THE RISE IN EDUCATION LEVELS ACCORDING TO CENSUS DATA FROM 1961–2001 IN THE CZECH REPUBLIC*)

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Abstract: This article examines the development of education based on the representation of the main education levels in different generations. The education levels of individual generations born between 1921 and 1985, divided into five groups, are analysed. Although the level of education among the youngest generations is continuously growing, the Czech Republic nonetheless lags behind advanced European states in terms of the overall level of education. A more rapid pace of increases in the percentage of people with secondary and university education can be observed mainly in the 1990s, but the proportion of people with university education is still low – according to the 2001 Census only 9% of the population over the age of 15 attained university education, and when post-secondary vocational education was taken into account the tertiary sector includes just over 10% of the population. Among both older and younger generations there is a persistent difference in the level of education of men and women, even though the level of education among women has risen more quickly. In the 1990s it is possible to observe a deceleration of the pace of relative increase in the percentage of people with university education, primarily owing to an increase in the length of the duration of study.

Keywords: education, education system, classification of education, generational analysis of level of education, census data

The article examines the development of education using census data since 1961, but it focuses mainly on the generational increase in education levels based on the representation of the main education levels in different generations (basic, lower secondary, upper secondary, and higher education). Post-war development of the education system was shaped by a number of legislative changes, and these were reflected in different ways of classifying education in individual censuses, so data from the four censuses is not fully compatible, but the classification of education levels used makes the differences and incompatibilities – with some reservations – negligible. Nevertheless, I consider it appropriate to briefly mention what the basic changes to the education system were.

That was not, however, the only problem that this analysis of the development of the education system had to deal with. Classifying the relevant birth cohorts into corresponding to five-year age groups of people with a certain type of education, for which the data are published, do not always match up in the time series. The censuses in 2001, 1991, and 1961 were taken at the start of March, and taking that calendar date into account, five-year generational groups were determined according to the date of birth of the cohort into corresponding the age of a person on 1 January of the given year or 31 December of the previous year. The fact

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that the other censuses in 1970 and 1980 took place at the end of the year was left aside, so the difference between censuses does not correspond exactly to a ten-year interval, as was the fact that people complete lower levels of education in the middle of the calendar year. The article contains an analysis of the level of education by five-year cohorts between the ages of 15 and 79, which in 2001 represented persons born between the years 1921 and 1985 (in the censuses in 1970 and 1980 the classification of data by five-year groups ends at the age of 59 and 64, respectively, and in addition the 1970 census used a non-standard classification of the youngest age groups: 15–18 and 19–24).

Classification of the level of education as a reflection of the development of legislation affecting the education system

Czech censuses, and before that Czechoslovak censuses, have only been recording data on the highest completed level of education since 1950. Initially the data referred to persons over the age of 6, and since 1961 they have referred to persons over the age of 15. The classification of individual levels and types of education in individual censuses largely adhered to legislation on education, which in the 1950s underwent a number of changes. A more detailed classification of persons by completed education differed considerably in the 1950 census from later censuses, although the April 1948 Act on the basic form of the integrated education system made school attendance legally compulsory for nine years and the union of primary school with lower secondary schools established the so-called unique school and modified the structure of secondary schools[1)]. It was only with the Education Act of 1960 that the school system began to resemble the school system that, with subsequent legislative changes, existed up to the start of the 1990s.

The Education Act of 1960 established the current school structure and its terminology. The duration of each individual level has varied over the years, as has the length of compulsory school attendance, and even the terms of compulsory attendance within individual levels has changed, which has had some impact on the percentage of people that have completed basic education.[2)] However, a much bigger impact on the structure of school education was the incorporation of apprenticeship education into the secondary school system. In the 1960s it began to be possible to obtain secondary education and later complete secondary with *maturita* (the school-leaving exam) even at vocational schools, which since 1960, together with secondary technical schools and gymnasium-type education, have all been part of the secondary school system (the secondary level of education), wherein all three types of schools were gradually supposed to be made more alike and more equal (a reform from 1976 introduced into the Education Act of 1984). All three types of secondary school were able also to provide complete secondary education ending in maturita (that is, even some disciplines offered at secondary vocational schools), allowing the graduates of all these schools to apply for study

[1)] With the introduction of unique school, the 1948 Education Act combined the five-year primary (formerly the general) schools and the four-year lower level of secondary education, where it was possible to complete the compulsory nine years of education. This also altered the concept of secondary education, which was then regarded to be just secondary education providing the higher (secondary) level of secondary education. A legislative amendment in 1953 integrated primary and lower secondary school into an eight-year "secondary school", and compulsory school attendance was reduced to eight years. Also, the addition of gymnasium (the second level of secondary school) resulted in an eleven-year secondary school, the last three years of which followed from basic education at an eight-year secondary school and provided secondary general education terminating in maturita.

[2)] Compulsory eight-year school attendance, legislated in 1953, was extended again to nine years in 1960, and then to ten years by the 1984 Act (No. 29/1984 Coll.; the actual change was however introduced in 1976), and then reduced to nine years again in the 1990 Act (No. 171/1991 Coll.). The 1960 Education Act also changed the structure of basic education: eight-year "secondary" school was replaced with nine-year basic school, which existed until 1979; in 1979–1989 it was shortened to eight years, in 1990–1995 it was again nine years in duration, as its first level was extended from four to five years. The 1995 Act again established compulsory school attendance at a nine-year basic school, after which it was possible to make the transition to a secondary school and complete school attendance there or school attendance could be completed at a multi-year gymnasium. Since 1996 the law is nine years of compulsory school attendance at a basic school or in combination with a multi-year gymnasium.

at a university. Since the 1961 census the more detailed classification of people by level and type of education is (with some differences) comparable (though in that year serve one's time apprenticeship was still a part of basic education), and in subsequent censuses the classification of education levels are adjusted to accommodate the changes in the education system.

The 1990 amendment to the Education Act re-introduced multi-year gymnasia, where students can complete compulsory school attendance and also higher secondary education. A 1995 amendment (No. 138/1995 Coll.) established in law a new level of education – higher technical vocational education, which is already a tertiary level of education, even though in the Czech Republic it is outside the higher education system.

In the 1950s higher education was centrally administered and planned on the basis of quotas and planned study-field structures, and some schools were even stripped of the status of university (e.g. theology faculties were listed separately in censuses in the 1970 and 1980 censuses). Only after 1989 did the universities regain their autonomy, self-administration, and academic freedom; their network expanded with the emergence of regional and private universities, and even their legal standing changed. Universities have gradually been transformed into a three-degree structure of study. Changes in the structure of higher education could only be reflected in the classification of higher education in the census in 2001, when the bachelor level of study was recorded for the first time within higher education and when the category of advanced research qualifications was also recorded.

The ISCED 97 classification (International Standard Classification of Education, 1997 revision) was used for the first time in the 2001 census. The ISCED 97 classified traditional forms of education into internationally comparable types. It comprises seven basic degrees of education at four levels:

Pre-primary education (ISCED 0) includes pre-school education (the start of formal education); in the census person over the age of 15 who had not completed the first stage of basic school or a special basic school) or the first or second stage of a remedial school, or with incomplete auxiliary school.

Primary education (ISCED 1) corresponds to the first level of basic school, graduation from the first level at a special basic school, the first and second levels at a remedial school, and graduation from a all levels of auxiliary school; in the census persons who had not complete basic education, then persons with finished only first basic or special basic school, first and second level of remedial school and with complete auxiliary school.

Secondary education (ISCED 2) comprises two categories: the first three levels of lower secondary education (ISCED 2A, 2B, 2C) includes people who have completed basic education (except those who completed the second level of a basic or special school, and persons who completed the third level of a remedial school, those with a working level of auxiliary school, graduates of one- and two-year vocational schools, council and civic schools, and courses for completing basic education).

The category of higher secondary education is divided into three programmes (ISCED 3A, 3B, 3C), where programme 3A is considered to be preparation for higher education (graduates have maturita or the school-leaving exam from one of various types of gymnasium, secondary general-education and eleven-year secondary schools, real gymnasia, higher schools for girls, secondary technical schools, including arts school and conservatory graduates with the school-leaving exam, or students who studied a vocational field terminating in maturita (the final school-leaving exam) at a secondary vocational school. The other two programmes (ISCED 3C and 3B) are regarded as degrees leading towards or preparing students for the labour market; they include training in various fields terminating in a final exam without maturita, graduates of practical three-year schools, people with an apprenticeship certificate, graduates of former technical one-year to three-year schools, including girls, family, and business academies, and the study of individual subjects terminating in a certificate.

ISCED 4 (which was introduced into the original classification only in a revision in 1997) encompasses programmes that are on the border between the higher secondary and post-secondary level; this includes follow-up courses and post-secondary study, courses leading to a certificate of apprenticeship for graduates of secondary school, re-qualification courses at secondary technical schools and secondary vocational school ending in a final exam or an apprenticeship certificate.

Tertiary education is divided into two programmes (ISCED 5 and 6). ISCED 5 encompasses category 5B (education terminating in a certificate from a higher technical school, with maturita and an absolutorium from an eight-year or six-year conservatory, former post-graduate study, experimental higher study at a secondary technical school) and category 5A (university, higher education), which includes graduates of higher education in bachelor programmes (Bc., BcA.), teacher training for primary, and graduates of most universities and current master's programmes and programmes following up on master's programmes (Mgr., MgA., MUDr., Ing., etc.). The second stage of tertiary education, ISCED 6, so-called advanced research qualifications, is aimed at awarding academic research qualifications; this includes the current doctoral study programme, post-graduate study, and until 2001 so-called research education (graduates of which bear the title of Ph.D., Th.D., formerly CSc., Dr.Sc.).

A table is appended to the end of the study showing the structure of the population by relevant education levels according to the ISCED classification and according to the classification used in the 2001 census; it also illustrates the substantial differences in the education of the population as a whole and in the 30-34 age group.

A brief overview of the development of overall education since 1950

The overall education level, measured by the percentages of people who completed levels of education higher than basic education, grew continuously in the period after the Second World War, but the Czech Republic and previously Czechoslovakia has nonetheless lagged behind advanced European countries in terms of the overall level of education. The rate of growth of the percentage of people with higher – secondary or university – education was the fastest in the 1950s and 1960s, but at that time it was growing out of a very small percentage. In the 1970s and 1980s there continued to be high inter-census increases in the number of people with university education – the number of people with university education always increased by approximately one-half, and by the 1990s the increase had begun to slow and the number of people with complete secondary and university education grew by just under one-third and their proportion by one-quarter. A role here was played by the prolongation of the total duration of study. Compared to 1950, twelve times as many people had university education in 2001 and their percentage in the population had increased tenfold. The rapid rate of increase in the percentage of people with university education in the 1950s is best illustrated by the fact that in the next census, in 1961, the increase was less than fivefold and the percentage had increased only fourfold. Nevertheless, the percentage of people with university education is still low – according to data from the 2001 census only just under 9% of the population over the age of 15 had university education and just over 10% had a tertiary level of education along with their higher secondary technical education. In EU countries the figures are between 10% and 30% of the population (the least are in Portugal and Italy, at around 10%, and the highest in Sweden, Finland, Denmark, Belgium, and Germany).

The number of people with complete secondary education (especially technical) increased more then sevenfold over a fifty-year period, and almost fourfold compared to 1961, while their percentage of the population tripled. A thirty-percent increase in the number of secondary school students in the past decade meant an increase in their percentage of the population by one-quarter, the same as the increase in the percentage of university students, the rate of increase in the percentage of secondary school students was, however, with more than a triple increase in numbers, slower throughout the period of forty years. In 2001 over 28% of the population had complete secondary education.

Table 1 Population over the age of 15 by highest completed level of education in 1950–2001

Highest completed education	Census year						Index (%) 2001/61
	1950	1961	1970	1980	1991	2001	
Population, total (thousands)							
Basic[1)]	5606.0	5743.7	4085.0	3511.7	2696.1	1975.1	83
Secondary technical incl. vocational[2)]	660.9	546.9	2225.0	2556.3	2878.6	3255.4	
Secondary full[2)]	344.6	642.8	1043.9	1348.5	1867.0	2431.2	378
incl. technical[3)]	203.1	437.4	783.8	1070.2	1524.5	2000.2	457
general	141.5	205.4	260.1	278.3	342.5	431.0	210
Tertiary education	61.7	156.4	263.1	393.5	582.8	762.5	487
No school education	21.8	24.5	22.2	20.1	27.8	37.9	155
Not identified	62.8	28.7	60.0	49.8	85.5	113.1	394
Population aged 15+, total	6757.8	7143.0	7699.2	7879.9	8137.8	8575.2	120
men	3239.0	3398.9	3668.4	3753.6	3891.9	4133.1	122
women	3518.8	3744.0	4030.8	4126.3	4245.9	4442.1	119
%							
Basic[1)]	83.0	80.4	53.0	44.6	33.1	23.0	69
Secondary technical incl. vocational[2)]	9.8	7.7	28.9	32.4	35.4	38.0	
Secondary full[2)]	5.1	9.0	13.6	17.1	22.9	28.4	315
incl. technical[3)]	3.0	6.1	10.2	13.6	18.7	23.4	381
general	2.1	2.9	3.4	3.5	4.2	5.0	175
Tertiary education	0.9	2.2	3.4	5.0	7.2	8.9	406
No school education	0.3	0.3	0.3	0.3	0.3	0.4	129
Not identified	0.9	0.4	0.8	0.6	1.1	1.3	328
Population aged 15+, total	100.0	100.0	100.0	100.0	100.0	100.0	100

Note: [1)] Basic, by the year 1961 incl. vocational school; [2)] since 1970 incl. vocational school; [3)] incl. follow-up courses, enterprise courses and higher technical education (2001).

In 2001 the largest percentage of the population had secondary school education without maturita, just like in 1991. Almost two-fifths of the population indicated they had this level of education. Since 1970s the percentage of this group grew by one-third at a relatively constant rate of increase, only slowing slightly in the last inter-census period. A comparison with the census in 1961 can only be carried out on basic and secondary education together, as in 1961 apprenticeship education was still included in the category of basic education. Mainly owing to the effect of the change in the category of apprenticeship education in 1961-1970 the percentage of people with secondary education increased from 8% to just below 30%, while the percentage of people with basic education in the population decreased from 80% to 53%.

The decrease in the percentage of people with basic education is also illustrated by the increases in the percentage of people with higher degrees of education. While in 1970 almost every second person in the population over the age of 15 had basic education, in 2001 it was every fourth person. While in 1950 and 1961 over 90% of the population had basic, apprenticeship, and to a lesser extent technical education, in 2001 it was over 60% of the population, two-thirds of which, however, were people with apprenticeship and secondary technical education. However, the overall trends in the development of educational levels concealed substantial differences in education by age group and between genders.

Differences in the structure of education by age and gender

Despite the generally faster rate of increase in education levels among women, manifested by the continuously greater approximation of percentages of higher education in both gen-

Table 2 Structure of the population over the age of 15 by gender and highest completed level of education in 1950–2001

Highest completed education	Census year						Index (%)	
	1950	1961	1970	1980	1991	2001	2001/61	2001/91
Men in %								
Basic[1)]	79.8	78.0	39.2	33.8	24.7	16.5	72	67
Secondary technical incl. vocational[2)]	10.4	7.3	40.0	41.1	43.1	45.3		105
Secondary complete[2)]	7.2	10.4	14.8	17.4	21.4	25.5	246	119
incl. technical[3)]	4.3	7.1	11.6	14.2	18.1	21.8	310	121
general	2.9	3.3	3.2	3.2	3.3	3.7	112	112
Tertiary education	1.6	3.6	5.1	6.9	9.4	10.8	296	115
No school education	0.3	0.3	0.2	0.2	0.3	0.4	143	129
Not identified	0.7	0.4	0.7	0.6	1.1	1.5	413	140
Population aged 15+, total	100.0	100.0	100.0	100.0	100.0	100.0	100	100
Women in %								
Basic[1)]	85.9	82.6	65.7	54.3	40.9	29.1	67	71
Secondary technical incl. vocational[2)]	9.2	7.9	18.8	24.6	28.2	31.1		110
Secondary complete[2)]	3.2	7.8	12.5	16.9	24.4	31.0	400	127
incl. technical[3)]	1.8	5.3	9.0	13.0	19.4	24.8	467	128
general	1.4	2.5	3.5	3.9	5.0	6.2	254	124
Tertiary education	0.3	0.9	1.9	3.2	5.1	7.1	816	139
No school education	0.4	0.4	0.3	0.3	0.4	0.5	120	130
Not identified	1.0	0.4	0.8	0.7	1.0	1.2	265	112
Population aged 15+, total	100.0	100.0	100.0	100.0	100.0	100.0	100	100

Note: [1)] Basic, by the year 1961 incl. vocational school; [2)] since 1970 incl. vocational school; [3)] incl. follow-up courses, enterprise courses and higher technical education (2001).

ders, even in the most recent census in 2001 women overall still had a lower level of education. The percentage of women with university education did increase from less than 1% in 1961 to more than 7%, but even this increase, which in absolute numbers signified an increase from 33 000 to 317 000 women, still fell short of the figure of 11% for men. In 1961 there were four times as many male university students than female, and in the inter-census periods up to 1991 their percentage increases were between 35% and 40%, and only in the past decade was there a decrease was there to 15% (i.e. 80 000 men, more than one-fifth the number in 1991). The number and percentage of female university students more than doubled in the period between 1961 and 1970. In the next two decades the increases were around 60%–70%, and although in the 1990s the increase in their percentage slowed, as did the percentage of men, it still reached almost 40% (in absolute figures by almost 100 000 female university students more than in 1991).

Although in 1970 significantly more men than women had complete secondary education (even though in terms of general secondary school education women outnumbered men), by the time of the 1991 census there were more women and men with complete secondary education, and in 2001 almost one-third of women but just one-quarter of men had complete secondary education. The faster rate of growth in the percentage of women with complete secondary education than men between 1961 and 2001 signified a fourfold increase in the percentage of women, while the percentage of male secondary school graduates only increased by 2.5 times. The biggest increase in the percentage of women, by 7.5 percentage points, occurred in the 1981–1991 period.

The proportion of women with secondary technical and apprenticeship education without maturita in 2001 in the overall educational structure was the same as the proportion of women with complete secondary education (31%), having increased since 1970 by two-thirds.

Secondary or apprenticeship education was most widespread among men (45%). Their percentage grew from 1970, but only by 5 percentage points. In the 1961–1970 inter-census period there was a sixfold increase in the percentage of men and a fourfold increase in the percentage of women with this type of education, which was largely the result of a legislative change, wherein apprenticeship education became part of the secondary school system. The 1970 census was the first to reflect this change.

In 2001 the percentage of women with basic education was just 2% lower than the previous two types, but the number of women with this level of education was less than half what it had been in 1970. In 1991 basic education was still the most common type of education among women – more than four-fifths of women had this type of education; but in the 1990s the percentage with this type of education declined rapidly (by 30%). Nevertheless, in 2001 the percentage of women with basic education was 1.8 times higher than the percentage of men (this comparison, however, is considerably affected by the different age structure of men and women). In 2001 there were almost equal percentages of women with basic, women with secondary, and women with complete secondary education in the population. The educational structure of women still reflects the influence of traditional attitudes towards women's education and the legacy of past years, even though among the younger generations the percentages of men and women with higher education are now equal.

The structure of people with secondary technical education without maturita and skilled persons reveal a predominant proportion of men over women throughout the age profile. This distribution is clearly influenced by the structure of fields offered – it is most apparent with respect to economics schools, where throughout the period women predominated, though their percentage has nonetheless declined. Also, the increase in the percentage of men and women with technical education in 2001 is – especially among young people – clearly influenced by the different school structure, which cannot be determined in greater detail from the available census data. Although the overall percentage of technical education among young people in the last inter-census period either stagnated (men) or grew slightly (women), apprenticeship education lost its appeal (another reason may also be that many apprenticeship schools were closed or transformed into technical schools, which would also help explain the decrease or stagnation in the percentage of skilled people with maturita in the under 30 age group in 2001)[3)].

A striking feature in the structure of people with secondary education is that there were almost twice as many women with general education as men in 2001 (and even more in the past), especially given that this type of education is usually seen as a path into university study. This would explain the increase in the percentage of this education again in the 1990s, but that could also be connected with structural changes in the school system (the re-introduction of multi-year gymnasia with the objective of providing better-quality education). The differences in the percentages of men and women with various types of technical secondary education were strongly influenced by the different opportunities – and gender stereotypes – for employment; women strongly outnumber men in secondary health and pedagogical education, and do so in all the age groups throughout the entire period and with rising percentages. Conversely, men prevail among graduates of secondary industrial fields, especially in the younger age groups. The increase in the percentage of men with technical education in particular but also general education in the 1990s may be the result of the prolongation of the

[3)] The higher proportion of apprenticeship education recorded in the censuses in 1991 and 2001 among middle-aged men (the small cohorts born in the second half of the 1950s and in the 1960s) is to a certain degree a hangover from earlier political interference in the structure of education in the 1960s and 1970s. As part of the professional allocation of young people it was necessary to meet the plans for the "reproduction of labour professions", which with the advent of smaller and smaller cohorts resulted in recruiting males for apprenticeship fields, which was reflected in a decrease in the number of boys accepted at secondary school.

Table 3 Population in the age of 25–29, 35–39 and 55–59 years by gender and selected types of secondary school education in the years 1970–2001

Level and type of education	Out of 1000 people in the given age group and gender in years							
	Men				Women			
	1970	1980	1991	2001	1970	1980	1991	2001
Population aged of 25–29								
Secondary technical school without maturita	476	528	490	493	207	338	348	383
incl.: vocational schools	440	514	478	196	135	283	327	130
technical schools	36	13	12	297	72	55	21	253
incl.: industrial[1)], agricultural and forestry	32	11	9	267	21	7	5	128
economic	2	1	1	1	47	30	12	5
Secondary with maturita exam.	224	194	267	276	277	280	407	363
incl.: vocational schools	0	4	51	43	0	2	19	21
general schools	37	26	35	44	61	50	70	82
technical schools	186	163	181	188	216	228	318	260
incl.: industrial[1)], agricultural and forestry	167	138	153	157	66	65	94	90
economic	6	17	17	1	63	84	117	51
medical[2)]	1	1	1	10	51	54	60	81
pedagogical	2	1	1	0	29	17	35	10
Population aged of 35–39								
Secondary technical school without maturita	444	472	515	471	218	254	334	342
incl.: vocational schools	360	430	504	199	108	175	292	168
technical schools	84	42	12	272	110	78	42	174
incl.: industrial[1)], agricultural and forestry	70	36	9	245	19	24	6	80
economic	9	2	1	0	57	47	22	10
Secondary with maturita exam.	195	228	204	266	149	276	305	367
incl.: vocational schools	0	0	8	30	0	0	5	11
general schools	24	29	19	31	26	53	44	63
technical schools	171	198	177	205	123	222	257	293
incl.: industrial[1)], agricultural and forestry	125	179	150	174	14	65	66	92
economic	20	10	18	1	35	67	109	44
medical[2)]	2	1	1	10	45	52	54	101
pedagogical	5	2	1	1	24	31	18	26
Population aged of 55–59								
Secondary technical school without maturita	426	355	409	503	164	227	248	302
incl.: vocational schools	344	242	323	334	80	94	124	184
technical schools	83	114	85	168	84	133	124	118
incl.: industrial[1)], agricultural and forestry	44	74	69	145	3	8	27	43
economic	35	32	9	1	52	69	58	35
Secondary with maturita exam.	85	166	210	212	45	82	167	251
incl.: vocational schools	0	0	4	6	0	0	1	4
general schools	22	37	26	30	10	31	29	59
technical schools	63	129	180	176	36	51	138	189
incl.: industrial[1)], agricultural and forestry	27	83	143	154	1	4	16	50
economic	21	34	21	1	8	19	41	37
medical[2)]	1	1	3	7	4	9	52	62
pedagogical	10	5	4	1	20	16	23	20

Note: [1)] In 2001 mentioned as industrial and technical sciences.
[2)] Incl. secondary social and legal school.
Remainder to 100% of the given education group is comprised of other fields and data not determined.

duration of university study, as the census records the highest completed level of education. Conversely, the percentage of women under the age of 40 with economic education decreased by half during the 1990s; in the 25–29 age group it decreased from over 11% to just under 5%.

While since the 1970s (but evidently even in the 1950s and 1960s) training in a trade was commonplace among men and even secondary technical education was relatively common, it was much less common for women to obtain this type of education, and the change in attitudes in society that can be observed mainly since the 1970s was reflected in an almost equal rate of increase in the intensity of secondary education (even apprenticeship) and complete secondary education terminating in maturita up until 1991. Complete secondary education is more prominent among women of every age group, but especially up to the age of 50, than the percentage of men who have it. Throughout the period these trends are most evident among the youngest generation and are also connected with the growing range of available fields of study, especially secondary school fields with maturita, which have often suited women more than men. Women with secondary education specialising in economics, pedagogy, or health found work more easily than men – partly because women with secondary education working in administration, the education system, or in the health-care system usually settled for wages lower than men's wages.

Another reason for the smaller proportion of men with complete secondary education than women is evidently the fact that they more often than women continue on to university study, so their education is not completed until they complete the tertiary stage of study. A higher percentage of women than men was recorded in 1961 among people up to the age of 25, and in subsequent censuses the predominant percentage of women is always found in the emerging generation, so in 2001 women with complete education predominated up to the age of 65 (socialist quotas for the number of graduates of various types of schools was also clearly a factor in this).

Differences in the structure of tertiary education between genders are similar to those in secondary education, but the overall lower percentage of female university students than male is also accompanied by differences in the percentages in various preferred branches. Women focus more on university education, where they predominate mainly in pedagogical fields, the social sciences, medicine, and they even slightly predominate, for example, in economic branches; men predominate in technical fields. However, the differences between genders in study orientation are smaller, and among the youngest age group 25-29 the overall percentages of people with university education in 2001 were equal.

The development of education levels by gender and by birth cohort

The trend of rising educational levels is much more apparent if we analyse them in relation to generations. The development of education levels between generations can be observed well in the wider context of the social and economic development of society and political changes.

The oldest five-year generation whose educational development was traced was for people born in the years between 1921 and 1925, which in the 1961 census were between the ages of 35 and 39. Although the majority of them had completed basic and apprenticeship education before the Second World War, many may have obtained their secondary school education during the war and university education after the war. The events of the war for many may have required them to terminate their education prematurely, which was more often the case of women than men. In this generation there were extremely large differences between the proportion of men and women who had complete secondary or university education. In 1961 only 13 women out of 1000 indicated having university education, that is 6.5 times fewer than the proportion of women with complete secondary education, while in the very next genera-

Table 4 Population in the 25–29, 35–39 and 55–59 age groups by gender and selected types of university education in the years 1970–2001

Level and type of education	Out of 1000 people in the given age group and gender in years							
	Men				Women			
	1970	1980	1991	2001	1970	1980	1991	2001
Population aged of 25–29								
Tertiary education	80	100	137	107	71	72	113	109
incl.: university	20	26	27	34	52	48	60	64
incl.: pedagogical	0	6	9	8	0	19	32	28
technical	42	52	77	42	9	10	25	11
economic	3	6	10	20	4	7	16	24
Population aged of 35–39								
Tertiary education	96	101	130	150	34	76	85	127
incl.: university	28	27	34	36	25	56	55	71
incl.: pedagogical	0	9	7	12	0	32	23	40
technical	39	52	63	75	4	9	12	20
economic	8	5	10	17	2	4	9	24
Population aged of 55–59								
Tertiary education	42	82	113	117	7	16	39	83
incl.: university	22	32	34	35	7	13	29	60
incl.: pedagogical	0	5	10	11	0	4	13	36
technical	9	24	45	52	0	1	4	8
economic	3	10	10	12	0	1	2	7

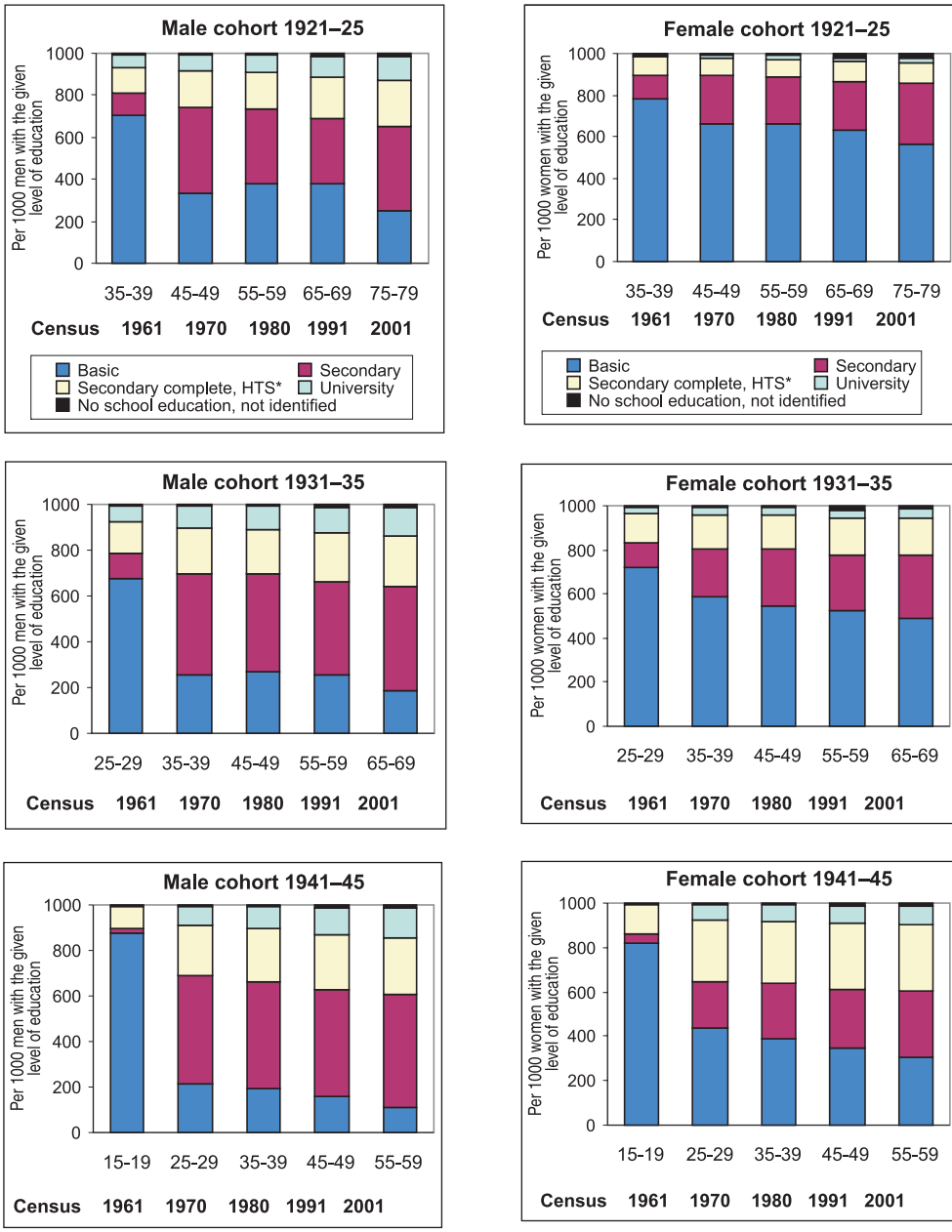
Note: Remainder to 100% of the given education group is comprised of other fields and data not determined.

tion the figure in the 30–34 age group was already 21 out of 1000, which represented just under one-quarter of the percentage of women with secondary education, and roughly the same relation can be observed in 1961 among the generation born in 1931–35. Among men in the 1921–25 generation, in 1961, 60 men out of 1000 had university education, which was just under one-half of the percentage with secondary education, and that one-half also applied to the 1926–30 and the 1931–35 generations. In 1961, 80% of men and nine-tenths of women born in the 1920s had basic or secondary education, while the proportion of women with basic education continued to be more than one-half right up until 2001, though the effect of differential mortality caused this percentage to decrease in favour of mainly secondary education and also university education (more than 85% of women of these generations had basic education together with secondary education without maturita).

The 1921–25 generation of men had on the whole a constant proportion of basic and secondary education until 1980, while in 1980 and 1991 basic education slightly predominated. From 1991, with increasing age the higher mortality intensity among men with basic education began to have an effect and their percentage began to decline.

The increase in the percentage of men born in the 1920s who obtained complete secondary education in the period between 1961 and 1970 and university education up to 1980 can be explained by the fact that men gradually obtained a higher education while working. At a later age the effect of differential mortality was already strongly felt; the percentage of men with complete secondary and university education in the 1921–25 generation increased in 2001 to more than one-third, and two-fifths of men aged 75–79 had secondary education. The number of persons born in 1921–25 decreased over a forty-year period up to 2001 to reach 45% of its level in 1961, two-thirds of whom in 2001 were women.

Figure 1 Selected generations between 1921 and 1945 by completed education (censuses 1961–2001)



Note: In 1961 basic education includes people with vocational education; from 1970 vocational education is included under secondary education without maturita, and partly under complete secondary education (vocational with maturita).
*Higher technical school.

It is possible to observe very similar development among the male generation of the 1930s, with gradual increases in the percentage of men with secondary education and somewhat later of the percentage of men with complete secondary. There was just a slight increase in the percentage of men with university education, mainly in the 1931–35 generation, while the generation born in the second half of the 1930s did not attain university education to the same extent – possibly because of the political developments in the 1950s.

A characteristic feature of the pre-war generation of women is a relatively steady decline in the percentage with basic education, an increase in the percentage of women with secondary and complete secondary education, and a very gradual increase in the percentage of women with university education. The rate of increase in the percentage of people with secondary and university education was faster mainly among women born in the 1930s, and the percentage of women with complete secondary education grew fastest among women born in 1936–40 and then among women born during the war in 1941–45. Although the percentage of women with just basic education continued to decrease, the percentage was still much higher than among men. In 1970 more than 40% of women of this generation (aged 25–29) had just basic education, which was double the percentage of men, and although in subsequent censuses this percentage declined somewhat it was still double that of men. Middle-aged women less often than men continued to further their education, and the decrease in the percentage of women with just basic education in the highest age groups in 2001 was also less the result of differential mortality than among men.

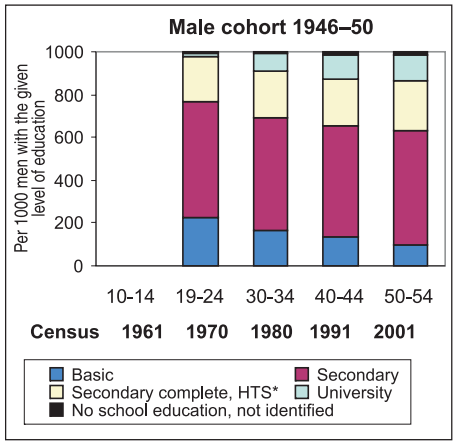
In the generation of men born in 1941–45 the increase in the level of education was mainly influenced by the rapid increase in the percentage with secondary education to the detriment of basic education, and the same trend can be observed among men born after the war and in the 1950s.

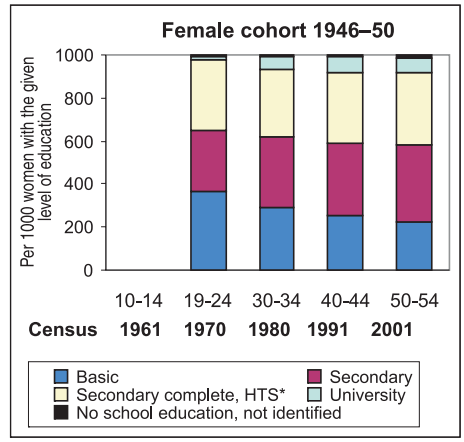
Among the post-war generation it is possible to evaluate the completed level of education according to data from the 1970s census. Typical for the male generations is a share of more than 50% with secondary education without maturita in all the age groups between 20 and 55, and one-fifth to one-quarter of men obtained complete secondary education (the effect of the planned professional allocation of young people into different fields – see above). In the generations born in the 1960s there was a decrease in the percentage of men with secondary education to below 50%, contributing to an increase to more than one-quarter of men with complete secondary education; among men born in the second half of the 1960s the latter figure even grew to 35% (in 1991 these were men aged 20–24). Ten years later complete secondary education was indicated by just 30% of men in this generation (aged 30–34). The decrease is clearly structural in origin, and it can be partly explained by the shift of some of these people into the group of university men or also by the fact that the highest completed education was incorrectly recorded. The lower percentage of men with university education in 2001 than in 1991 is evidently the result of the extension of the duration of study; the generation born in 1966–70 only reached the age of 30–34 in 2001, and many in this generation had not yet completed their education.

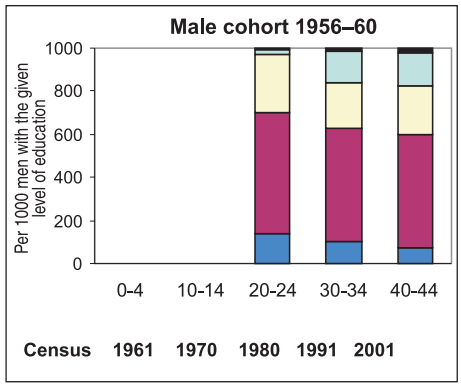
The percentages of women in individual education levels in the post-war generations developed similarly to the percentages of men, but with the difference that the percentage of women with basic education deceased faster than among men (and from higher values) and the percentage of women with complete secondary education also grew faster. The percentage of women with secondary education with maturita in the generation born in the 1960s exceeded the percentage with secondary without maturita (unlike men), and the percentage of women with university education almost came to equal the percentage of men.

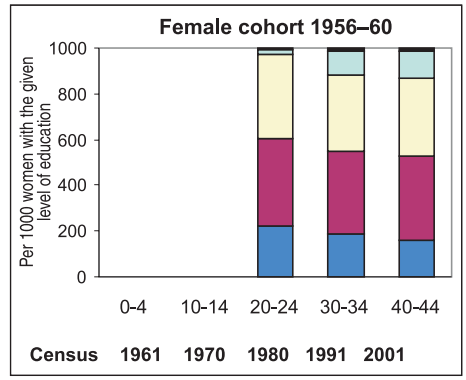
Figure 3 provides an overview of the overall development in the structure of education by age and gender. The faster increase in the level of education among women in the younger and youngest generations is particularly evident, as indicated not just by the growing percent-

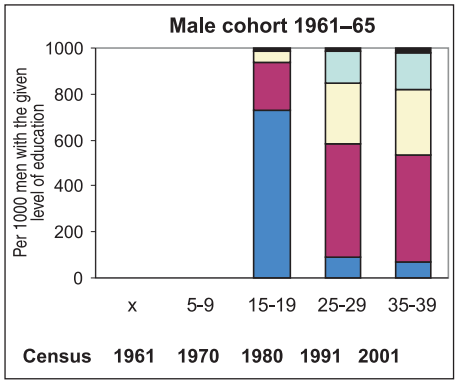
Figure 2 Selected generations between 1946 and 1965 by completed education (censuses 1961–2001)

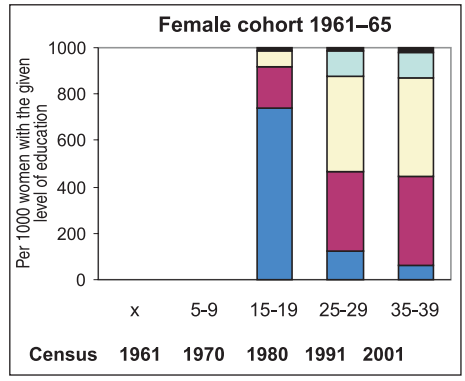












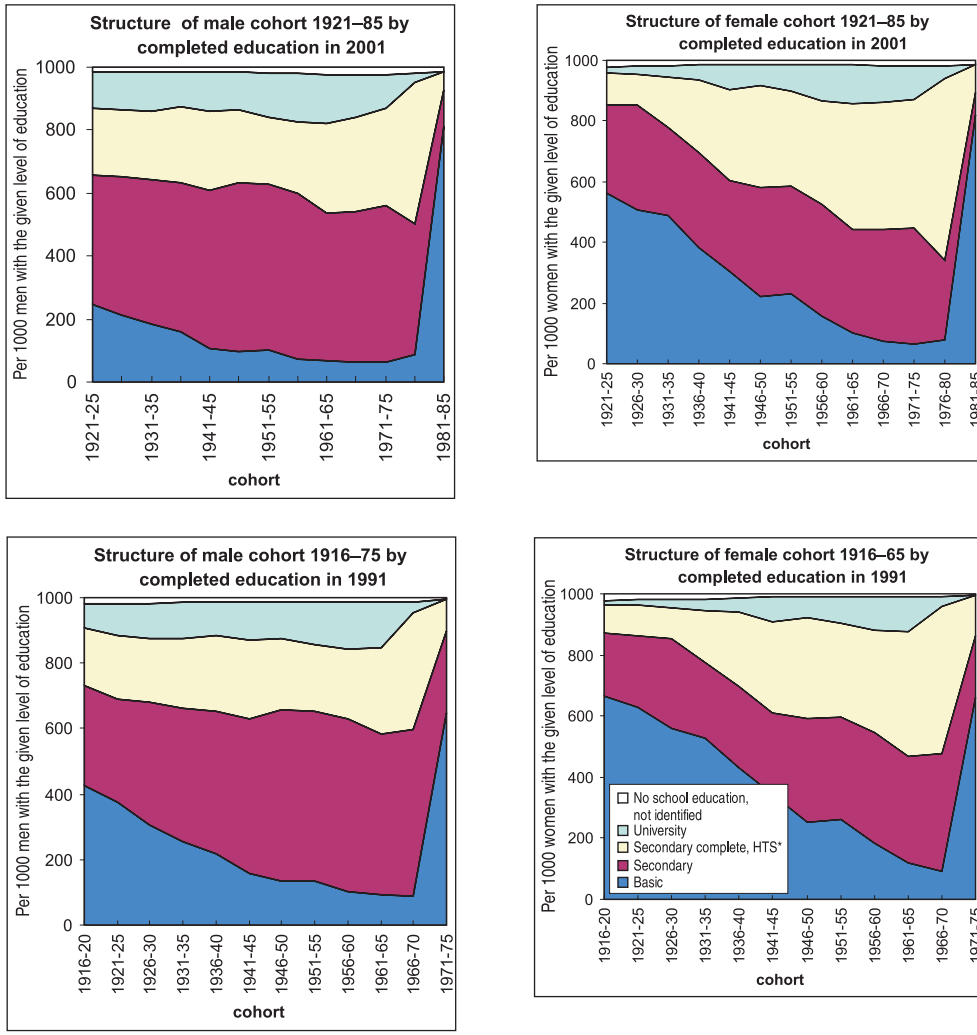
Note: *Higher technical school.

ages of women with complete secondary education but mainly by the increasing percentage of women with university education.

A comparison of the education structure in 2001 with changes in education levels in 1970–1991

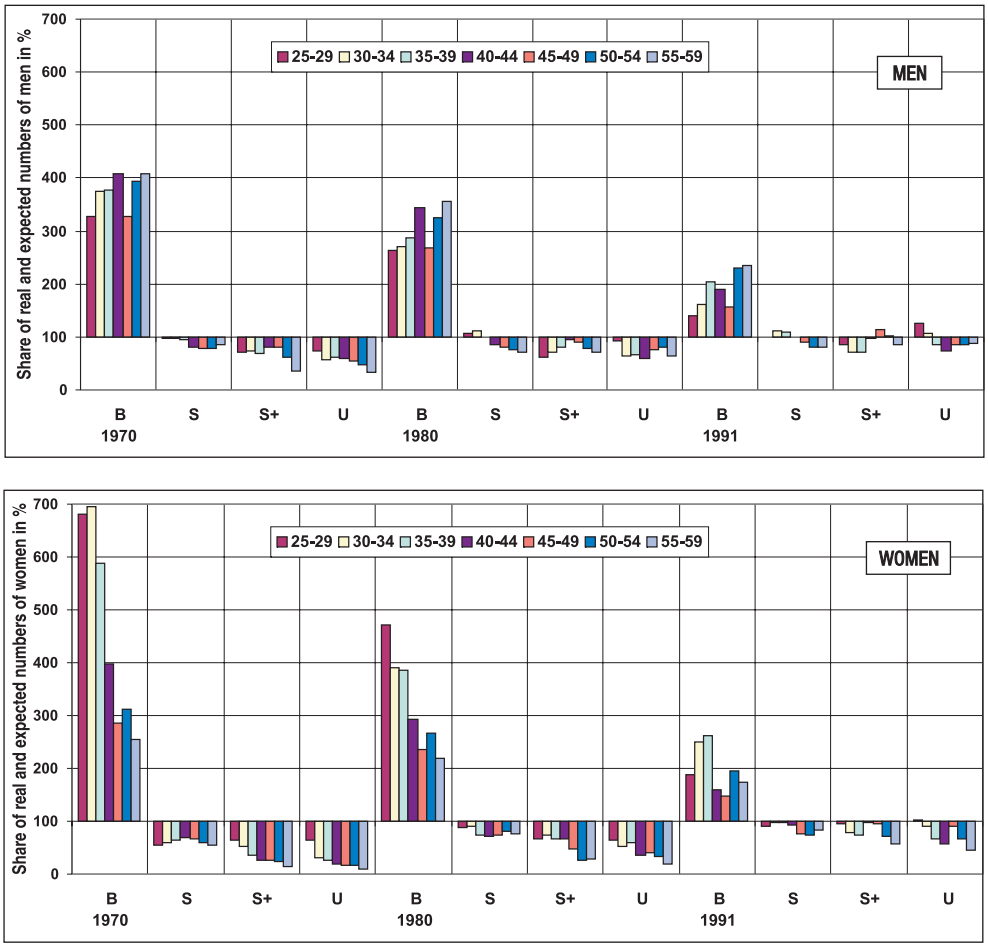
Comparative (indirectly standardised) indices were used to assess the significance of the changes in the proportion of individual education levels between 1970 and 2001. The education structures by age and gender (which can be regarded as an expression of the intensity of

Figure 3 Structure of the population born between 1916 and 1985 by completed education according to the censuses in 1991 and 2001



Note: * Higher technical school .

Figure 4 Comparative indices of real and expected population numbers by sex, age, and education level 1970–2001 (standard from 2001=100)



Note: Stage of education: B – basic, S– secondary without maturita, S+ secondary with maturita, follow-up courses and higher professional education, U – university incl. doctoral programmes.

a certain education in a given age group) from 2001 were applied to the numbers in the relevant categories of individuals in the 1970s and in 1980 and 1991 to create hypothetical numbers of people with the relevant type of education.

The comparative indices used, which show the ratio of real to hypothetical numbers of people with the given degree of education, make it possible to observe on a comparable level the change in the structure of persons by level of education, influenced only by the given age composition. Figure 4 contains the indices comparing the real to the hypothetical numbers of persons with a given type of education for five-year age groups of men and women between the ages of 25 and 59. For example, the values in the index for basic education, well above the level of 100 (which is the standard intensity), indicate that the intensity of basic education in 2001 would mean that the hypothetical numbers of women with basic education in 1970

would in relation to age be two to seven times higher than in reality, and thus the improvement in the level of education expressed by the reduction in the percentage of women with basic education was much higher than expected. In the indices evaluating the percentage of people with higher secondary and especially with university education the interpretation of the growth in the level of education is usually the opposite: the expected numbers of female university graduates were much higher than in reality, especially in the years 1970 and 1980, when the biggest differences related to the oldest age groups – thus the level of university education in 2001 was much higher than was expected; comparable figures for real and hypothetical numbers of university students in 1991 among younger women aged 25–29 are evidently a result of the extension of the duration of study witnessed at the end of the 1990s. The results for men, depicted in the second graph in Figure 4, can be interpreted similarly.

Table 5 Education level of the Czech population over the age of 15 and people in the 30–34 age group in 2001, by education classification used in the census (JKOV) and main ISCED 97 classifications*

Completed education		Code ISCED 97	ISCED 97	Persons (thousands)		%		In % by ISCED	
				Total	30–34 years	Total	30–34 years	Total	30–34 years
Basic[1)]		2A, 2B, 2C	Lower secondary stage of education	1975.1	46.8	23.0	6.8	23.0	6.8
Secondary technical school without maturita	Total	3C	Upper secondary stage of education	3255.4	290.7	38.0	42.3	62.9	75.2
	With apprenticeship certificate			1760.7	96.3	20.6	14.0		
	Technical			1494.7	194.4	17.4	28.3		
Secondary with maturita exam[2)]	Total	3A, 3B		2134.9	226.4	24.9	32.9		
	Vocational schools			125.3	18.8	1.5	2.7		
	Technical			1578.6	167	18.4	24.3		
	General			431.0	40.6	5.0	5.9		
Follow-up courses	Total	4	Post-secondary stage, lower than tertiary	188.1	16.7	2.2	2.4	2.2	2.4
Higher technical school, conservatoires with maturita and absolutorium		5B	Tertiary stage of education	108.1	4.7	1.3	0.7	10.2	13.5
Tertiary education	Total	5A		729.6	86.4	8.5	12.6		
	Bachelor			46.1	3.9	0.5	0.6		
University doctoral programmes		6		32.9	1.8	0.4	0.3		
No school education		0.1		37.9	2.9	0.4	0.4	0.4	0.4
Not identified				113.2	11.4	1.3	1.6	1.3	1.7
Total				8575.2	687.7	100.0	100.0	100.0	100.0

Note: *) International Standard Classification of Education, revision 1997.
1) Including the first four years of eight-year conservatory, and including the first four years of a six-year and two-year gymnasium (2A) (secondary general schools).
2) Including the next two years of an eight-year conservatory (3B), and including the first four years of a six-year conservatory.

Conclusion

The results of this generational analysis confirm knowledge about the rising level of education over the course of forty years of development. However, they clearly point to the fact that the rise in the level of education is determined by the young, emerging generation, that the intervals at which people complete their education have expanded in range and shifted, and that there is an increasing percentage of people for whom furthering their education even at a later age is a matter of course (in 2001 people who studied follow-up courses or at higher technical schools and the number of people indicating they had advanced research qualifications at universities: the second qualification for master's).

The analysis also revealed the much more rapid rate of increase in the level of education among women than among men, which was particularly evident in the 1980s and 1990s, and a change in the relationship to education among the post-war generation of men especially, who gave preference to secondary technical or apprenticeship education over just basic education, which was reflected in a reduction in the percentage of people with basic education and a rapid rise in the percentage of those with secondary education. It is apparent in the generational comparison that women in the post-war generations gave preference to complete secondary education over secondary education without maturita, but on the other hand they less often obtained a university education. Although from the 1960s the trends of social modernisation, the real emancipation of women, and efforts towards gender equality began to make themselves felt even in the politically unchanging Czech society, it was only when the country opened up to the advanced part of Europe in the 1990s that this development began to pick up in intensity, and the youngest generation of women are more and more striving towards the same education levels as men. It is only women born in the second half of the 1960s and younger that are producing equal percentages of university graduates as their male counterparts of the same generation, but the ratios in this regard are not yet final.

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