

Singapore: Education and Change of Class Stratification *

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Abstract

In Singapore education has made a significant contribution to the change of class stratification in the past three decades. This contribution was accomplished in two basic ways: (1) by facilitating economic development, thereby helping to create a functional imperative to expand the proportion of professionals, technicians, executives and managers, i.e., to expand the relative size of the upper division of the class hierarchy; and (2) by equipping members of underprivileged groups (the lower class division, the female group, and some ethnic minorities) with necessary qualifications to respond to this imperative and move upward to join the upper division — thus leading to change of the social composition of the upper division. Differential advances of the underprivileged groups are reported. Forces that affect education's transformational power are identified.

I Introduction

This paper attempts to examine how and to what extent education has contributed to the transformation of class stratification in Singapore in the past three decades.

Much research has been conducted on the conservative role of formal education in social reproduction, especially in the contexts of Britain and the United States [Durkheim 1952; Warner *et al.* 1944; Parsons 1961; Sewell and Shah 1977; Bowles 1977; Bourdieu 1977; Colclough and Beck 1986; Apple and Weis 1986; Bourdieu and Passeron 1990; Scrase 1993]. According to Durkheim [1956], "Education is . . . only the means by which society prepares, within the children, the essential conditions of its very existence." This means was perceived by him as one of *reproduction* rather than *production*. Thus he [1952: 132] claimed, "Education is only the image of and reflection of society. It imitates and reproduces the latter in abbreviated form, it does not create it." In the capacity of this reproduction education had the job of fitting out children — physically, intellectually and morally — not only for society as a whole but also for that particular section of society for which they were particularly destined [Durkheim 1956: 28]. Following Durkheim's lead, Parsons specified two major mechanisms which are used by education to perform this job, namely socialization and selection. In Parsons' view

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[1961: 435], socialization operates to internalize in students “both the commitments and capacities for successful performance of their future adult roles,” and selection functions to “allocate these human resources within the role structure of the adult society.” He believes that in a society like that of the United States, selection is conducted basically on the basis of meritocracy.

Marxist scholars [Althusser 1971; Bowles and Gintis 1976; Bourdieu 1977] share with these functionalists in recognizing the function of education in maintaining and reproducing social and economic systems. But unlike the latter, they question the justice of capitalism (and capitalist-style social stratification) and on that ground, they further question the reproductive function of education under capitalism. Furthermore, they discredit the concept of meritocracy by showing educational attainment as a function of class background. In Reid’s words [1986: 274], such education “appears to follow the biblical edict regarding the social structure: ‘for the man who has something will be given more, so that he will have more than enough.’”

Education’s role in social reproduction is also readily discernible in Singapore (see Note 9). However, the picture is not exactly the same as those painted by Durkheim and the Marxist scholars: reproduction is only a partial function of education in this country, for education has also produced tremendous social change. A major part of the change is in the dimension of class stratification.

In this paper I intend to emphasize the neglected aspect — namely the transformative function — of formal education; my focus is to reveal the impact of Singapore’s post-independent education on the change of its class stratification.

“Class” is defined as large-scale social grouping, with its members sharing a similar power base (in the form of office, property, expertise, skills or muscles), similar power relationships with the other such groupings (characterized by domination, subordination, and degree of independence), and subsequently similar material and social returns (such as status, prestige, income, life style, and life chances). The variation of the power base determines the differentiation of social classes in terms of kind, whilst power relationships as well as the distribution of material and social returns define the relative position of each class in the system of social hierarchy. Using this definition, then, we can identify the following classes in Singapore: (1) office-based bureaucratic class (legislators, administrators, managers, and officers); (2) property-based employer class; (3) expertise-based professional class (professionals, para-professionals, technicians); (4) clerical skills-based clerical class; (5) manual operation-based working class (production and transportation workers, waiters and waitresses, sales workers, fishermen, and farmers). The first three classes, which enjoy more income,¹⁾ higher status [cf. Chiew, Ko and Quah 1991], and greater controlling power, constitute the *upper division* of the class hierarchy and the remaining two classes form the *lower division*. Children and non-working wives are treated as dependents associated with the five classes.

I shall explore the transformational impact of education on two particular aspects of this class structure — the relative size and social composition of the upper division. Specifically, I shall examine: (a) how and to what extent education has helped to expand the proportion of the

upper division, and (b) how and to what extent education has helped to re-construct the social composition of the upper division.

This investigation will demonstrate that modern education has enormous transformational power. Regarding transformation of the class structure, this power consists of two dimensions — that of production and that of allocation. In the first dimension modern education has the capacity to promote and upgrade industrialization, thereby helping to create a functional imperative to expand the proportion of professionals, technicians, executives and managers. This implies that when put into use for industrialization, education can help to expand considerably fast the proportion of the upper division of the class hierarchy. In the second dimension modern education has the capacity to allocate people to various kinds and levels of occupation by equipping them with corresponding knowledge and expertise. Education is not a social closure by nature — open to some groups while closed to others. Differential access to education, especially at higher levels, is the product of external forces rather than originating from education's non-existent built-in social discrimination. It follows that when connected with management of such external forces, the allocating power of modern education can operate to alter the social composition of the upper division.

At this point it is helpful to clarify the distinction between “capacity” and “realization of the capacity.” The transformational capacity is an inherent property of modern education, but this capacity cannot be realized (i.e., translated into empirical effects) without the help of a number of conditions beyond education itself. Among these conditions the role of the government seems to be decisive in a country where the government exercises effective control of the general orientations of the major social institutions. With the transformational capacity, education is potentially qualified to function as a vehicle for social stratificational change; however, whether to employ the vehicle and how effectively it can be used — if employed — are primarily contingent upon the value and wisdom of such a government. Therefore, the empirical effects of education on the transformation of the class structure reflect both the strength of education's transformational capacity and the operation of those forces — particularly the government — that helps to materialize this capacity. For this reason, in the following sections

1) In Singapore average basic and gross wages by occupation in 1992 were as follows:

Occupation	Basic Wage(\$)	Gross Wage(\$)
Managers	4,851	4,997
Professionals	2,990	3,163
Technicians/para-professionals	1,915	2,310
Clerical workers	1,083	1,242
Service and sales workers	940	1,296
Craftsmen/related workers	1,083	1,454
Machine operators/assemblers	837	1,184
Cleaners/labourers	749	1,024

Source: Reconstructed from the *Yearbook of Statistics* (Department of Statistics, Singapore), 1992:62.

education's transformational effects will be presented in such a way that the direct contribution of education's capacity and the indirect contribution of government policies will both be recognized.

II Expanding the Relative Size of the Upper Division

Before it became a self-governing state in 1959, Singapore had been used as a colonial trading outpost—an entrepot port—to serve the British economic interests. As such, Singapore was led to “a dead end, with little economic growth, massive unemployment, wretched housing and inadequate education” [Goh 1976: 84]. By 1959 even primary education had not been sufficiently popularised. There were two universities then; but their enrolment was very small, and the graduates produced by one of them, the Chinese community-backed Nanyang University, were not officially recognized by the colonial government.

Shortly after assuming the self-governing power of Singapore, the elected PAP (People's Action Party) Government initiated an ambitious program for industrialization—a program to advance Singapore's own interests. In order to implement this program, it decided primarily to mobilize the country's human resources, given the fact that Singapore was lack of natural resources. One of the major attempts in this regard was to develop education to meet the needs of industrialization for management, technology, and a skilled labour force. In line with this thinking, the government adjusted the education system in four dimensions: (1) altering its previous orientation toward colonial or ethnic interests and shaping it into an effective means of economic development for an independent and unified republic; (2) popularizing education up to secondary level and at the same time expanding considerably the scale of post-secondary and tertiary education; (3) dividing the development of tertiary education into two stages, with an overwhelming emphasis on training administrators, professionals and technicians in the first stage;²⁾ (4) keeping public schools—including universities—affordable and open to all school-aged children and youths qualified according to meritocratic selection regardless of race, gender, and class backgrounds.

Industrialization in Singapore has passed the first stage of import substitution (1961-1968) and the second stage of skill intensification (1969-1978) and is now in the middle of developing technology-intensive industries [Low *et al.* 1991]. To help accomplish the

2) On 7 February 1966 Mr. Lee Kuan Yew presented a speech at the University of Singapore on the role of universities in social and economic development. In this speech he pointed out that university education in Singapore should develop following a two-stage plan with an emphasis on technical/professional training in the first stage:

It is first to produce the teachers, the administrators, the man to fill the professions—your accountants, your architects, your lawyers, your technocrats, just the people to do jobs in a modern civilized community. And next and even more important, it is to lead thinking—*informed thinking*—into the problems which the nation faces.

objective of the first stage, the PAP Government managed to expand the enrolment of secondary schools and tertiary institutions by 1.5 and 0.5 times respectively by 1968 as compared with 1960 (Department of Statistics, Singapore, *Yearbook of Statistics*, 1967: 148; 1970: 148). In 1968, students enrolled for technical, commercial and vocational courses in secondary schools were 7.2 times as many as those in 1963. The 1968 enrolment of the technical and vocational institutes increased by 1.6 times as compared with 1963 (*Yearbook of Statistics*, 1970: 148). Given the poor foundation of education and extremely limited funds available to the government, the educational emphasis of the country during this stage was placed on the popularization of secondary education and the training of lower middle and middle levels of skilled labour force.

However, this emphasis was obviously inadequate for matching the needs of higher levels of industrialization. To advance beyond the elementary stage, the focus of technical training had to be elevated to the tertiary level. This would require a substantial re-organization of the tertiary curricula on the one hand, and a significant expansion of the tertiary enrolment on the other.

In 1966 Mr. Lee Kuan Yew, the then Prime Minister, made the following comment at the University of Singapore:

... we have established a more or less educated elite in the sense that they can write, they can read, they can compose their thoughts, they can perhaps become administrators, they can alleviate suffering as doctors or help discharge the administration of justice as lawyers; they can, in fact, increase your population and your capacity to consume, but they are unable to increase the things that the people want to consume. Your men who can produce your modern industrial society—your industrial chemists, your technocrats—are missing.

Mr. Lee's "diagnosis" was empirically grounded: at that time, the two universities in Singapore did not offer any courses on engineering, architecture, etc. which could "increase the things that the people want to consume." In fact, 48.5 percent of the students of the University of Singapore were committed to law, medicine, dentistry or pharmacy, and an additional 24.9 percent majored in arts and social sciences.

In 1969 Singapore ushered in the second stage of industrialization, and the University of Singapore began to enrol its first group of engineering students in line with Mr. Lee's expectations. Since then, the proportion of engineering majors, etc. has kept expanding, and that of arts and social sciences majors shrinking. In 1992 the proportion of the arts and social sciences majors among the university freshmen was reduced to 17.5 percent (in contrast with 38.4 percent in 1968), whilst the proportion of the freshmen who studied science, engineering, architecture, and business ascended to 74.7 percent (as compared with 42.7 percent in 1968). When the polytechnic colleges are also considered, the freshmen proportion of the arts and social sciences category decreased from 11.8 percent in 1968 to 6 percent in 1992, but that of the second category went up from 68 percent in 1968 to 82.4 percent in 1992 (see Table 1).

Table 1 Tertiary Freshmen: Proportions by Major (in Percentage) in Selected Years, 1963-1992

Year	Arts & Social Sciences	Science, Engineering, Architecture, & Business
1963	9.5	38.8
1968	11.8	68.0
1973	9.7	78.2
1978	8.9	74.5
1983	8.0	82.7
1988	8.2	84.3
1992	6.0	82.4

- Sources: (1) The figures for 1968-1992 are constructed from Department of Statistics, Singapore's *Yearbook of Statistics*, 1970, 1974, 1979, 1984, 1989 and 1992.
- (2) The two figures for 1963 are estimates based on the overall specification by major of the general enrolments of the universities and polytechnics. The raw data used for the estimation are obtained from the *Annual Report of the University of Singapore*, 1963-1964: 149-150; *Nanyang University of Singapore: Enrolment Statistics*, 1956-1970: 32-33; *Yearbook of Statistics* (Department of Statistics, Singapore), 1966.

Along with the adjustment of curricula, the scale of tertiary education has also been considerably expanded. The enrolment of the first-year tertiary students in 1992 increased by 3.5 times as compared with 1968. Most of the increases occurred after 1979 to meet the needs of the third stage of industrialization. For example, the 1978 university enrolment was 1.3 times as large as that of 1968 (the concluding year of the first stage of industrialization), but another ten years apart, the enrolment in 1988 became 2.4 times as large as that of 1978.

Furthermore, with the intention to reduce drop-out rates and improve educational quality and efficiency, a streaming system was introduced in 1979.

Unlike large and economically developed countries such as the United States or Japan where education can produce a huge group of researchers to lead economic development using their discoveries and inventions, the education in Singapore has not taken it as part of its top priority to produce such research leaders. Most of the major technologies used for Singapore's industrialization have been introduced by multinational corporations or purchased by the Government or local enterprises. The basic role played by the education of Singapore has been to provide an adequate skilled labour force and a sufficient number of economically productive professionals to ensure highly effective use of the imported advanced technologies.

Many a scholar have raised doubts about the value of education in promoting industrialization or economic development in general [Berg 1970; Layard *et al.* 1971; Collins 1977]. This is not the place to reproduce their arguments and assess the validity of their research. But so far as Singapore is concerned, education has made a significant contribution to

its industrialization. This is reflected in education's contribution to the GDP increases. The rate of profitability of educational investments in generating GDP increases — namely social returns to education in the terminology of economists — has been impressive (see Table 2). For example, Table 2 indicates that in 1986 the rate of social returns to tertiary education for males was 17.76 percent, meaning that for every hundred dollars of investment in tertiary education for males, there was 17.76 dollars of net gain (as profit) or 117.76 dollars of gross gain (investment equivalent + profit) in the GDP increase.

Table 2 Rates of Social Returns to Education (in Percentage) by Level and Sex, 1977-1986

Year	Primary		Secondary		Tertiary	
	Male	Female	Male	Female	Male	Female
1977	- 0.43	2.23	10.15	9.89	40.59	31.32
1978	- 0.73	2.38	8.20	12.98	37.50	25.72
1979	- 0.25	2.53	6.42	7.65	34.07	25.40
1980	- 0.08	2.41	8.33	9.19	29.76	22.25
1981	- 0.02	1.59	8.42	8.00	25.75	20.78
1982	- 0.07	0.08	8.26	9.00	18.91	15.97
1983	- 0.08	3.11	9.65	10.50	16.00	13.08
1984	- 0.51	3.13	5.64	11.14	20.26	15.91
1985	3.51	5.07	8.55	8.75	19.91	16.80
1986	3.49	3.81	8.29	10.23	17.76	15.05

Source: Reorganized from Low *et al.* [1991: 175].

As signified by the rapid GDP growth, industrialization in Singapore has undergone a process of fast development since late 1960s. This process has caused continuous change in the occupation structure characterized by the progressive expansion of the proportion of managing and professional positions. In 1992, legislators, administrators, working proprietors and managers constituted 10 percent of the working force — 3 percentage points higher than the corresponding category in 1974 and 8 percentage points higher than in 1966; furthermore, professionals, para-professionals and technicians made up 19.5 percent of the labour force in 1992, whereas earlier in 1966 and 1974 this category only shared 10 and 11.7 percent respectively. From 1966 to 1992, the combined proportion of these two categories more than doubled, jumping from 12.3 percent to 29.5 percent (see Table 3).

Table 3 Distribution of Working Persons by Occupation (in Percentage), 1966, 1974, 1992

Occupation	1966	1974	1992
Administrators, managers, proprietors & officers	2.3	7.0	10.0
Professionals & technicians	10.0	11.7	19.5
Clerical workers	11.9	14.9	14.3
Sales and service workers	34.7	20.2	13.6
Production, transport & other manual workers	37.2	38.8	38.2
Farmers & fishermen	3.5	2.9	0.2
Non-classifiable by occupation	0.4	4.4	4.1

Sources: Constructed from Ministry of Labour of Singapore, *Report on the Labour Force Survey*, 1974: 51-55; 1992: 39; Ministry of National Development of Singapore and Institute of Economic Research, University of Singapore, *Singapore Sample Household Survey*, 1966, No.1: 146-153. The original figures for 1966 and 1974 are adjusted according to the Singapore 1990 occupation classification codes.

Note: The statistics on the distribution of working persons by occupation over the past three decades published in Singapore's *Yearbook of Statistics* and *Singapore Census of Population* are based on inconsistent classification criteria and therefore cannot be directly used for comparison. Those publications themselves do not contain sufficient information to warrant statistical adjustments using the same classification code.

This change in the occupation structure defines the change of approximately the same magnitude in the class structure in Singapore. People in the first category of Table 3 constitute the bureaucratic and employer classes, and those in the second category, the professional class. Thus, from Table 3, it is reasonable to infer that the upper division of the class hierarchy in Singapore was about 29.5 percent in proportion — 1.4 times larger than in 1966. Within the lower division, the clerical class made a slight gain, increasing from 11.9 percent in 1966 to 14.3 percent in 1992; the working class experienced a significant decline in relative size, from 75.4 percent down to 52 percent; the farmers and fishermen stratum of this class dropped from 3.5 percent to an insignificant 0.2 percent. As a result of these changes, the total proportion of the lower division was reduced from 87.3 percent in 1966 to 66.3 percent in 1992.

III Re-Constructing the Social Composition of the Upper Division

1. Education as a Precondition of Upper Division Membership

Education has not only helped to create the imperative to expand the proportion of the upper division, but also supplied qualified people to meet the needs of this expansion. In 1966 approximately 29 percent of the upper division members had never attended school or had received incomplete primary education, whereas in 1992 the same category of people

constituted only 3.5 percent. In other words, in 1966, 71 percent of the upper division members had school certificates, diplomas or degrees, and the proportion of this category increased to 97 percent by 1992. Twenty-one out of these twenty-six percentage points of gain had been created by tertiary education (see Table 4); tertiary education is becoming crucial.

Table 4 Composition of Upper Division by Educational Qualification (in Percentage), 1970, 1992

Qualification	1970	1992
Never attended school/ lower primary	29.0	3.5
Primary/lower secondary/ secondary/post secondary	52.4	57.5
Tertiary	18.4	39.0

Sources: Constructed from the Department of Statistics, *Census of Population*, 1970, Vol.1: 130; Ministry of Labour, *Report on the Labour Force Survey of Singapore*, 1992: 39.

At the individual level, this situation defines education as an increasingly important channel leading to upper division membership. Furthermore, it also defines varied probabilities of success for different levels of educational qualification in securing access to the upper division. In 1992 the probability for university graduates was 93.7 percent, and the probability for diploma holders was also as high as 75 percent. In contrast, the probabilities for the primary and secondary school leavers were only 11 and 29 percent respectively (see Table 5).

Table 5 Probability of Gaining Upper Division Membership by Education, 1992

Qualification	Probability of Success
Never attended school/ incomplete primary	6.6
Primary/lower primary	10.7
Secondary	28.7
Post secondary	47.0
Diploma	75.3
University	93.7

Source: Calculated from *Report on the Labour Force Survey of Singapore*, 1992: 39.

This fact has several implications at the level of aggregate analysis. First, it suggests that in Singapore, the social composition of the newly expanded sector of the upper division must to a large extent mirror the social composition of the tertiary student enrolment in the past three decades. Second, this means that tertiary education can operate either effectively to reproduce or alter the social composition of the upper division by keeping constant or changing the social composition of student enrolment. Finally, it follows that any social force that is capable of changing the social composition of tertiary enrolment would be able to modify the social composition of the upper division more or less to the same extent. By "social composition" is meant composition in terms of ethnicity, gender, and class origin.

2. *Government as an Agent of Change*

In the past three decades the most fundamental force affecting the social composition of tertiary enrolment has proved to be the PAP Government. The influence of the government was two-fold: intended as well as unintended. Intentionally, the government adopted two major policies to generate expected effects, namely the policy of open boundary meritocratic selection, and the policy of preferential aid to disadvantaged groups.

When Sir Stamford Raffles first proposed to set up a native college in Singapore in 1823, he was thinking of providing higher education for sons of "the higher order of natives and others" and those of the Chinese who "if not possessed of the advantage of birth, have raised themselves by their talents, to opulence and a respectable rank in society" [Tan 1986]. Even by the eve of Singapore's self-government, the door of tertiary education in Singapore was still basically open to children of wealthy families, for the fees were forbidding enough to keep lower class children away. Under these circumstances, higher learning institutions became a closure for social class reproduction. The boundary of the closure was largely set in financial terms.

The PAP Government removed the boundary by heavily subsidizing education at all levels. For example, about 80 percent of the expenses of running higher learning institutions has been paid from the state coffers. University students are offered scholarships or grants if their academic performances are outstanding; for those others who have financial difficulty, they can obtain special bank loans sufficient to sustain their studies. Fees for students at the primary, secondary and post secondary levels are not much more than nominal. When selection is conducted, it is done on the basis of school achievements, not according to hidden financial requirements. This policy has brought all lower class children into education and hope as well as into a practical race for tertiary qualification. In this way an opportunity for the poor to move up has been created.

In order to increase the probability of success for underprivileged groups in the school race, the government has also adopted measures to offer preferential aid to them. Ethnic-based community organizations were organized — first, MENDAKI³⁾ for Malays, then SINDA (Singapore Indian Association) for Indians, and finally, CDAC (Chinese Development Assistance

3) "MENDAKI" originates from a Malay word, meaning "to strive for" or "to move up."

Council) for Chinese. These organizations mobilize resources within each ethnic group to help children who have financial and learning difficulties. But half of their funds have been provided by the government. To encourage the Malay community to catch up in education, the Government also offered free education to the Malay undergraduates for a number of years. These measures have helped to further increase the representation of lower class children, particularly lower class Malay children in tertiary enrolment.

The impact of PAP Government policies on the gender composition of tertiary students is basically unintended in nature. Schools were open to girls even before the PAP Government came into power; but in those years, education preferences were generally given to sons, especially for those lower class families which could ever afford to send their children to school for some learning. A major reason behind the discrimination against daughters was instrumental: most parents would have to rely on their sons to support them when they became aged. However, the industrialization program has brought unprecedented prosperity to the country. On the one hand, this has enabled the government to introduce the CPF program,⁴⁾ HDB housing policy,⁵⁾ etc. to the effect of basically relieving Singaporeans of their dependence on children for old-age survival; and on the other hand, together with the effects of lower school fees (and perhaps also of family planning), this has enabled even lower class families to send daughters to school without the traditional type of worry about draining extremely scarce family resources. As a by-product, these developments have unintentionally helped to increase female representation in tertiary enrolment.

To examine the direct and indirect effects of government policies on the social composition of tertiary students, an ideal approach would be to study the composition of all tertiary students who were Singaporeans or permanent residents and who graduated from the local tertiary institutions over the past years since 1958, the year before Singapore became a self-governing state. However, because of resource and information limitations, I decided to basically focus on graduates of the local universities for selected years since 1964, the year before Singapore became fully independent.

3. *Change of Ethnic Composition of University Graduates*

I found it impossible to obtain access to official data on ethnic identity of the graduates; so, as a substitute, the convocation lists of the local universities are used as a major data source and the spelling of the listed names is taken as the basis for determining ethnic identity. This method is marred by the problem of being unable to identify the foreign graduates and some of

4) CPF (Central Provident Fund) is designed mainly to ensure old age security. Each and every gainfully employed Singaporean citizen or permanent resident is entitled to establish a fund of this kind for himself/herself. The value of each person's CPF is accumulated through his/her own contribution plus a substantial contribution from his/her employer, which is normally equivalent to 12 to 20 percent of his/her salary/wages.

5) The Housing Development Board (HDB) is in charge of building government-subsidized flats for low income families. These flats are referred to as "HDB flats."

the Eurasian Singaporean graduates. However, the proportions of both of these two categories were very small and the graduate names of these unidentifiable categories were scattered on the graduate lists of all the major ethnic groups; consequently, the error of classification associated with each ethnic group cannot pose a fundamental threat to validity.

Table 6 presents a summary of my findings on the change of ethnic composition of the graduates of the local universities. The Malay group gained marked progress — from 1.2 percent in 1964 to 3.8 percent in 1993, an increase by 2.2 times. The proportion of the Chinese graduates remained relatively stable — 90.1 percent in 1964, followed by a slight increase to 92.6 percent six years later, and then falling back to 90.1 percent in 1988 and 90.5 percent in 1993. The Indian group experienced greater fluctuations over the years, resulting in a measure of competitive loss. The proportion of the Indian graduates in 1993 was only 70 percent as much as in 1964.

Table 6 Ethnic Composition of University Graduates (in Percentage)

Year	Chinese	Malay	Indian	Others
1964	90.1	1.2	5.3	3.4
1970	92.6	1.4	3.6	2.4
1976	93.0	1.9	3.2	1.8
1982	92.8	2.3	2.9	2.0
1988	90.1	3.2	5.0	1.8
1993	90.5	3.8	3.7	2.0

Sources: Constructed from the convocation lists of the National University of Singapore (NUS), Nanyang Technological Institute (NTI), University of Singapore (US), and Nanyang University (NU). The higher degree (Master or Ph.D) receivers are excluded. The 1993 graduates of the Nanyang Technological University are not calculated for this table.

Because these ethnic groups vary in proportion in the general population, it is helpful to examine each group's ratio of participation in university graduation in evaluating their competitive strength and change. This *participation ratio* is defined as the ratio of the proportion of university graduates of an ethnic group in a certain year over the proportion of the same ethnic group in the general population in the same year. Table 7 presents the participation ratios of all the four ethnic groups in selected years between 1964 and 1993.

Table 7 University Graduates: Participation Ratio by Ethnic Group

Year	Chinese	Malay	Indian	Others
1964	1.18	0.08	0.74	1.70
1970	1.22	0.09	0.54	1.14
1976	1.22	0.13	0.46	0.95
1982	1.21	0.16	0.45	0.91
1988	1.19	0.21	0.77	0.75
1993	1.17	0.27	0.52	1.82

Sources : Constructed from convocation lists of NUS, NTI, US and NU.

This table shows that the Chinese community was over-represented by 17 percent or more in the university graduates as compared with its proportion in the general population. Eurasians were over-represented even by a larger margin in some years. Both the Indian and the Malay groups were under-represented. The Malay group had the weakest position.⁶⁾ Nevertheless, the competitive strength of the Malay group relative to the other groups has undergone drastic change. In 1964, the competitive strength of the Chinese group, the Indian group, and the category of the "others" relative to that of the Malay community was 14.8, 9.3 and 21.3 times respectively. By 1993, these figures have been reduced to 4.6, 2.8, and 5.1 times respectively.

Probably, this change partly originates from MENDAKI's operation and the Government's encouragement and preferential aid to the Malay community and partly from the overall improvement of the competitive strength of the lower class division. Details of the situation of the lower class division will be presented shortly. Here suffice it to say that because the

6) The ethnic composition of pupils at the primary level is proportional to the ethnic composition of the general population. However, under the system of meritocratic selection, it becomes progressively disproportional as the level of education moves up. To the extent of the perpetuation of disproportion, education exerts a reproductive effect on the ethnic composition of the upper class division.

On the basis of scholarly research conducted in other countries, it may be hypothesized that the disproportion in question has probably originated from unequal distribution of cultural capital (see Note 8 for definition) and material resources among the various ethnic groups. One indicator of the difference in cultural capital is that on the average the Malays seem to appreciate speech, behaviour and beliefs more than money, education and occupation — a sharp contrast with the Chinese [Quah 1991: 48-49]. An index of the difference in material resources is that in the Malay group, those who owned an expensive private house or flat in 1990 constituted 1.6 percent, but the proportion of the same category of people was 12.3 percent for the Chinese and 10.6 percent for the Indians (*Census of Population, Housing*, 1990: 43).

If this hypothesis holds up, then, the selection system based on meritocracy necessarily helps to perpetuate the disproportion in question, since this kind of selection encourages each student to utilize his/her resources to achieve learning merit, and since unequal distribution of cultural capital and material resources would thus quite logically lead to unequal acquisition of learning merit.

lower/upper division membership ratio of the Malay community is the largest among all the ethnic groups in Singapore, this community is likely to be the most sensitive in reflecting the overall improvement of the status of the lower class division. However, given the absence of relevant data, I have to keep it as an unresolved problem regarding the exact extent to which the improvement of the Malay group can be explained in terms of the overall improvement of the lower class division vis-a-vis MENDAKI's operation and the preferential aid of the PAP Government.

4. *Change of Class Origin Composition*

Because accurate information on the class backgrounds of the university graduates is also regarded as confidential, only obtainable proxies can be used for approximation. The proxy used here is the family housing type of tertiary students.

According to Singapore's 1990 census (*Singapore Census of Population: Households and Housing*, 1990: 11), the average of monthly household income from work was \$3,076. Eighty percent of the households who owned a 1-3 room government HDB flat received a monthly income below this average; in contrast, about 70 percent or more of those who owned an expensive house, a private flat or a high class public flat had a monthly income above the average. Thus it appears reasonable to use the ownership of private flats and houses (not including shop-houses and attap/zinc-roofed houses) as an indicator of upper division background and the ownership of 1-3 room HDB flats an indicator of lower division background.

Obviously, these indicators involve inaccuracies since there is a small number of high-income upper division families owning just a 1-3 room HDB flat. Furthermore, these indicators basically represent families on the two extremes—the upper sector of the upper division on the one hand and the lower sector of the lower division on the other. Thus the data originating from these indicators cannot generate statistics on the exact proportions of tertiary students by class origin. However, by betting on the information of the majority households of each housing type, this kind of data should be adequate for determining whether the upper sector of the upper division families on the average has significantly greater opportunities in gaining access to tertiary education than the lower sector of the lower division families. For example, to determine whether or not there is marked difference of this kind between the two sectors, we can compare the participation ratio of the children of each sector at the level of tertiary education; "participation ratio" here refers to the ratio of the proportion of the tertiary students with a certain type of family housing over the proportion of the households with the same type of housing in the general population in a given year. Moreover, such data should also be effective for characterizing change (if any) of the competitive strength of both sectors in the past three decades.

Table 8 shows that in 1980, 39.5 percent of the tertiary students were from families owning an expensive private house or flat. This proportion resulted in a participation ratio of approximately 3.2 for the upper sector of the upper division. In the same year 27.9 percent of

Table 8 Proportion and Participation Ratio of Tertiary Students by Type of Family Housing, 1980, 1990

Housing Type	Proportion		Participation Ratio	
	1980	1990	1980	1990
Private houses/ private flats	0.395	0.230	3.2	2.1
1-3 room HDB flats	0.279	0.320	0.5	0.7

Sources: Constructed from *Census of Population*, 1980, No.6: 34; *Straits Times*, 16 January 1992.

the tertiary students were from families owning a 1-3 room HDB flat; and this percentage reduced the participation ratio of the lower sector of the lower division to approximately 0.5. The striking difference in participation ratio suggests that children of the upper division had overwhelming advantages in competition for tertiary education in 1980.

This disparity seems to have been gradually narrowed. By 1990, students from the lower sector of the lower division had outnumbered students from the upper sector of the upper division by 39 percent. That year, the participation ratio of the upper sector of the upper division had dropped to approximately 2.1, down by 34 percent from 1980; and the participation ratio of the lower sector of the lower division had increased to about 0.7 — a 40 percent gain as compared with 1980. The margin of change is probably much larger still if the 1990 data are compared with the situation of the 1960s. (Unfortunately, no relevant data on the 1960s could be obtained.)

The narrowing of difference between upper and lower division children in gaining access to tertiary education seems to attest to the working of the government policy of heavily subsidizing education at all levels to ensure its financial affordability to lower class families. While the upper division families can afford to send their children to school with or without such subsidies, these subsidies have made a tremendous difference for the lower division families, enabling almost all of them to send their children to school to pursue as high an education as their learning merit allows them to. As more and more lower division families respond to the benefit of subsidization positively, the proportion of lower division children in the tertiary enrolment will naturally increase for a period of time; and for that matter, it will also be natural for the proportion of the upper division children to decrease. In this sense, the policy has the effect to reduce the family income-based privileges of the upper division children in gaining access to tertiary education. This kind of effect may be called "equalization effect," and a policy that generates such effects "equalization policy."

In contrast with the logic of equalization, the policy of early streaming⁷⁾ is expected to

7) Streaming initially began with primary 3 when the policy was first introduced in 1979. Later, the starting point was adjusted to primary 4 as a result of the PAP Government's response to public critique.

generate a bias in favour of upper division children, because early streaming tends to be substantially based on cultural capital⁸⁾ of each pupil obtained through family socialization, and because cultural capital is unequally distributed along class lines with upper division children having an advantage on the average [Bourdieu 1977; Bernstein 1961; Kahl 1961]. In other words, it is theoretically meaningful to hypothesize that early streaming probably tends to reduce the probability of lower division children in gaining access to tertiary education while increasing the probability of access of upper division children. This kind of hypothetical effect may be called "polarization effect."

So far, no empirical research has been conducted to systematically determine if such an effect is real or to what extent it is real in Singapore. However, one thing is certain at this point: if it is real at all, it must have been expressed in or after 1988—about nine years after the first attempt at primary 3 streaming. Table 8 shows that actually, in 1990 the difference between the upper and lower division children in their chances of being admitted to university or polytechnic had been reduced to the ratio of 3:1 as compared to 6:1 in 1980. Assuming that the hypothetical effect exists, then, it must be true that such an effect has been substantially overshadowed by the equalization effect.

5. *Change of Sex Composition*

The greatest change has turned out to be in the gender dimension: basic equality has been achieved between males and females in tertiary education. In 1964, 72 percent of the university graduates (not including higher degree receivers) were males, 1.5 times larger than the proportion of female graduates. However, the percentage of females gradually increased to 30 percent in 1970, and then rapidly to 53 percent in 1993, even surpassing males by 6 percentage points (see Table 9). The overall proportion of female students graduated from the higher learning institutions (including the polytechnics) was 47 percent in 1992, up from 37 percent in 1972 (Department of Statistics, Singapore, *Yearbook of Statistics*, 1976: 203; 1992: 304-307).

Table 9 Sex Composition of University Graduates (in Percentage), 1964, 1970, 1993

Year	Male	Female
1964	72	28
1970	70	30
1993	47	53

Sources : Constructed from convocation lists of NUS, NTI, US and NU.

8) Cultural capital may be defined as cultural potential which can be utilized for educational attainment, for example, education-related values, aspirations, knowledge, sensitivity to differentiation and analysis, language skills, etc.

However, the situation varies by ethnic group. For both the Chinese and Malays, females have gained an upper hand at the university level; the Indian community is the only group in which males have managed to sustain their traditional superiority.

When a historical comparison is made within each ethnic gender category (see Table 10), Malay females are found to have obtained the greatest margin of progress, from 0.2 percent of the graduate population in 1964 to 2.2 percent in 1993, an increase by 10 times. Within the same period, Chinese females advanced by 0.9 times; but females of the other two ethnic categories have made little progress. If change is measured in absolute terms, then Chinese females should be regarded as the top winner. In 1964 Chinese females constituted 25.3 percent of the university graduates whereas in 1993 this category occupied as high as 48.8 percent. This gain of 23.5 percent of the graduate population absolutely outshone Malay female's gain of 2 percent and Indian female's gain of 0.2 percent (see Table 10).

Table 10 Proportions of University Graduates by Gender and Ethnic Group (in Percentage), 1964, 1970, 1993

Year	Chinese		Malay		Indian		Others	
	Male	Female	Male	Female	Male	Female	Male	Female
1964	64.8	25.3	1.0	0.2	3.8	1.5	1.9	1.5
1970	64.2	28.5	1.0	0.4	3.1	0.5	1.4	0.9
1993	42.4	48.8	1.5	2.2	2.0	1.7	0.7	1.3

Sources : Constructed from convocation lists of NUS, NTI, US and NU.

Female's competitive strength is also affected by class origin. In 1980, tertiary students from households with an expensive private house or flat were equally divided between the two sexes, regardless of ethnic backgrounds; of those whose families lived in a 1-3 room HDB flat only 44 percent were female in contrast to 56 percent for males (cf. *Census of Population*, 1980, Table 11). There is no information available to the public of the male/female ratio of tertiary students by type of dwelling for the recent years. However, we can reasonably assume that the 1:1 male/female ratio of the upper division children has been sustained after 1980. According to published government statistics, in 1992 nearly 47 percent of the tertiary graduates were female (Table 8). If our assumption holds, then the six-percentage-point difference between male and female graduates must have originated from the lower division of the society.

The difference and change of female children of the upper and lower divisions suggest that the overall major improvement of female representation in tertiary enrolment is basically a result of the newly acquired affordability of lower division parents to send their daughters to school. This affordability has three meanings. First, these lower division parents are now capable of paying school fees for their daughters. Second, they can afford not to rely on the work of their teenage daughters for a supplementary income to ensure the survival of the

family. Finally, they can afford to break away from the traditional pattern of fundamental and almost exclusive reliance on the sons for security in old age and expect more or less equal but non-fundamental care from both sons and daughters when they become aged. This affordability reflects the combined equalization effects of such government policies as school subsidization, national welfare, and promotion of lower division family income through industrialization and community assistance.

The affordability factor has improved the status of lower division female children of all ethnic groups. However, the fact that the margin of improvement varies by ethnic group suggests that some other factors have intervened to differentiate the influence of the affordability factor, although their strengths appear to be much weaker than the latter. It should be interesting, therefore, to investigate and identify these "residual" factors. But before such investigations are materialized, it is perhaps better not to speculate their types and dynamics at this point.

6. *Change of Social Composition of the Upper Division*

In this section, so far I have discussed how some of the equalization policies of the government have effected to change the social composition of tertiary graduates. Given the extremely high probability of success of tertiary graduates in acquiring upper division membership, we can reasonably infer a picture of compositional change of the upper division from the compositional change of the tertiary graduates.

However, three major cautions need to be made about the inference. First, the state and change of the social composition of tertiary graduates have been characterized using proxies as the basis of calculation. There is naturally a gap between empirical reality and the statistics presented above, although the disparity is probably not large. Second, only less than 40 percent of the upper division members have tertiary qualifications. In 1992, for example, 58 percent had educational qualifications at lower levels. Because ethnic and class origin composition is more equalized at lower levels, statistics on the ethnic and class origin composition of the tertiary graduates need to be adjusted accordingly in order to precisely reflect the overall change of the social composition of the upper division. The overall ethnic representation of the Chinese and "others" in the upper division is probably somewhat smaller in percentage than their proportions in the university graduates. The same might be true of the overall representation of those upper division members who had an upper division family origin. Finally, a certain portion of female graduates became housewives after they married an upper division husband. Therefore the overall proportion of females in the upper division must be smaller than the female proportion of tertiary graduates.

IV Conclusion and Discussion

In Singapore education performs a double function — for social change as well as for social reproduction.⁹⁾ Education has helped to transform the class structure in two basic ways: (1) by

promoting economic development, thereby generating functional imperatives for enlarging the proportion of administrative and professional occupations, and thus creating a practical necessity of expanding the relative size of the upper division of the class hierarchy; and (2) by training qualified personnel to fill in the expanded high-status and high-paying positions and through this connection, re-constructing the social composition of the upper division. The transformation is impressive (although not revolutionary).

However, the transformational operation of education cannot be adequately understood by focusing on education's transformational capacity alone; the strategic role of government policies should be appreciated also. Education is a dynamic vehicle for change; but the way it is used in Singapore has been fundamentally defined by policies of the PAP Government. In a sense, therefore, the scope and depth of the stratificational change originating from education may be regarded as intended as well as unintended consequences of the education-related policies of the PAP Government.

The PAP Government's education policies are subordinated to its industrialization program and its general attempts at nation building. Under these policies, education has primarily been used as a tool for fast industrialization. It is not the only tool; but it is a powerful and indispensable one, because it has supplied knowledge and information as well as managerial and professional personnel and a skilled labour force to meet part of the most essential needs of Singapore's industrialization [Goh 1993]. It should be noted, however, that the relationship between education and industrialization is dialectical. It is precisely because it is connected to industrialization that education in Singapore has been able to transcend its traditional limitations and play a major role as a locomotive to advance productivity. The change of occupational structure and the expansion of the upper division of the class hierarchy are both unintended effects of this dialectical relationship. Assuming that the PAP Government had adopted a less effective industrialization program or a different kind of education policy — for example, one that does not emphasize technical education — it would not have been possible for the proportion of the upper division to have expanded by 1.4 times between 1964 and 1992. In other words, the realization of the transformational capacity of education in altering class structure at the division level would have been restricted correspondingly. (Following the same logic, one may also speculate that education might have been able to do even a better job

9) In Singapore education has played a major role in reproducing the social system — including class stratification — since independence. Although it has helped to substantially expand the relative size of the upper class division, the general configuration of the class structure has remained intact. Today, the number and types of classes, the relative position of each class in the class hierarchy, and the inter-class relationships, etc. are virtually the same as in the early post-independent years. Moreover, the Malay group and lower division children are still in a relatively weak position in gaining membership of the upper class division, despite the fact that their competitive strengths have been significantly improved. It requires serious efforts to study the causes and conditions of the conservative role of education in Singapore. This paper is not meant to deny or play down the reproductive function of education. Rather, it is an attempt to address one particular aspect of education's transformative function, which has been largely neglected in sociological research.

in expanding the upper division if more effective policies had been designed and practised for industrialization and education.)

At the level of intra-division social composition, the PAP Government's policies have also played a substantial role in shaping the direction and strength of education's transformational operation. In this regard, the Government emphasizes open boundary meritocracy. This principle differs from the kind of elitism proposed by Raffles in that it makes the doors of higher learning institutions widely open to the children of the less privileged groups. It is also distinguished from Malaysia's quota policy which is designed to ensure the representation of Malay students at the tertiary level to be more or less equal to the Malay proportion in the general population [Ashari 1988; Lim 1992], or the quota policy of the former Soviet Union under Stalin and Khrushchev [Dobson 1977] which was deployed to ensure prominent representation of working class children and worker/peasant students in higher learning institutions; the difference is that the Singapore Government rejects academic compromise and insists on merit-based selection. Had any of these policies been implemented in Singapore for the past three decades, the social composition of university graduates and the upper division would have been considerably different from what it is today.

The Singapore policies have their own features, and these features reflect the Government's firm belief in meritocracy, its pragmatic attitude in adaptation, its categorical emphasis on rationality, and its specific knowledge and understanding of education.

However, it would be mistaken to conclude that the Government has implemented these policies simply according to its own wish and will, for the formation and choice of these policies have been definitely conditioned by *higher-order conditions and constraints*. These constraints include: (1) Singapore's pressing need for industrialization; (2) its equally pressing need for efficiency of economic development; (3) general societal imperatives which are shared by various kinds of society — for example, those to use stratification as a means for survival and development [cf. Davis and Moore 1945] ; (4) society-specific system imperatives — for example, given a certain level of technology and scale of the economy, a certain number of managerial and professional personnel is required to ensure optimal productivity [cf. Clark 1962; Bendix and Lipset 1967] ; (5) the post-colonial class and ethnic composition of the society and balance of demand, power, and influence associated with it; (6) the history and cultural background of Singapore; (7) the geo-political location of the country; and (8) others. These constraints constitute definite boundaries and would negatively sanction the Government for any of its policies that attempt to trespass them.

For example, if the Government decided to strive for complete social and educational equality, it would be fated to fight a losing battle in the face of the constraints (3) and (4). The Government would also be in trouble if it tried to imitate Malaysia's quota policy, because such a policy violates the constraints (2) and (5), particularly (5). In Malaysia, although the Malay group is relatively weak in education, it is dominantly represented in the legislature, government, police and armed forces; and as a majority in the population, it also carries a substantial weight in determining social stability or instability. This kind of power has been

effective in legitimizing and enforcing a quota system using different cut-off points of examination for university admission in favour of Malays (in the name of national reconciliation, social order, and progress).

In Singapore, however, the majority (the Chinese community) are relatively strong in competitive strength in education; the Malaysian type of quota policy would neutralize this competitive superiority and take away something they could otherwise legitimately earn based on learning merit. Given the significance of tertiary education, it is not likely, then, that the majority of the population in Singapore would approve of such a policy. Thus, if a government insists on implementing it, it would not only lose substantive legitimacy, but probably also lose political support from the majority in democratic elections. The Government has to be alert to all these constraints and formulate policies within their boundaries. These constraints, with the exception of the first item, will continue to define boundaries for the future education-related policies of the government.

Higher-order conditions and constraints define the strength and limitations of government policies which, in turn, affect the realization of the transformational capacity of education. If the change of class structure directly reflects the transformational capacity of education, indirectly, then, it is clearly a product of government policies and those forces operating behind the policies.

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