4

Family Background and Educational Attainment in the Netherlands for the 1891–1960 Birth Cohorts

PAUL M. DE GRAAF AND HARRY B.G. GANZEBOOM

Introduction

In the last decade, stratification research in the Netherlands has followed the lines of international research (for an overview see Ultee 1984, 1989). It has concentrated on the intergenerational inheritance of occupation and social class, and to some extent neglected the important intermediate role played by education in the intergenerational creation and reproduction of status. This also applies to our own analyses of trends in social stratification in the Netherlands, which started with comparisons of intergenerational occupational mobility at different points in time: the first analysis dealt with a historical comparison of intergenerational prestige mobility tables for men in 1954 and 1977 (Ganzeboom and De Graaf 1984); the second analysis compared ten intergenerational class mobility tables for men for surveys ranging from 1970 to 1985 (Luijkx and Ganzeboom 1989). In both studies we used log-linear scaled association models to remove the effects of marginal distributions, and metric constraints to perform powerful comparisons and to summarize possible trends within one or two degrees of freedom. The conclusions drawn from these two independent historical comparisons of intergenerational occupational mobility were identical: over the last decades, the intergenerational occupational association (that is, the degree to which occupational status is inherited from one generation to the next) has loosened significantly. At the time this conclusion seemed to be at odds with the existing literature on constant fluidity, but more recent and powerful analyses for other countries have also shown a trend towards more relative mobility (Ganzeboom, Luijkx and Treiman 1989). In more recent work we have supple-

mented these analyses of intergenerational occupational mobility with bivariate analyses of intergenerational educational mobility between fathers and respondents (De Graaf and Ganzeboom 1990). Using log-linear scaled association models the results of this analysis strongly parallel those of the earlier ones on occupational mobility: we can observe a substantial downward trend of the association in the intergenerational educational mobility tables for both men and women across birth cohorts.[1] The present study elaborates on our 1990 educational mobility analysis.

Research Problems and Hypotheses

In order to analyze educational stratification in the Netherlands, we will first estimate OLS regression models to assess trends in the effects of father's occupational and educational status on *final educational attainment* for both men and women.[2] We will then extend the analysis with an assessment of the effects of family background on *transitions* in the educational career. Thus, educational attainment is understood in two ways: as a single measure; and as a series of separate transitions between different grades of education. In this respect we follow Mare (1980, 1981b), who argued that it is useful to complement the regression type analysis of educational attainment on family background with an analysis of educational transitions, because the two different types of analysis give different answers to questions about change in the impact of family background on educational attainment. Our first two research questions then are: *to what degree does final educational attainment depend upon family background and does this change over time?*; and *to what degree do educational transitions depend upon family background and does this change over time?* In both cases we have used two family background indicators, father's educational attainment and father's occupational status, as predictor variables. This raises the relative explanatory power of these two dimensions and leads to our third research question: *which family background factor is most important in educational careers, father's occupational status or father's educational status, and does this change over time?*

With respect to the first question, historical changes in the determination of the final level of educational attainment, we will show that the impact of family background has decreased considerably and constantly over time.[3] The observed trends conform to observations made on intergenerational occupational mobility (Ganzeboom and De Graaf 1984; Luijkx and Ganzeboom 1989), and educational homogamy (Sixma and Ultee 1984), and thus seem to reveal a persuasive trend towards more openness in Dutch society.

With respect to the second issue, historical changes in family background effects on educational success at given transition points in the educational career, we expect that the pattern of transition rates will display the same pattern as observed elsewhere that the effects of social background are greatest at the beginning of the educational career, and smaller in the more advanced stages (see Mare 1981b).

The decreasing effect of parental status on educational attainment at the higher transitions of the educational career, together with the historically

increasing proportion of individuals making higher-level transitions, means that trends in the metric effects of parental status need not parallel historical developments at each transition point. Examples of this are given by Mare (1980, 1981b), who found a historically increasing effect of family background at transitions, and a stable metric effect on final educational attainment in the United States, and by Smith and Cheung (1986), who, in their study of the Philippines, found a historically stable effect at each transition and an overall declining metric impact.

The development of the impact of social background on final educational attainment and on educational transitions over time is an important piece of information about the validity of the two competing theoretical perspectives on educational stratification: modernization theory and cultural reproduction theory (Collins 1979; De Graaf 1986; Ganzeboom, De Graaf, and Robert 1990). On the one hand, (functionalist) modernization theory posits the lowering of financial and social thresholds, and suggests that the influence of (ascribed) family characteristics will decline with modernization. On the other hand, cultural reproduction (conflict) theory suggests that this influence will be stable.

This supposed trend toward meritocracy appeared to be supported by two tendencies, one intended, and one accidental. First, Western countries promoted legislation aimed at equality of opportunity. In the 1950s and 1960s states started to sell education at below its real cost, partly because they thought that international economic competition demanded a well-educated labor force, and partly because a value was placed on individual development per se. Secondly, increasing affluence and job security caused a reduction in both the direct and opportunity costs of education. Thus, modernization theory hypothesized that financial resources of the family of origin would no longer have a direct effect on educational outcomes, and that, for this reason the dependence of educational attainment on family background would necessarily be weakened.

Cultural reproduction theory counters these arguments by pointing to the enduring influence of status culture in education, particularly in secondary and tertiary schooling (Bourdieu and Passeron 1977). It is stressed, that the educational system is not a neutral testing device for the capabilities of individuals, but functions instead as a filter that favors those children who bring with them from their homes the cultural preferences and competences that are rewarded in school. For this reason, and because selection within the educational system is often self-selection produced by a mismatch between the cultural background of children and the (perceived) cultural patterns of school, equality of results has not been achieved *despite* the existence of equality of financial opportunity. The proper test for such a conflict theory of stratification is to see whether the association between family background and children's educational attainment can be explained by control over cultural resources (DiMaggio 1982; DiMaggio and Mohr 1985; De Graaf 1986, 1988).

The assessment of historical developments in the relative effects of family background factors on educational attainment does not tell us anything about

the implied mechanisms, but it can help us to make a decision as to the relevant weight to be attached to the competing theories. With respect to the third issue—the relative effects of father's education and father's occupation—our expectations are shaped by the competing views of modernization theory and cultural reproduction theory. Modernization theory, on the one hand, posits a decreasing influence of family background by pointing to lowered financial thresholds. Given that father's occupation is a more direct indicator of family income than father's education, we would expect modernization to show up more strongly in the impact of father's occupation than in the impact of father's education. On the other hand, cultural reproduction theory argues that control over cultural codes is responsible for the enduring inequality of educational opportunity, and that father's education is a more direct indicator of important cultural resources than father's occupation. The two theories are in fact compatible and lead us to conclude that the impact of father's education is stronger and more resistant to change than that of father's occupation.

The Educational System in the Netherlands

In comparison to the comprehensive and essentially one-dimensional progression that characterizes the educational system in the United States, the Dutch educational system is relatively complex. Fortunately, however, the changes and reforms that have taken place during the period under analysis have not altered the fundamental contours of the system, although the names of the various schools have changed (see Figure 4.1).

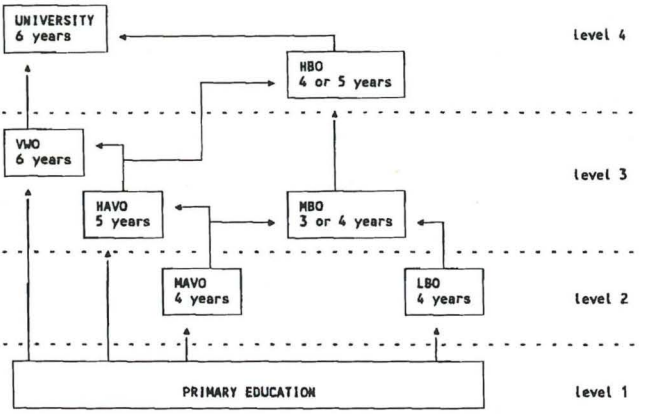
Primary Education

Primary school has been compulsory for children aged from six to twelve years throughout the period analyzed (1900–1980).[4] Pre-primary school or *Kindergarten* was quite common for children aged four to five years of age, but was not compulsory during the educational careers of the birth cohorts investigated in this study. In primary school children are taught general non-vocational skills. Classes are usually made up of children with a wide variety of aptitudes who are taught a common curriculum, although some informal streaming may take place towards the end of primary school. Parallel to the standard primary education there is a small and in the present context, negligible, stream of special education for children with particular cognitive and/or behavioral problems.

Secondary Education

Throughout the entire period under review, the branching point in the Dutch educational system comes at the age of twelve, after six years of primary education. This is the main decision point in the educational career when students decide on the type and level of secondary education in which to enroll. It has been quite normal for children to choose from among up to six alternatives, each with a different level of complexity and prospects of contin-

Figure 4.1 Contours of the Netherlands' educational system



abbreviations:

LBO: junior vocational training
MBO: senior vocational training
HBO: vocational colleges
MAVO: junior general secondary education
HAVO: senior general secondary education
VWO: pre-university education

uation. The most fundamental choice, however, is between the vocational track (that is, preparing for manual occupations), and the general track. Secondary education falls into two groups: the lower level takes in lower occupational and lower general education (LBO and MAVO respectively), and is normally completed by the age of fifteen or sixteen; the higher level also takes in a vocational and a general track (MBO and HAVO and VWO respectively), which is normally completed by the age of about eighteen. It is important to note that in many cases the transition from lower to higher secondary education is not a true transition as virtually all students with a higher general secondary education diploma have already chosen this type of education at the age of twelve. Students who complete the higher secondary level in the vocational track may have come from both the vocational and general lower secondary tracks. Both tracks of higher secondary education lead to a diploma, which gives access to tertiary education, albeit to different tracks.

Tertiary Education

Tertiary education is also divided into two tracks: the university level; and colleges for non-academic professions (HBO). Both last for from four to six years and are normally completed by the age of twenty-three. In this study, we distinguish between four categories of the highest educational level attained:

- Less than primary education or primary education;
- Lower secondary general education or lower secondary vocational training;
- Higher secondary general education or middle-level vocational training;
- Higher vocational training or university level.

This division conforms to the UNESCO standard system of educational classification (ISCED), and has the very practical advantage of allowing comparisons across all the different data sets used for this study.

From Figure 4.1 we see that educational transitions cannot be rigidly linked to age, insofar as transitions to a particular level may take place at different ages. Moreover, the highest level attained cannot always be linked to a particular set of transitions, because the same level may be reached by different routes. We can, however, describe the fundamentals of educational careers within a limited set of categories, where the crucial decisions are made as follows: at about the age of twelve, at the end of primary school and on entering lower or higher secondary education; between the ages of twelve and eighteen, when decisions are made about leaving school or participating and finishing higher secondary education or middle-level occupational training; and at around the age of eighteen, namely, at the end of higher secondary training and the start of professional-vocational college or university. As a consequence we will study three types of transitions:

- From no diploma to any diploma in secondary education;
- From any diploma in secondary education to any diploma in higher secondary education;
- From any diploma in higher secondary education to completed tertiary education.

Between them, the four levels of schooling and the three transitions sum up the general contours of the Dutch educational system, but may conceal some important differences. First, all those who have no diploma after primary education are classified in the lowest educational category. To some extent this conceals real differences in educational attainment: members of the older birth cohorts largely fall into the category "only primary education," whereas there may in fact be substantial differences in acquired skills among individuals. Second, although our approach produces an adequate representation of the *final level* of educational attainment and can therefore be used as a dependent variable in a regression analysis, it obviously has some drawbacks when it comes to mapping educational *careers*. Students entering a particular school type but not passing the examinations are recoded as not having had that particular level of education at all. This may conceal transition probabilities within the educational career. On the other hand, the procedure aggregates several transitions within a certain curriculum into a single transition, and therefore still matches selection procedures within the educational career. The third, and probably the most serious (conceptual) problem, is that our four levels of educational attainment do not necessarily follow

transition vs. completion

each other in the career. This is especially the case for transitions in secondary schooling, where different types of school curriculum run parallel to one another. After primary education most students go directly into either a lower or a higher level of secondary education and remain in that track. In the analysis of transitions reported below, we have chosen to disregard these issues, largely because the three decision processes involved take place one after the other in the educational career.

Data

In order to cover a maximum time-span and a maximum number of individuals, we have merged all available national Dutch cross-sectional data-sets which contain information on the educational attainment of the respondents and their fathers, together with respondent's gender and year of birth (see Table 4.1). The analysis is limited to respondents for whom we have complete information on education, father's education, father's occupation, age, and gender, and who were aged twenty-five or over at the time of the interview. Without this latter limitation we would have created a selection bias on the dependent variable "educational attainment" because the longest educational careers are not completed until the age of twenty-five. Therefore our analysis will be limited to the seven ten-year cohorts born before 1960

Table 4.1 Data sources used

Title of the data-set (researcher, no. Steinmetz Archives)	Year of collection	Number of cases analyzed	
National Election Survey 1970 (Stouthardt a.o., P0136)	1970	928	(8.3%)
Seven Nations Study (Irving and Molleman, not in Steinmetz Archives)	1971	667	(5.9%)
Income Satisfaction 1976 (Hermkens and Van Wijngaarden, P0653)	1976	671	(6.0%)
Life Situation Survey 1977 (Central Bureau of Statistics, P0328)	1977	1054	(9.4%)
National Election Survey 1977 (Research Group National Election Survey, P0354)	1977	1291	(11.5%)
Political Action, second survey (Barnes and Kaase, P0823)	1979	1069	(9.5%)
Prestige and Occupational Mobility (Ultee and Sixma, P0839)	1982	553	(4.9%)
National Labor Market Survey Program (Heinen and Maas, P0748)	1982	1506	(13.4%)
Organization Strategic Labor Market Research (OSA, not in Steinmetz Archives)	1985	2836	(25.2%)
Income Satisfaction 1987 (Hermkens and Van Wijngaarden, not in Steinmetz Archives)	1987	669	(5.9%)
Total		11244	(100%)

(see Table 4.2). The operational definitions of the variables analyzed are shown in Table 4.2.

The oldest cohort are those born in the 1890s and who first completed their educational careers around the year 1900. The youngest people in our analysis were born in 1960 and have only recently finished their educational careers. Thus, the analysis covers mobility processes from 1900 to 1980, but, since both the oldest and youngest cohorts are sparse, our conclusions primarily reflect events in the period 1910–1970.

Different coding schemes for educational attainment were used in the ten surveys, and these sometimes varied within a single survey between respondents and their fathers. However, all the graduations of educational attainment of respondents and their fathers were recoded into our fourfold classification with the help of the detailed educational codings used in the individual surveys.

Father's occupational status is coded according to two alternative classification schemes. The first, with which we will work only briefly, is a modified class scheme (Erikson and Goldthorpe 1987) (see Table 4.2). In order to limit the number of parameters in our models we will primarily use a metric scale, for which we will use a Dutch Socio-Economic Index of occupations (SEI), developed by Klaassen and Luijkx (1987). In addition to being parsimonious, this has the conceptual advantage of being the most straightforward measurement of economic resources in the parental family.

Table 4.2 Description of classifications used

Birth cohort

	men	women
1891-1900	112	91
1901-1910	263	282
1911-1920	620	466
1921-1930	1097	852
1931-1940	1361	1069
1941-1950	1694	1395
1951-1960	981	961
Total	6128	5116

Educational attainment of respondents and their fathers

Level completed	Age at completion	Decision age span
0. Primary (no diploma afterwards)	12-13	12 through 13
1. Secondary, lower level	15-16	12 through 16
2. Secondary, higher level	18-19	12 through 18
3. Tertiary	22-25	18 through 25

Father's occupation

1) Modified class scheme of Erikson, Goldthorpe and Portocarero (1982):

EGP I/II	Business and administrative - elite and intermediate Professionals - academic and non-academic
EGP III	Routine non-manual workers
EGP IV	Self-employed small shopkeepers and artisans
EGP V/VI	Supervising and skilled manual workers
EGP VIIa	Semi- and unskilled manual workers
EGP IVc/VIIb	Farm owners and farm laborers

2) SEI: Socio-Economic Index of occupational status (Klaassen and Luijkx, 1987)

Range: 0 through 8 (recoded from original range from 8 through 88: SEI=(SEI-8)/10

Final Level of Educational Attainment: OLS Regression Analysis

Table 4.3 displays the gradual expansion of the Dutch educational system, by presenting the highest educational level reached by each birth cohort. Most individuals in the first birth cohorts, especially women, did not obtain any diploma after primary education, but this has changed in the course of this century with most men and women in the last cohorts reaching the higher levels of secondary education. Table 4.3 also documents the advantage men have had over women throughout this century, but also that this situation has changed markedly for the youngest birth cohorts, and that the gap between the sexes has narrowed sharply.

Table 4.4 gives the results for the OLS regression analyses of educational attainment on father's educational and occupational status. The models are estimated separately by cohort and sex. Father's occupation is first recoded according to a modified Erikson and Goldthorpe class scheme, and second according to the SEI. When we look at the predictive power of both models, it is clear that the single degree of freedom approach used with the SEI measure of occupational status binds as much variance as the less parsimonious class scheme. We will therefore comment primarily on the regression model with father's SEI. A downward trend in the effects of father's educational status and father's occupational status is evident for both men and women. The intercept seems to rise gradually, indicating that the rise of mean educational attainment is not only due to a change in household composition, but also has a large autonomous momentum. Before discussing the values of the effects, we will test whether the trends observed in Table 4.4 can be confirmed by inferential statistics.

The statistical procedure used to test for linear trends is a simultaneous covariance analysis with dummy variables for the separate cohorts and the inclusion of multiplicative interaction terms to the model (Jaccard, Turrisi, and Wan 1990):

Table 4.3 Educational attainment, highest level completed, by birth cohort and gender

	birth cohort						
	91-00	01-10	11-20	21-30	31-40	41-50	51-60
Men	%	%	%	%	%	%	%
1. Primary education only	67.9	51.3	39.5	28.2	21.4	13.7	9.7
2. Secondary education, lower level	20.5	27.8	32.7	30.0	29.6	28.4	24.2
3. Secondary education, higher level	7.1	13.3	18.4	26.2	29.2	34.9	40.7
4. Tertiary education	4.5	7.6	9.4	15.7	19.8	23.0	25.5
Mean	1.48	1.77	1.98	2.29	2.47	2.67	2.82
Number of cases	112	263	620	1097	1361	1694	981
Women	%	%	%	%	%	%	%
1. Primary education only	76.9	70.9	62.7	49.9	30.6	19.7	11.6
2. Secondary education, lower level	14.3	13.5	23.0	28.8	38.2	40.4	27.0
3. Secondary education, higher level	7.7	10.6	11.4	16.5	22.5	28.2	41.3
4. Tertiary education	1.1	5.0	3.0	4.8	8.8	11.7	20.2
Mean	1.33	1.50	1.55	1.76	2.09	2.32	2.70
Number of cases	91	282	466	852	1069	1395	961

Table 4.4 Ordinary Least Squares regression of final educational attainment on father's education and father's occupation, by birth cohort and gender

Men

Models with father's occupation coded in EGP class scheme

	birth cohort 91-00	01-10	11-20	21-30	31-40	41-50	51-60
Father's education	.729	.614	.503	.427	.332	.302	.219
Father's class							
I/II	.244~	.864	.491	.604	.514	.345	.299
III	.694~	.391~	.602	.706	.656	.338	.168~
IVab	.386~	.361	.359	.295	.295	.020~	.201~
V/VI	.277~	.280	.264	.271	.316	.069~	-.027~
VIIa	-.195~	.233~	-.040~	.027~	.004~	.089~	-.109~
Intercept (Father primary+farmer)	.306	.344	.591	.817	1.012	1.277	1.527
Adjusted R^2	.308	.309	.280	.235	.185	.142	.119
Number of cases	112	263	620	1097	1361	1694	981

Models with father's occupation coded in Socio-Economic Index

	birth cohort 91-00	01-10	11-20	21-30	31-40	41-50	51-60
Father's education	.475	.589	.529	.432	.351	.319	.238
Father's SEI	.208	.227	.090	.133	.100	.055	.068
Intercept	-.172	-.029	.504	.648	.936	1.232	1.346
Adjusted R^2	.349	.353	.256	.234	.172	.136	.114
Number of cases	112	263	620	1097	1361	1694	981

Women

Models with father's occupation coded in EGP class scheme

	birth cohort 91-00	01-10	11-20	21-30	31-40	41-50	51-60
Father's education	.629	.605	.365	.413	.382	.337	.234
Father's class							
I/II	-.023~	.395	.628	.458	.340	.226	.104~
III	1.241	.197~	.418	.326	.405	.314	.101~
IVab	.300~	.553	.294	.084~	.162~	.076~	-.063~
V/VI	.155~	.217	.315	.122~	-.078	-.124~	-.242
VIIa	-.092~	.009~	.122~	.061~	.038~	-.095~	-.209~
Intercept (Father primary+farmer)	.107	.141	.200	.435	.748	1.036	1.524
Adjusted R^2	.448	.375	.235	.229	.215	.142	.122
Number of cases	91	282	466	852	1069	1395	961

Models with father's occupation coded in Socio-Economic Index

	birth cohort 91-00	01-10	11-20	21-30	31-40	41-50	51-60
Father's education	.602	.560	.370	.440	.395	.354	.250
Father's SEI	.102	.113	.132	.077	.080	.068	.056
Intercept	-.073	-.028	.023	.331	.590	.833	1.244
Adjusted R^2	.302	.371	.232	.224	.208	.194	.112
Number of cases	91	282	466	852	1069	1395	961

~ denotes insignificance, $p>.05$

$$EDUC_1 = b_0 + b_1 * FEDUC_1 + b_2 * FOCC_1 + b_3 * COHORT_1 + b_4 * (FEDUC_1 * COHORT_1) + b_5 * (FOCC_1 * COHORT_1) + e_1$$

In the first step, a dummy variable was created for each of the seven cohorts, and each dummy variable is multiplied with the predictor variables father's educational attainment (FEDUC), and father's occupational status (FOCC). This generates a model with twenty-one regression effects for both sexes; seven intercepts for the separate cohorts; and seven effects of father's education and father's occupation. This model is equivalent to the reported regression models of Table 4.4 (when using father's SEI score) and the estimated effects can be read from Table 4.4.

Subsequently, these twenty-one regression effects are constrained, first by introducing the variable COHORT as a metric variable, and secondly by computing the products of COHORT and FEDUC and of COHORT and FOCC respectively. These three metric variables are then introduced, one by one, into the model, replacing the dummy variables and their interactions. This procedure generates a number of nested models, and the contrast between $model_a$ and $model_b$ evaluated by an F-test, according to the following formula:

$$F(df_a - df_b, N - df_b) = \frac{(SS_a - SS_b) / (df_a - df_b)}{(SS_{total} - SS_b) / (N - df_b)}$$

In this formula df_a and df_b stand for the numbers of degrees of freedom, SS_a and SS_b stand for the sums of squares of the models, SS_{total} is the total sum of squares, and *N* is the number of cases. In the final step we tested whether the linear interaction effects in fact resembled a trend or a stability.

Table 4.5 gives the relevant fit statistics. Model 1 is the baseline; all twenty-one parameters are estimated separately. Model 2 constrains the intercept to follow a linear trend. This brings five degrees of freedom, whereas the sum of squares decreases by 5.69 points for men and by 6.32 points for women. The F-test shows that both for men and women this constraint does not weaken the model. The same holds true when both the effects of father's education and father's occupation are modelled to follow a linear trend over cohorts (Models 3 and 4). However, when any of these parameters is constrained to be stable over time in Models 5, 6 and 7, the model fit worsens significantly. Thus Model 4 is the preferred model. This implies that all the effects as observed in the cohort specific models of Table 4.4 can be represented via linear trends, for both men and women.

The estimates are presented in Table 4.6. Cohorts are numbered from 0 (oldest cohort) to 6 (youngest cohort), and so the intercepts in the interaction effects represent the implied effect in the oldest cohort. The overall intercept increases with 0.257 for each birth cohort of men, and with 0.252 for women, net of changing family background. The effect of the two family background indicators decrease significantly. According to Model 4, the effect of father's educational attainment was $b = 0.630$ for men in the first birth cohort, and has

Table 4.5 Tests for trends in OLS family background effects in educational attainment, by gender

Models	Constraints[a]: father's education	father's SEI	intercept	number of parameters	men SS_{model}	women SS_{model}
(1)	Cohort	Cohort	Cohort	21	1725.66	1645.81
(2)	Cohort	Cohort	Trend	16	1719.97	1639.49
(3)	Trend	Cohort	Trend	11	1718.66	1636.18
(4)	Trend	Trend	Trend	6	1711.22	1619.18
(5)	Trend	Constant	Trend	5	1694.47	1614.85
(6)	Constant	Trend	Trend	5	1679.89	1609.50
(7)	Trend	Trend	Constant	5	1527.91	1465.73

Contrasts[b]	df	men SS	F	p	women SS	F	p
(2)-(1)	5	5.69	1.4	n.s.	6.32	1.9	n.s.
(3)-(2)	5	1.31	0.3	n.s.	3.31	1.0	n.s.
(4)-(3)	5	7.44	1.9	n.s	7.44	2.3	n.s.
(5)-(4)	1	16.75	20.9	<.001	16.75	25.4	<.001
(6)-(4)	1	31.33	39.2	<.001	31.33	47.5	<.001
(7)-(4)	1	183.31	229.1	<.001	183.31	267.2	<.001

n.s. = not significant, p>.05
[a]Constraints: Cohort = separate effects for each birth cohort; Trend = linear trend in effects over birth cohorts; Constant = equal effects over birth cohorts
[b]See text for calculation of F-value; SS_{total}(men) = 6614.65; N of cases (men) = 6128; SS_{total}(women) = 4973.93; N of cases (women) = 5116

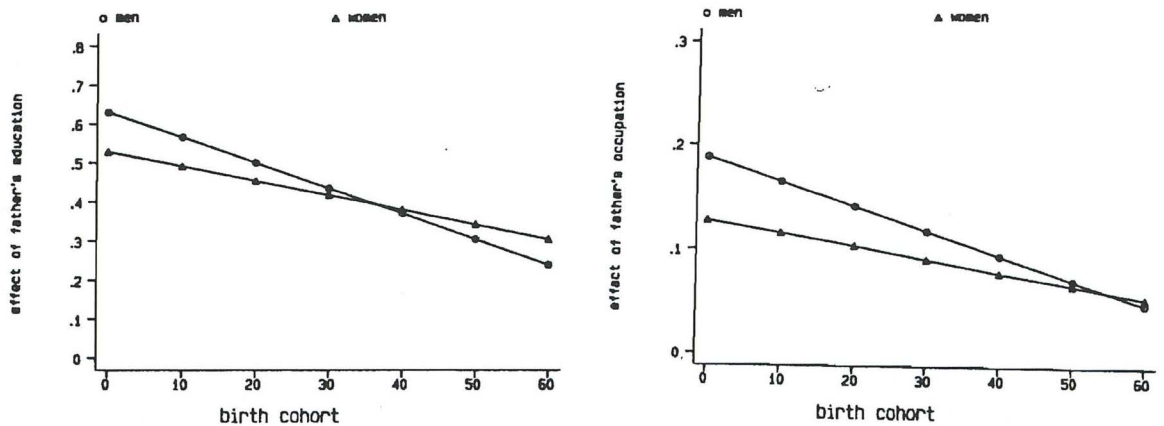
decreased by 0.065 for each successive birth cohort, giving an effect of $b = 0.240$ for the last birth cohort. For women the effect of father's educational status started at $b = 0.528$ for the first cohort, and has decreased by 0.037 for each successive cohort to $b = 0.306$ for the last birth cohort.

The effects of father's occupational status have also decreased dramatically. Again according to the preferred Model 4 of Table 4.5, the effect of father's SEI was $b = 0.188$ for the oldest cohort and has gradually decreased until it reached a value of $b = 0.050$ for the youngest cohort. For women the effect was $b = 0.128$ for the oldest cohort and $b = 0.056$ for the youngest cohort. The trends in both background factors are displayed in Figure 4.2. The downward trend is somewhat steeper for men than for women, and the standard errors of the interaction effects suggest that these differences are significant (see Table 4.6). The interaction effects of father's educational background and cohort differ by 0.028 between the sexes (-0.065 for men and -0.037 for women), while the standard errors are around 0.010. For occupational status the difference between the interaction effects for men and women is 0.013 with a standard error of 0.005, again a significant difference. The reduction in the influence of family background factor has been stronger for men than for women.

Table 4.6 Estimates of Models (4) of Table 5 (standard errors in brackets)

	men		women	
Intercept first cohort	.893	(.073)	.610	(.072)
Intercept linear trend	.257	(.017)	.252	(.016)
Father's education first cohort	.630	(.057)	.528	(.054)
Father's education linear trend	-.065	(.010)	-.037	(.010)
Father's occupation first cohort	.188	(.027)	.128	(.026)
Father's occupation linear trend	-.023	(.005)	-.012	(.005)

Figure 4.2 Trends in effects of father's educational status and father's occupational status on final educational attainment of men and women, of birth cohorts 1891-1960 (models (4) of Table 4.5)



We are also interested in the relative effects of father's educational attainment and father's occupational status. To evaluate these, we standardized the regression coefficients of predictor variable x in our preferred model using the standard errors for each birth cohort:

$$\beta_{(c)} = b^*_{(c)} \frac{Sx_{(c)}}{Sy_{(c)}}$$

Where b^* is the effect of x on y as implied by the model in cohort c and $Sx_{(c)}$ and $Sy_{(c)}$ are the relevant standard deviations in cohort c.

The results are reported in Table 4.7 for both men and women. For each cohort, father's education has a greater effect on the educational attainment of his children than his occupational status. Both effects decrease over cohorts, but the difference between the standardized effects of educational and occupational background has widened. This suggests that cultural resources are now more important than financial resources, while both kinds of resources were of about equal importance before. To some extent, this corroborates cultural reproduction theory.

We conclude our OLS analysis regression analysis of the impact of family background on final educational attainment by summarizing that for both men and women the effects of father's educational and occupational status have decreased over cohorts in a linear way, and that in general father's educational status is the major family factor predicting educational success.

Transitions in the Educational Career: Logit Analysis

In this section, we will analyze the transitions within the educational career. Figure 4.3 shows the gross development of the percentages of those making the three transitions over birth cohorts. The first transition—to any diploma in secondary education after primary education—was only made by a small proportion of the oldest cohort, whereas 90% of the youngest cohorts obtained at least one certificate after primary education. Boys made this transition more often than girls throughout the entire period, but now this difference has almost disappeared.

Table 4.7 Standardized effects* according to Models (4) of Table 4.5

	men			women		
	father's education	father's occupation	ratio	father's education	father's occupation	ratio
Cohort 1891-1900	.42	.33	1.3	.41	.26	1.6
1901-1910	.36	.27	1.3	.42	.23	1.8
1911-1920	.40	.23	1.7	.40	.19	2.1
1921-1930	.35	.20	1.8	.38	.18	2.1
1931-1940	.33	.17	1.9	.37	.16	2.3
1941-1950	.30	.14	2.1	.36	.14	2.6
1951-1960	.26	.10	2.6	.34	.12	2.8

* See text for calculation

For the second transition—from any diploma in secondary education to any diploma in higher secondary education—the increase in the transition rate is less striking. Whereas the fluctuations in the early cohorts are probably due to the small number of cases involved, the trend seems to be from 40% in the oldest cohort to 70% in the youngest cohort. Again the differences between the sexes decrease sharply in the youngest cohorts.

The third transition—from any diploma in higher secondary education to completed tertiary education—shows a remarkable pattern. For men, the continuation rate is around 40% for all cohorts, and for women the rate is stable at 30%. Given a diploma in higher secondary education, the probability of continuing the educational career has apparently been stable.

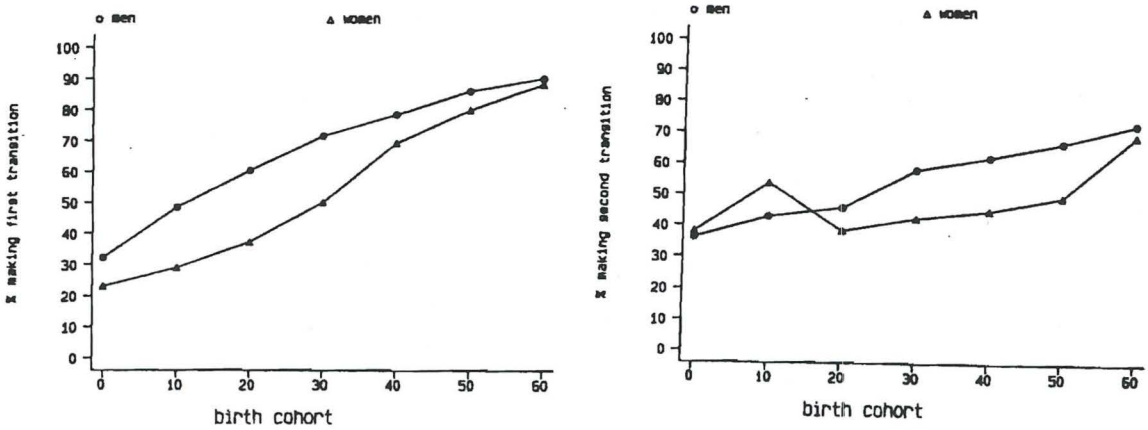
Table 4.8 presents the result of selected logit models of conditional continuation probabilities by sex and transition. The second panel of Table 4.8 gives the contrasts in fit statistics between the models. The table starts with a logit analysis of the transition to any diploma after primary education. The analytical design is the same as that used in the regression analysis. First, separate parameters for all seven birth cohorts are estimated, which then are constrained to follow linear trends or to be stable over time. For both men and women Model 1.4 is the preferred model as it models the intercept, and the effects of father's education and occupation as linear over time.

The second transition is not quite as simple. For men, we again find that linear interaction effects adequately represent the changes in the intercept, and in the effects of father's education and occupation. However, the preferred model here is Model 2.5, and we cannot reject the hypothesis that there are no changes in effects of father's occupation at all and that this effect is constant across cohorts, while the effect of father's education is historically declining. The situation is even more complicated for women. The comparison between Model 2.1 and Model 2.2 shows that there are changes in the educational attainment of women, net of changing family background, but that these cannot be represented by a linear trend. While this comparison (for the changes in the intercept) is still on the borderline of statistical significance, this is not true for the comparison between Model 2.4 and Model 2.3, which is strongly significant. This proves that the changing effects of father's occupation cannot be represented by a linear trend. The subsequent comparisons shows that linear trend specifications of the effects of father's occupation and father's education do not differ significantly from the situation of no trend at all. Were we to disregard the evidence in the comparison between Model 2.4 and Model 2.3, which shows a significant over-time fluctuation in the effect of father's occupation, the models would suggest that there are no significant linear changes in the effect of family background on transition to the third level for women.

The models become very simple again for the third transition, towards completion of tertiary education. None of the comparisons between the models is anywhere near statistical significance, and so the most constrained model fits the situation for both men and women: there is no historical change at all in continuation towards tertiary level, nor any change in the dependence of this continuation upon family background.

Table 4.9 gives the estimated parameters of Model 1.4. This first transition

Figure 4.3 Description of conditional school continuation decisions of men and women, birth cohorts 1891-1960



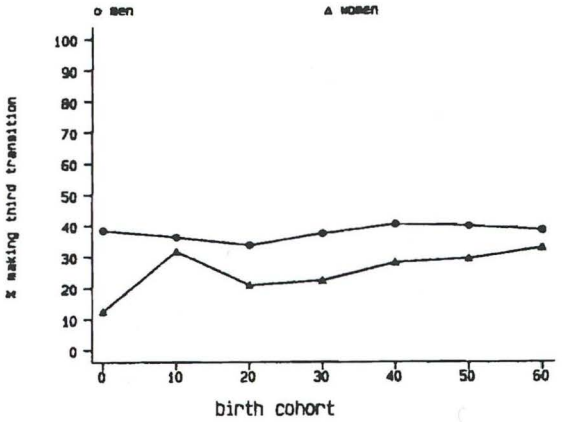

o men
Δ women
% making third transition
100
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
birth cohort

Table 4.8 Tests for trends in logit models of school continuation decisions in the Netherlands on father's educational attainment and father's class, by birth cohort and gender

Models	Constraints[a]: father's education	father's SEI	intercept	number of parameters	men log likelihood	women
Transition 1: any diploma in secondary education (6128 men, 5116 women)						
(1.1)	Cohort	Cohort	Cohort	21	-2712.03	-2527.37
(1.2)	Cohort	Cohort	Trend	16	-2717.17	-2527.42
(1.3)	Trend	Cohort	Trend	11	-2718.91	-2532.85
(1.4)	Trend	Trend	Trend	6	-2720.66	-2537.10
(1.5)	Trend	Constant	Trend	5	-2728.99	-2549.63
(1.6)	Constant	Trend	Trend	5	-2728.83	-2541.26
(1.7)	Trend	Trend	Constant	5	-2796.50	-2663.83
Transition 2: diploma in higher secondary education, given any diploma in secondary education (4745 men, 3416 women)						
(2.1)	Cohort	Cohort	Cohort	21	-2830.39	-2084.26
(2.2)	Cohort	Cohort	Trend	16	-2832.70	-2092.36
(2.3)	Trend	Cohort	Trend	11	-2834.13	-2096.24
(2.4)	Trend	Trend	Trend	6	-2837.80	-2116.58
(2.5)	Trend	Constant	Trend	5	-2839.07	-2116.64
(2.6)	Constant	Trend	Trend	5	-2840.74	-2116.70
(2.7)	Trend	Trend	Constant	5	-2856.67	-2124.68
Transition 3: finished tertiary education, given diploma in higher secondary education (2996 men, 1782 women)						
(3.1)	Cohort	Cohort	Cohort	21	-1893.17	-1004.36
(3.2)	Cohort	Cohort	Trend	16	-1893.90	-1008.81
(3.3)	Trend	Cohort	Trend	11	-1894.76	-1011.53
(3.4)	Trend	Trend	Trend	6	-1897.46	-1012.89
(3.5)	Trend	Constant	Trend	5	-1897.50	-1013.43
(3.6)	Constant	Trend	Trend	5	-1898.57	-1012.90
(3.7)	Trend	Trend	Constant	5	-1897.49	-1012.89
(3.8)	Constant	Constant	Constant	3	-1898.63	-1013.48

Contrasts[b]	df	men Chi^2	p	women Chi^2	p
Transition 1: any diploma in secondary education					
(1.2)-(1.1)	5	10.28	n.s.	0.11	n.s.
(1.3)-(1.2)	5	0.10	n.s.	10.85	n.s.
(1.4)-(1.3)	5	3.49	n.s	8.51	n.s.
(1.5)-(1.4)	1	16.67	<.001	25.05	p<.001
(1.6)-(1.4)	1	16.35	<.001	8.32	p<.01
(1.7)-(1.4)	1	135.34	<.001	253.46	p<.001
Transition 2: diploma in higher secondary education, given any diploma in secondary education					
(2.2)-(2.1)	5	4.62	n.s.	16.20	p<.01
(2.3)-(2.2)	5	2.88	n.s.	7.77	n.s.
(2.4)-(2.3)	5	7.33	n.s	40.67	p<.001
(2.5)-(2.4)	1	2.54	n.s.	0.13	n.s.
(2.6)-(2.4)	1	5.87	<.05	0.25	n.s.
(2.7)-(2.4)	1	37.75	<.001	16.21	p<.001
Transition 3: finished tertiary education, given diploma in higher secondary education					
(3.2)-(3.1)	5	1.48	n.s.	8.90	n.s.
(3.3)-(3.2)	5	1.70	n.s.	5.44	n.s.
(3.4)-(3.3)	5	5.40	n.s	2.72	n.s.
(3.5)-(3.4)	1	0.10	n.s.	1.08	n.s.
(3.6)-(3.4)	1	2.23	n.s.	0.02	n.s.
(3.7)-(3.4)	1	0.06	n.s.	0.01	n.s.
(3.8)-(3.4)	3	2.34	n.s.	1.18	n.s.

n.s. = not significant, p>.05

[a]Constraints: Cohort = separate effects for each birth cohort; Trend = linear trend in effects over birth cohorts; Constant = equal effects over birth cohorts

[b]Chi^2-test on signifance between nested models a and b calculated according to formula: $Chi^2(df_a-df_b)=-2*(likelihood_b-likelihood_a)$

in the educational career shows a clear decline in the impact of family background. For men the effect of father's education decreases by 0.206 for each birth cohort, starting at 1.768 for the oldest cohort, and according to the model, sinking to 0.532 for the youngest. For women the effect of father's educational attainment declines with decrements of 0.119 from 1.363 for the oldest cohort to 0.649 for the youngest cohort. The effects of father's occupation on the probability of surviving lower secondary education have decreased even more dramatically. For men, the effect was 0.506 for the oldest cohort, and 0.203 for the youngest cohort, whereas for women this effect decreases from 0.477 to virtually nil in the time span studied. Apart from these declining family background effects there has been a general increase in the transition rate at this level, as shown by the gradual rise in the intercept over cohorts. In sum, the situation at the first transition strongly resembles the situation described above for the final level of education.

The second transition in the educational career, from any diploma to a diploma in higher secondary education, is less dependent on family background than the first. The models of Table 4.8 again show that the effect of father's education only changes significantly over birth cohorts in the case of men. Although the other three interaction terms are not statistically significant, it is important to note that they all go in the same direction, namely that of decreasing influence of father's statuses. More importantly, the non-significant interaction parameters are substantial when compared to their value in the first cohorts. For example, although the interaction parameter for father's education is not significant for men, they still imply that the effect of father's education in the youngest cohort is only half of what it used to be in oldest cohort. This illustrates once again that even given the generous amount of data we have amassed for our analysis and the parsimonious models used to estimate trends, it is still difficult to pick up sizeable changes.

The third transition—from a diploma in higher secondary education to completed tertiary education—is less dependent upon family background than the second transition. Father's occupational status has no effect for any cohort, while the effect of father's educational status was small and constant for all birth cohorts.

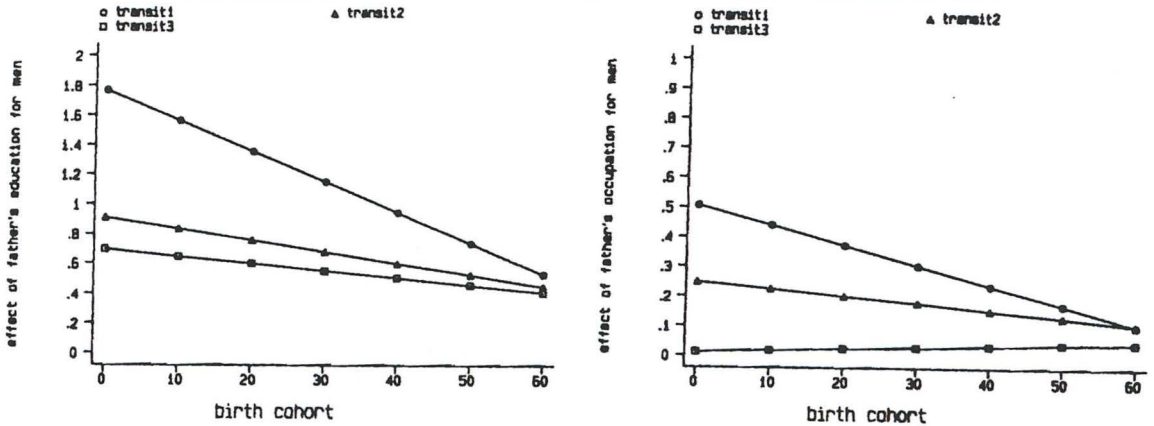
Figure 4.4 displays the estimated trend effects in the logit models of tran-

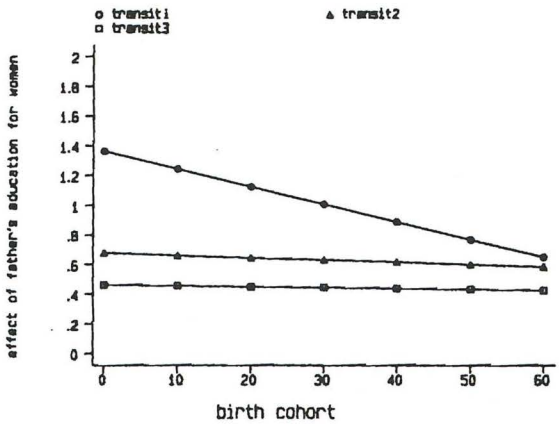
Table 4.9 Logit estimates of Models (1.4), (2.4) and (3.4) of Table 4.8

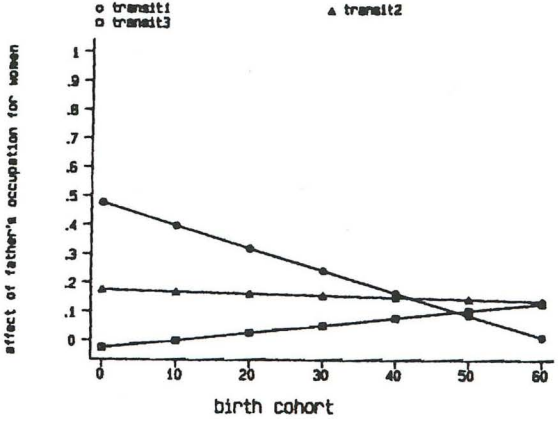
	Transition 1		Transition 2		Transition 3	
	men	women	men	women	men	women
Intercept first cohort	-2.177	-3.502	-1.733	-2.151	-1.175	-1.865
	(.209)	(.233)	(.241)	(.325)	(.342)	(.562)
Intercept linear trend	.615	.840	.329	.272	.020-	.004-
	(.052)	(.056)	(.054)	(.068)	(.074)	(.113)
Father's education first cohort	1.768	1.363	.910	.681	.696	.463
	(.241)	(.184)	(.144)	(.149)	(.146)	(.201)
Father's education linear trend	-.206	-.119	-.077	-.016-	-.048-	-.006-
	(.052)	(.042)	(.032)	(.032)	(.032)	(.041)
Father's occupation first cohort	.506	.477	.248	.175	.013-	-.026-
	(.068)	(.065)	(.065)	(.080)	(.082)	(.126)
Father's occupation linear trend	-.067	-.078	-.024-	-.006-	.006-	.026-
	(.016)	(.015)	(.015)	(.017)	(.018)	(.025)

- denotes insignificance, p>.05

Figure 4.4 Trends in effects of father's educational status and father's occupational status on educational transitions of men and women, of birth cohorts 1891-1960, (models (1.4), 2.4) and (3.4) of Table 4.8)




o transit1
▲ transit2
□ transit3
effect of father's education for women
2
1.8
1.6
1.4
1.2
1
.8
.6
.4
.2
0
0
10
20
30
40
50
60
birth cohort


o transit1
▲ transit2
□ transit3
effect of father's occupation for women
1
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
0
10
20
30
40
50
60
birth cohort

sition rates. We give the implied effects for all cohorts for models 1.4, 2.4, and 3.4. The figure illustrates that where there are trends in background effects they are towards a declining impact of social background on educational attainment. One interesting point to note is that the effects for the three transitions converge at more or less the same point in the youngest cohorts. This implies that the effect of father's education, and father's occupation respectively, on the probabilities of progression at each transition are now equal for all transitions.

In Table 4.10 we standardize the estimated logit model in a way parallel to the method used to standardize the regression coefficients introduced above. Here, however, we restrict standardization to the predictor variable, and so the resulting coefficients are "semi-standardized." Table 4.10 gives the relevant figures for father's education and father's occupation, for each of the subgroups of the cohorts that survived the particular transition. The resulting coefficients can be compared between the two indicators of father's status, but the comparability is questionable between the transitions and between the sexes, since these involve different groups. However, what stands out here is the ratio of the two effects. It is clear that the effect of father's occupation always falls short of the effect of father's education, for all cohorts at all transitions and for both men and women. The difference between the two effects is clearly wider and more resistant to change in the younger cohorts, especially for the first transition. This pattern clearly confirms the expectations of cultural reproduction theory: that educational careers are driven by cultural resources (education) as opposed to financial resources (occupation).

Table 4.10 Semi-standardized logit estimates* according to models (1.4), (2.4) and (3.4) of Table 4.8

Men

	transition 1			transition 2			transition 3	
	father's educ	occ	ratio	father's educ	occ	ratio	father's educ	occ
cohort 1891-1900	.95	.73	1.3	.82	.44	1.9	.89	n.s.
1901-1910	.93	.67	1.4	.66	.38	1.7	.67	n.s.
1911-1920	1.06	.59	1.8	.71	.34	2.1	.67	n.s.
1921-1930	.97	.54	1.8	.63	.32	2.0	.57	n.s.
1931-1940	.87	.44	2.0	.59	.29	2.0	.54	n.s.
1941-1950	.71	.32	2.2	.52	.24	2.2	.48	n.s.
1951-1960	.52	.20	2.6	.44	.20	2.2	.41	n.s.

Women

	transition 1			transition 2			transition 3	
	father's educ	occ	ratio	father's educ	occ	ratio	father's educ	occ
cohort 1891-1900	.70	.64	1.1	.63	.23	2.7	.55	n.s.
1901-1910	.93	.69	1.3	.76	.31	2.5	.57	n.s.
1911-1920	.81	.48	1.7	.62	.27	2.3	.54	n.s.
1921-1930	.82	.42	2.0	.63	.29	2.2	.51	n.s.
1931-1940	.80	.31	2.6	.61	.29	2.1	.48	n.s.
1941-1950	.74	.16	4.6	.60	.27	2.2	.46	n.s.
1951-1960	.65	.01	65.0	.60	.27	2.2	.45	n.s.

* Standardized coefficient of logit on predictor x computed according to formula:
$\beta_{cohort} = b_{model} *$ standard deviation of x in cohort

Conclusion

As a result of our analysis of the trends in educational opportunity in the Netherlands for cohorts born between 1891 and 1960, we have reached several conclusions.

First, there is a clear downward trend in the determination of final educational level by father's education and father's occupation. This trend is stronger for men than for women. On average, the effect of father's education is greater than the effect of father's occupation. The rate of decline differs between the two dimensions of father's status: the effect of education declines to about 50% in the period of investigation, whereas the effect of father's occupation has virtually vanished in the most recent cohorts. The standardized coefficients also indicate that father's educational status has more predictive power than father's occupational status and that it has not decreased as dramatically over time.

Second, if we disaggregate the data on final level of educational attainment into the progression rates at the three transitions in the educational career, we find that the effect of father's education and father's occupation are far from uniform over the educational career. We find that the largest effects are in the early stage of the career, at the transition from primary to secondary education, and that it becomes smaller with each successive transition.

For the first two of the three transitions, we find a substantive downward trend in the effects of father's education and father's occupation on the likelihood of continuation for men. For women, on the other hand, the only significant downward trend is for the first transition with an irregular pattern for the second transition. For the final transition (from secondary to tertiary education) we find that the effects of father's statuses are stable over cohorts, for both men and women.

In response to our three research questions then we find that there has been a marked overall decline in the effect of father's education and father's occupation on final educational attainment. Second, we find that the significant downward effects of family background on transitions in the educational career are restricted to the first transition (between primary and secondary education) for both sexes. The effects of family background on transitions to higher secondary and tertiary education are generally smaller than on the transition to secondary education; we do find significant and substantive changes at the second transition for men, but for women the downward trend is neither significant nor substantive. For the third transition, the effects of social background are significant, but quite small and there is no evidence of change over time. Third, across regression models of educational attainment and logit models of educational transitions, father's education is a more important predictor than father's occupation. At the same time, the contrast between the two has widened: father's education is more resistant to change than father's occupation. This pattern confirms the expectations of cultural reproduction theory rather than those of modernization theory.

In discussion, two things need to be noted. First, we want to stress the significance of both types of analysis applied to the data. Several authors,

starting with Mare (1980, 1981b) suggest that regression-type analysis of educational attainment is inadequate, because it fails to take into account the varying degrees of association found at different levels of educational attainment. The basic finding here is that parental influence decreases at the more advanced stages of the educational career: parental status is very important for the progression from primary to secondary education, but has a negligible impact for those that have survived secondary education. Combined with the higher levels of educational attainment of younger cohorts, these different levels of association may be responsible for declining trends in metric regressions. Although we have found in our data that this is not the case in the Netherlands, and that there are also decreasing social background effects for transition rates, we would like to stress that neither of these representations of the data are the sole true representation, but that they present complementary views. While it is important to know that the association of transition rates with parental status have been stable or even increased, it is equally important to know to what extent the general growth of education has produced a lower association across the board. Here again, there are important theoretical and political issues at stake. If the composition effects do produce declining association, notwithstanding an unchanged pattern of transition rates, then this is owing to increased educational enrollment. This explanation of over-time trends in terms of composition effects is important, but does not mean that over-time trends are not important per se: declining parental influence over the total educational outcome is of great social and sociological importance in itself. In events that occur after the completion of the educational career (such as entry into the labor and marriage markets) it is normally the level of completed education, relative to the distribution of the relevant cohort, that counts and nothing else. A general decrease in the influence of parental status on the final level of completed education appears to be a primary factor in explaining the drop of association in intergenerational occupational mobility (Luijkx and Ganzeboom 1989) and educational homogamy (Sixma and Ultee 1984).

As regards educational policy, an important implication of the decreasing effects of family background on educational continuation is that the promotion of educational attainment at large pays off in terms of increased social opportunity for the underprivileged as compared to privileged status groups. This is not only important from the point of view of social engineering, but is also in striking contrast with received views of educational selection processes (Boudon 1974) which stress that longer educational careers sharpen or increase the effect of family background.

Secondly, we want to point out the importance of the number of observations for trend analyses. It is clear, that even given the generous size of the data set available to us for this analysis, we have been unable to distinguish between substantial trends in effects and the hypothesis of no change. Many of the effects observed in this trend analysis would not have been observed had our data been smaller. In our opinion, this is the most plausible explanation why we find significant (and substantial) changes, where other researchers have found no evidence of trends. Since many trend analyses nor-

mally employ smaller data sets than those we have used, it may well be that conclusions of "no trend" are simply due to low statistical power.

Notes

We would like to thank the original investigators of the data-sets analyzed in this study and the Steinmetz Archives in Amsterdam for their valuable services. Thanks also go to the members of the ISA Research Committee 28 on Social Stratification and the SISWO working group on Social Stratification and Mobility for their helpful comments and advice; in particular, Bart Bakker, Jos Dessens, Nan Dirk De Graaf, Jaap Dronkers, Wim Jansen, Ruud Luijkx, Paul Nieuw Beerta, Yossi Shavit, Sjerp van der Ploeg and Wout C. Ultee.

1. Our findings that there is a historically declining association between fathers' and respondents' educational attainments is at variance with conclusions reached earlier by Dutch researchers (Peschar 1987; Peschar and Popping 1986; Dronkers 1983; Vrooman and Dronkers 1986) who found that this association had remained stable. However, this can be explained by differences in data and methods employed (see De Graaf and Ganzeboom 1990); in particular, the statistical power in our analysis is greater than that of earlier research. Estimates of the minimal sample sizes needed to observe the decline of effects we have observed (De Graaf and Ganzeboom 1990) suggest that 3,000 cases are necessary to reach a conclusion of statistical significance on the interaction between the effects of birth cohort and family background on educational attainment. This result is not reached because these interaction effects are small and negligible: the effects of family background variables have more than halved in the period under investigation.

2. Association pattern and marginal distributions in the educational mobility table differ from the pattern in the occupational mobility table by their relative smoothness. A simple uniform association model fits the whole pattern very well and we come close to a regression-like, single-parameter type of representation of the data. Because of this, we felt encouraged to conduct OLS regression analysis on these data.

3. This analysis echoes the conclusions reached in earlier analyses; see Ganzeboom and De Graaf 1989 and De Graaf and Ganzeboom 1990. The only respect in which it differs from earlier analyses is the different categorization of the cohorts involved.

4. In the period studied, compulsory schooling in the Netherlands has developed as follows: until 1928, compulsory school-leaving age was twelve; and this subsequently rose to thirteen in 1928, to fourteen in 1942, and to fifteen in 1950. After 1950 there have been only partial changes in compulsory schooling age, requiring young people aged sixteen to seventeen who are in the labor force to take vocational courses for one or two days a week (Van Kemenade 1981).