Data_Access/FDZ_Scientific_Use_Files.aspx) and the conclusion of a data use agreement between the user and the FDZ.

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