Social Inequality Series
Marta Tienda and David B. Grusky, Series Editors

Persistent Inequality

Changing Educational Attainment in Thirteen Countries

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Trends in Educational Attainment in Japan

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Introduction

Equality of educational opportunity has long been regarded the cornerstone of equality of life chances in industrial societies. Since in such societies occupational status is mainly determined by educational attainment (Treiman and Yip 1989), the key variable affecting the extent of class reproduction is the strength of the dependence of education on social origins. With the growth of education in the twentieth century, the strength of this connection has appeared to decline wherever the trend was assessed. For example, Featherman and Hauser found such a decline in the United States (1978), as did Halsey (1975) in Britain, Hout and Raftery (1989) in Ireland, and Cobalti (1990) in Italy.

This conclusion, however, was derived from analyses that assessed the overall dependence of the level of educational attainment on social origins. In an influential paper, Mare (1981b) showed that the overall strength of association between social origins and the level of educational attainment can be decomposed into two components: the effect of social origins on the odds of moving from one educational level to the next and the relative frequency of making various transitions. Since, in general, the effect of social origins on the odds of making a transition declines for successive transitions, as populations become more educated the effect of social origins on the overall level of educational attainment would be expected to decline *even if there were no change in the effect of social origins on making any particular transition.*

Mare showed that in the United States the effect of social origins on making each educational transition has, if anything, increased over the course of the twentieth century, but this increase has been more than offset by an increase in average educational attainment. Prior to the research on which this volume is based, Mare's analysis had been (more or less) replicated in five other countries: France (Garnier and Raffalovich 1984), Hungary (Simkus and Andorka 1982), Ireland (Hout and Raftery 1989), Italy (Cobalti 1990), and

Philippines (Smith and Cheung 1986). While the results are somewhat
[com]plex in detail, on balance they suggest a near universal pattern across
[cou]ntries: *a remarkable degree of stability in the effect of social origins on the odds of
[ma]king particular educational transitions, despite a systematic upward shift across
[coh]orts in the average level of educational attainment.* In this study we consider
[wh]ether the same conclusion holds with respect to Japan.

The Theoretical Puzzle

Before turning to a discussion of the Japanese educational system, we first
[con]sider why the effect of social origins on educational attainment decreases
[as] the amount of education increases. Mare (1980) has provided a formal ex-
[pla]nation based on expected changes in the covariance structure of parental
[ch]aracteristics and intervening variables, such as mental ability, ambition,
[etc]., for successive levels of education resulting from differential attrition by
[soc]ial origins. It is worthwhile elaborating the social processes involved.
[Ea]ch level of education is more likely to be regarded as normatively expected
[by] those from high-status origins than by those from low-status origins. For
[thi]s reason, for each educational transition those from low-status origins are
[mo]re likely than are those from high-status origins to be positively selected
[wi]th respect to the variables that directly affect educational continuation de-
[cis]ions: that is, mental ability, grades, and ambition. In the United States, for
[exa]mple, since the children of professionals regard attending college as
[no]rmatively expected, most children of professionals will attend college,
[wh]ereas for the remainder of the population, for which the normative expec-
[tat]ion is weaker, only the brightest and most ambitious will attend. The con-
[se]quence of differential selectivity with respect to unmeasured intervening
[var]iables such as mental ability is that the association between social origins
[an]d the intervening variables is successively reduced with each educational
[tra]nsition and hence the total effect of the social origin variables is corre-
[sp]ondingly reduced.

In addition, of course, those from high-status origins are more likely to be
[abl]e to afford educational fees and better able to bear the cost of income fore-
[go]ne by remaining in school. Since the financial burden of continuing educa-
[tio]n beyond the compulsory level is greater for those from low-status origins,
[it i]s relatively more probable that only the best and the brightest of such stu-
[de]nts will continue than is true for those from higher status origins; so again,
[the]re is differential selectivity with respect to social origins.

The Japanese Context

Japan was one of the first nations to take the creation of a literate popula-
[tio]n seriously. At the time of the Meiji restoration in 1868, which ended 268
[ye]ars of extreme isolation imposed by the Tokugawa regime, the population
[wa]s already substantially literate (Dore 1965; Lee 1974) and the new govern-
[me]nt adopted a policy of mass education and technical training in order to
[ach]ieve modernization. The Fundamental Code of Education promulgated in

1872 declared universal literacy as a goal, and established what is now
known as the "old system" of Japanese education (Cummings 1980). This sys-
tem, which is diagrammed in Figure 10.1a, included compulsory elementary
education (six years), which led directly into the labor force, to various kinds
of terminal vocational schools, or to the academic track "middle school"—
effectively the only channel to further education (academic high school and
university). The Japanese government founded several "Imperial univer-
sities" and a larger number of private universities. The system was steeply
graduated, with a relatively small proportion of those at each educational
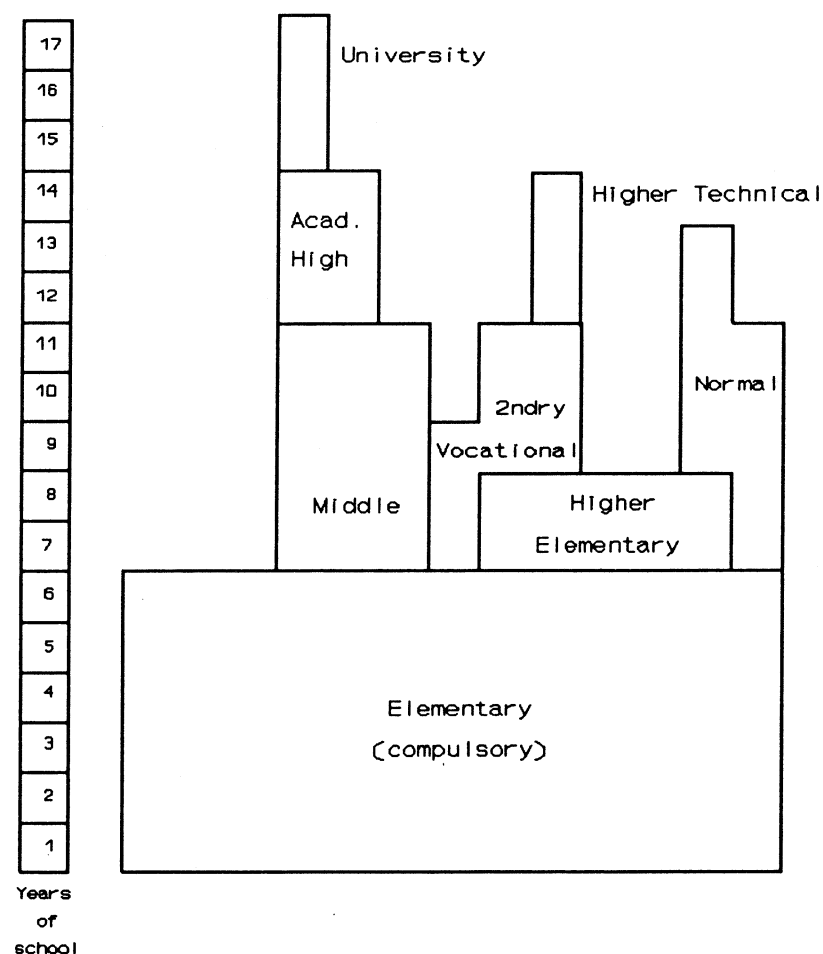level going on to the next level (Passin 1982).

Figure 10.1a *The old Japanese educational system*

After the war, the Japanese educational system was completely revamped [by] the Occupation government, more or less along American lines. The [mu]lti-track old system was replaced with a unidimensional educational sys-[tem] (see Figure 10.1b), consisting of six years of compulsory elementary [sch]ool and three years of compulsory lower secondary school. Senior level [sec]ondary school was not compulsory and admission was determined primar-[ily] by performance in entrance examinations. The main effect of the entrance [exa]minations, however, was to distribute students *among* upper secondary [sch]ools rather than to deny any substantial fraction of students *access* to
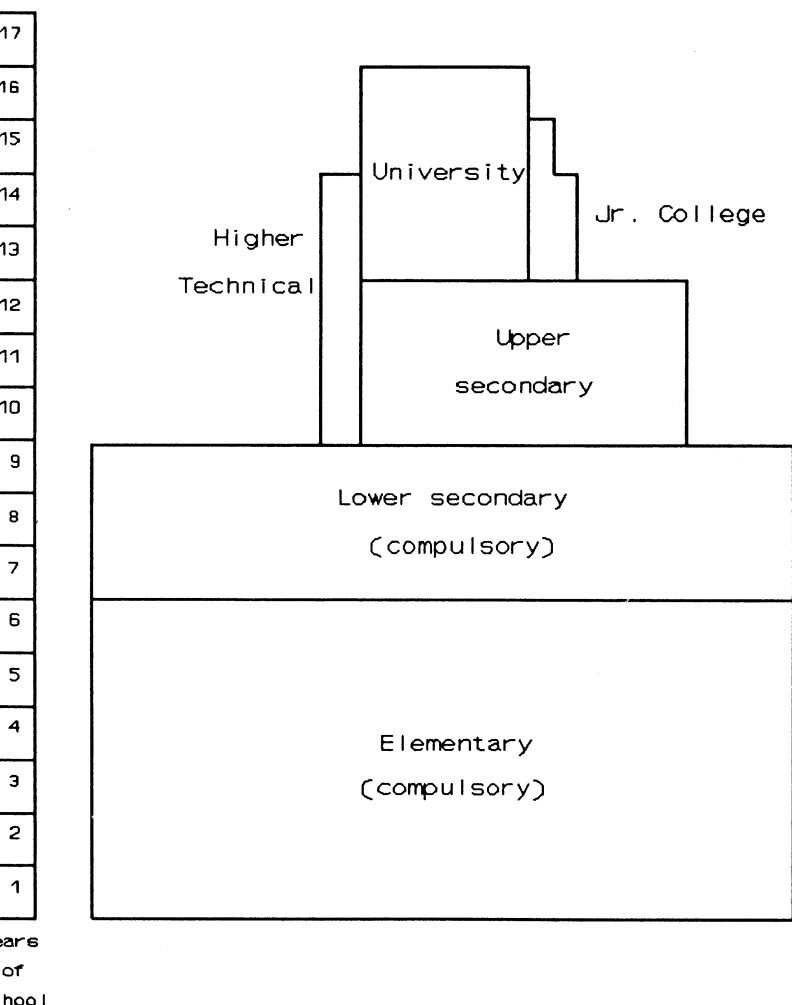
upper secondary education (Kariya and Rosenbaum 1987). Finally, a tertiary education system was created, consisting mainly of four-year univcrsities, with admission determined almost entirely on the basis of performance in entrance examinations. In addition, there are some junior colleges, which serve mainly to prepare women for opportunities on the marriage market and draw very few men, and also a small number of higher vocational schools. In principle, a student may apply to any university from any upper secondary school; but in practice there is a strong association between the selectivity of the secondary school attended and both the probability of going on to university and, for those who do so, the selectivity of the university attended.

In the course of the twentieth century there has been only one radical transformation of the Japanese educational system—that imposed by the American Occupation following World War II. Of course, education was badly disrupted during the war itself, especially toward the end of the war when American bombing raids destroyed many schools and when the Japanese government became increasingly desperate for military man-power. The old system nonetheless remained in place until the introduction of the postwar system in 1947. Since then there has been a rapid expansion in the number of upper secondary schools and, in conjunction with the explo-sive economic development of the 1960s, of universities: in 1950 there were 201 universities, in 1960 there were 245, and in 1970 there were 382 (Lee 1974). Given the timing of these events, and the fact that the process of educational attainment extends over many years, the optimal specification of cohorts to capture period effects on educational transitions is not altogether obvious (see Ono 1990 for a discussion of period effects on career beginnings). We have therefore chosen simply to divide our sample into five ten-year birth cohorts. As will be seen below, the two oldest cohorts (those aged 50–69 in 1975) completed their education entirely under the old system, the middle (war) cohort under both systems, and the two youngest cohorts entirely under the postwar system.

Data and Analytic Design

Data

The data used here are from the 1975 Japanese National Social Stratifica-tion and Mobility Survey, a representative sample of males aged 20–69. Inter-views were obtained from 2,724 respondents from a target sample of 4,001. See Tominaga (1979) for additional details on the sample and data collection procedures.

Variables

Educational Transitions. As was noted above, studying cohort variations in educational attainment in Japan is complicated by the fact that the edu-cational system was radically transformed by the American Occupation government immediately after World War II (Cummings 1980). The main channels in the prewar educational system consisted of the following:[1]

Figure 10.1b *The new Japanese educational system*

- Elementary school (six years, compulsory), leading to the labor force, higher elementary school, normal school, secondary vocational school, or middle school;
- Higher elementary school (two years), leading to the labor force, normal school (rarely), or secondary vocational school (rarely);
- Secondary vocational school (three years), leading to the labor force or higher technical school;
- Normal school (five years), leading to the labor force;
- Middle school (five years), leading to the labor force or academic high school;
- Higher technical school (variable length), leading to the labor force;
- Academic high school (three years), leading to the labor force or university;
- University (three years), leading to the labor force.

nfortunately, our data set only indicates the highest level of education tended,[2] and not the respondent's educational history. Further, normal hool, secondary vocational school, and middle school are combined; and gher technical school and academic high school are combined. Finally, odelling educational transitions under the old system is somewhat probmatic because in the prewar system elementary education could lead either higher elementary school and hence (almost always) to the labor force or to ormal, vocational high, or middle school" with the chance of still further lucation. Our solution was to carry out two analyses: a multinomial logit alysis of the odds of obtaining only elementary schooling vs. higher eleentary schooling vs. at least "normal, vocational high, or middle school," d a series of binary logistic regression analyses of the transitions:

- From elementary *or* higher elementary to "normal, vocational high, or middle school";[3]
- From "normal, vocational high, or middle school" to "higher technical school or academic high school";
- From "higher technical school or academic high school" to university.

he postwar educational system is, by contrast, rather simpler, consisting ith minor exceptions) of the following categories:

- Elementary school (six years, compulsory);
- Lower secondary school (three years, compulsory);
- Upper secondary school (three years);
- Junior college, higher technical school, professional school;
- University.

is for the most part a single-track system, with compulsory education rough lower secondary school and a multiple-branch only in the transition om secondary to tertiary education.[4] Graduates of upper secondary schools enior high schools) may enter the labor force, attend junior college or

professional school, or enroll in a university. However, junior college/professional school is an uncommon choice for males: only 1.6% of our sample ended their education at this level, compared to 12.6% who attended university. Hence, we chose to combine this category with university education. Since our data were coded with "lower secondary" as the minimal level of education, we study the following two postwar transitions:

- From lower to upper secondary school;
- From upper secondary to tertiary level education (junior college or university).

The separation of the prewar and postwar systems creates serious difficulties for the study of historical changes in educational attainment. Thus, we needed a way to combine the two systems. We did this by defining three categories:

- Primary education: prewar elementary; prewar higher elementary; postwar lower secondary;
- Secondary education: prewar normal, vocational, middle school; postwar upper secondary;
- Tertiary education: prewar higher technical school, academic high school; prewar university; postwar junior college, professional school; postwar university.

While this classification appears to have the same level of education in different categories depending on whether it was prewar or postwar, the division is justified on the grounds that in the transition from the old to the new system, middle schools were converted more or less automatically to senior high schools and prewar academic high schools were similarly converted more or less automatically to universities—which was the device by which the tertiary educational system was expanded from the small number of universities existing before the war to some two hundred universities in 1950. Moreover, completion of prewar middle schools and postwar upper secondary schools required approximately the same number of years (eleven and twelve respectively), and the requirements of prewar middle schools were often more demanding than those of postwar upper secondary schools. We use this classification to combine prewar and postwar educational attainment.

In modelling the effect of social origins on educational transitions, we consider the two variables that most strongly tap aspects of human (or cultural) and material capital known to affect educational attainment (Treiman and Peng 1989).[5] These are parents' average years of schooling and the prestige of the father's occupation.

Parents' Average Years of Schooling. Tominaga and his colleagues have assigned estimates of years of schooling completed to the educational categories discussed above (see Tominaga 1979).[6] We average mother's and father's education to avoid unstable estimates resulting from multicolinearity; where the education of only one parent is known, we use that.

Father's Occupational Prestige. This is measured for the occupation when

e respondent was age fifteen, scaled according to the International Occupa-
onal Prestige Scale (Treiman 1977). This scale is highly correlated with the
panese Standard Occupational Prestige Scale (Naoi 1979), so the choice
tween them makes little difference. We used the International Scale to facil-
te cross-national comparisons.

Cohort or Birth Year. For some purposes, it is useful to present data cohort-
-cohort. To do this, we simply divide our sample into five ten-year birth
horts based on age in 1975: 20–29 through to 60–69. We also investigate
hether cohort variations follow a linear trend, by substituting (the last two
gits of) birth year for the set of dummy variables representing cohorts in
ur logistic regression equations.

nalytic Design

We have two basic hypotheses to test: (1) that the effect of social origins is
eaker for higher transitions than for lower transitions; and (2) that within
insitions the effect of social origins declines over time. We assess these
ypotheses by estimating logistic regression equations: for both education
stems combined and then separately for the old and postwar educational
stems. In each case we are interested in the effect of each of the social origin
riables on the odds of making a particular educational transition.

Assessing whether these odds vary over time is straightforward (see
low), but testing whether they vary for different transitions is more com-
ex since a single individual may make several transitions. Our solution
ollowing Hout and Raftery 1989) was to pool data for all transitions into a
ngle dataset. We thus analyze not a sample of *people* but rather a sample of
nsitions.

To see how this is done, consider the analysis of the old and postwar sys-
ns combined. For this analysis, there are two transitions to be studied: from
imary to secondary education, and from secondary to tertiary level educa-
n. Excluding those with missing data on any of the variables of interest, we
ve an effective sample of 2,122 men aged 20–69. Thus, 2,122 men were "at
k" of obtaining at least secondary education. Of these, 1,254 did so, and
nce were "at risk" of obtaining tertiary education. Combining the two
oups, we have 3,376 "transition possibilities" to study. For each of these
ses, we create a dummy variable, "Success" (S), scored 1 if the transition
s made and 0 otherwise. We distinguish the two transitions by a dummy
riable, "Transition" (T), scored 1 for the transition from secondary to tertia-
education and 0 otherwise. We then estimate a series of logistic regression
uations in which the dependent variable is the natural log of the odds of
uccess" and the independent variables are the social origin variables, the
ransition" variable, either birth year or a set of dummy variables to distin-
ish cohorts, and various interactions among the variables; the models we
imated are specified in Table 10.4, which appears later in this chapter.

Similar samples of "transition possibilities" were constructed separately
the old educational system and the postwar system. As noted above, how-
er, we also carried out a multinomial logit analysis treating higher elemen-

tary and middle school education as alternative outcomes. This enabled us to
determine whether the effect of social origins on the odds of entering higher
elementary and middle school were appreciably different. Then we carried
out a nested set of binary logistic regression equations for the entire sample, just
as we did for both systems combined. In this analysis, the first transition studied
was the odds of obtaining at least a middle school education, among all those
educated under the old system. This transition was pooled with two additional
transitions: from middle to high school and from high school to university.

Analysis

We begin by confirming for Japan two trends that are nearly universal in
industrialized societies in the twentieth century: an increase in the average
level of schooling, and a decline in the dependence of educational attainment
on social origins. First, as we see in Table 10.1, the average level of schooling
increased cohort by cohort over the forty-year period covered by our data,
from 9.1 years for men aged 60–69 in 1975 to 12.5 years among men age 20–29
in 1975.[7] Second, as measured by the OLS regression of years of schooling
completed on average parental schooling and the prestige of father's occupa-
tion, the dependence of educational attainment on social origins has declined
substantially, although not monotonically, over the forty-year period. For the
oldest cohort, 46% of the variance in educational attainment is attributable to

Table 10.1 *OLS regression estimates of amount of schooling, by 10 year birth cohorts, Japanese males age 20-69 in 1975 (ratios of coefficients to standard errors in parentheses).*

Year of birth Age in 1975	1906-1915 60-69	1916-1925 50-59	1926-1935 40-49	1936-1945 30-39	1946-1955 20-29
Parent's schooling	.978 (9.60)	.695 (7.62)	.480 (8.52)	.473 (10.81)	.359 (8.94)
Father's occ. prestige	.0321 (1.61)*	.0583 (3.95)	.0867 (8.24)	.0508 (5.27)	.0465 (5.13)
Intercept	.956	2.32	3.41	5.94	7.61
R^2	.458	.269	.329	.325	.240
S.E.E.	2.16	2.50	2.37	2.07	2.05
Mean yrs. of school S.D. yrs. of school	9.1 2.9	9.5 2.9	10.4 2.9	11.7 2.5	12.5 2.4
Mean yrs. of parental educ. S.D. yrs. of parental educ.	7.1 1.8	7.1 1.7	7.4 2.1	8.1 2.3	8.6 2.4
Mean prestige of fr's. occ. S.D. prestige of fr's. occ.	37.5 9.4	39.2 10.4	39.1 11.1	39.1 10.5	39.1 10.8
(N)	(174)	(309)	(518)	(552)	(569)

*p > .05.

e two social origin variables while for the youngest cohort only 24% of the
riance in educational attainment can be so attributed. The one departure
om monotonicity may well be due to the disruptive effect of the war, since
r the cohort born between 1916 and 1925 the oldest members were com-
eting their education during Japan's military foray into Manchuria while
e youngest members were completing their education toward the end of
orld War II. The coefficient of determinant for the next younger cohort may
somewhat deflated by the wartime situation as well.

As in other countries (Treiman and Yip 1989), parental education is a more
portant determinant of educational attainment than is father's occupa-
nal status (the ratio of the standardized coefficients, averaged over cohorts,
2.55). The trends in the coefficients are instructive. The effect of parents'
ucation systematically declines, so that each additional year of parental ed-
ation is worth only about a third as much to the youngest cohort as to the
dest cohort. By contrast, the effect of father's occupational status is curvi-
ear. It may be that the increasing importance of father's occupational status
m the oldest to the middle cohort is an artifact of the shift of the labor force
m farming to manual jobs, but further analysis is required for a definitive
planation.

The obvious question is how to explain these trends. As noted previously,
s quite possible that the decline in the overall dependence of educational
ainment on social origins simply reflects the increase in the overall level of
ucation in Japan, which has brought proportionately more students into
se sectors for which dependence on social origins is relatively weak. That
there may be no decline in the effect of social origins on the odds of making
/ particular educational transition, but simply a shift in the proportion of
population making various transitions.

We begin by considering the distribution of educational attainment across
orts. Table 10.2 shows these distributions for old and postwar education
bined and then separately for each of the two systems. Inspecting the top
el first, it is evident that there has been a sharp decline in the proportion
he male labor force attaining only primary education, but a much less
rp increase in the proportion attaining tertiary level education. This sug-
ts that the odds of obtaining secondary education increased much more
idly than the odds of obtaining tertiary education, given that one has
ained secondary education. The top panel of Table 10.3 confirms this infer-
e: the transition rate from primary to secondary school systematically in-
ased cohort by cohort, more than doubling over the forty-year period
m .36 to .80) while the transition rate from secondary to tertiary schooling
wed no systematic trend, hovering in the .3 range. Clearly, the important
y in Japan was the expansion of the secondary school system.

Unfortunately, limitations in our data make it difficult to be certain exactly
en and how the increases occurred. The main problem is that members of
middle cohort were likely to have had part of their schooling under the old
em and part under the postwar system. But since we lack educational
ory data, these cases cannot be identified. We therefore have had to as-
e that all those who reported their highest level of educational attainment

Table 10.2 *Percentage distribution of educational attainment, by 10 year birth cohorts.*

Year of birth Age in 1975	1906-1915 60-69	1916-1925 50-59	1926-1935 40-49	1936-1945 30-39	1946-1955 20-29
(N)	(174)	(309)	(518)	(552)	(569)
Both systems combined[a]					
Primary	64	60	52	35	20
Secondary	24	25	33	44	50
Tertiary	12	16	16	21	30
Total	100	101	101	100	100
Old system					
Elementary	25	15	7	-[b]	-
Higher elementary	38	44	29	1[c]	-
Middle, normal, vocational	24	24	18	1[c]	-
Academic high, higher tech.	8	11	3	-	1[c]
University	5	5	3	-	-
New system					
Lower secondary	-	-	16	34	20
Upper secondary	-	-	15	43	50
Jr. college, professional	-	-	1	2	4
University	-	-	10	19	26
Total	100	99	102	100	101

[a]See text for details on how categories from the two systems were combined.
[b]Less than one half of one per cent, or none.
[c]These probably are errors.

in a category of the postwar system had obtained all of their education in this system.

Notwithstanding this limitation, we can still conclude from Table 10.2 that in general there was an upward shift in educational attainment both prior to the war and after the war. The locus of the expansion of educational opportunities is not so obvious, however, apart from the dramatic increase in the odds of attending upper secondary school for the youngest cohort, who would have entered upper secondary school during the 1960s, a period of explosive economic expansion. To assess these patterns, we turn to a series of logistic regression analyses.

Logistic Regressions

Table 10.4 reports summary statistics for a set of nested models predicting the odds of moving from one education level to the next, for both systems combined and separately for the old system and the postwar system (plus a multinomial logit model of a portion of the old system transitions). The logistic regression models were estimated using the SPSSX Logistic Regression routine and the multinomial logit model was estimated using the SAS Mlogit routine. In each case, the model χ^2 is -2 times the difference between the log likelihood for a model in which the log odds of transition are estimated from

Table 10.3 *Educational transition rates, by 10 year birth cohorts (proportion in each category progressing to the next category).*

Year of birth Age in 1975	1906-1915 60-69	1916-1925 50-59	1926-1935 40-49	1936-1945 30-39	1946-1955 20-29
Both systems combined					
To secondary	.36	.40	.48	.65	.80
Secondary to tertiary	.33	.39	.33	.32	.38
Old system					
To middle	.37	.40	.40	-	-
Middle to high	.35	.40	.25	-	-
High to university	[.35][a]	.32	.50	-	-
Postwar system					
To upper secondary	-	-	.62	.66	.80
Upper secondary to univ.[b]	-	-	.42	.33	.38

[a]Denominator is less than 20.
[b]Includes junior college.

the intercept only and the log likelihood for a model in which the log odds of transition are estimated from the independent variables indicated, a quantity which is distributed as χ^2 with degrees of freedom corresponding to the number of independent variables.

Since the models are not completely hierarchical, contrasts between models cannot always be made by testing the significance of the difference in the model χ^2. Accordingly, we adopt a modification of the Beysian Information Coefficient (BIC) introduced into the sociological literature by Raftery (1986). Raftery has proposed BIC, which compares the relative likelihood that some model, m, is true given the observed counts of a contingency table to the likelihood that the saturated model will be true given the observed counts, as a way of comparing large log-linear models when none of the models fits the data by conventional statistical standards. Since the comparison of interest within a logistic regression framework is not with a saturated model but with a baseline model in which predictions are based on the intercept alone, we adopt a version of BIC, which we call BIC*, defined as:

$$BIC^* = Model\ \chi^2 - (model\ d.f.)^* \ln(N)$$

where N is the number of persons in the analysis. Thus, we have for the first line of Table 10.4:

$$BIC^* = 497 - 2 \cdot \ln(2122) = 482$$

Here, the question is whether the posited model, in the above case Model 1, is more likely than the baseline model, given the observed data. The answer is yes. But the issue of interest is *which* of the posited models is most likely given

Table 10.4 *Summary statistics for various models of the process of educational transition in Japan (preferred models shown in bold face italic)*

Model and independent variables	Model L^2	d.f.	BIC*
Both systems combined (N = 2122)[a]			
(1): social origins	497	2	482
(2): (1) + transition + (social origins)*(transition)	910	5	872
(3): (2) + year + (year)*(transition)	**1043**	**7**	**989**
(4): (3) + (year)*(social origins)	1046	9	977
(5): (2) + cohort + (cohort)*(transition)	1054	13	954
(6): (5) + (cohort)*(social origins)	1092	21	911
(7): (3) + war cohort + (war cohort)*(transition)	1047	9	978
(8): (7) + (war cohort)*(social origins)	1054	13	954
(9): (2) + system + (system)*(transition)	1025	7	971
(10): (9) + (system)*(social origins)	1029	9	960
Contrasts			
(2) - (1)	413	3	390
(3) - (2)	133	2	117
(4) - (3)	3	2	12
(5) - (3)	11	6	35
(6) - (4)	46	12	66
(7) - (3)	4	2	11
(8) - (4)	8	4	23
(9) - (3)	-18	0	18
(10) - (4)	-17	0	17
Old system (elementary only vs. higher elementary vs. middle school) (N = 802)			
(1): social origins	261	4	234
(2): (1) + year	**279**	**6**	**239**
(3): (2) + (year)*(social origins)	281	10	214
Contrasts			
(2) - (1)	18	2	5
(3) - (2)	2	4	25

(continued)

Table 10.4 (continued)

Model and independent variables	Model L²	d.f.	BIC*
Old system (N = 802)			
(1): social origins	180	2	167
(2): (1) + transition			
+ (social origins)*(transition)	275	8	222
(3): (2) + year			
+ (year)*(transition)	278	11	204
(4): (3) + (social origins)*(year)	283	13	196
(2) - (1)	95	6	55
(3) - (2)	3	3	-18
(4) - (3)	5	2	-8
Postwar system (N = 1320)			
(1): social origins	265	2	251
(2): (1) + transition			
+ (social origins)*(transition)	675	5	639
(3): (2) + year			
+ (year)*(transition)	703	7	653
(4): (3) + (social origins)*(year)	706	9	641
(2) - (1)	410	3	388
(3) - (2)	28	2	14
(4) - (3)	3	2	-8

[a]The N's refer to the number of *persons* studied, not the number of
transitions. The number of persons is the appropriate quantity for the
estimation of BIC*.

the observed data. BIC* provides an answer: the model with the largest BIC*
is most likely given the observed data.

Armed with BIC*, we see that when both old system education and post-
war education are combined, the most likely model is Model 3, in which the
effect of social origins differs for the primary to secondary and secondary to
tertiary transitions and also in which the relative probability of making the
two transitions varies over time. What *does not* vary over time, however, is the
effect of the social origin variables. Models positing such variation are less
likely given the observed data. We thus are led to our first substantive con-
clusion: the effect of parental status on the odds of going from primary to
secondary education and the odds of going from secondary to tertiary educa-
tion have remained constant over the forty years studied, net of the shift in
the marginals—that is, once account is taken of the expansion of the educa-
tional system.

Note, also, that the variation over time is linear. Models 3 and 4, which
posit a linear trend in the odds of making each transition, are more likely,
respectively, than Models 5 and 6, which permit the odds to vary cohort by
cohort. We also tested the possibility that the war cohort (those born between
1916 and 1925) deviated from the linear trend, by estimating Models 7 and 8,

but these, too, are less likely, respectively, than Models 3 and 4. Finally, we
considered the possibility that what we are interpreting as temporal trends
merely reflect differences between the old and postwar Japanese educational
systems, and also that the effect of social origins differs in the old and new
systems, by estimating Models 9 and 10. But these models also are less likely
than Models 3 and 4. Thus we maintain Model 3 as our preferred model."

The top panel of Table 10.5 displays the estimated parameters for Model 3
We note first that the effects of both social origin variables on the transition
from primary to secondary schooling are positive and significant, as would
be expected from what is generally known about other industrialized coun-
tries. Moreover, the effects of both of these variables on the transition from
secondary to tertiary level education are weaker than their effects on the tran
sition from primary to secondary education. This can be seen from the fact
that the coefficients of both of the interaction terms involving T and the social
origin variables—which give the *difference* in the strength of the effect on the
first and second transition—are negative but are smaller in absolute value
than the corresponding coefficient for the social origin variable alone.

To assess the strength of these effects, we take their antilogs. For example,
the coefficient of .428 for parents' education implies that, net of father's occu
pational status and trends in the odds of making each transition, each addi
tional year of parents' education would be expected to increase the odds of
their son making the transition from primary to secondary schooling by 53%,
since $e^{.428} = 1.53$. By contrast, net of the other factors each additional year
of parents' education would be expected to increase the odds of their son
making the transition from secondary to tertiary schooling by 36%, since
$e^{(.428-.122)} = 1.36$. For example, the odds of the sons of old system academic high
school graduates making the transition from elementary to secondary school
ing are more than three and a half times the odds of the sons of old system
middle school graduates making the transition, since $1.53^{(14-11)} = 3.61$. But the
odds of the sons of academic high school graduates making the transition
from secondary to tertiary education are only two and a half times those for
the sons of middle school graduates, since $1.33^{(14-11)} = 2.50$. Similarly, the net
effect of each unit increment in occupational prestige is to increase the odds of
the first transition by 6% (since $e^{.0259} = 1.06$), but to increase the odds of
the second transition by only 3% (since $e^{(.0598-.0329)} = 1.03$). Thus, for example,
the net odds of the son of a shopkeeper (prestige score = 42) making the tran
sition from primary to secondary schooling are more than twice as great as
the odds of the son of a factory worker (prestige score = 29) making the
transition (since $1.06^{(42-29)} = 2.18$). But the net odds of a shopkeeper's son
making the transition from secondary to tertiary education are only about
40% greater than those for a factory worker's son (since $1.03^{(42-29)} = 1.42$).

Estimation details aside, the conclusion is unmistakably clear: in Japan as
in most other industrialized countries, the effect of social origins on educa
tional attainment is reduced for higher educational transitions relative to
lower transitions.

The remaining question concerns trends in the transition rates. The posi

Table 10.5 *Parameters for the preferred models (from Table 4).*

Independent variable	b	Ratio of coefficient to std. error
Both systems combined: Model 3		
Intercept	-6.78	-18.51
E: Parent's education	.428	11.96
P: Prestige of father's occupation	.0598	9.06*
T: Transition[a]	2.35	4.46
T*E	-.122	-2.61
T*P	-.0329	-3.70
Y: Year of birth	.0489	11.11
T*Y	-.0494	-6.86
Old system (elementary only *vs.* higher elementary *vs.* middle school): Model 2		
Contrast between elementary and higher elementary schooling		
Intercept	-7.45	-5.22
E: Parent's education	.905	4.27
P: Prestige of father's occupation	.0483	2.83
Y: Year of birth	.0518	3.82
Contrast between elementary and middle schooling		
Intercept	-13.3	-8.89
E: Parents' education	1.375	6.43
P: Prestige of father's occupation	.1065	5.81
Y: Year of birth	.0569	3.68

(continued)

tive coefficient associated with year of birth indicates that, net of social origins, the odds of entering secondary school have systematically increased over time. Indeed, the increase is very large, about 5% per year ($e^{.0489} = 1.05$), which implies that the odds of entering secondary school are more than seven times as great for the youngest cohort as for the oldest (since $e^{.0489 \cdot 40} = 7.07$). That is, over time an increasing proportion of students of given social origins made the transition from primary to secondary schooling. This simply confirms what we already observed in Table 10.3 without the controls for social origins: in Japan opportunities for secondary education have systematically increased over the past forty years. By contrast, the odds of those with secondary education entering tertiary education have remained constant over time ($e^{(.0489 - .0494)} = 1.00$).

Table 10.5 *(continued)*

Independent variable	b	Ratio of coefficient to std. error
Old system: Model 2		
Intercept	-6.91	-12.12
E: Parents' education	.564	8.66
P: Prestige of father's occupation	.0656	6.43
T2: From middle to high school[c]	3.48	4.33
T3: From high school to university	2.99	2.62
T2*E	-.234	-2.62
T3*E	-.366	-3.42
T2*P	-.0667	-4.42
T3*P	-.0340	-1.77*
Postwar system: Model 3		
Intercept	-6.16	-10.40
E: Parents' education	.348	8.18
P: Prestige of father's occupation	.0569	6.54
T: Transition[d]	1.23	1.43*
T*E	-.0503	-.92*
T*P	-.0180	-1.59*
Y: Year of birth	.0519	5.30
T*Y	-.0439	-3.44

*P > .05.
[a]Transition = 0 for the transition from primary to secondary schooling, and = 1 for the transition from secondary to tertiary schooling.
[b]The cohort age 20-29 in 1975 is the omitted category.
[c]Transition to middle school is the omitted category.
[d]Transition = 0 for the transition from lower to upper secondary schooling, and = 1 for the transition from upper secondary to tertiary schooling.

Separate Analyses of the Old and Postwar Systems

As we have noted, in the analysis discussed thus far we have had to make several assumptions about the equivalence of various levels of education in the old and postwar systems, assumptions that are not totally unproblematic. As an additional assurance that we are not simply interpreting system differences as temporal effects, we also carried out separate analyses of the old and postwar systems. The results of these analyses are shown in the remainder of Tables 10.4 and 10.5.

The Old System. Here we have a complication, as noted above. There are three possible outcomes of elementary education: no further schooling; higher elementary schooling; and middle schooling. To model the process

that generates choice among these outcomes, we used a multinomial logit procedure. A comparison of models is shown in the second panel of Table 10.4 and the coefficients for our preferred model in the second panel of Table 10.5.

The most likely model given the data is Model 2, which posits that social origins affect the odds of getting additional schooling and that the odds of the outcomes vary over time, but that the effect of social origins does not. As we will see, the time trends are not trivial. Equally important, however, is the negative result regarding interaction between social origins and time. As in our overall analysis of both systems combined, we find here that the effect of social origins on going from elementary to higher elementary school or from elementary to middle school did not vary over the period studied—from the beginning of the century through World War II.

Not surprisingly, social origins more strongly affect the odds of attending middle school than the odds of attending higher elementary school, since middle school is the first step toward higher education while higher elementary school merely provides an additional two years of education for those destined mainly for manual and farming jobs. However, for both transitions the social origin effects are substantial.

Finally, the odds of obtaining both kinds of post-elementary education systematically increased over time, at 5% and 6% per year, respectively.

Our second approach to analyzing educational transitions in the old system is to examine the factors affecting the odds of obtaining middle school education; academic high school or higher technical education; and university education. These results are reported in the third panels of Tables 10.4 and 10.5. Again, the preferred model is that in which social origins affect the odds of making each transition and in which the effects vary across transitions. In contrast to the analysis of both systems combined, however, the relative odds of making successive transitions do not vary significantly over time.

In general, as seen in Table 10.5, the effects of parental education on the odds of making any given transition are similar to those reported above for both systems combined. Consider the same example used above, the relative odds that the son of parents with academic high school education and the son of parents with middle school education will make each transition. These are:

odds of middle school	$e^{(14-11)(.564)} = 5.43$
odds of high school given middle school	$e^{(14-11)(.564-.234)} = 2.69$
odds of tertiary given high school	$e^{(14-11)(.564-.366)} = 1.81$

With respect to father's occupational status, however, there is an anomaly: the reduction in the effect of father's occupational status is greater for the middle school to high school transition than for the high school to university transition. Again working through the same example, the relative (net) odds that the son of a shopkeeper and the son of a factory worker will make each transition, we have:

odds of middle school	$e^{(42-29)(.0656)} = 2.34$
odds of high school given middle school	$e^{(42-29)(.0656-.0667)} = .99$
odds of tertiary given high school	$e^{(42-29)(.0656-.0340)} = 1.51$

We are not certain how to interpret this result, but note that an increased effect of father's occupational status in the highest transition also appears in other studies in this volume.[9] We conjecture that since in the prewar period even academic high school graduation qualified persons for elite jobs, university education was a "luxury" rather than an instrumental investment. Hence, those few (less than 5% of the population) who could bear the opportunity costs and who had a taste for academic pursuits (both indexed, albeit imperfectly, by father's occupational status) entered university.

The Postwar Educational System. Here the preferred model is again that in which the effect of social origins differs across transitions, in which the relative odds of making successive transitions vary over time, but in which the effect of social origins on the odds of making any given transition does not vary over time. Although the coefficients for the interaction terms that assess the differential effect of social origins for the two transitions are not significant individually, they are significant collectively and are of fairly substantial magnitude. We can assess their magnitudes by evaluating the expected net odds as before. For parents' education, the expected net odds are:

odds of upper secondary school	$e^{(14-11)(.348)}$	2.84
odds of tertiary given upper secondary	$e^{(14-11)(.348-.050)}$	2.44

With respect to father's occupational status, the expected net odds are:

odds of upper secondary school	$e^{(42-29)(.0569)}$	2.10
odds of tertiary given upper secondary	$e^{(42-29)(.0569-.0180)}$	1.66

Conclusion

There are two main conclusions to our analysis: first, as in most other industrialized countries, the dependence of educational attainment on social origins has been declining throughout the twentieth century; second, this decline is entirely due to the expansion of the Japanese educational system, particularly at the secondary level. There has been no change over time in the extent of equality of opportunity—that is, the relative odds of going on to the next level of education for those of different social origins has remained constant over time. However, the proportion of people of all social origins continuing to secondary school has increased steadily over time (the expansion of the tertiary level has been more modest, just keeping abreast of the supply of secondary graduates). Since, in Japan as elsewhere, the effect of social origins on the transition from secondary to tertiary education is weaker than the effect of social origins on the transition from primary to secondary education, the consequence is that the overall dependence of educational attainment has declined, even through the relative odds of men from different origins making each transition have remained unchanged.

These conclusions are based on an analysis of primary to secondary and secondary to tertiary transitions over a forty-year period spanning World War II and the subsequent restructuring of the Japanese education system by the American Occupation forces. Separate analyses of those completing

their education under the old and postwar systems confirm the results just summarized.

The most striking feature of these results is the *lack* of difference between the old and postwar systems with respect to equality of opportunity. Despite the enormous expansion of the Japanese educational system, from one in which the majority of men obtained no more than primary schooling to one in which a majority obtained upper secondary schooling and more men entered university than terminated their education at the primary level, and despite the emphasis on equality of opportunity of the American Occupation authorities (Cummings 1980), the *relative* chances of men from different social origins obtaining each level of education, given that they obtained the previous level, have remained unchanged over the entire period studied. These results suggest that the basic processes of stratification are relatively impervious to policy manipulations or institutional reforms. It may well be that the major systematic determinant of educational advancement in Japan is the acquisition of cultural capital at home, which in turn is dependent upon parental education and occupational position. Cultural capital brings a competitive advantage, which holds equally whether the educational sluice gates are held tight or opened wide. So, although absolute chances for educational advancement will change over time as the educational system expands, the relative chances of those from different origins will not.

Notes

Thanks are due to Yusheng Peng for research assistance, to Matthijs Kalmijn, Hiromi Ono, Adrian Raftery, and Yossi Shavit for critical readings, and to Harry B.G. Ganzeboom, Robert Mare, and William Mason for helpful discussions.

1. Some minor schooling alternatives are omitted for the sake of simplicity, and because the distinctions are not available in our data. See Passin (1982) for a comprehensive representation of the Japanese old system. Figure 10.1a is adapted from his chart of the Japanese old system, and Figure 10.1b is adapted from his chart of the Japanese new system.

2. Although our data allow us to identify those who failed to complete the highest level attended, the proportions doing so were so small as to preclude separate analysis—about 7% in the prewar system and about 5% in the new system.

3. Although this formulation appears to do violence to the reality of prewar Japanese education, in which higher elementary schooling generally led directly to the labor force, what we are in fact studying is the odds that a person will obtain at least a middle school education vs. less education.

4. An exception, which affects very few cases, is that higher technical schools draw their students directly from middle school graduates and provide a five-year education, the first three of which are regarded as the equivalent of senior high school and the last two the equivalent of junior college.

5. While a number of other variables of potential interest are available in the Japanese data-set, we have restricted our analysis to parental education and father's occupational prestige in order to conform to the specifications of the comparative project. See Sato (1988) for an analysis of these data that includes additional variables.

6. For the old system, these are: elementary = 6; higher elementary = 8; middle school, etc. = 11; academic high school, etc. = 14; and university = 17. For the new system they are: junior high school = 9; senior high school = 12; junior college, etc. = 14; and university = 16.

7. "Years of schooling" is, in fact, the level of educational attainment, converted into approximate years of schooling by Tominaga (1979).

8. Note that Sato (1988), in an analysis of the same data, concludes that the effect of social origins is *greater* in the postwar system than in the old system. We suspect that Sato's result turns on a somewhat novel definition of educational transitions; rather than defining transitions in terms of years or levels of schooling, Sato defines them, in part, with respect to the distinction between compulsory and non-compulsory education.

9. We thank Yossi Shavit for having pointed this out to us.