Educational Expansion and Inequality:

Social Class and Gender Differentials in School Transitions in Korea

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I. Introduction

Research on educational stratification has passed through two different phases. First, researchers have paid attention to how family background variables affect school transitions within age cohorts. Secondly, researchers have dealt with how the effects of family background variables vary between age cohorts within school transitions (Mare, 1993: 351). The former means personal time of life course, and the latter means social-historical time of stratification process (Phang and Kim, 2001: 3). Especially, this study examines Korean data to see if changing patterns of educational inequality hold for the Korean school transition regimes.

According to both OECD and UNESCO reports (2003)[1], Korean students got the highest mean scores of academic performance in the Program for International Student Assessment (PISA). Moreover, the level of relationship between students' family backgrounds and student performance was found to be the lowest despite family backgrounds having been found to be one of the most determining factors influencing students' academic performance. This report therefore praised Korea as model case in which high student performance was achieved without much disparity in educational opportunity between social classes.

On the other hand, it is well known that entering prestigious colleges is extremely competitive in Korea. Many high school graduates may spend one or more additional years preparing for the college entrance exam in order to be able to enter the college of their choice. In 2003, the number of repeat applicants for universities and junior colleges was 184,188 (27.4% of total applicants). Moreover, due to extreme competition, the burgeoning expansion of after-school shadow education (private cram schools, private tutoring, etc) had already emerged as one of the most serious social problem. In 1980, 14.9% of all students were reportedly involved in shadow education (*Hagwon*), with the percentage having increased to 58.1% as of 2000 (Kim et al, 2001: 40). Korea even goes to the extreme in that regard as some high school students commit suicide out of despair over poor school records[2].

The results of the PISA may indicate that Korea had been successful in setting up a high performance educational system that provides students of all classes with relatively equal opportunities and even outcomes. Still, the extreme competition and the expansion of shadow education may indicate that Korea failed to build up educational environments in which students' aptitudes and interests are best served, and as a result, have turned their educational systems into a 'contested terrain.'

In the following section, we will review past research on family background and educational

[1] *Literacy Skills for the World of Tomorrow: Further Results from PISA 2000* (OECD and UNECO, 2003). See OECD website on detail contents (http://www.pisa.oecd.org).

[2] According to an adolescent survey in Korea, 33.2 percent of middle school and high school students have once thought of committing suicide. And the main cause of suicide impulse was stress or depression related to academic performance as 19.8 percent (Choi, 2004).

inequality, especially in the context of expanding educational opportunity. Thereafter, we describe the Korean educational systems along with the history of educational expansion, and introduce our research questions. Then this paper will present the data and variables to be used along with the analytical models we have adopted in order to analyze social class and gender differentials in school transition rates over age cohorts. Finally, we present the results of our analyses and discuss their implications.

II. Educational Expansion and Inequality

Researchers on educational inequality have paid attention to relationships between family background or gender, and educational continuation. The interests of many researchers have mainly focused on how the relationships vary across age cohorts at each level of school transitions (Mare, 1993: 351). Previous research on changing patterns of educational continuation has found some empirical regularity for the economically developed countries (Blossfeld and Shavit, 1993)[3]. First, the effects of family backgrounds have not decreased over time despite a rapid educational expansion. Second, gender differentials have persisted but have continuously decreased across age cohorts. Third, the effects of family background almost vanish at the graduate school level (Mare, 1980; Stolzenberg, 1993).

Why the effects of family background have persisted over time despite a rapid expansion of education? Several hypotheses were introduced to explain it. Ratery and Hout (1990) insisted that inequality in educational opportunity is maximally maintained (MMI, *maximally maintained inequality hypothesis*). They said that the effects of social origins do not change, except when the attendance rates of the privileged classes are saturated. These results might emerge from the rational choices of parents and students. Parents in advantaged and students from advantaged backgrounds are more interested in furthering their own goals and aspirations than are in blocking the advance of lower-class students (Hout, Raftery, and Bell, 1993:26). Breen and Goldthorpe (1997) propose the *relative risk aversion hypothesis*. This is similar to MMI hypothesis. This hypothesis explains that parents of all classes want their children to achieve upward mobility or at least avoid downward mobility. Although the efforts to avoid downward mobility are the same among all classes, the results of such efforts differ substantially among classes. In other words, working class children might be satisfied with either a middle class or working class, while middle class children expect to be at least middle class. By the way, Mare (1980) insisted that the passage to graduate school is not affected by the

[3] Blossfeld and Shavit (1993) analyze thirteen countries. Thirteen countries are classified three major groups. Western capitalist countries are the United States of America, Germany, United Kingdom, Italy, Switzerland, the Netherlands, and Sweden. Non-western counties are Japan and Taiwan. Western formerly socialist countries are Poland, Hungary, and Czechoslovakia

effects of family background. Also, Stolzenberg (1994: 67) suggests that family background is not relevant to educational continuation of university graduates and that the aspirations of students to graduate school are formed in university without parental influence.

Decreasing trends of gender differentials can be explained from several theoretical perspectives (Buchmann, DiPrete, and Powell, 2003: 2-9). Family economy perspectives view educational attainment as a product of family decision making, in which parents consider both issues of efficiency and equity to determine the optimal distribution of educational resources among children (Behrman, Pollak, and Taubman, 1986). If gender differences in return to schooling become decrease over time, families become invest more resources in their daughters' education for wealth maximization. This means that gender differentials tend to decrease when female's participation in labor market is high and the possibility getting good jobs tends to be fully higher. Another explanation is cultural capital perspectives. According to the *education egalitarianism hypothesis*, parents who hold egalitarian values strive to ensure that sons and daughters are equally (Thornton and Freedman, 1979). Highly-educated parents are more likely to hold gender-egalitarian views. If parents schooling become increase over time, parental bias toward investing in sons' education become weaker.

These perspectives imply that educational inequality can be explained from decision making of parents and students on educational attainment regardless to specific issues. In other words, these hypotheses share the assumption that educational expansion would be due to response to growing educational demand from the population. But governments have regulated educational demand for politic need in many countries without regard to whether governments have accelerated policies for educational expansion or constrained educational demand. And educational policies of government change over time. Some countries have shown trends of deregulation and privatization facilitating rapid expansion, while other countries have undergone the opposite trends reinforcing government's intervention. According to Arum, Gamoran, and Shavit (2004), educational systems can be divided in two regimes relating to government's educational policies, demand-driven systems for the population and supply-driven ones for the government authority. They suggest that demand systems are more likely to undergo rapid, differentiated expansion than supply systems. And in supply systems where expansion is closely regulated, upper classes are likely to be best positioned to take advantage of new opportunity, while demand system may add members of disadvantaged groups more rapidly than members of the privileged class for a variety of reasons (Arum, Gamoran, and Shavit, 2004: 14).

Another critique of previous explanation is that they ignore school tracking systems. Educational systems are divided into several pathways in many countries. Lucas (2001) proposes an alternative hypothesis considering school tracking systems, so-called the *effectively*

maintained inequality hypothesis (EMI). This hypothesis explains that upper class parents try to get any advantages in the educational ladder in terms of both quantitative differences and qualitative differences. And he said that qualitative differentiation replaces educational inequality from the quantitative differentiation. And Breen and Jonsson (2000) propose the *path dependence hypothesis*. This hypothesis explains that the degree which transition probabilities from on level and/or type of education to another may be influenced by the particular educational pathway by which students arrived at the point of choice. They propose a new method, multinomial logit model, which measures the effects of family background on qualitative different pathways of school transitions[4]. Karen (2002) insisted that analysis of educational stratification must include the uniqueness of educational system. Also, Mullen, Goyette and Soares (2003) analyzed educational continuation after university using multinomial logit model. They stated that parents' education has an effect on their children's entry to graduate school by type of graduate programs. Although family background has no effect on entry into MBA programs and master's programs, it has a strong effect on entry into first-professional and doctoral programs.

In the following section, we will review the Korean educational systems, especially focusing on government policies and trends of educational expansion.

III. The Case of Korea

Table 1 describes the educational systems in Korea. Following the Korean War, the occupying Allied Forces reformed the old educational system of Korea into an American one. The school grade systems had been the single-track '6-3-3-4' system, in which students spent six years receiving primary education, three years of lower secondary education, three years of upper secondary, and four years of tertiary education. Another feature of the Korean educational systems is that these are highly standardized (Kim, 2003; Park, 2003). According to Allmendingers (1989), "standardization" describes the degree to which the quality of education meets the same standard nationwide. Korean students are educated according to standardized curricula without regard to individual ability, through all levels of compulsory education. Moreover the Korean government has even controlled the number of students.

Also school tracking starts only at the upper secondary educational level, where the curriculum is divided into 'general education' and 'vocational education'. Historically vocational education was socially regarded as less important than general education. General

[4] This is related with criticisms of Mare model (binary logit model). Breen and Jonsson (2000) criticized the assumption of Mare model that individuals progress through the educational system in a linear sequential mode. This model cannot explain the qualitative differences in each educational level. School systems are seen as qualitatively different alternative pathways with different probabilities of school transitions attached to them.

educational courses were mainly focused on preparing students for continuing into college education, while vocational educational courses were geared towards training students for various vocations such as those found in agriculture, commerce, industry, music and art, etc.

Table 1. Post War Educational systems in Korea

Start year	1951 (since the Korean War)
School system	6-3-3-4 system, a single track
Primary	Elementary Schools (*Chodeunghakgyo*), 6 year, compulsory education since 1959
Secondary	1. Middle Schools (*Junghakgyo*), 3 year, compulsory education since 2002 2. High Schools (*Godeughakgyo*), 3 year, general / vocational courses
Tertiary	1. Junior Colleges (*Jeonmundaehak*), 2-3 year, higher education since 1951 2. Universities (*Daehakgyo*), 4-6 year since 1951 3. University of Education (*Gyoyukdaehak*), 4 year since 1981, 2 years since 1962 4. Industrial Universities (*Saneopdaehak*), higher education since 1982 5. Korea National Open University, 4 years since 1991, 5 years since 1981 6. Graduate Schools (*Daehagwon*)
Others	Miscellaneous Schools
Standardization	High
Stratification	Compulsory stage: Low Upper secondary stage: Low Tertiary stage: High

Another feature of Korea is that compulsory education was promulgated much later than other countries. Compulsory education was applied only up to the elementary educational level and was subsequently raised to the middle school level quite late, in 1985 for rural areas and nationally in 2002. It was a very late decision, because in 1985 the middle school enrollment rate had already reached over 90%. On the other hand, Japanese compulsory education was required up to the 9th grade in 1947, and lower secondary education was the minimum official standard for educational participation during the 1950s.

Yet private expenditures on college education in Korea are estimated to be the highest in the world, standing at about 1.9 percent of its GDP. The relative proportion of private funding at the tertiary education in Korea is very greater (See A-Figure 1). An average of private share expenditure for the OECD countries is 22 percent, while Korean proportion shows surprisingly 84.1 percent in 2001. And about 80% of the tertiary educational institutions are private in Korea. The cost for attending private colleges is much (1.3 times) higher than for attending public (or national) colleges. In Korea, most of the cost is privately financed out of parent's savings or

debt. By the way, 16.8 percent of public expenditures in OECD countries is used to financial aid for students such as scholarships, student loans, other grants to households, while a percentage of this type in Korea is merely 9.5 percent. It is an exceptional case when compared with other countries where the level of private funding is higher (Chang, 2003: 16). The level of public subsidies tends to be higher in these countries. For examples, 37.4 percent of public expenditures on tertiary education are provided in this type of support in United States.

There are several prominent features in the change of educational expansion in Korea (See A-Figure 2). The first centers around, the fact that the proportion of students entering secondary education has reached almost 100 percent. In the trends in the number of Korean high school students by the school type, general high school students have increased steadily in the post war period, while vocational high school students have slowly decreased after the 1990s. Until the 1980s in Korea, many affluent middle school students were attracted to vocational high schools, because these schools were formally required as the answer to rapid industrialization's demand for manpower, and students in vocational schools were eligible to receive such financial support as various scholarships. But, after the 1990s, the vocational high schools came to a crisis point in that they lost their reason for exist. Although vocational schools were founded to provide technical semi-skilled workers, vocational schools recently have offered little contribution to the development of technical manpower.

Second, enrollment rates to institutions of higher education in Korea show a higher proportion than other countries. The proportion of those entering junior colleges and universities has increased by almost 2.5 times from 1965 (32.3%) to 2003 (79.9%) in Korea. Almost 80 percent of Korean high school graduates went to attend institutions of higher education in 2003. The expansion of higher education in Korea is an exceptional case among other countries. For example, Korea shows the highest change ratio among OECD countries; the percentage of the population that has attained tertiary education of the age group 25 to 34 is 4.5 times higher than that of the age group 55 to 64 (See A-Figure 3). For examples, though Japan also shows the third highest change ratio among OECD countries, Korea's change ratio is 1.5 times higher than that of Japan. To be more specific, the trends in the number of Korean junior colleges students show a very different pattern from other countries. Surprisingly, the number of junior colleges students in Korea increased almost 28 times from 33,483 in 1970 to 925,963 in 2003. In real terms, the expansion of higher education in Korea can be explained by the rapid expansion of the number of junior college students. According to the OECD report (OECD, 2003), the percentage of the population that attained Type-B tertiary education in the 25 to 34 age group was a 19.2 times higher than that of the 55 to 64 age group in Korea.

Third, the total number of master's course students in Korea has increased 38 times from 6,122 in 1970 to 234,358 in 2003. The number of students enrolled in graduate school per 1,000

persons in Korea is already twice as large as that in Japan in 2000. This can be explained by the higher educational expectation level in Korea. According to Nakamura, at al (2002: 76-77), up to 20% of Korean senior high school students want to go to graduate school, while this number stands at just 9.7% of male and 4.8% of female Japanese.

Figure 1. Trends of Government Policies and Educational Expansion in Korea

Government Policies			Educational Expansion	
Secondary Education	Higher Education		Secondary Education	Higher Education
Demand-driven	Demand-driven	1990s	General ⇑ Vocational ⇌	University ⇑⇑ Junior Col. ⇑⇑
Demand-driven	Demand-driven	1980s	General ⇑ Vocational ⇌	University ⇑⇑
Demand-driven	Supply-driven	1970s	General ⇑⇑ Vocational ⇑	University ⇌ Junior Col. ⇑
Demand-driven	Supply-driven	1960s	General ⇑⇑⇑ Vocational ⇑	University ⇌ Junior Col. ⇌

Note: ⇑⇑ Rapid expansion, ⇑ Expansion, ⇌ Stable, ⇓ Contraction

Figure 1 shows the relationships between government policies and educational expansion in Korea. Government policies changed from supply-driven direction to demand-driven one after the 1980s. But we need to explore it separating into secondary education and higher one. The Korean government constrained further expansion of higher education through control policies over student admission quotas system until the 1970s, while the Korean government tried to accelerate expansion of primary and secondary education. During the military government by President *Chung Hee Park*, the primary and secondary education experienced rapid expansion due to the active policies for the need of manpower required from rapid industrialization. But these policies on secondary education drove without government's deregulation and

privatization on education. And the Park's regime emphasized to provide workers with vocational skills to the heavy industries in manufacturing during the 1970s. Therefore, during this period the number of vocational high schools and junior colleges students increased than that of before and after periods.

After the President *Doo Whan Chun*'s military government, Korea have experienced the transformation of educational policies. Although the Korean government has intervened actively in education until the present, the tight control policies on the size of higher education discontinued in the 1980s. For example, university admission systems changed admission quotas system into graduation quotas one. Although 30 percent of university students added excess member of admission quotas, most of them have graduated contrary to intention of policies. In result, this change of policy results in significant increase in the number of university students. And these situations have reinforced after the advent of democratic government. The President *Young Sam Kim*'s government accelerated deregulation, decentralization, and privatization on education. And these educational reform continued until the President *Dae jung Kim*'s government.

IV. Research Questions

This study addresses the following three questions. *First, we examine whether or not parental effects decline across age cohorts in Korea*. Previous research on Korea has been consistent in this empirical regularity. Chang (2000) insisted that the effects of social origins have not decreased across age cohorts despite a rapid expansion of education in Korea. Park (2001) also stated that the impact of social origins on educational transitions has not decreased over this period in Korea, though there is some evidence of narrowing gaps between persons who grew up in metropolitan area and others.

Especially, we explore whether or not the change of government policies affects the changing patterns of educational inequality. The Korean government policies have changed form educational supply driven direction to educational demand driven one after the 1980s. Enrollment rates of upper secondary and higher education have increased more rapidly in demand-driven periods than in supply-driven period. Therefore the educational reforms may lead to a reduction in the association between family backgrounds, or gender and educational continuation. And there is less research about the changing patterns in terms of educational tracking or pathways (Lucas, 2001). Particularly in Korea, there is little detailed analysis by educational pathway. Some research merely considered educational tracking at the higher education levels (Chang, 2003, 2004; Park, 2003). Phang and Kim (2003) created an analysis by the path of transition taken at each stage, namely at the secondary (general / vocational) and the

tertiary stage (universities / junior colleges) in Korea. They insisted that the overall long-term trend in Korean educational stratification was toward decreasing inequality in the quantity (success) but increasing inequality in the quality (path) of educational continuation among social classes. This study focuses on the effects of background variables on qualitative different pathways of school transitions across age cohorts.

Second, we examine how educational continuation across age cohorts vary by gender in Korea. Researchers showed that gender disparities in access to education have steadily decreased, although gender inequality has persisted (Chang, 2003, 2004). Chang (2004) showed that gender differentials have steadily decreased in almost all transitions. But these differentials have decreased unequally across socio-economic backgrounds. We are quite interested in the tertiary stage as we continue to try and make more specific claims.

Third, we examine the effects of family backgrounds and gender on transitions from university to graduate school in Korea. Yet we do not know whether or not these factors have a substantial effect on the likelihood that university graduates will matriculate to graduate school in Korea. Korea has showed quite a fast expansion of the number of graduate school students. If university credentials lose their value due to the expansion of higher education, post-graduate credentials enter the field of competition of social class. Therefore, family backgrounds and gender may have significant effects on transitions from university to graduate school.

V. Methods and Models

Data

We used the 2002 Korean Labor and Income Panel Study (KLIPS) for this analysis[5]. The KLIPS was conducted by the Korea Labor Institute after 1998 and is a longitudinal survey of 5000 households and their members (aged 15 and over) residing in urban areas. The final number of members amounted to 13,321 in 1998, and the respondents of the fifth wave (2002) numbered 10,557. The sampling method of The KLIPS was a two-stage cluster systematic sampling. The field work of the fifth wave was started in May and finished in October in 2002.

The final samples of the KLIPS for this analysis were restricted to the respondents born between 1940 and 1979. The total observations of the KLIPS numbered 4,423, which do not include the missing cases. Sample sizes also decline across school transitions, since analytic cases in higher school transitions are the respondents that successfully advance from lower school transitions.

[5] See English web sites of the KLIPS (http://www.kli.re.kr/30_labp_eng/index.asp) on the detail information.

Dependent Variables

The first transition point (T1) was marked by whether the respondents begin studies at high schools or leave school over junior high (middle) schools. At this point, the alternatives (MT1) are starting studies in either general courses or vocational ones. The fourth wave (2001) of the KLIPS offers information about the types of high schools. General high schools include academic high schools[6] with humanities and natural science curriculums, specialized science high schools[7], and foreign language high schools. Vocational schools include academic high schools with vocational classes, agricultural high schools, industrial high schools, commercial high schools, fishery and oceanography high schools, comprehensive high schools, and other assorted types of vocational high schools. Meanwhile, the MT1 variable was used as the independent variable.

The second transition point (T2) was marked by whether the respondents start studies at the tertiary education level (over 2-3 year junior colleges/colleges of technology) or not. At this point, the tertiary education entrance as a dependent variable is differentiated between 2-3 year junior colleges (included colleges of technology in Japan) and 4-6 year universities (MT2).

The final transition point (T3) was marked by whether the respondents who completed their undergraduate education got into graduate school or not. Table 2 shows the dependent variables and their percent distributions.

Table 2. Dependent Variables and Their Measurements

Name	Items used with coding
T1	High Schools Entrance 79.9 % (3,536), Leave School 20.1 % (887)
MT1	General 48.8%(2,157), Vocational 31.2% (1,379), Leave 20.1% (887)
T2	Junior Colleges/Universities 40.2 % (1,421), Leave 59.8 % (2,115)
MT2	Universities 26.4%(935), Junior Colleges 13.7%(486), Leave 59.8%(2,115)
T3	Graduate Schools 15.0 % (140), Leave 85.0 % (795)

Independent Variables

In this analysis, the main independent variables were family background variables. This analysis focused on three family background measures: the father's education, mother's

[6] The curriculum for the first year of the academic high schools consists of common subjects, while the curriculum for the second and third years includes humanities, natural sciences, vocational training, and other necessary subjects. The category of general high school in this study excludes students of vocational training class of academic high schools.

[7] Science high schools were established to provide places for the education of students with affluent scientific talent. There are 16 science high schools in Korea, including the Seoul Science High School. Students who have completed two years in a science high school can be admitted to entry at the Korea Advanced Institute for Science and Technology (KAIST).

education, and father's occupation. The father's and mother's educations were measured by the number of years of schooling. In the KLIPS data, parents' education was measured by the grade of the highest level of school at which they graduated, and additionally the half of schooling years if they dropped out or were not registered.

The father's occupation was measured by social class category. The KLIPS offers some information about the father's occupation[8] and employment status from when the respondent was 14 years old. Also, the father's occupation was diverted to units in the four-class version of the EGP schema (Erikson and Goldthorpe, 1992).

(1) I+II+III White-collar Workers: I+II Service Class (professionals, administrators and managers; higher-grade technicians, supervisors of non-manual workers) and III Routine non-manual workers (routine non-manual employees in administration and commerce; sales personnel; other rank-and-file service workers)
(2) IVab Petty bourgeoisie: proprietors and artisans, etc., with and without employees
(3) V+VI+VIIa Manual Workers: V+VI Skilled (lower-grade technicians; supervisors of manual workers; skilled manual workers) and VIIa Non-skilled (semi-and unskilled manual workers)
(4) IVc+VIIb Farm workers: farmers and smallholders and self-employed workers in primary production; agricultural and other workers in primary production

This study did not treat family income, because the KLIPS do not offer information about family income from when the respondent grew up[9]. Academic ability is also an important variable in the analysis of educational continuation. This is known as a factor mitigating the disparity between family background and educational attainment (Mare, 1980: 296). However the KLIPS merely provides information about the academic ability of young people under 30 years old in the 5th (2002) wave. Also, this information comes from the College Scholastic Ability Test (the CSAT), which only students who completed high school had taken. Therefore, this study only includes academic ability at the transition from university to graduate school (T3). The community variable indicates the place where the respondent grew up, mostly during the early teens (middle school ages). This variable distinguished the metropolitan areas from non-metropolitan areas[10].

[8] The job category of the KLIPS uses 3-digit code of the KSCO (Korea Standard Classification of Occupation). The KSCO code uses the code of the ISCO-88 (International Standard Classification of Occupation) to major group (1-digit) from unit group (4-digit). We converted the ISCO-88 job code to EGP schema using Ganzeboom's conversion tools (http://home.scw.vu.nl/~ganzeboom/PISA/INDEX.HTM). And we reconverted using other variables because job code cannot classify self-employed and firm size.

[9] The KLIPS merely offer household incomes over the last year.

[10] The KLIPS sample is an equal probability sample of households from the 7 metropolitan cities and urban areas in 8 provinces (excluding Cheju Ireland).

Age cohorts were divided into four ten-year cohorts: 1940-1949, 1950-1959, 1960-1969, and 1970-1979. The oldest cohort respondents were those born in the 1940s and who graduated from high schools in the 1960s. The second cohort respondents were those born in the 1950s and who attended universities or junior colleges in the 1970s. The third cohort respondents were those born in the 1960s, and the fourth cohort respondents were those born in the 1970s, which defined the youngest cohort.

Table 3. Independent Variables and Their Measurements

Name	Items used with coding	Mean (S.D.)
GENDER	Male 51.0 % (2,254), Female 49.0 % (2,169)	
COHORT	1940-1949 12.1% (537), 1950-1959 26.0% (1,151), 1960-1969 34.2% (1,511), 1970-1979 27.7% (1,224)	
LOCAL	The metropolitan 34.2 % (1,512), Non 65.8% (2,911)	
FEDU	None=0, Elementary=6, Middle School=9, High School=12, College=14, University=16, Master or Doctoral Course=18	6.82 (4.56)
MEDU	See FEDU	4.29 (4.02)
CLASS	White Collar 16.0% (706), Petty 17.3% (764), Manual Workers 16.5% (729), Farmers 50.3% (2,224)	
CSAT	The College Scholastic Ability Test (self-reported) 1= very lower score to 12=very higher score	8.77 (2.19)

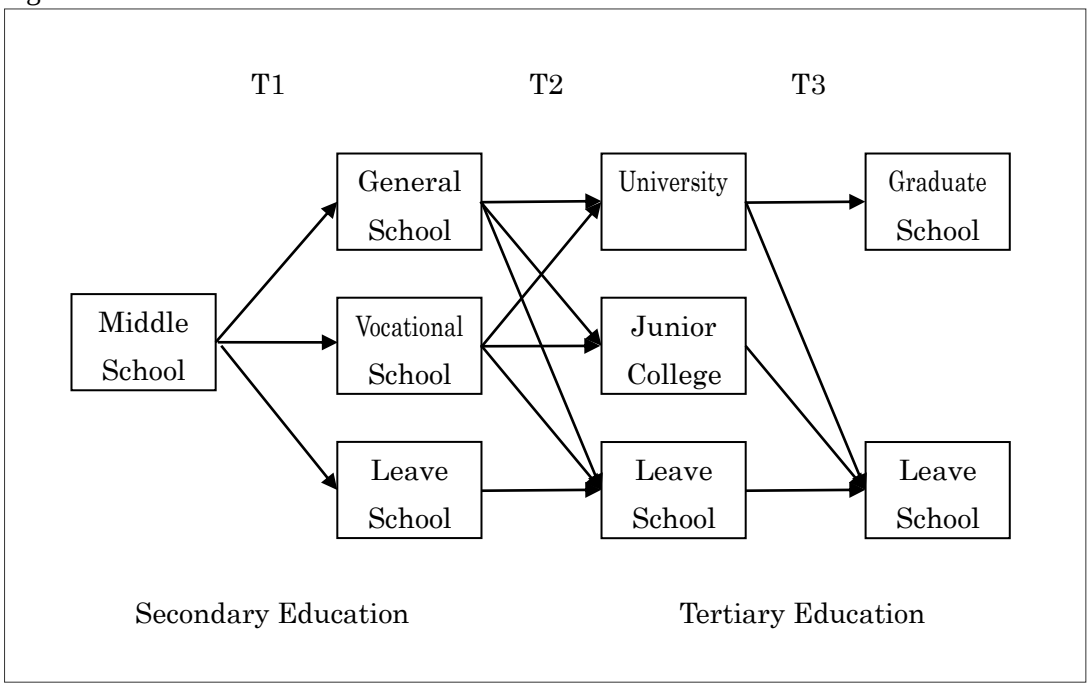
Models

Figure 2 describes education pathways in the educational systems in Korea. This shows that this study will theorize about three school transitions (T1 (MT1) =>T2 (MT2) =>T3). To estimate the effects of family background on the three school transitions, we used the Mare model (Mare, 1980, 1981), which employed binary logistic regression to estimate the effects of family background for each school transition. The dependent variables in the Mare model were transitions from lower to higher stages in educational continuation.

As the second stage analysis, we utilized multinomial logit model (MT model) for comparison with results of the traditional binary logit model (Mare model). This focused on the two steps, upper secondary education (T1) and tertiary education (T2), because the T3 does not have alternative pathways to entry levels of higher education. The MT model focused on whether or not individuals successfully advanced to alternative pathways after middle school. The MT1 as a dependent variable was differentiated between (1) general high school, (2) vocational high school and (3) leaving school. The MT2 as a dependent variable was constituted

as a 3-state transition: (1) entrance to 2-3 year junior colleges, (2) entrance to 4-6 year universities, and (3) leaving school altogether. In model tests, we considered the Beysian Information Coefficient (BIC) and the significance of independent variables.

Figure 2. School Transition Models in Korea



V. Research Findings

Tables 4 and 5 show descriptive statistics and percentage distributions for family background variables by age cohort. According to Table 4, the results of the means show that both the father's and mother's education variables consistently increased across age cohorts. Table 5 presents percentage distributions for the father's class and community of origins by age cohort. The distributions of petty bourgeoisie or self-employed workers (IVab) in Korea have increased from 12.7 percent in the oldest cohort to 23.3 percent in the newest cohort. And white collars (I+II+III) and manual workers (V+VI+VIIa) have also consistently increased in size across age cohorts, but the number of farmers (IVa+IVIIb) has sharply decreased from the oldest cohort to the newest cohort. These results suggested that the transition from agricultural society to industrial society has made rapid progress in Korea after the half of the 20th.

Table 4. Descriptive Statistics for Father's and Mother's Education by Age Cohorts in Korea

(Mean)

	1940-1949	1950-1959	1960-1969	1970-1979

KOREA				
FEDU	4.60(4.47)	5.52(4.61)	6.83(4.35)	9.00(3.83)
MEDU	1.66(3.02)	2.76(3.52)	4.27(3.78)	6.91(3.63)

Note: Numbers in brackets are standard deviations.

Table 5. Percentage Distributions for Father's Class and Community of Origin by Age Cohorts in Korea

(%)

	1940-1949	1950-1959	1960-1969	1970-1979
KOREA				
CLASS				
I+II+III With Collar	11.0	15.2	14.8	20.3
IVab Petty	12.7	13	17.3	23.3
V+VI+VIIa Manual	6.7	10.8	14.2	28.9
IVa+IVIIb Farmers	69.6	60.9	53.8	27.5
LOCAL(1=metro)	24.8	27.7	31.2	48.1

Table 6. School Transition Rates by Age Cohorts in Korea

(%)

	1940-1949	1950-1959	1960-1969	1970-1979
KOREA				
T1(MT1)				
Upper Secondary	53.3	63.7	87.4	97.7
General Courses	34.5	39.8	51.8	59.8
Vocational Courses	18.8	23.9	35.7	37.9
Leave School	46.7	36.3	12.6	2.3
T2(MT2)				
Tertiary	29.7	28	37	53.7
University	27.6	20.9	25.4	30.8
Junior Colleges	2.1	7.1	11.7	22.9
Leave School	70.3	72	63	46.3
T3				
Graduate School	11.4	22.2	13.4	14.1
Leave School	88.6	77.8	86.6	85.9

The distribution of the community of social origin variable consistently increased in size across age cohorts. This result shows that the Korean population has become concentrated in metropolitan areas. In reality, Korean metropolitan areas show the dubious honor of having the highest population density in the world with the exception of the city-state of Singapore. The population of Seoul, the capital city of Korea, totaled 10.3 million, which represented almost 22 percent of the entire population.

Table 6 shows descriptive school transitions rates by age cohort at selected levels of schooling.

School transitions rates by age cohort persistently increased across age cohorts, especially in the case of upper secondary education which has expanded more quickly than tertiary education. This case has shown that those in general courses and vocational courses have simultaneously increased across age cohorts. In tertiary education, Korean junior colleges showed a rapid increase. These results were similar to the trends of national statistics in Korea.

Table 7. Coefficients of Independent Variables for Preferred Models in Transition 1

	Binary logit model	Multinomial logit model		
	High school/leave	General/leave	Vocational/leave	General/vocational
FEDU	.116(.013)***	.137(.014)***	.087(.014)***	.050(.010)***
MEDU	.148(.016)***	.173(.016)***	.111(.017)***	.062(.011)***
CLASS				
IVab	-.052(.219)	-.149(.222)	.275(.236)	-.424(.128)**
V+VI+VIIa	-.512(.217)*	-.660(.221)**	-.119(.234)	-.541(.130)***
IVc+VIIb	-.538(.188)**	-.704(.192)***	-.118(.207)	-.586(.127)***
GENDER	-1.423(.210)***	-1.253(.234)***	-1.798(.314)***	.545(.330)
LOCAL	.319(.116)***	.270(.121)*	.384(.126)**	-.114(.083)
COHORT				
1950-1959 (2)	.216(.152)	.041(.171)	.415(.178)*	-.374(.172)*
1960-1969 (3)	1.323(.173)***	1.187(.188)***	1.485(.195)***	-.299(.163)
1970-1979 (4)	1.669(.272)***	1.503(.283)***	1.891(.290)***	-.388(.179)*
C2*GENDER	.522(.249)*	.627(.278)*	.517(.356)	.110(.369)
C3*GENDER	.722(.267)**	.507(.291)	1.161(.359)**	-.654(.349)
C4*GENDER	2.467(.464)***	2.181(.479)***	2.965(.524)***	-.785(.352)*
Constant	.217(.227)	-.301(.240)	-.898(.258)***	.597(.198)**
Pseudo-R^2	.401	.331		
-2LL	3137.846	2916.075		
Chi-square	1295.360	1512.302		
N	4,423	4,423		

Note: Pseudo-R^2 is Nagelkerke R^2. Reference groups of father's class, gender, and cohort are white collars (I+II+III), female, and the oldest cohort (1940-1949).

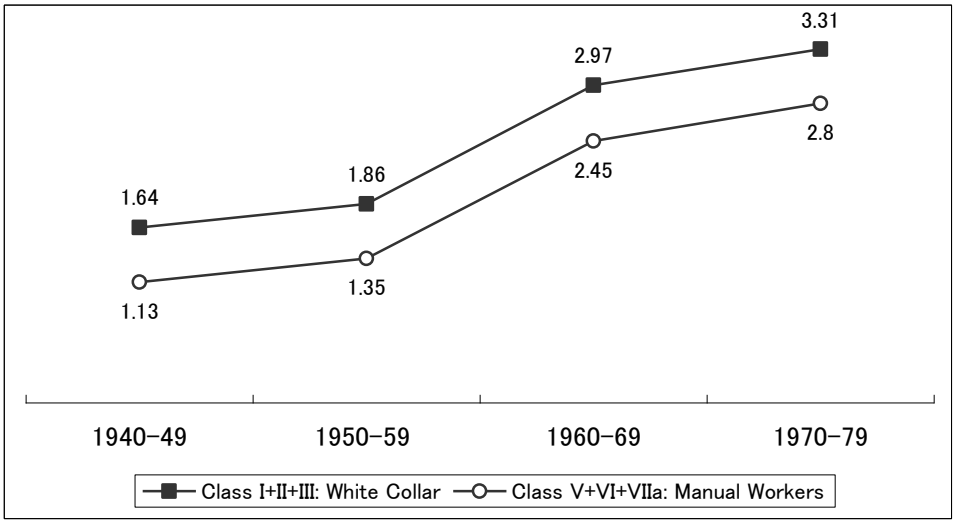
1) * : $p < .05$ ** :$p < .005$ ***: $p < .001$

Table 7 shows coefficients of the independent variables for the preferred model at the secondary educational stages. The results of BIC model tests are presented in A-Table 1, A-Table 2. The primary interest of this study is the question of whether parental effects declined

across age cohorts. According to the model tests, the interaction terms between age cohort and family background variables were mostly insignificant. These results mean that the effects of family backgrounds have not changed across age cohorts.

Figure 3 presents the log odds of attending high school instead of leaving school by the father's class (white collars / manual workers) across age cohorts from the result of binary logit model in Table 7. This result means that the effect of father's class never decreased across age cohorts in T1.

Figure 3. Log Odds of Attending High School Instead of Leaving School by Father's Class across Age Cohorts in Transition 1



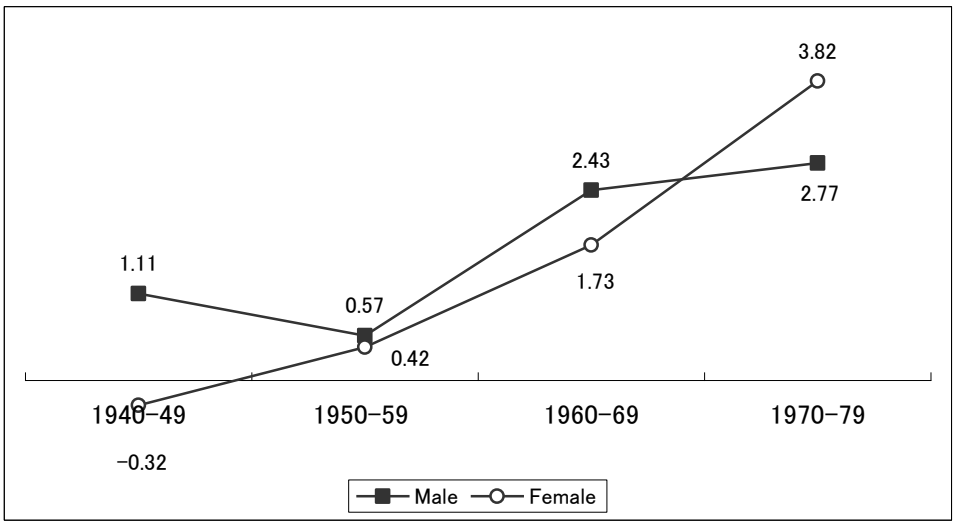
Note: FEDU=6.82, MEDU=4.29, LOCAL=0, GENDER=0. Continuous variables are calculated at means, and category variables are calculated at values of the largest proportion in distribution.

By the way, the father's class displayed different features according to educational pathway, although it did not show significant changes across age cohorts in Table 7. The disparity of social classes in binary logit model is lower than that in the case of the log odds of attending general high school instead of vocational high school. Meanwhile, the log odds of attending vocational courses instead of leaving school show that disparity among classes is insignificant. According to Lucas (2001), if the expansion of education in any stage of the educational ladder has reached saturation, this means that qualitative differentiation has replaced educational inequalities in terms quantity. Therefore this result can be interpreted to mean that differentiation among social classes did not manifest strongly itself in terms of the quantity of education attained, but in the quality of placement in selective educational tracks.

A second interest of this study is how educational continuation across age cohorts varies by gender. Table 7 shows that the interaction terms between age cohort and gender display significant positive (+) effects. These results show that the quantitative disparity of gender has

deceased over time in the T1. Figure 4 shows log odds of attending high school instead of leaving school by gender over time. To limit discussion to quantitative disparity, we can say that gender inequality has decreased over time at the stage of secondary education. But qualitative inequality (general courses / vocational courses) has significantly increased in the youngest cohort according to the multinomial logit model.

Figure 4. Log Odds of Attending High School Instead of Leaving School by Gender across Age Cohorts in Transition 1



Note: Continuous variables are calculated at means, and category variables are calculated at values of the largest proportion in distribution

Table 8 shows the coefficients of independent variables for preferred model at the higher education stages. The results of the BIC model tests are presented in the Appendix, A-Table 3, A-Table 4. First, we have been interested in whether or not parental effects decline across age cohorts in Korea. The model tests in the Appendix show that all interaction terms between age cohort and family background variables are insignificant. These results mean that the effects of family backgrounds have not changed across age cohorts at higher stage of education.

Also, Table 8 shows basic patterns of differentiation as follows. First, differentiation in the quantity and the quality at the tertiary levels displays features contrary to the T1. In the case of the log odds of attending tertiary education (university + junior college) instead of leaving school, the impacts of family backgrounds are larger than those of attending university instead of junior college. This result can be interpreted to mean that differentiation among social classes manifests itself in terms of the quantity of education attained at the tertiary levels.

Second, family backgrounds have stronger effect on university track (university / leave school) than on junior college track (junior college / leaving school), with the exception of farmers (IVc+VIIb). Previous research has shown a similar result (Breen and Jonsson, 2000, Chang, 2004, Ishida, 2003, Phang and Kim, 2003). Breen and Jonsson (2000) explained this

result by reasoning that the pathway to university was more difficult than that of junior college, and that differentials of social origins were more consequential to determining success at this level.

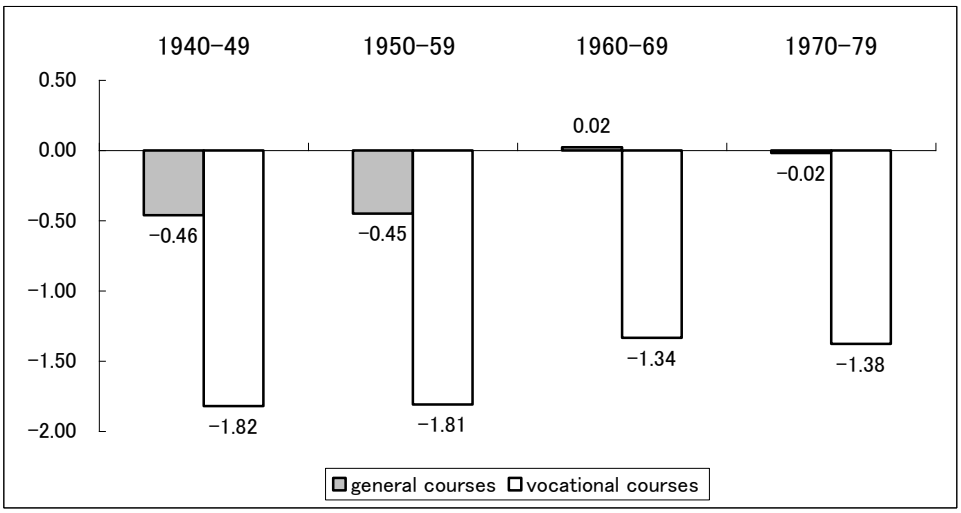
Table 8. Coefficients of Independent Variables for Preferred Models in Transition 2

	Binary logit model	Multinomial logit model		
	Tertiary/leave	University/leave	Junior College/leave	University/Jun.Col.
FEDU	.047(.012)***	.061(.014)***	.023(.017)	.038(.018)*
MEDU	.101(.013)***	.118(.110)***	.073(.017)***	.044(.019)*
CLASS				
IVab	-.387(.131)**	-.389(.146)**	-.376(.168)*	-.013(.169)
V+VI+VIIa	-.605(.135)***	-.631(.153)***	-.593(.173)**	-.037(.179)
IVc+VIIb	-.808(.132)***	-.648(.149)***	-1.088(.181)***	.441(.192)*
GENDER	-.693(.338)*	-1.021(.366)**	1.393(.890)	-2.414(.916)**
LOCAL	.300(.090)**	.398(.102)***	.120(.120)	-.279(.127)*
MT1	1.359(.087)***	1.801(.110)***	.753(.114)***	1.048(.139)**
COHORT				
1950-1959 (2)	.013(.195)	-.277(.208)	2.130(.735)**	-2.408(.744)**
1960-1969 (3)	.486(.183)**	.108(.194)	2.782(.724)***	-2.675(.731)***
1970-1979 (4)	.445(.197)*	-.107(.213)	3.038(.728)***	-3.146(.736)***
C2*GENDER	-.533(.391)	-.301(.428)	-2.456(.948)*	2.155(.986)*
C3*GENDER	-.470(.362)	-.344(.396)	-2.212(.908)*	1.869(.938)*
C4*GENDER	.496(.363)	.596(.396)	-1.339(.904)	1.935(.930)*
Constant	-1.767(.228)***	-2.388(.253)***	-4.358(.743)***	1.969(.756)**
Pseudo-R^2	.327	.330		
-2LL	3783.847	3231.284		
Chi-square	980.992	1157.547		
N	3,536	3,536		

Note: Pseudo-R^2 is Nagelkerke R^2. Reference groups of father's class, gender, MT1, and cohort are white collars (I+II+III), female, general courses, and the oldest cohort (1940-1949).

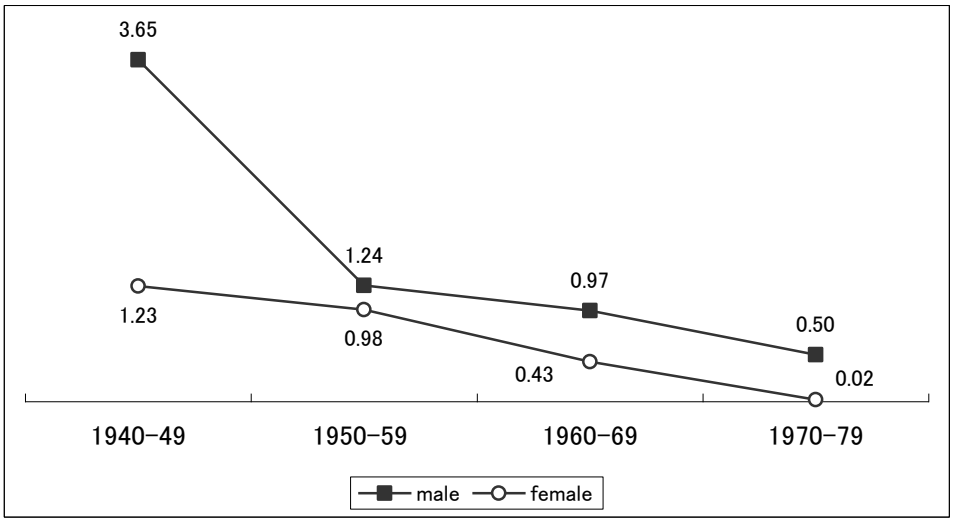
1) * : $p < .05$ ** :$p < .005$ ***: $p < .001$

Figure 5. Average Log Odds of Attending Colleges Instead of Leaving School by Previous Educational Track in Transition 2



Note: Continuous variables are calculated at means, and category variables are calculated at values of the largest proportion in distribution

Figure 6. Log Odds of Attending University Instead of Junior College by Gender across Age Cohorts in Transition 2



Note: Continuous variables are calculated at means, and category variables are calculated at values of the largest proportion in distribution, provided that CLASS is self-employed (IVab) without related to this criterion.

Meanwhile, an individual's previous educational track has a strong effect on school transitions at the tertiary levels. Figure 5 shows the estimated average log odds for path dependence by age cohorts at the T2 (tertiary levels). It is clear that different pathways led to different conditional probabilities. Students who followed the vocational track have a very low conditional probability of entering institutions of higher education. The conditional probability of males entering colleges (university + junior college) to general high school (-0.02) is very larger than that of vocational high school (-1.38) in the newest cohort. This result gives support to the Breen and Jonsson (2000)'s *path dependence hypothesis*. According to Breen and Jonsson (2000), the effects of family background on transition probabilities vary according to the

particular choice, and the probabilities of making a particular choice vary depending on the educational pathway.

Subsequently, Table 8 shows that the interaction terms between age cohort and gender are insignificant in the binary logit model. These results mean that gender differential has never deceased over time in the quantitative disparity (high school attendance / leaving school). By the way, qualitative inequality (university / junior college) by gender is very stronger than those of other pathway, while gender disparity has decreased over time in this case. Figure 6 shows log odds of attending university instead of junior college by gender across age cohorts.

Table 9. Coefficients of Independent Variables for Preferred Models in Transition 3

	Except CSAT	Included CSAT
FEDU	.017(.029)	-.096(.077)
MEDU	.016(.030)	.073(.345)
CLASS		
IVab	-.171(.278)	-1.102(.559)*
V+VI+VIIa	-.093(.291)	-.693(.532)
IVc+VIIb	-.294(.314)	-1.270(.733)
GENDER	-.980(.228)***	-.977(.385)*
LOCAL	-.044(.207)	-.279(.419)
COHORT		
1950-1959	.713(.413)	-
1960-1969	.143(.400)	-
1970-1979	.323(.415)	-
CSAT	-	.161(.093)
Constant	-1.872(.500)***	-1.683(1.194)
Pseudo-R^2	.057	.121
-2LL	758.747	192.718
Chi-square	30.851	18.172
N	935	266

Note: C is measured as continuous variable of COHORT. Pseudo-R^2 is Nagelkerke R^2.

1) * : p < .05 ** :p < .005 ***: p < .001

We are interested in whether independent variables have a substantial effect on the likelihood that university graduates continue to go to school or not. Table 9 shows the coefficients of dependent variables for preferred models in Transition 3. T3 models include the binary logit models with and without academic ability variable (CSAT). These models with CSAT analyze

respondents under 30 years old. The results of BIC model tests yielded A-Table 5. This shows that all interaction terms between age cohorts and other independents are insignificant. These results mean that the effects of family backgrounds and community of origin, as well as gender, have not changed over time.

And Table 9 shows that the effects of these variables are almost insignificant. Gender variable is only negative (-) and significant. For example, the log odds ratio of female graduates of university on entering graduate school are about 0.375 times (=exp. [-.980]) smaller for male graduates in the model included CSAT. Meanwhile, the affect of academic ability is insignificant. Previous research shows that academic ability is a strong determinant of continuation into graduate education (Mullen, Goyette and Soares, 2003: 157). Although academic ability always does not show the strongest effect in determining entrance of graduate school, it at least shows significant positive effect in previous research (Stolzenberg, 1994: 66). Why academic ability does not show significant effects in case of new generation in Korea? This partly can be explained from abnormal motivation going to graduate school of new generation. About 11% of Korean university graduates go to graduate school because of difficult of employment (see A-Table 4). These graduate students may do not regard graduate school as educational institutions bearing professional academic career, but as a shelters of labor market avoiding unemployment after graduation.

VI. Conclusions

This study analyzes the relationships between educational expansion and inequality in educational opportunity. The main topic is whether educational expansion reduces inequality or not. Educational inequality is defined by social class and gender differentials in both the quantity and quality of school transitions made at the secondary and the higher education. Previous research has found that social class differentials in school transitions have persisted over time despite the expansion of education, while gender gaps have decreased continuously across age cohorts. This study examines Korean data to see if changing patterns of educational inequality hold for the Korean school transition regimes. Dependent variables are school transitions from lower to higher stages of educational continuation. Main independent variables are family backgrounds (father's education, mother's education, and father's class), community of origin, and gender.

As a result, the effects of family backgrounds have not changed across age cohorts in all school transitions. Surprisingly, social class differentials have persisted at the high school level although school transition rate of middle school students has reached almost saturation in the youngest cohort. And we found that previous educational track (general / vocational courses)

affects strongly on school transition at the higher education level. The log odds ratios of general high school graduates on entering colleges are about 4 times larger for vocational ones.

Second, gender inequality has decreased over time at the stage of high school, while we did not find same trends at the higher education level. But we found that the qualitative gender differentiation (university / junior college) at the higher education have decreased in the youngest cohort.

In addition, this study observes that family backgrounds do not have substantial effects on the likelihood that university graduates go to graduate school or not. But gender differentials have persisted over time in the transition to graduate school.

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The Appendix

A-table 1. BIC Test for Binary Logit Models in Transition 1

Model	-2LL	d.f.	Chi.	N	BIC
m1: Fedu+Medu+Class+Local+Gender+Cohort	3169.16	10.00	1264.04	4423	1180.10
m2: m1+C*Fedu	3163.07	13.00	1270.14	4423	1161.01
m3: m1+C*Medu	3166.15	13.00	1267.06	4423	1157.93
m4: m1+C*Class2	3163.69	13.00	1269.51	4423	1160.38
m5: m1+C*Class3	3167.60	13.00	1265.60	4423	1156.47
m6: m1+C*Class4	3162.54	13.00	1270.67	4423	1161.54
m7: m1+C*Local	3163.94	13.00	1269.27	4423	1160.14
m8: m1+C*Gender	**3137.85**	**13.00**	**1295.36**	**4423**	**1186.23**
m9: m1+C*Gender+C*Fedu	3127.45	16.00	1305.76	4423	1171.45
m10: m1+C*Gender+C*Medu	3135.85	16.00	1297.36	4423	1163.04
m11: m1+C*Gender+C*Class2	3131.46	16.00	1301.75	4423	1167.43
m12: m1+C*Gender+C*Class3	3136.21	16.00	1297.00	4423	1162.68
m13: m1+C*Gender+C*Class4	3130.28	16.00	1302.93	4423	1168.62
m14: m1+C*Gender+C*Local	3132.16	16.00	1301.04	4423	1166.73

Note: BIC = Model χ^2 – (Model d.f. * LN(Number))

A-table 2. BIC Test for Multinomial Logit Models in Transition 1

Model	-2LL	d.f.	Chi.	N	BIC
m1: Fedu+Medu+Class+Local+Gender+Cohort	2971.31	20.00	1457.06	4423	1289.17
m2: m1+C*Fedu	2937.58	26.00	1490.80	4423	1272.54
m3: m1+C*Medu	2952.71	26.00	1475.67	4423	1257.41
m4: m1+C*Class2	2964.76	26.00	1463.62	4423	1245.36
m5: m1+C*Class3	2967.81	26.00	1460.56	4423	1242.30
m6: m1+C*Class4	2959.12	26.00	1469.26	4423	1251.00
m7: m1+C*Local	2957.43	26.00	1470.95	4423	1252.69
m8: m1+C*Gender	**2916.08**	**26.00**	**1512.30**	**4423**	**1294.04**
m9: m1+C*Gender+C*Fedu	2875.54	32.00	1552.84	4423	1284.21
m10: m1+C*Gender+C*Medu	2897.30	32.00	1531.08	4423	1262.45
m11: m1+C*Gender+C*Class2	2908.53	32.00	1519.85	4423	1251.23
m12: m1+C*Gender+C*Class3	2912.23	32.00	1516.15	4423	1247.52
m13: m1+C*Gender+C*Class4	2903.06	32.00	1525.32	4423	1256.70
m14: m1+C*Gender+C*Local	2902.37	32.00	1526.01	4423	1257.38

Note: BIC = Model χ^2 – (Model d.f. * LN(Number))

A-table 3. BIC Tests for Binary Logit Models in Transition 2

Model	-2LL	d.f.	Chi.	N	BIC
m1: Fedu+Medu+Class+Local+Gender+Cohort	4077.41	10.00	687.43	3536	605.72
m2: m1+MT1	3816.43	11.00	948.41	3536	858.53
m3: m2+C*Fedu	3808.40	14.00	956.44	3536	842.04
m4: m2+C*Medu	3818.35	14.00	951.49	3536	837.10
m5: m2+C*Class2	3807.28	14.00	957.56	3536	843.17
m6: m2+C*Class3	3813.08	14.00	951.76	3536	837.37
m7: m2+C*Class4	3806.90	14.00	957.94	3536	843.55
m8: m2+C*Local	3813.35	14.00	951.49	3536	837.10
m9: m2+C*Gender	**3783.85**	**14.00**	**980.99**	**3536**	**866.60**
m10: m9+C*Fedu	3775.63	17.00	989.21	3536	850.31
m11: m9+C*Medu	3782.25	17.00	982.59	3536	843.69
m12: m9+C*Class2	3774.76	17.00	990.08	3536	851.18
m13: m9+C*Class3	3780.74	17.00	984.10	3536	845.20
m14: m9+C*Class4	3773.33	17.00	991.51	3536	852.61
m15: m9+C*Local	3780.23	17.00	984.61	3536	845.70
m16: m9+C*MT1	3768.39	17.00	996.45	3536	857.55

Note: BIC = Model χ^2 – (Model d.f. * LN(Number))

A-table 4. BIC Test for Multinomial Logit Models in Transition 2

Model	-2LL	d.f.	Chi.	N	BIC
m1: Fedu+Medu+Class+Local+Gender+Cohort	3585.86	20.00	802.98	3536	639.56
m2: m1+MT1	**3265.27**	**22.00**	**1123.57**	**3536**	**943.81**
m3: m2+C*Fedu	3252.76	28.00	1136.07	3536	907.29
m4: m2+C*Medu	3257.83	28.00	1131.01	3536	902.23
m5: m2+C*Class2	3254.20	28.00	1134.63	3536	905.85
m6: m2+C*Class3	3257.80	28.00	1131.03	3536	902.25
m7: m2+C*Class4	3253.24	28.00	1135.59	3536	906.81
m8: m2+C*Local	3256.07	28.00	1132.76	3536	903.98
m9: m2+C*Gender	**3231.28**	**28.00**	**1157.55**	**3536**	**928.77**
m10: m2+C*MT1	3224.24	28.00	1164.59	3536	935.81
m11: m10+C*Gender	3193.11	34.00	1195.73	3536	917.92

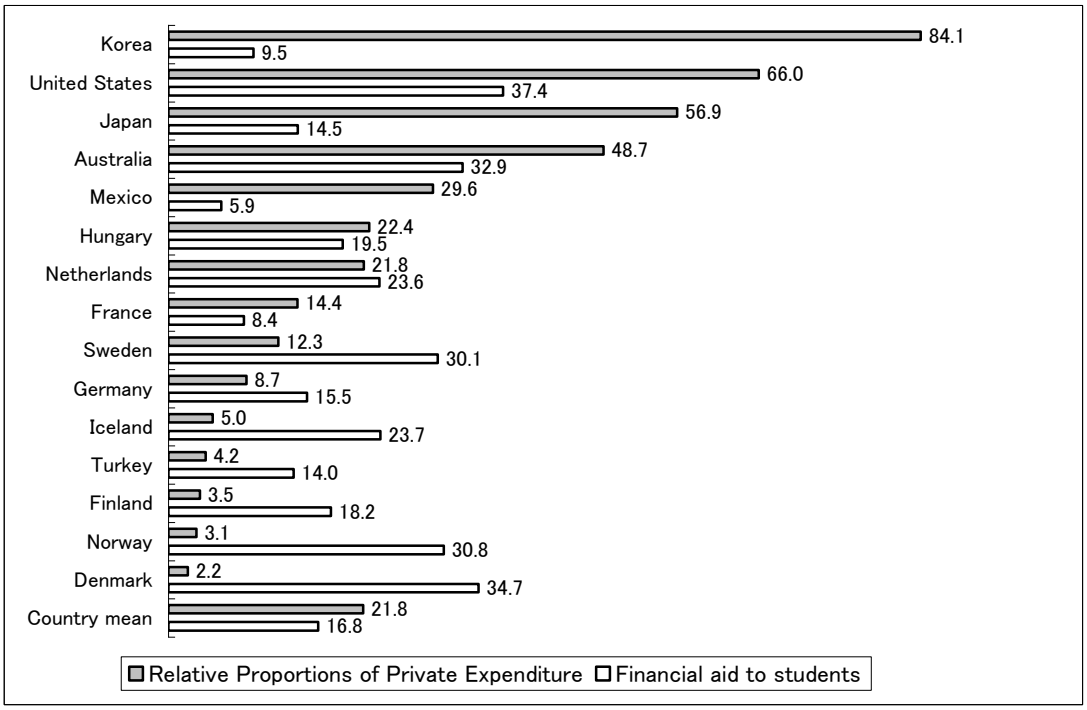
Note: BIC = Model χ^2 – (Model d.f. * LN(Number))

A-table 5. BIC Test for Binary Logit Models in Transition 3

Model	-2LL	d.f.	Chi.	N	BIC
m1: Fedu+Medu+Class+Local+Gender+Cohort	**756.42**	**12**	**33.18**	**935**	**-48.91**
m2: m1+C*Fedu	756.23	13	33.37	935	-55.56
m3: m1+C*Medu	755.48	13	34.12	935	-54.81
m4: m1+C*Class	750.92	17	38.68	935	-77.61
m5: m1+C*Local	754.06	13	35.54	935	-53.39
m6: m1+C*Gender	756.13	13	33.47	935	-55.46
m7: m1+Gender*Fedu	755.50	13	34.10	935	-54.83
m8: m1+Gender*Medu	754.28	13	35.31	935	-53.61
m9: m1+Gender*Class	751.73	17	37.87	935	-78.42
m10: m1+Gender*Local	756.39	13	33.21	935	-55.72

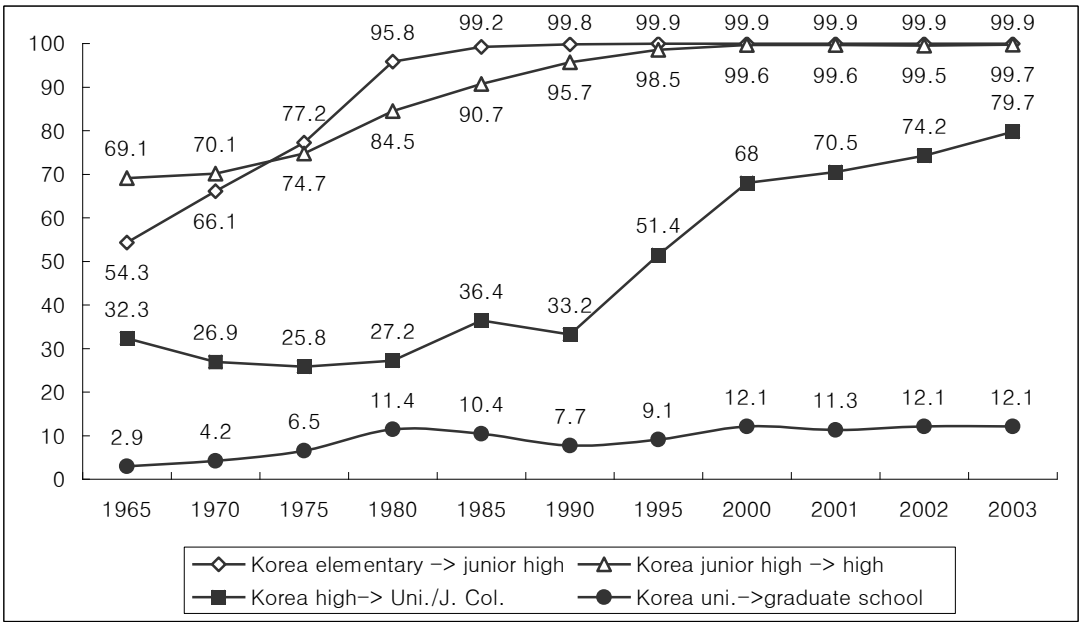
Note: BIC = Model χ^2 – (Model d.f. * LN(Number))

A-Figure 1. Relative Proportions of Private Expenditure on Educational Institutes and Public Subsidies for Students as a Percentage of Total Public Expenditure on Education in Tertiary Education (2001)



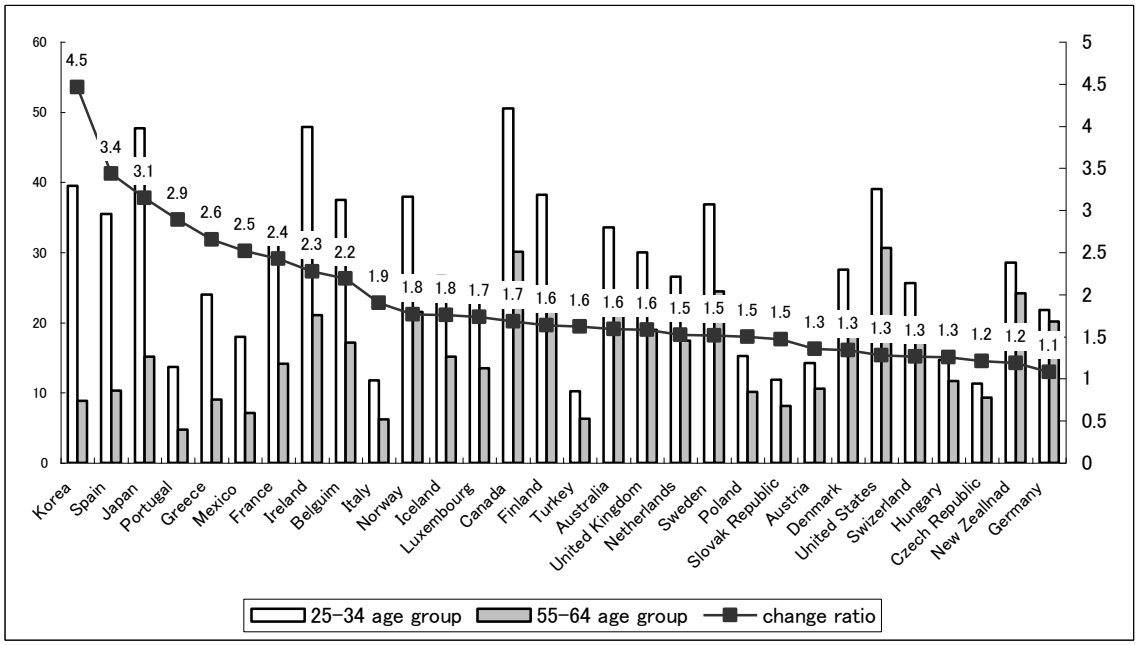
Source: OECD, 2004 *Education at a Glance: OECD Indicators.* See Table B3.2b and Table B 5.2

A-Figure 2. Trends in Advancement Rates to Upper Education in Korea, 1965-2003



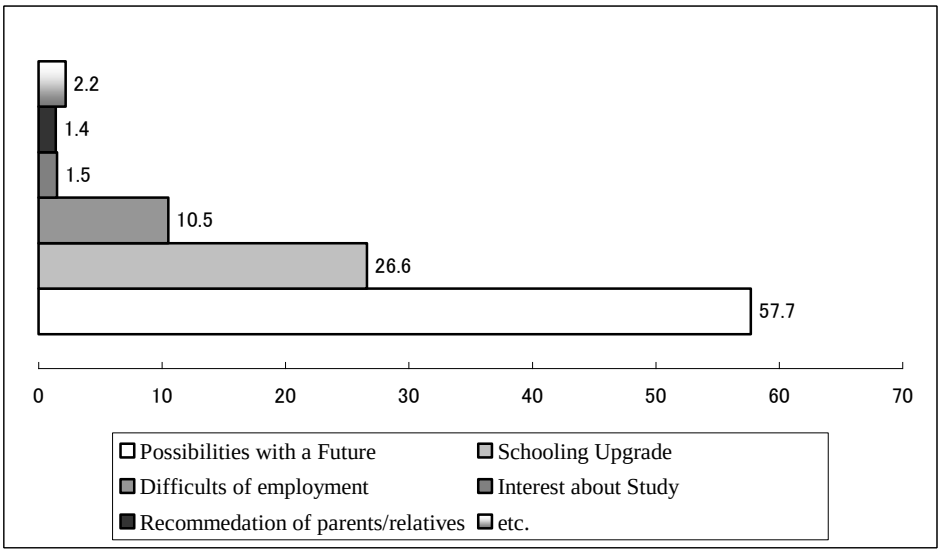
Source: Korean Educational Development Institute, 2003. *Statistical Yearbook of Education*.

A-Figure 3. Percentages of the Population that has Attained Tertiary education (type A+B) and Change Ratioa of Percentages between 25-34 Age Group and 55-64 Age Group in 2001



Source: OECD, 2003. *Education at a Glance, OECD Indicators*.Table A2.3

A-Figure 4. Distribution of Main Motivation Going to Graduate School (%)



Source: *the Graduate Students Survey* (2002). Korea Research Institute for Vocational Education & Training (KRIVET)