Educational Inequality in Korea:
Recent Trends and Persistent Structure

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Abstract

This paper analyzes how and to what extent inequalities in educational opportunity in Korea have changed during the second half of the twentieth century. Educational inequality is defined by social class differentials in both the quantity (success) and quality (path) of school transitions made at the secondary (middle to high school) and tertiary (college) levels of schooling. The extent of educational stratification as examined by the probability of transition to a higher grade has not been visibly alleviated over multiple generations. We also find that the extent of educational stratification is stronger in the secondary levels than in the tertiary schooling transition. The results also show that the long-term trend of stratification in the Korean educational system has decreased inequality in terms of scale, but increased the qualitative inequality of educational achievement between social classes. Even during the period of educational expansion and rapid economic development, social inequality in educational opportunity has resisted change. Such inequalities tend to reproduce themselves between successive cohorts, especially when quantitative socioeconomic opportunity remains limited.

Keywords: educational inequality, social stratification, tracking, age cohort, social background

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Introduction

A society's academic or policy concerns over educational inequality are based on the importance and influence of its institutional provision of educational opportunity (supply) and the individual level of education (demand). For the past half century, Korean society has experienced an expansion in educational opportunity, and an improvement in educational standards, along with sudden and rapid economic development. During Korea's modernization process, educational expansion was an indispensable part of the provision of a high-quality labor force required by its industrial society. By grasping such opportunities, individuals were able to enjoy social mobility, which had not been possible in Korea's traditional hierarchical society.[1] However, the structure and extent of educational stratification in Korean society today are quite different than when the Korean economy was still developing. As a result of the dramatic educational expansion, the quantitative equalization of educational levels has reached the standard of advanced countries. However, qualitative discrimination and inequality in education levels through selection and competition have worsened.[2]

This article aims to examine the recent trends and persistent structure of educational inequality in Korea based on two analyses: the expansion of educational opportunity at the macro level and school continuation rates and transition paths at the micro level. The former analysis is based on past statistical sources on the educational system and the rate of increase in educational opportunity in Korea.

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1. In fact, previous researches on industrialization and social mobility in Korea (Phang and Yi 1996; Cha 1991; Gu 1986; Jo 1985; Kim B. 1999; Sin 1994) point that, as a result of rapid industrialization and structural change, high social mobility—especially to the white collar class through educational achievement—was high.
2. The contradictory phenomenon of expansion in educational quantitative opportunity and the inequality in educational qualitative level is not unique to Korea. International comparative studies on educational stratification show that there is a "persistent inequality" in educational opportunity (Blossfeld and Shavit 1993).

Already in the early 1980s, the transition rate to secondary education in Korea was over 90%. In the mid-1990s, the rate of transition to tertiary education was 50%, and today has reached 70%, exceeding other advanced countries. Yet despite this quantitative expansion, inequality between social strata has been rearranged in the form of qualitative differentiation of education. Specifically, individual competition over quantitative educational opportunity in the past has been replaced by hierarchical differentiation in tertiary education and competition between social strata for differentiated educational levels (Phang and Kim 2002; Kim Y. and Kim B. 1999; Jang 2000). This phenomenon corresponds to the fact that the stage of expansive reproduction of socioeconomic wealth and opportunity experienced with the beginning of industrialization is coming to an end, and that a new class structure is forming based on a system of distribution of limited wealth and opportunity (Phang and Kim 2001).

Theoretical Review of the Educational Expansion and Changes in Educational Stratification

Modernization theorists who postulate a linear model of social development argue that as a society modernizes and industrializes, the structures of opportunity and distribution further equalize, empowered by an increase in social rationality (Davis and Moore 1945; Treiman 1970). As a result, the relationship between the ascribed status (such as family background) and the achieved status (such as education and occupational status) gradually weakens. According to this argument, as modernization progresses with the educational expansion, the degree of inequality in educational opportunity between social strata decreases throughout educational levels. Previous researches that have used a status attainment model of social stratification have given empirical evidence to this hypothesis of modernization theory. According to these studies, the influence that the social status of the parents' generation has on the educational achievement of their children has been decreasing steadily (Featherman and Hauser 1978).

In contrast, the advocates of cultural reproduction theory (Collins 1971) point out the simplicity of the equalization hypothesis of the modernization theory and denote the contradictory functions of the educational system: socialization and selection functions. They suggest that the changes in educational inequality following expansion of the educational system differ according to the level of schooling. In other words, at a lower level where the socialization function is carried out, the interests of the upper class (expansion of socialization) and that of the lower class (increase in educational demand) coincide, leading to a gradual decrease in educational inequality. At a higher level, however, where the selective function takes place, the degree of inequality in educational opportunity may stay the same or even increase due to restraints placed by the upper class. As for changes in educational stratification following the expansion of educational opportunity, while both modernist and cultural reproduction theories predict equalization at a lower level, they differ when it comes to the higher level of schooling (Blossfeld and Shavit 1993).

Hout and his colleagues (Hout, Raftery, and Bell 1990; Raftery and Hout 1990) established the empirical conceptualization of the rigidity of educational stratification based on the MMI (Maximally Maintained Inequality) hypothesis. The MMI hypothesis premises an interaction between changes in the institutional supply of educational opportunity (i.e. expansion) and changes in the demand arising from changing composition of social strata (i.e. upgrading). The main proposition of MMI is that until general transition rates to higher education are saturated, the association (odds-ratio) between family background and higher educational attainment tends to resist change.

Analysis of Educational Stratification Based on School Continuation Probability and Transition Path: Theory and Methodology

The status attainment model measured individuals' educational achievement by the number of years of completed schooling. Later, researchers such as Mare (1980, 1981), who tried to overcome the conceptual and methodological limitations of this model, conceptual-

ized educational achievement as a result of individual choice or a selective transition from secondary to tertiary education. Methodologically, their approach identified the limits of the linear regression model upon which previous researches were based. That is, if the linear regression model that takes the number of years of schooling as a dependent variable is used for analysis, the estimated effect of background variables reflect a compound effect of marginal progression rates at each level of schooling and the net effect of background variables.

Therefore, the decreasing effect of family background variables on educational achievement that often appears in age-cohort analysis partly reflects the fact that marginal progression rates at the educational level have been increasing over age cohorts (Mare 1981). This suggests that if such trends as the expansion rate of educational opportunity are controlled in the analysis of educational stratification over age cohorts, the social background effect on an individual's educational achievement would stabilize at a certain level regardless of the age cohort concerned, rather than decreasing with age cohort. This argument has been supported by other researchers that have used the same model to analyze the educational stratification progress between age cohorts in thirteen countries (Blossfeld and Shavit 1993).

Mare's improved methodology (1980, 1981) uses the logit model that includes the rate of transition from lower to higher levels of schooling as a dependent variable. The estimated coefficients of the logit model can solve the above-mentioned problem of the compound effect between marginal progression rates and the net background effect. Such problems of compound effect become more apparent at the lower level of education (i.e. elementary and secondary), where, along with social development, the transition rate approaches 100%. Another advantage of conceptualizing educational attainment as a transition process and using a binomial choice model is that one can analyze the way and extent to which background variables are effective at each level of school transition. The results of such systematic analysis can contribute to a greater understanding of the structure

and process of educational stratification than can be rendered through a simple linear model.

Most of the existing studies that conducted empirical analysis on the changes or differences in the effect of family background on each transition within the same generation suggest that the effect decreases with upward transition (Blossfeld and Shavit 1993). According to such studies, the marginal progression rate declines gradually across the secondary and the tertiary level, and the more advanced the transition level, the more homogeneous the composition of the members who have been successful in the transition. Therefore, the differences in these members' family backgrounds diminish, and the effect coefficient decreases in proportion (Mare 1980).

Mare and his colleagues analyzed the educational stratification not in terms of the total number of years of schooling, but in terms of the selection or dropout sequence in each level. On the other hand, Lucas (2001) takes this discussion a step further with his EMI (Effectively Maintained Inequality) hypothesis.

Adopted for an educational stratification analysis, the EMI hypothesis offers a model in which tracking at secondary education before entering into university is integrated as an important part of selection and dropout in the educational achievement process. In other words, this model classifies the destination state in secondary education into dropout and transition; and next, divides the destination state of transition into academic and vocational tracks. The main aim of the EMI model is to classify the differentiation by strata in educational attainment into quantitative differentiation and qualitative differentiation. In the process of educational stratification, the privileged group always maintains a superior position in quantity or in quality.[3]

The EMI hypothesis posits that the competition between strata to take advantageous positions in secondary education before the transition to higher education centers on track selection and dropout. In

3. This argument is in line with Phang and Kim (2002) hypothesis on the quantitative and qualitative analysis of Korean educational stratification.

this way, EMI complements MMI, which explains the changes in educational stratification over time. The MMI hypothesis postulates that when transition rates to a certain level of schooling become saturated, the competition and differentiation between strata decrease. However, in this case, the EMI hypothesis suggests that the competition between strata focuses on the type of education, i.e. track selection. In fact, by using a model analysis based on empirical data, Lucas shows how influential the individual socioeconomic background variables are in tracking of secondary education. He also points out the great importance of tracks in determining transition to universities. Therefore, even if the impact of the socioeconomic background variables at the higher level of educational stratification seems low, it does not signify the absence of a strata effect. It rather implies, according to EMI, that the educational stratification has already taken effect at the tracking stage, thus maintaining inequality (Lucas 2001).[4]

The various research and methods of analysis related to changes in society and in educational stratification examined thus far have important implications for the verification hypotheses and methodologies in this article, which sets out to analyze the changes in educational stratification between age cohorts in Korean society.

The first implication focuses on changes over age cohort in the relationship between educational achievement and family background in the period of educational expansion accompanying industrialization. According to previous theoretical arguments and analytical results, the influence of family background on educational achievement decreases with age cohort when measured by the number of years of completed schooling. However, when the transition probabilities at each level of schooling are measured, the effect of family background on educational achievement does not decline with age cohort, but rather remains stable.

The second implication concerns the effect of social background on the probabilities of school continuation and the path of transition

4. The term EMI seems to have been derived from this point of view.

at different levels. According to the differential selection effect hypothesis, since the transition rate to higher grades increases across all strata during the educational expansion phase, the heterogeneity of unobserved variables increases with the level of schooling. As a result, the estimated effect of observed family background variables gradually increases (Mare 1980). On the other hand, the life-course hypothesis posits that as students reach higher educational levels, their dependence on parents' material and cultural resources in educational attainment will decrease, in which case the effect of family background variables will also decline gradually (Blossfeld and Shavit 1993; Lucas 2001). The two hypotheses make different theoretical assumptions regarding the degree of educational stratification at each level of schooling. Therefore, for more accurate verification, it is necessary to examine the changes in the effect of background variables at each level, under control of educational expansion as the external variable. For such an examination, the effect of background variables at each level of schooling needs to be estimated according to age cohort.

Finally, if quantitative differentiation becomes meaningless due to the continuous expansion of educational opportunity, as implied by the EMI hypothesis, the upper class will focus on a strategy emphasizing a qualitative differentiation. In this case, tracking and the type of university (junior college or university) at the tertiary education, rather than the probabilities of transition to secondary education, will become more important factors in educational stratification (Phang and Kim 2002; Lucas 2001).

The Educational System and the Expansion of Educational Opportunity in Korea

The Educational System

The formal educational system in Korea is divided into five levels of schooling: elementary school (six years), middle school (three years),

high school (three years), university (two or four years) and graduate school (two years) (see Figure 1 for detailed illustration). At each level of schooling, different types of special educational institutions exist alongside formal ones. Education is compulsory up to middle school, and selective tracking into both academic and vocational schools takes place in high school. In terms of curriculum, academic schools aim for university admission, whereas vocational schools focus on technical and vocational education. However, there is no restriction on the individual's choice of schools. In this regard, it is appropriate to begin our discussion and analysis on educational inequality in Korea with the transition from middle school to high school and selective tracking (into academic or vocational schools). University education is divided into junior college (two to three years) and university (four years). Special universities (industrial, education and technical) have mostly four-year programs, while medical school lasts six years.

Changes in the Expansion of Educational Opportunity

Figure 2 shows the proportion of each age-cohort completing each level of schooling based on the *Korean Labor and Income Panel Study* (Phang et al. 2002). The graphs show that secondary education becomes rapidly saturated across age cohorts. While the rate of middle school completion is approximately 52% for the cohort of 51 years and older, the rate for the cohorts of 31-40 and 30-and-under (the youngest cohort) is over 95%. The proportion of respondents with a high school degree has also increased dramatically, resulting in more than a 63% difference between the 30-and-under cohort (93%) and the 51-and-over cohort (30%). As for the transition to university including junior college, although less than in secondary education, the rate of increase between the 30-and-under and the 51-and-over cohorts was over 30%. Notably, the increase in the 30-and-under cohort was faster than in other cohorts.

The proportion of each age-cohort completing each level of schooling shown in Figure 2 is the result of the expansion of educa-

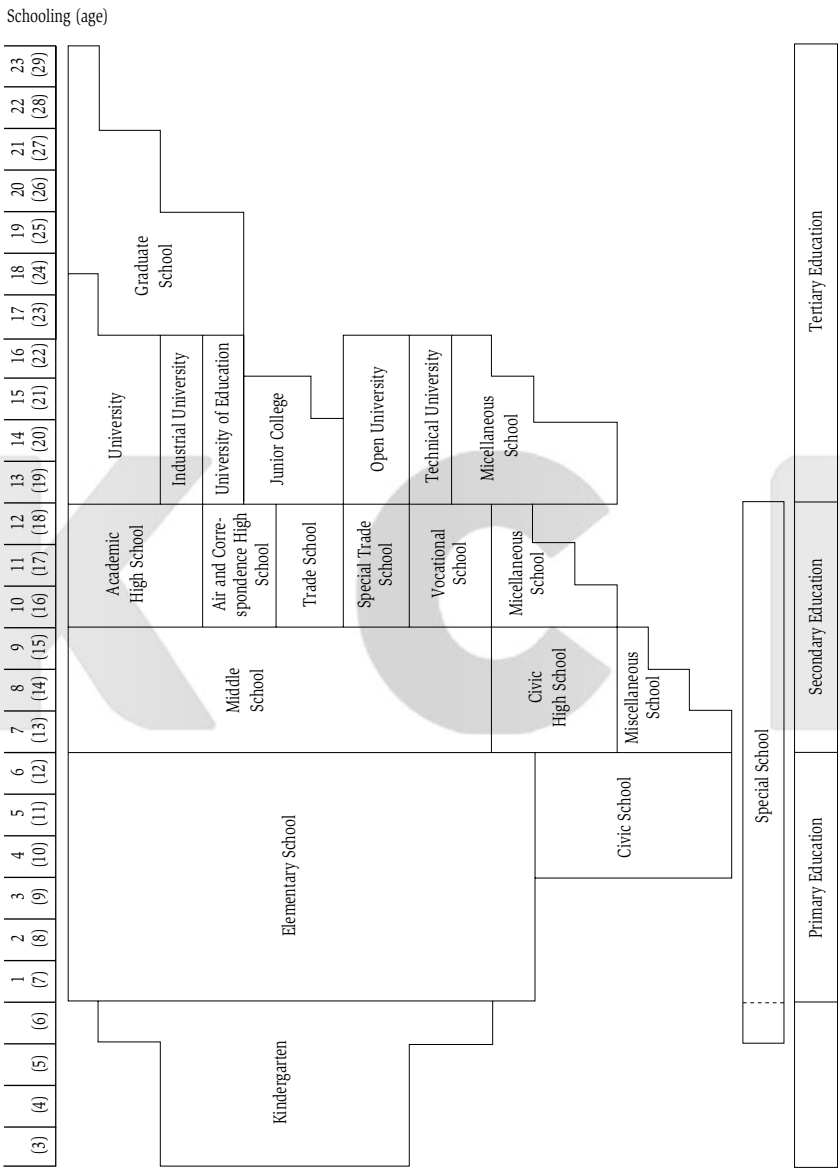

Figure 1. Educational System in Korea

Source: MOE and KEDI (2001).

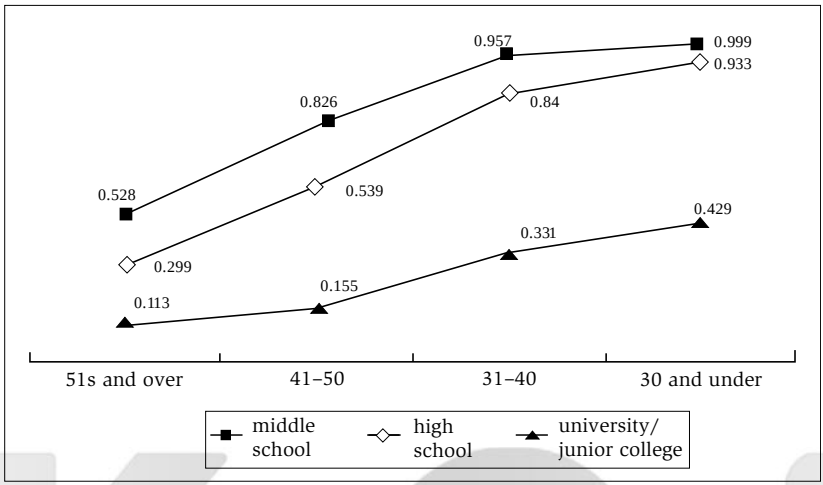

Figure 2. The Proportion of Each Age-Cohort Completing Each Level of Schooling

tional opportunity and Table 1 shows the transition rates at each level of schooling for the past 25 years. According to the data, the transition rate to middle- and high-schools reached almost 100% in the mid-1980s and mid-1990s respectively. By the year 2000, the transition rate to university reached 70%, reflecting that two-thirds of high school graduates continued to higher education.

With the introduction of a graduation quota in the mid-1980s, the transition to university became easier, providing a quick boost to both supply and demand. Since the latter half of the 1990s, there has been an over-supply of higher education that exceeds the demands of the labor market (see Figure 3).

The rapid expansion of higher education and the subsequent increase in transition rates at each level of schooling since the early 1980s are reflected in the steady rise of years of schooling in formal education from older to younger age cohorts. Table 2 describes the

Table 1. Transition Rate to Middle School, High School, and University: 1976–2000

Year	Middle School	High School	University
1976	79.5	75.5	23.8
1980	95.8	84.5	27.2
1985	99.2	90.7	36.4
1990	99.8	95.7	46.0
1995	99.9	98.5	51.4
2000	99.9	99.5	68.0

Source: MOE and KEDI (each year).

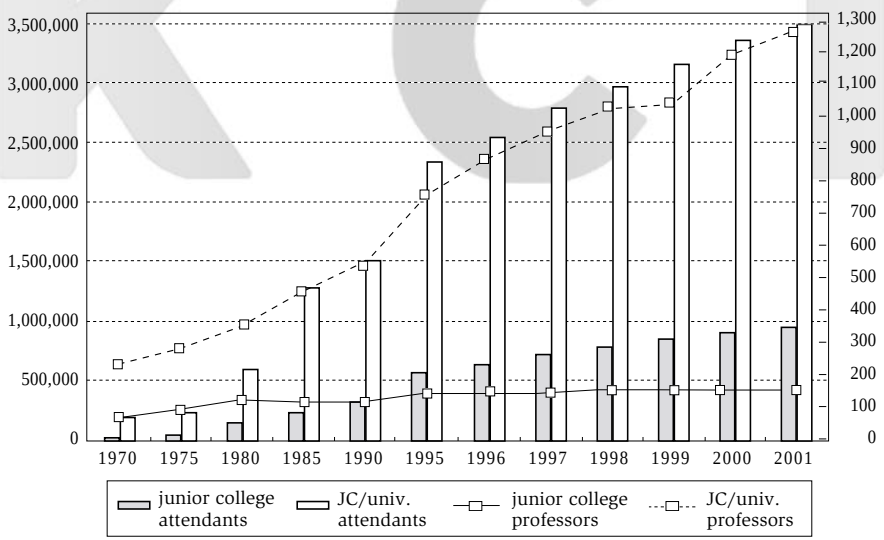

Figure 3. Expansion of Demand and Supply of Higher Education: 1970–2001

Table 2. Average Years of Completed Schooling by Parents' Educational Level

		Parents' Education					
		1 = None	2 = Elementary	3 = Middle School	4 = High School	5 = University	Average
Age Cohort	1 = 25-29	11.85	12.81	13.43	13.84	15.12	13.41
	2 = 30-34	11.75	12.65	13.3	13.77	14.99	13.29
	3 = 35-39	10.76	12.23	12.85	13.7	14.79	12.87
	4 = 40-44	9.92	11.21	12.36	13.21	14.19	12.18
	5 = 45-49	8.88	10.87	11.88	12.58	14.19	11.68
	6 = 50-54	8.45	10.24	11.16	11.84	13.8	11.10
	7 = 55-64	6.71	9.5	10.46	11.82	12.86	10.27
	8 ≧ 65	3.41	7.75	9.63	11	11.23	8.60
	Average	8.97	10.91	11.88	12.72	13.90	

average years of completed schooling among five-year age cohorts according to parents' education.

The average years of schooling reach 8.6 years for the eighth cohort and 10.27 years for the seventh cohort, but rise to 13.41 years in the youngest cohort of age 25-29, indicating a linear increase across cohorts. The average years of completed schooling by parent's educational level are presented in detail in Table 2. The table shows that the average years of schooling in children consistently increase with parents' education. For example, in the second cohort (one of the youngest cohorts), if parents have had no education, the children's average years of schooling is 11.75 years, whereas the offspring of parents with a university degree will continue their education for 14.99 years on average, showing a gap of 3.24 years between the two groups. These differences are similar to those between the seventh cohort that possesses an average of 10.27 years, and the youngest cohort that shows an average of 13.41 years. Notably, however, the degree of educational inequality between social strata

according to parents' education has gradually decreased across generations. For example, the difference between children of parents with the lowest level of education and those of parents with the highest level in the seventh cohort is six years. However, the youngest cohort shows that the gap has diminished to approximately three years.

Through this simple description of educational expansion and inequality between social strata, it is clear that educational opportunity has been continuously increasing. However, although educational inequality between social strata has eased somewhat at a quantitative level during the expansion process, it is still visibly maintained in Korean society.

The Structure of Educational Inequality by School Level and Its Changes over Age Cohort

Preliminary OLS Regression Analysis of Educational Achievement by Age Cohort

The educational expansion of the past 20 to 30 years in Korea is expected to have decreased the degree of inequality between social strata. If the decline in educational inequality through increase in the supply of educational opportunity is a phenomenon occurring due to social change, the way in which the structure of educational inequality has been changing in this social process can be discussed more thoroughly by analyzing the educational attainment model.

In much of the past research done on the structure of educational inequality, parents' socioeconomic status and background were included in the model analysis as critical determinants. Studies reported that there was a general trend of decline in educational inequality with socioeconomic development, and behind this trend was an overall upgrading of family background variables that influence educational achievement.

Table 3 describes the average and standard deviation of the main family background variables (parents' education and father's occupa-

Table 3. Descriptive Statistics on Family Background Variables by School Level and Age Cohort

(Unit: mean, standard deviation)

School Level \ Age Cohort	30 and under	31–40	41–50	51 and over
Middle School (N = 9,423)				
Father's education	10.02 (3.77)	7.09 (4.44)	5.32 (4.67)	3.35 (4.29)
Mother's education	8.13 (3.70)	4.40 (3.84)	2.48 (3.48)	1.14 (2.64)
Father's occupation	36.40 (12.5)	31.17 (12.2)	29.71 (11.8)	27.87 (10.8)
High School (N = 6,664)				
Father's education	10.09 (3.72)	7.58 (4.33)	6.89 (4.66)	5.64 (4.80)
Mother's education	8.21 (3.64)	4.86 (3.81)	3.57 (3.80)	2.28 (3.41)
Father's occupation	36.49 (12.5)	32.14 (12.7)	32.98 (13.7)	31.78 (13.8)
University (N = 2,877)				
Father's education	10.84 (3.54)	9.04 (4.51)	8.95 (4.88)	6.54 (5.23)
Mother's education	8.86 (3.40)	6.30 (3.74)	5.15 (4.21)	3.378(3.95)
Father's occupation	39.03 (13.3)	36.71 (14.5)	39.70 (15.8)	34.75 (16.4)

tional status) in each age cohort, based on analytical samples classified by levels of schooling. According to the provided data, the higher the level of schooling and the younger the cohort, the higher the family's socioeconomic status. At the same time, the standard deviation of the family background variables at both high school and university level transitions is on general decline as it approaches younger cohorts. This indicates that heterogeneity between family members' education levels is also diminishing. This tendency of upgrading and homogeneity suggests that the degree of educational stratification has been decreasing across age cohorts.

Table 4 below presents an estimated analysis of an OLS regression analysis model that takes the total number of years of schooling completed as a dependent variable, as in the typical status attainment model (Phang and Kim 2003). The results of this OLS regres-

Table 4. OLS Regression Analysis on Educational Attainment by Age Cohort

	Total Sample	30 and under	31–40	41–50	51 and over
Father's education	.146(.205)***	.050(.094)**	.094(.163)***	.151(.219)***	.222(.266)***
Mother's education	.162(.190)***	.085(.155)***	.177(.264)***	.201(.218)***	.247(.175)***
Father's occupation	.020(.070)***	.019(.113)***	.016(.075)**	.027(.100)***	.027(.081)***
No. of siblings	.051(.029)**	–.063(-.048)	.004(.003)	–.007(–.004)	.071(.035)*
Family's social capital	1.140(.139)***	.494(.097)**	.891(.151)***	1.322(.176)***	1.435(.173)***
Location of growth	.374(.051)***	–.132(–.034)	.308(.057)*	.574(.080)**	.782(.089)***
Gender	1.269(.187)***	–.026(–.006)	1.083(.214)***	1.303(.208)***	2.156(.313)***
Age cohort					
Under 30	2.872(.342)***				
31–40	2.768(.364)***				
41–50	1.475(.188)***				
Constant	6.195***	11.643***	9.752***	7.513***	4.987***
R^2	.476	.115	.281	.342	.343
Adjusted R^2	.475	.110	.278	.339	.340
N	5,886	1,207	1,598	1,451	1,630

Notes: 1) Reference category of age cohort is 51 years and over, and the numbers in parentheses are standardized coefficient (*ß*).
2) †P < .10; *P < .05; **P < .01; ***P < .001

sion analysis show that the degree of educational inequality in Korea has decreased over time. The decline in the influence of parents' socioeconomic status on children's educational attainment across age cohorts supports this result. Specifically, the effects of the educational level of parents, the social capital of the family, and the location of

growth have all linearly decreased.[5]

Nevertheless, the results indicate that the socioeconomic status variables of the family, characterized by parents' education, father's occupation and family's social capital, are still significant in the youngest cohort. On the other hand, the effects of gender and location of growth, rapidly declining over time, have become almost insignificant in the youngest age cohort.

Educational Inequality in School Continuation Probabilities and Transition Path by Level of Schooling

Following Mare's (1980, 1981) methodology, we analyze educational inequality in school continuation probabilities and in the path of transition by level of schooling as dependent variables. Educational transition can be divided into the transition from middle school to high school and from high school to university.[6]

1) Track Transition from Middle School to High School

We will begin by looking at the track transition (academic and vocational) from middle school to high school. We will then move on to analyze the probabilities of transition from high school to tertiary educational institutes (junior college and university). The preliminary study of the track transition to high school before the analysis of the transition probabilities from high school to university is useful in two ways. First, as today's transition rate to high school from middle school is close to 100%, it is more practical to analyze track transitions rather than school continuation probabilities. Second, the track division between academic and vocational high schools has a decisive impact on the transition to university in the present education

5. The explanatory power of the model measured by R^2, is also decreasing from older to younger age cohort (0.34 to 0.28 to 0.12).
6. The results of the analysis on educational inequality by age cohort and by transition level is based on research by Phang and Kim (2003), its analytical data from Phang et al. (2002).

system in Korea.

Table 5 lays out the respondents' high school track distribution by his/her family background variables. As the father's education, occupational status and family income level goes up, the proportional transition to the academic high school track also goes up. For instance, when the father's education is higher than junior college, the transition rate to academic high school reaches almost 90%, whereas it drops to 53% when the father's education is below middle school, marking a difference of 37% between the two groups. The difference according to the father's occupational strata is clear between so-called blue collar and white collar workers. For example, in blue collar occupations (technical and production), the academic track ratio is 54%, while in white collar occupations (management and professional), it reaches almost 80%, showing a 26% gap between the two. The academic track ratio by family income level also shows a marked difference of 57%, 65% and 75%.

Table 5. Respondents' High School Track Distribution by Social Strata

(Unit: no. of students, %)

		Academic School	Vocational School	Total
Father's education	middle school or lower	52.6	47.4	1,494 (100%)
	high school	70.6	29.4	1,102 (100%)
	junior college or higher	89.6	10.4	434 (100%)
Father (Mother)'s occupation	agriculture/forestry/ fishing	53.4	46.6	577(100%)
	technical/production	54.2	45.8	371 (100%)
	service/sales	58.4	41.6	743 (100%)
	semi-professional/ office administration	77.1	22.9	558 (100%)
	management/professional	79.6	20.4	476 (100%)
Family income	low	56.7	43.3	698 (100%)
	middle	64.5	35.5	1,448 (100%)
	high	75.1	24.9	674 (100%)

2) The School Continuation Probabilities and Transition Path from Secondary to Tertiary Education

Table 6 outlines the distribution of the transition from high school to higher education (junior college or university) by social strata. It shows that as parents' education, occupational status, and income level increase, children's transition rate to higher education also linearly increases. In particular, the transition rate to university appears to be more dependent on the father's education, occupation and income level than to junior college.

Table 7 presents the results from the multinomial logit analysis of the transition from high school to university and the transition

Table 6. The Distribution of Transition to Higher Education (Junior College or University) after High School by Social Strata

(Unit: no. of students, %)

		Not Continuing	Continuing to Junior College	Continuing to University	Total
Father's education	middle school or lower	54.7	18.3	27.1	1,271 (100%)
	high school	31.0	24.0	45.0	816 (100%)
	junior college or higher	16.9	14.1	69.1	320 (100%)
Father (Mother)'s occupation	agriculture/forestry /fishing	557.8	17.9	24.3	531 (100%)
	technical/production	53.6	17.9	28.5	274 (100%)
	service/sales	42.8	21.7	35.5	549 (100%)
	semi-professional/ office administration	28.5	22.5	49.1	432 (100%)
	management/ professional	10.5	16.0	58.2	368 (100%)
Family income	low	249.5	18.6	31.9	548 (100%)
	middle	42.1	20.3	37.6	1,118 (100%)
	high	29.5	18.3	52.3	526 (100%)

Table 7. Multinomial Logit Analysis on the Continuation to Higher Education (Junior College or University) by Age Cohort

Independent Variable	Dependent Variable	30 and Under	31–40	41–50	51 and Over
Father's education	University/NC	.084(0.21)***	.067(0.02)**	.055(0.03)†	–.082(0.08)
	JC/NC	.023(0.23)	.028(0.03)	.035(0.04)	–.082(0.08)
	University/JC	.060(0.26)*	.039(0.03)	.019(0.04)	.055(0.08)
Mother's education	University/NC	.019(0.02)	.160(0.03)***	.074(0.03)*	.097(0.03)**
	JC/NC	.006(0.02)	.086(0.03)**	.049(0.04)	–.045(0.12)
	University/JC	.014(0.02)	.074(0.03)*	.026(0.04)	.142(0.13)
Father's occupation	University/NC	.028(0.01)***	.019(0.01)**	.032(0.01)***	.018(0.01)*
	JC/NC	.015(0.01)**	.030(0.01)***	.023(0.01)†	.036(0.12)
	University/JC	.012(0.01)†	–.011(0.01)	.001(0.01)	–.019(0.02)
No. of siblings	University/NC	–.022(0.05)	.005(0.05)	.012(0.05)	.015(0.05)
	JC/NC	–.031(0.05)	–.060(0.06)	–.184(0.08)*	–.058(0.18)
	University/JC	.009(0.06)	.065(0.06)	–.196(0.09)*	.073(0.19)
Family social capital (Yes = 1)	University/NC	.532(0.14)***	.723(0.16)***	.976(0.21)***	.731(0.22)**
	JC/NC	.302(0.16)†	.430(0.19)*	.802(0.30)**	1.713(0.85)*
	University/JC	.229(0.16)	.293(0.20)	.174(0.32)	–.982(0.87)
Location of high school (City = 1)	University/NC	.003(0.11)	.561(0.15)***	.405(0.21)*	.845(0.23)***
	JC/NC	-.224(0.12)†	.095(0.18)	.161(0.29)	.398(0.76)
	University/JC	.226(0.14)†	.466(0.20)*	.245(0.32)	.447(0.78)
Gender (Male = 1)	University/NC	.178(0.11)	1.538(0.16)***	1.172(0.23)***	.808(0.30)**
	JC/NC	–.422(0.13)	.717(0.18)***	.931(0.31)**	–1.508(0.79)†
	University/JC	.600(0.14)***	.821(0.20)***	.241(0.35)	2.315(0.82)**
Constant	University/NC	–2.651(0.27)***	-4.199(0.35)***	–4.338(0.45)***	–3.012(0.48)***
	JC/NC	–1.425(0.29)***	-3.452(0.39)***	–3.567(0.59)***	–4.426(1.45)**
	University/JC	–1.226(0.32)***	-.746(0.43)†	-.771(0.66)	1.413(1.48)
N(No. of samples)		2,023	1,372	761	477
–2 Log likelihood		3266.059	1871.829	928.485	483.588
Pseudo-R^2 (Nagelkerke)		0.105	0.266	0.242	0.184

Notes: 1) Numbers in parentheses are standard error.

2) NC: Not Continuing, JC: Junior College

3) †P < .10; *P < .05; **P < .01; ***P < .001

path (junior college or university) by age cohort. Figures 4 and 5 show the result of this analysis by age cohort based on the estimated effect of the main background variables.

Figure 4 illustrates the multiplicative effect of the main background variables in terms of the probability of continuation to university vs. discontinuation. Figure 5 shows the same effect on the transition to university vs. junior college according to age cohort. The results show that in Figure 4, the effect of the mother's education, which oscillates from one cohort to another except on the 30-and-under cohort, is influential. At the same time, the effect of the father's education increases across cohorts, widening the gap between the youngest and the oldest cohorts. However, the effect of the father's occupational status remains stable across cohorts, without significant changes. Figure 5 shows that while the effect of the mother's education appears generally to decline, the effects of the father's education and occupational status increase slightly as the cohorts get younger.

Figures 6 and 7, based on Table 7, compare the results of the OLS regression model analysis (Table 4) with the estimated results of

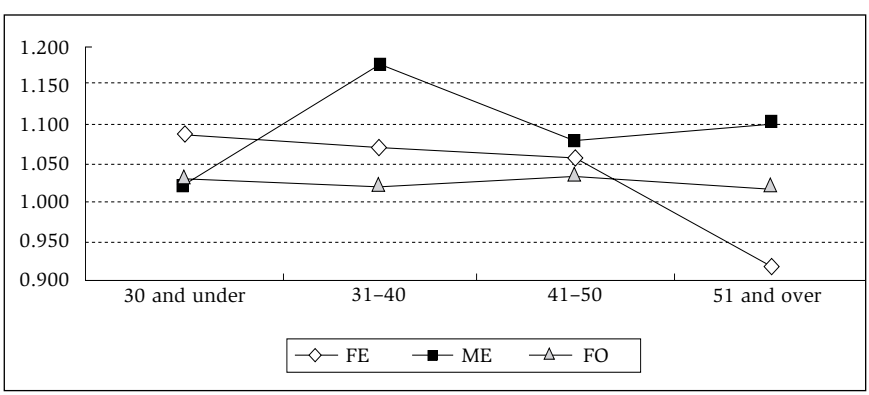

Figure 4. Changes in the Effect of Main Background Variables (exp(ß)) on P (Transition to University/Not Continuing) by Cohort

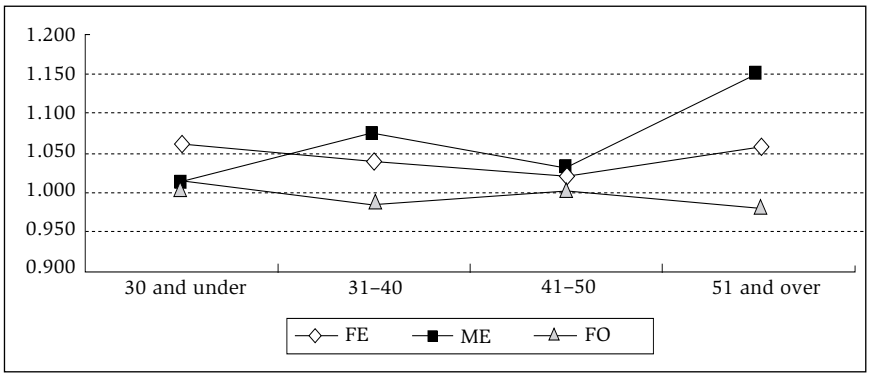

Figure 5. Changes in the Effect of Main Background Variables (exp(ß)) on P (Transition to Junior College or University) by Cohort

the multinomial logit model analysis concerning the father's education (FE) and father's occupation (FO) variables, in which the effect of interaction between age cohorts was relatively influential. According to Figure 6, in the OLS regression model that adopts total number of years of schooling as a dependent variable, the effect of the father's education, ß(FE), has been decreasing rapidly. However, the effect of the father's education in the logit model that takes the probability of transition to university vs. junior college as a dependent variable has been increasing across cohorts. Although the effect of the father's occupation, ß(FO), as shown in Figure 7, does not change significantly between cohorts, its fluctuation is similar to that of ß(FE). As for the father's occupational status variable, its effect on the transition probability to university vs. junior college is relatively high when comparing 51 and over and 30 and under cohorts.

These results show that despite expansion in educational opportunity throughout social strata, educational stratification has not diminished either in tertiary education or in secondary education. In fact, it has been maintained or even increased, particularly in the selective path of transition, reflected in the choice to attend university rather than junior college.

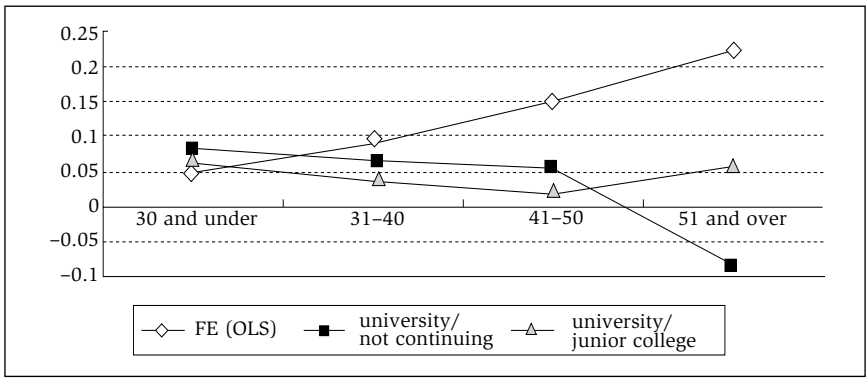

Figure 6. The Estimated Effect of the Father's Education (FE) by OLS and Multinomial Logit Model

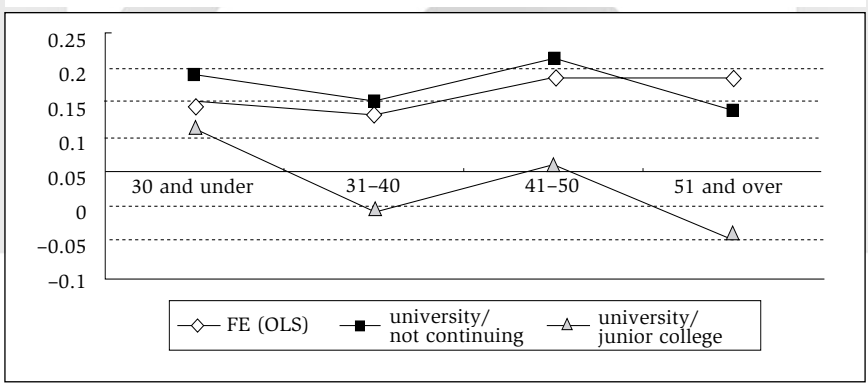

Figure 7. The Estimated Effect of the Father's Occupation (FO) by OLS and Multinomial Logit Model

Inequality in the Achievement of Tertiary Education According to University Ranking

Earlier on, we suggested the possibility that with the quantitative expansion of educational opportunity, the competition between social strata to obtain qualitative educational opportunity would move from a lower to a higher educational level. Another possibility was that in higher education, the competition would focus on the type of tertiary

educational institute—junior college or university—along with the rankings assigned to these institutions. In this section, we will analyze how an individual's family background can be the cause of qualitative inequality in higher education, with emphasis on university rankings. The rankings of the universities (departments) used in the analysis are calculated by mean SAT scores of the year 1997 enrollments at the corresponding institutes in 1997.[7]

Before presenting the results of the analysis, Table 8 delineates the distribution of SAT scores of university enrollments according to family's socioeconomic level. As in the case of university transition success and transition path, the higher the father/mother's education, occupational status and family income, the higher the SAT scores of the enrollments. Particularly, students whose father possesses education higher than junior college, as well as an occupation in the management and professional category, and whose family income is high achieve much higher SAT scores than those who do not.

Table 9 shows the results of logit model analysis on the effect of socioeconomic variables that influence the SAT level for enrollments into university/junior college. As expected, the high school track (academic or vocational) is a decisive factor in determining the SAT ranking of a university (department). The location of the high school (metropolitan or non-metropolitan), an element that was insignificant in other analyses, also plays a significant role.

Also, even among students with the same socioeconomic background, those from academic high schools have more than eight times (= exp (2.15)) the probability of obtaining a higher SAT score ($j \rightarrow j+1$) than those from vocational schools, and those from big cities have a 1.5 times (= exp (0.43)) higher probability to do so than those from other areas. Therefore, the differences in SAT scores

7. The analysis is based on Phang and Kim (2002). Analytical data comes from the additional research of the third Korean Labor and Income Panel Study additional research on the transition to university and mean SAT scores (external source) of corresponding universities or departments. For further information on this data, see Phang et al. (2002).

Table 8. The Distribution of SAT Score Level among College Enrollees by Social Strata

(Unit: no. of students, %)

		Low SAT	SAT Average	Upper SAT	Total
Father's education	middle school or lower	233 (51.2)	152 (33.4)	70 (15.4)	455 (100)
	high school	192 (43.2)	141 (31.8)	111 (25.0)	444 (100)
	junior college or higher	44 (20.4)	75 (34.7)	97 (44.9)	216 (100)
Mother's education	agriculture/ forestry/fishing	95 (55.2)	52 (30.2)	25 (14.5)	172 (100)
	technical/ production	50 (48.1)	32 (30.8)	22 (21.2)	104 (100)
	service/sales	117 (47.2)	80 (32.3)	51 (20.6)	248 (100)
	semi-professional/ office administration	97 (38.3)	85 (33.6)	71 (28.1)	253 (100)
	management/ professional	58 (27.5)	75 (35.5)	78 (37.0)	211 (100)
Family income	low	101 (47.2)	65 (30.4)	48 (22.4)	214 (100)
	middle	224 (43.0)	175 (33.6)	122 (23.4)	521 (100)
	high	95 (33.0)	92 (31.9)	101 (35.1)	288 (100)
Family social capital	no	385 (44.9)	278 (32.4)	195 (22.7)	858 (100)
	yes	91 (32.5)	96 (34.3)	93 (33.2)	280 (100)

between students from academic schools in big cities and those from vocational schools in other areas show a difference ratio of approximately 13 to one. In this regard, the track and the geographic location of the high school most heavily determine the SAT level of students competing to enter university.

These two variables represent high schools' organizational and regional environments, and the results show that quantitative attain-

Table 9. Logit Analysis Results on the Factors that Determine SAT Score Level

	Total Sample			Sample of Vocational H.S. Graduates	Sample of Academic H.S. Graduates
	Model I	Model II	Model III		
Demographic variables					
Gender (Male = 1) age group[1)]	.206(.131)	.276(.135)**	.264(.186)*	–.521(.469)	.343(.150)**
Cohort (1)	.243(.174)	.201(.179)	.288(.186)	–.550(.585)	.381(.197)*
Cohort (2)	.111(.174)	.145(.179)	.160(.185)	–.279(.595)	.222(.195)
Family background variables					
Father's education[1)]					
– High school		.401(.156)**	.255(.163)*	–.310(.539)	.348 (.174)*
– Junior college and higher		1.282(.239)***	.936(.246)***	.724(1.509)	1.003(.254)***
Father (Mother)'s occupation		.012(.006)*	006(.007)	.001(.027)	.006(.007)
Family income[1)]					
– Middle		.019(.170)	.079(.177)	–.670(.560)	.172(.187)
– High		.136(.199)	.230(.209)	.415(.586)	.227(.222)
Powerful relative (Yes = 1)		.174(.171)	.005(.171)	.005(.171)	.005(.171)
School background variables					
High school track			2.149(.234)***	–	–
Location of high school			.430(.144)***	.430(.144)***	.472(.153)***
Threshold 1	–.108(.165)**	.861(.292)***	2.624(.370)***	.954(1.038)	.703(.331)**
Threshold 2	1.283(.171)***	2.386(.343)***	4.289(.386)***	2.628(1.094)**	2.383(.343)***
N	844	844	844	156	688
–2 Log likelihood	1624.526	159.537	1259.719	152.211	1102.980
Pseudo–R^2 (Cox & Snell)	.005	.046	.223	.046	.096

Notes: 1) For the reference group of each variable, see Table 3.
2) Numbers in the parentheses are standard error.
3) *P < .1; **P < .05; ***P < .01

ment defined by probabilities of transition to tertiary education and qualitative attainment defined by SAT scores are largely endowed discriminately by the preceding transition path (academic or vocational), as well as by the environment (location of high school). The strong differentiation effect of high school tracks, as Jeong (1988) points out, suggests that those from a vocational track are at much greater disadvantage than those from the academic track, even in the occupational upgrading through education.

Thus far, we have noted the decisive discriminatory and differential impact of the socioeconomic status of the family of origin on the prerequisite transition, the track transition from middle school to high school. We have also seen that family background variables are highly significant and influential in the transition probabilities and path to higher education. The last transition to higher education is preceded, as discussed in the previous section of this paper, by multiple transition events and paths at the secondary educational level. Our analytical results show that in this process, the socioeconomic status of the family of origin has a cumulative and selective impact on who will be able to take advantage of the quality as well as the quantity of higher education.

Assuming the validity of the above-mentioned findings, the next question is whether and to what extent family background variables affect the academic rank of a college or university. The academic rank of a college or university, in this analysis, is measured by the average SAT score of the class of 1997 enrolled at the specific department at the specific college or university. Table 9 provides a partially affirmative answer to this question. Family income variable has a moderate effect, even though it is not statistically significant. However, the differentiation effect of parents' education, even after taking the high school background variable into consideration, continues to manifest itself. According to analyses that focus separately on samples of vocational and academic high school graduates, the effect of parents' education is apparent only among students from academic high schools. For vocational school graduates, the effects of other variables other than the location of high school are insignificant. This

may be due to the fact that most vocational school graduates enter junior college rather than university, which makes the difference between SAT levels almost meaningless.

If we focus on academic high school graduates, the effect of qualitative differentiation of family socioeconomic strata variables (parents' education and occupational status) is as influential as those observed in the previous analysis of the transition path to university. In other words, students whose parents went to junior college or higher had more than 2.7 times (= exp (1.0)) the probability of entering a more prestigious university than those whose parents were middle school graduates, and 1.4 times (= exp (0.35)) more than the offspring of high school graduates.

From the above results, we can conclude implications regarding educational stratification in Korea as follows. First, although limited, the results indirectly reflect the fact that the middle and upper class in Korea invest competitively in qualitative differentiation of education. They also show that the "strategy of differentiation" (Raftery and Hout 1990) is also applicable to Korea's educational stratification system.

Second, the school location variable—urban vs. rural—has a larger effect on the academic rank of the university than on the probabilities of transition to university per se). The quantitative difference between regions regarding the opportunity of transition to university has decreased steadily due to the expansion of higher educational institutions through the 1990s. On the other hand, the qualitative difference between cities and other areas still appears strong today. Considering that educational resources and environment are unequally distributed between regions and that such inequality shapes the residential distribution of social strata, qualitative differentiation in higher education between regions is expected to continuously reproduce itself in the future.

Conclusion

In this article, we have analyzed the trends and the extent of change in educational inequality between social strata, focusing on the school continuation probabilities and the transition paths from secondary to tertiary education. The analytical results, with reference to the hypotheses suggested at the beginning of the article, are outlined below.

First, educational inequality between social strata measured by the number of years of completed schooling at a simple quantitative level, as shown in OLS regression model analysis, has been decreasing continuously across age cohorts. This may be the outcome of the equalization of educational opportunity between strata that has been implemented, following the rapid expansion of educational system for the past twenty to thirty years.

Second, according to the multinomial logit model analysis of the transition probability at different levels, the degree of inequality in educational attainment between strata has not been reduced but rather increased, especially when transition paths are concerned at relevant stages.

Third, the differentiating effect of family background variables as confirmed by the model-estimated transition probabilities from one schooling level to another appears to be much larger at the lower level (high school) than at the higher level (university). This implies two potentially important points regarding the structure of educational inequality. First, the reduced effect of the socioeconomic background variables at the higher level may be due to their strong track selection effect at the lower (i.e. secondary) educational level. Second, the success of transition at the higher level may depend more on individuals' academic ability rather than on family background variables.

Fourth, the younger the age cohort, the more influential the background variables on the transition path throughout both secondary and tertiary education. The age cohort analysis shows that the long-term trend of educational stratification in Korea is moving

from quantitative to qualitative inequality.

Fifth, when inequality between social strata in the qualitative attainment of higher education is analyzed by the SAT scores of university enrollees, high school track assignment is most influential. The school location variable, which was not significant in determining the probability and path of transition to higher education, proves to be highly important in determining the level of SAT and thus the academic rank of the university. Two conclusions can be drawn from this result. First, that the quantitative and qualitative differentiation in higher education is greatly determined by track transition to secondary education. Second, that track transition is to a great extent determined by family background, implying that quantitative and qualitative differentiation in educational attainment between social strata is an outcome of a stage-by-stage selection and screening process in the secondary and tertiary educational system in Korea .

Our analysis in this article is in line with the larger framework of other studies following the theoretical discussions and methodological suggestions regarding educational stratification made by Mare (1980, 1981), and Hout, Raftery and Bell (1990).[8] We have found that despite constant educational expansion, the inequality of educational opportunity in both quantity and quality between social strata continues to exist in Korea, as it does in other countries. This shows that although Korean society has developed economically and its educational system has expanded in the past half century, the educational inequality between social strata has not decreased but rather intensified, especially in terms of qualitative differentiation. Within such a rigid, unequal system, the opportunity for higher educational achievement, which increases especially with the social prestige of the attended university, still forms a contested terrain between social strata. In this process, the upper class has acquired a dominant position through defensive expenditure in their children's education.

8. For further information, refer to analyses done in thirteen countries in Blossfeld and Shavit (1993).

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