

**EFFECTS OF STUDENTS' BACKGROUND VS. SCHOOL CONDITIONS ON  
PRIMARY SCHOOLS STUDENTS' ACADEMIC ACHIEVEMENT IN THAILAND**

by

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## **Abstract**

This study attempted to investigate whether or not the results derived from research conducted in industrialized countries, about school resources and school conditions having very little effect on students' academic achievement when students' background is controlled for, apply to a developing country such as Thailand. Data on Grade-6 students from the BRIDGES Project in 1987-1988 were analyzed; however, the aggregated nature of data only allowed an investigation at the school level. The analyses show that both sets of variables representing students' background and school conditions have a significant impact on students' achievement scores. However, the national-level results do not agree with results from any single region. The study concluded that specific social and economic conditions in each locality seem to have a significant impact on how students' background and school conditions affect students' academic achievement; therefore, one should not assume that results from research in industrialized countries will necessarily apply to a developing country, or that national-level results will apply to regions within the country.

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## Chapter 1

### Introduction

In modern society, one measure of social change is the extent to which individual success or failure rests on ability and effort, rather than on social origin or parental socioeconomic status. Greater stress on equality of educational opportunity is one of the most common signals of this shift from an ascriptive (who you are) to achievement (what you can do) principle.

Research in the sociology of education, of which the majority is done in the United States, has consistently found that schooling has relatively less effect on students' academic achievement than does social background. This implies that schools may not be able to moderate the influence of students' socioeconomic backgrounds, and thus not reduce the gaps in academic achievement among students from different social origins.

Findings from research in developing countries, on the other hand, tend to be more equivocal. Some research even suggests that schools may exert a greater influence on students than does their socioeconomic background (Heyneman and Loxley, 1983). Thus this line of research points to schools as a potential agent for bringing about more *effective* equality of opportunity, and recommends that an increase in educational expenditure together with a redistribution of school resources (particularly those that are found to have significant effects on students' achievement) should be carried out if the desire is to reduce the inequalities in achievement among students from various backgrounds.

The purpose of this research is to evaluate the relative effects of socioeconomic background and school quality on the scholastic achievement of primary school students in Thailand. It is not known whether primary schools in a developing country like Thailand will have independent effects on students' academic achievement relative to that of social background. Moreover, the

effects of social origins and schools may vary among geographic regions and communities with different degrees of economic development as suggested by previous Thai research (Setapanich, 1982). To understand these effects, the role of primary schooling in promoting equality of educational opportunity will be assessed by comparing the degree to which the resources of Thai primary schools impact on the achievement of students with the effect of the students' socioeconomic backgrounds on achievement.

To facilitate the comparison, this research will attempt to answer the following questions: 1) what effect does school resources have on students' academic achievement?, 2) what effect does social background have on students' achievement?, 3) do the effects of social origin or school vary among different geographic regions?, and 4) most importantly, which effect is stronger, the school effect or the effect of socioeconomic context? Answers to these questions will allow a comparison of the results of Thai research with those from other countries, especially America. These questions will be discussed in greater detail in the following chapters.

### **Equality of Opportunity**

The notion of equality of opportunity was originally used to mean that each individual should have an equal chance to succeed or to fulfil their potential, regardless of their social origins (Turner, 1986). According to this initial concept of equality of opportunity, the society was responsible for providing an equal 'opportunity' (in such areas as schooling, health care, elections, free markets) to every person regardless of that person's sex, age, racial and ethnic origin, or socioeconomic background. However, the achievements or failures of each individual were attributed to that person's own talent or ability. The original concept of equality of opportunity assumed that the 'differences' between

individuals were natural, inevitable, and not transferable from generation to generation (Green, 1988).

More recently, the idea of equality of opportunity has been closely related to school-based education. Schools were perceived as relatively autonomous institutions where each individual was admitted and recruited on a universalistic criterion (i.e., a person's performance determined his/her success at school). By attending school, each person has an equal chance to be equipped with 'knowledge,' to move up the social ladder. Therefore, schools are regarded as an important agent of social mobility.

The concept of equality of opportunity has been criticized, partly due to the persistent differences in achievement between different socioeconomic groups (Hurn, 1985: 111-112). Individual talent and ability are argued to result more from the differences in status origins than from innate abilities (see Coleman, 1990). Equal access or 'opportunity' is then perceived as inadequate, since higher-status children may grow up in a more supportive environment, providing them with an advantage in 'cultural capital' over lower-status people. Poor children may have to drop out of school in order to help their family earn money. Poor parents may not encourage their children to study diligently, nor socialize them in a way that makes them ready for life in school. A completely free and competitive society is thus no longer considered an 'equal' society. Some argue that society is expected to provide not only equal formal 'opportunity', but also equal 'conditions' for every individual through social welfare and education, as well as positive discrimination in favour of the 'disadvantaged' groups (cf. Green, 1988: 3).

Under this latter view, schools are perceived not only as an agent of social mobility but also as an agent of social equality. Schools are expected to be able to effectively bridge the differences in socialization patterns among different

social groups, in order to bring about an equal level of achievement among all students (Coleman, 1968). Various educational programmes have been set up in attempts to provide equal 'conditions,' especially for lower-status students, such as the Head Start Program in the U.S. which attempted to prepare minority students for Grade 1, or the programmes to integrate students from different racial backgrounds with a belief that high-achieving students will help or have a positive influence over low-achieving students (Hurn, 1985: 112, 129-130).

Changes in the conception of equality of educational opportunity have resulted from debates on what actually constitutes an equal opportunity. The original idea of equal opportunity, that emphasized an equal access to school resources, has been shown to be inadequate since children from the lower social groups appear to have already lagged behind children from higher social groups by the time they start school. Attempts to prepare lower-status children for life in school or to provide extra help and resources when they are in school result from the belief that every child, regardless of his/her social origin, should have an equal opportunity to compete. The concept of equality of opportunity that has evolved thus emphasizes the effectiveness of schools in providing equal 'conditions' for each child. In other words, the effect of school comes to be evaluated against the influence of the child's socioeconomic background.

### **Background of Thailand: regional variations**

To examine whether students' background and school conditions have differential impacts on achievement in Thailand, two pertinent aspects of this country should be considered, namely, 1) how does Thailand compare with other countries in levels of economic development, and 2) how do different regions in the country compare with one another.

On the basis of national average per capita income (US \$ 1,454, in 1990), Thailand is considered to be a lower-middle income country (World Bank, 1990a). The country's economy, which has shifted from agricultural-based, to more industrial and service-based, has grown rapidly and somewhat consistently since the late 1960's (Fry, 1992: 93; World Bank, 1990b: 7, table). To some, Thailand thus appears to be approaching the rank of Southeast Asia's newly industrialized countries (NICs) (see Fry, 1992: 84-85). However, its dramatic economic growth is mostly limited to Bangkok Metropolitan areas, while the majority of the population continues to reside in the rural areas (Economist, 1991: 36; Fry, 1992: 85). The agricultural sector remains Thailand's largest employer, taking in about 65 per cent of the total labour force in 1987 (World Bank, 1990b: 11, table). Similarly, Thailand remains largely a rural country, with the exception of Bangkok, the largest city, and a few other cities in the regions outside Bangkok Metropolis (Knodel et al., 1987: 28-30). In addition, its rapid economic growth has concealed large regional differences in levels of economic development (see TDRI, 1987: 42), which are somewhat associated with ethno-linguistic differences among populations in each region (see Kaplan, 1980: 61).

Thailand appears to be relatively homogeneous, i.e., the majority of population are Theravada Buddhists (about 95 per cent), and speak a language of the Tai family (about 85 per cent or more) (Tuchrello, 1989: 69). However, differences in social, economic, and political conditions do exist between regions and ethno-linguistic groups (Tuchrello, 1989: 69; Cohen, 1992; Keyes, 1987). The country can be divided into four 'natural' regions (i.e., the Central, North, Northeast, and South) on the basis of landforms and drainage (Kaplan, 1980: 55). Although this regional classification does not entail any administrative significance, it appears to coincide more or less with the differences in ethno-linguistic background of population, basic resources, and level of social and

economic development (Kaplan, 1980: 55; see Cohen, 1991: 12; cf. Moore, 1974: 5). In addition, Bangkok Metropolis, which is in the Central region, should be considered a fifth region, due to its distinct social, political, and economic conditions (see Knodel et al., 1987: 30; Tuchrello, 1989: 62).

Generally, those who speak the Standard Central Thai dialect, concentrated in Bangkok and some central provinces, have had advantages over people in the rest of the country. Economically, Bangkok and to a lesser extent, the Central region, have consistently enjoyed much higher average income than those in the other regions, due largely to the concentration of commercialized agriculture, and industrial- and service-based industries there (see Fry, 1992: 87, table; Chowdhury, 1989: 53). Linguistically, the Standard Central Thai dialect, which is difficult to learn for speakers of other dialects, entails high status and prestige to the speakers, since it is the sole official language required in schools and government offices (Kaplan, 1980: 63; see Diller, 1991: 99-100; Tuchrello, 1989: 70-71). Politically, Bangkok has been the centre of power and decision making that has influence on the rest of the country (Moore, 1974: 4).

The North has the second lowest per capita income of the country (Knodel et al., 1987: 47, table; see also Fry, 1992: 87, table). Increasingly, there has been a shift from subsistence-based agriculture to a more commercialized one, which highlights the problems of landlessness and concentration of land ownership (see Ganjanapan, 1989; Turton, 1989), observed earlier in the Central region (Chiengkul, 1983). Northern residents have their own dialect, called Lanna Thai or Kham Muang (see Keyes, 1987: 6), which has been neglected until recently (see Tuchrello, 1989: 72; Diller, 1991: 115). The hilltribes people in the northernmost parts of the region also have their own distinct languages, and have been engaged in shifting cultivation of various crops, including opium (see Tuchrello, 1989: 75-77).

The Northeast (or Isan) is the poorest region of the country (see Fry, 1992: 87, table TDRI, 1987: 42, table; see also Economist, 1991: 36). With most areas being dry and arid, the majority of the northeastern population (about 31 per cent of the country's total population) continues to rely on subsistence agriculture (Moore, 1974: 4-5). A large number of the northeasterners have consistently migrated to work in Bangkok, a few cities inside and outside the region, or to foreign countries (see Economist, 1991: 36; TDRI, 1987: 43). Generally, these northeasterners speak a variety of the Lao language (Cohen, 1992; Diller, 1991), and to a certain degree, have developed regional consciousness on the basis of this shared linguistic and cultural background (see Tuchrello, 1989: 81-82; Keyes, 1987; Cohen, 1992).

The South generally ranks third in per capita income (see Fry, 1992: 87, table; TDRI, 1987: 42, table). Its population is engaged in a variety of economic activities, such as mining, fishing, and rubber production. Southerners have their own dialect (Pak Tai), which also belongs to the Tai language-family with a number of Malay loan-words (Diller, 1991: 95; Kaplan, 1980: 63). Moreover, a large number of Muslims are concentrated in the four border provinces, and speak Malay language (e.g., Yawi). In the past, some of these Muslims, who are generally of lower socioeconomic status than other ethnic groups in the region, were involved in separatist movements against the central government; however, the government has recently introduced various conciliatory measures that accept the distinct religion and ethno-linguistic characteristics of the southern Muslims (see Pitsuwan, 1985; Satha-Anand, 1987: 3; Tuchrello, 1989: 82-83). The success of these government-run programmes remains to be seen.

In sum, the differences in levels of economic development closely associated with ethno-linguistic backgrounds of the Thai population appear to coincide with geographic boundaries of the country. The 'regional' differences have

contributed to ethnic and / or regional consciousness (Kaplan, 1981: 61), which has occasionally led to separatist movements in the past, such as in the Northeast and the South (Cohen, 1992: 12), and may possibly again in the future (see Keyes, 1987: 14, 201). It is not known whether and how the differences among regions in Thailand will contribute to the impact of government-controlled primary schooling, as a major instrument by the Central government to unify different ethnic groups and regions, on students' academic achievement.

### **Primary education in Thailand**

Primary school can be considered the most important level of formal education in Thailand for the following reasons: 1) it has the largest enrolment and accordingly requires the largest proportion of the national budget for education, 2) it is the only formal education that the majority of Thai people receive, as compulsory education exists only at this level, and 3) it is the base for higher education, or on-the-job training (NEC, 1977). In fact, it is estimated that about 80 per cent of workers, in all sectors of the country, have only primary education (Myers and Sussangkarn, 1991: 49, table 12).

### **Historical background of Thai primary education**

Prior to the introduction of modern education, education in most parts of Thailand was in the monastic tradition of Theravada Buddhism. The *wats* (temple-monasteries) were the centres of learning, wherein Buddhist monks lived and taught village boys how to read and recite religious texts (Keyes, 1991: 90-91). The relationships between the monks and villagers were considered sacred, whereby the latter usually paid a high degree of reverence and obedience to their teachers (Hanks, 1958, 9). In addition to literacy in religious texts, villagers could also learn various crafts and other indigenous forms of knowledge such as



midwifery, preparing corpses, traditional medicines, astrology, legends and myths, poetry or customary laws, through an apprenticeship with the monks or other learned villagers (Hanks, 1958: 9-10; Keyes, 1991: 91-92).

The expansion of Western colonial powers (especially Great Britain and France) into Southeast Asia during the nineteenth century posed significant threats to the political sovereignty and stability of Siam (as Thailand was known then). Thus the central government of the country at that time sought to strengthen its control over various parts of the country, to improve its military organization, and to reform its administrative systems (Sudaprasert *et al.*, 1980: 203). Several Western values and ideas were also adopted in programmes to modernize the country, one of which is the development of public education.

Modern (i.e., secular) education was perceived as one of the more effective tools to help modernize and unify the country wherein a variety of linguistic and ethnic groups reside (Na Thalang, 1970; see Myers and Sussangkarn, 1991). The growing administrative bureaucracy also demanded a large number of literate government employees (Wyatt, 1969; Samudavanija, 1987: 222). In addition, an expansion of education seemed also to bring about an increase in equality of educational opportunity for every Thai citizen, as intended by King Rama V (Chulalongkorn, 1868-1910) who laid the foundation for modern education in the country,

so that everyone - be it my children or the children of my poorest subject, being children of a noble lord or children of a slave - shall receive an equal opportunity in education. I hereby declare that education in this country is our first priority and that full development in education must soon take place. (Kasemsak, 1974, cited in Chantavanich et al., 1990: 15)

Primary education is the first level of the formal schooling system that was introduced nation-wide. A Royal Proclamation, inviting Thai people to send their children to school, was issued in 1885, the same year as the establishment of the first government school outside the Royal Palace (Jumsai, 1951: 21; Watson,

1980: 255). The promulgation of the Primary Education Act in 1921 required every child to attend school, and this law has been implemented in most communities throughout the kingdom since the 1930s (Keyes, 1991: 89). The Buddhist Sangha (monks) community was actively involved in the early development of secular schooling through providing their temple buildings for schools and some monks as teachers (Jumsai, 1951: 15, 45, table), while the central government worked on building new schools and training lay teachers. However, the initial steps in the expansion of state-controlled schools were slow, in part due to a shortage of trained teachers (Jumsai, 1951; Wyatt, 1969; Watson, 1980; Grandstaff, 1986). Massive construction of (primary) schools in almost every village did not begin until the 1960s and 1970s following recommendations of the Karachi Plan of 1960 (Watson, 1980: 57-59, 218). Since 1959, the Thai government has dramatically increased its national education budget, and in particular, allocated over half of the budget to the primary level (Watson, 1980: 152-153; Chantavanich and Fry, 1985: 5238). However, at least until the Educational Reform (see below) school resources (e.g. budget per student, teachers' qualifications) were not distributed equally among different provinces and types of schools (Sudaprasert *et al.*, 1980: 243-246, 252, 257-259; Leonor, 1982; NEC, 1974).

Modern education differs from traditional education in many respects. The law now requires every child to attend school for a certain period of time, unless it is extremely difficult to do so. The curriculum has also been made uniform throughout the country and covers more subjects, such as arithmetic, general science, history, geography, and (boy) scouting, with the content of some subjects being biased toward conditions in Bangkok (the largest city and capital of the country). The Central Thai dialect is used as the sole language of instruction. Monks were replaced by lay teachers who are government

employees; however, the respectful relationships between students and teachers continue to prevail (see Gurevich, 1972). A teacher is generally perceived by students as a venerable person whose behaviour has to be almost perfect (Suvannathat, 1978, cited in Avalos and Haddad, 1981: 7). The central government has control over the administration, finance, curriculum, and personnel of all schools except the private ones. In addition, the implementation of formal education allowed women to attend schools for the first time, which has resulted in a dramatic increase in the enrolment of female students in primary schools (Jumsai, 1951: 41-42; Watson, 1980: 107).

Responses to modern education are varied. Many parents perceive modern schooling as a means of social mobility for their children (Hanks, 1958; Saradatta and Savannathat, 1973) allowing them to move out of farming into government service and other sectors. On the other hand, some parents see modern education as lacking relevance to the conditions in their localities and of their occupation (Hanks, 1958; cf. Wyatt, 1975: 146). A resistance to state-sponsored education is especially evident among the Southern people whose Muslim background differs sharply from the prevailing Buddhist culture in the rest of the country (see Dulyakasem, 1991). However, this resistance to modern education may gradually fade away, considering the increasing scarcity of lands and the concentration of land in the hands of a small group of people, which makes it increasingly difficult for people to survive solely by farming. Educational qualifications may become very important for obtaining positions in the modern job markets and they can be obtained only through schooling (see Chantavanich et al., 1990: 149).

Equally important is the finding that the nation-wide implementation of primary education has been followed by disparities in the achievement levels of students from different geographic regions and types of schools. These educational

disparities have been characterized as the differences between the core, usually referred to as Bangkok and the neighbouring provinces in the Central region, and the periphery or the rest of the country (Sudaprasert *et al.*, 1980: 206).

In standardized achievement tests of the Thai language and arithmetic carried out in 1973, Grade-3 students in Bangkok obtained average scores twice as high as those in the Northeast. The scores of students in the Central region, the North, and the South were somewhere in between (NEC, 1974: 6, 8, tables; NEC, 1977: 25, table 1). Similar patterns in the distribution of achievement scores persisted in another nation-wide test carried out in 1980 (Chantavanich *et al.*, 1990: 29, table 6).

In 1967-1977, under the old curriculum, wherein primary education lasted for seven years and was separated into lower and upper primary levels (Grade 1-4, and Grade 5-7), only about 30-58 per cent of Grade-4 students went on to Grade 5 (Chantavanich *et al.*, 1990: 2; Leonor, 1982: 106-108), with high disparities in enrolment between provinces in the Central region and those in the other regions (Sudaprasert *et al.*, 1980: 222-229; Fry, 1983: 209). This may be due in part to the previous use of selective examinations for students who wished to continue to the upper primary level (Grade 5) (Sudaprasert *et al.*, 1980: 222), and a shortage of upper primary schools and teachers especially in the rural areas (Watson, 1980: 161). In addition, there were wide regional disparities in the proportion of students who completed their primary education. During 1972-1975, in the Central region, which includes Bangkok, about half of the students who had started in Grade 1 reached Grade 7, whereas the proportion was about 10 per cent for students in the frontier provinces of the Northern and Southern regions of the country (Leonor, 1982: 108, 113-114).

Prior to the Educational Reform in the late 1970s, there were dual systems for the administration of primary schools in the urban and rural areas. Rural schools,

which made up about 90 per cent of all primary schools in the country, were under the authority of the Ministry of Interior (MOI). Schools in the urban areas consisted of three major categories, namely private schools, municipal schools, and schools under the authority of the Ministry of Education (MOE). The different school systems appeared to cater to students from different social backgrounds. In the urban areas, many children from elite and middle class backgrounds attended private and MOE schools, while children from low-income families went to municipal schools. In the rural areas, MOI or provincial schools served the majority of children, who came from a farming background (Sudaprasert *et al.*, 1980: 251-252). In general, provincial schools ranked the lowest in the quantity and quality of school resources available to their students (NEC, 1974: 12-15). Likewise, the levels of students' scholastic achievement, and of repetition and dropout rates, in provincial schools were inferior to those of the other types of schools (Leonor, 1982: 117, Table 7; Sudaprasert *et al.*, 1980: 251-254).

This problem of educational disparities has been of concern to policy makers. Following the student led political movement in 1973, the Thai government attempted to redress these problems, especially with regard to the equity, quality, and relevance of primary education. An Education Reform Committee was set up in 1974, followed by the initiation of the National Education Scheme in 1977. There were attempts to allocate basic educational resources more equitably across provinces (Fry, 1983: 206; Ketudat, 1984: 526-527; cf. Sudaprasert *et al.*, 1980: 257-258). Nation-wide studies on *Equality of opportunity in primary schools* (NEC, 1974; Leonor, 1982: 116) and *The factors affecting scholastic achievement* (NEC, 1977; Leonor, 1982: 116-120) called for large-scale changes in primary education in four major areas: 1) the unification of diverse educational organizations under the MOE, and the decentralization of educational administration to the local provinces, 2) establishment of new curriculum goals

leading toward an appreciation of the relation between education, life, and society, 3) improvements in quality and relevance of education, and 4) special emphasis on non-cognitive learning and moral values (Chantavanich and Fry, 1985: 5237). The new curriculum included four learning areas: basic skills (literacy, arithmetic), life experience, habit formation, and work orientation. The two levels of primary education were also merged, and the duration of this level of schooling was reduced to six years.

As part of the Educational Reform programme, the administration of provincial schools was returned to the Ministry of Education in October 1980, under the Office of the National Primary Education Commission (ONPEC), which is responsible for policy making and planning. However, actual day-to-day operations are controlled by the Provincial Primary Education Commissions, which have flexible control over placement of teachers, selection of school textbooks and materials, and location of schools (Chantavanich and Fry, 1985: 5237). Each school has its own educational committee which is in charge of the school's non-academic management and operations, and which consists of both leaders and other residents of the community where the school is located (Chantavanich *et al.*, 1990: 150-151).

Despite the government's attempts to reduce the differences in educational achievement and attainment among primary school students, the disparities in completion rate and achievement levels appear to continue. Almost all students in Bangkok complete the sixth grade, the terminal year of primary education, while only 56 per cent of students in the South do (Myers and Sussangkarn, 1991: 24, citing World Bank, 1990). Moreover, from 70 to 90 per cent of students in Bangkok continue to the secondary level while less than 10 per cent of primary school students in rural areas continue their studies beyond the primary level (Komin, 1989: 47, Fry, 1983: 207). From 1985 to 1988, the scores of Grade 6

students in the mathematics and Thai language tests (World Bank, 1990; see also NEC, 1990a and 1990b) showed a similar pattern of disparity between Bangkok and the rest of the country, with the South and the Northeast regions being particularly low.

Modern education has been introduced in Thailand partly in response to the penetration of Western colonial powers into Southeast Asia during the nineteenth century. Education has been perceived as an important tool to develop the country, to unify various ethnic and linguistic groups of people. However, existing disparities in educational achievement among different geographic regions led to attempts by the Thai central government to reform the educational systems, but without much success. The present study will investigate possible factors that contribute to differences in the average level of achievement of primary school students, as measured by the standardized tests in 1987. Previous studies of factors that contribute to differences in the academic achievement of Thai primary school students will be discussed in the next chapter.

## **Chapter 2**

### **Literature review and theoretical background**

Educational research has consistently found a large gap in the learning achievement between students from different socioeconomic backgrounds. This has spurred interest in highlighting the factors that affect academic achievement. Two major sets of variables that have been identified are those relating to family conditions and those relating to school conditions. However, the general results of research in Western industrial countries appear to contradict those of research in developing countries: in industrially advanced countries family socioeconomic background is much more influential on students' achievement than are school resources, while the opposite seems to hold for the developing countries. Differences in national educational policies as well as in the social and economic conditions between industrialized and developing countries raise concerns about the generalizability of research findings across the two groups of countries.

#### **1. The influence of socioeconomic background on students' achievement**

##### **Results from Western industrial countries**

Research in industrialized countries has generally found that socioeconomic background, at both individual and aggregate levels of analysis, has a greater impact on students' academic achievement than do school and teacher characteristics. In *Equality of Educational Opportunity*, one of the most important surveys on this issue, Coleman *et al.* (1966) show that student's background (especially socioeconomic status) appears to have a significant and persistent influence on the achievement of students at both elementary and secondary levels of schooling. Subsequent large-scale survey research done in the United States, where the majority of educational research has been conducted, and in other industrialized countries tends to confirm the results of Coleman *et al.*'s



report (Jencks *et al.*, 1972; Sewell and Hauser, 1976; Rutter *et al.*, 1979; Anderson, 1967; Armor, 1972; Hanushek, 1972; Cummings, 1977).

The measures of student's background that have been used in large-scale survey research include: educational and occupational status of parents, family income, family size, and number of possessions in the home (see Bridge *et al.*, 1979: 213-228). Bridge *et al.* (1979: 215) noted that most of the large-scale survey research is more interested in estimating the effects of school and teacher characteristics; therefore, the selection of measures for family socioeconomic backgrounds is largely to control for the differences in students' backgrounds before they enter school, and thus may not necessarily correspond to the actual differences between families. However, the research findings about the strong impact of students' socioeconomic background on their academic achievement suggest that these conventional measures of socioeconomic status in industrial societies do adequately reflect the differences between families in the practices of child rearing, which in turn influences the children's academic achievement (Bridge *et al.*, 1979).

Status attainment researchers, who studied male high school students in Wisconsin over more than a decade, found that students who had low SES origins tended to exhibit lower 'ability,' as measured by IQ tests administered at about age fourteen, and also lower aspirations for educational achievement than students from higher status backgrounds (Sewell and Hauser, 1976). When dividing the index of socioeconomic status into quartiles, the researchers found that the highest quartile had a 4-to-1 advantage over the lowest in reaching college graduation, and a 9-to-1 advantage in attaining graduate or professional education.

The influence of student's background is felt mainly in the socialization processes (see Kerckhoff in Richardson, 1986). Students from a high status

family and/or more developed community may be encouraged to develop high aspirations for education. Middle-class children may grow up in an environment which prepares them for socialization in school, through the use of more sophisticated language and social manners compatible to what school expects (see Bernstein, 1973, 1974, 1976, cited in Hurn, 1985: 192-193; Bourdieu and Passeron, 1991).

In sum, research in industrial countries has consistently observed a strong and significant influence of socioeconomic background on students' academic achievement. Parents' educational and occupational status appears to adequately indicate patterns of child socialization which results in differences in academic achievement.

### **Results from research in developing countries**

Differences between Western industrial societies and the developing countries in terms of national educational policies, the structure of social stratification, as well as in the roles and meanings of "family" cast doubt on the general applicability of research findings about the influence of students' socioeconomic background on their academic achievement. The findings of research in some developing countries are generally more equivocal than findings of research in Western industrial societies about the persistent influence of students' socioeconomic background. Some even suggest that family socioeconomic background may have a weaker impact on students' achievement than do school resources (Heyneman and Loxley, 1983).

Burstein *et al.* (1980) argued that different national policies on how educational resources are distributed and managed in each community may lead to differential effects of students' family/ community background on their educational achievement at the school level. In their comparisons of the effects

of students' socioeconomic backgrounds, aggregated at the school level in the United States, England, and Sweden, they found that the socioeconomic status of a community had a greater impact on students' achievement at the school level in the United States and England than in Sweden (although they did not find differences in the SES effect on student achievement within schools). Burstein *et al.* (1980) argued that local communities in the United States and England had greater control over the style of programs offered, the curriculum, and the ability of the school to seek better facilities and personnel, and thus students' achievement was more dependent on the community's socioeconomic status. On the other hand, the pattern of resource allocation in Sweden was more centralized (which is similar to many developing countries), and thus the level of community socioeconomic status may not have as much influence over students' achievement. The differences in academic achievement between schools in Sweden were much lower than in the U.S., and England.

Foster (1977) suggested that in many non-Western societies (modern) educational and occupational status may not relate to differences in child rearing practices that influence the child's academic achievement to the same extent as they do in Western countries. The levels of parental education and occupation in developing countries may not affect the value attributed to the children's education (Fagerlind and Munck, 1981, cited in Heyneman and Loxley, 1983: 1182, footnote), nor the self-concept of children. Thus the conventional measures of students' socioeconomic background (e.g. the parents' education and occupation) being used in research in industrial societies may not be valid for identifying the differences between families in many Third-World countries.

Heyneman (1979: 177, table) found no relationships between students' socioeconomic background and their self-attitudes, which were identified in American research as contributing to students' learning performance (Coleman *et*

*al.*, 1966; see Heyneman 1979:176-177). Ugandan students from low social origins did not seem to have lower opinions about themselves than those from higher socioeconomic backgrounds (cf. Lockheed *et al.*, 1989: 245-246).

Heyneman (1976, 1979; see also references in Heyneman, 1982: 135-136) also found that the correlation between achievement of primary school students and their father's education in Uganda was very weak. He obtained similar results with other indicators of students' socioeconomic backgrounds, similar to the ones used in the Coleman report, (i.e., mother's education, number of modern possessions in the home, father's occupation, and the summary measure of the four SES variables). (Heyneman and Loxley [1983: 1176-1177] claimed that the lower degree of variance in students' SES backgrounds in developing countries did not contribute to the weak effects of students' SES. For example, they could not find any particular patterns of relationships between mother's educational attainment and student's scores in developing countries). In another study, Heyneman (1977) compared the average scores of primary school students from communities in Uganda with different levels of development. He found that students from more backward communities did better than those from urban backgrounds. Heyneman pointed to a smaller proportion of the school-age population in backward regions who attended schools, and postulated that the selection processes there may be more competitive and relatively restricted to more talented students. Elsewhere, Heyneman (1979: 177-178) asserted that there was no relationship between SES and the performance of students in both backward and more developed communities of Uganda.

Some research suggests that other measures may be more relevant to the social and economic conditions in the Third-World countries. Dialect, caste membership, amount of land holding, type of residence, access to electricity, nutritional status, and parent's demands for their children's labour, have been

proposed as measures that better indicate the differences in social and economic backgrounds among the population in the less industrial societies than do parents' educational and occupational status (Schiefelbein, 1979: 138). Research in India, Malawi, and other developing countries examined some of these variables and found that they affected students' academic achievement (Lockheed *et al.*, 1989: 242, 250-253). The effects of some of these identified variables will be tested in the present study.

In addition, the concept of 'family' may differ between Western societies and non-Western ones. While the term family in Western societies usually refers to father, and/or mother, and child(ren), in many cases of rural societies family covers more generations of members and/or kin. Theisen *et al.* (1983) suggested that poor families in Third World countries may be able to rely on resources provided by their kin, and thus their own socioeconomic status may not reflect their ability and support for children's education as would be the case in Western societies. (However, the data available to me do not allow me to explore the issue.)

Very few studies looked at the possible differences in effect of students' socioeconomic background between regions and areas of residence (urban vs. rural), and few use non-urban samples (Lockheed *et al.*, 1989: 241). For example, the Thai sample in Heyneman and Loxley (1983) was limited to urban schools in Bangkok and nearby areas, and it was thus not possible to explore the variations among regions.

The influence of students' background appears to vary by school subject (e.g. reading vs. science). Students' background in Uganda was found to have a weak but statistically significant impact on their achievement in English, while it did not seem to have any significant effect on other subjects (such as mathematics, general knowledge in history, geography, and general science) (Heyneman,

1976: 47). SES was shown to have less impact than school variables on Greek students' achievement in physics (Kostakis 1987).

Evidence from research in some developing countries about the weaker impact of socioeconomic background may be due to 1) the centralized pattern of school resource allocation, 2) different bases of social stratification other than socioeconomic status, and 3) different meanings of 'family.' The effects of socioeconomic background may, however, vary among geographic regions and school subjects.

### **Results of research in Thailand**

The results of studies on the influence of students' socioeconomic background on students' achievement in Thailand are rather mixed. The impact of socioeconomic background on students' academic achievement remains largely uncertain. Also, the effect of socioeconomic background seems to vary among different geographic regions, largely due to the differences in social, economic, and cultural backgrounds in each region.

A re-analysis of data from a nation-wide survey (Setapanich, 1982: 127, table) found that student socioeconomic background (measured by father's education and occupation as well as the degree of exposure to newspapers, television, and magazines) appeared to have less impact on Grade-3 student achievement than school and teacher related variables, in all regions. On the other hand, in another survey in 1979-1980 (Chantavanich *et al.*, 1990) found that their measure of students' SES (the regularity of children having pocket money to take to school) had a stronger effect on Grade-3 students' test scores in Thai and arithmetic than did other school variables. The analysis of Chantavanich *et al.* was based on aggregate-level data and at the national level only.

In a longitudinal study on the effects of various measures of student's background on mathematics achievement of lower secondary school students in Thailand, Lockheed *et al.* (1989: 244, 246, 248, table) discovered that mother's education and father's occupation (conventional measures of socioeconomic background) contributed little to students' achievement. On the other hand, the motivational variables, such as student's educational expectations, perceived parental support, and attitudes toward one's ability and usefulness of mathematics for future occupation continued to exert a moderate and significant impact on the gains in students' achievement scores. Since father's occupation and mother's education did not seem to be strongly related to the motivational variables, the researchers contended that these motivational variables may be considered additional family background variables (Lockheed *et al.*, 1989: 246). It is possible that student's socioeconomic background may not have as strong an impact on achievement of secondary school students since these students may be a select group. (Only 30 per cent of Thailand's school-age population continue beyond the primary level. In the rural areas, about 10 per cent of primary school graduates do so [Komin, 1989].) It was not possible to estimate the effect of parental encouragement on achievement of students at the primary level since no analysis has been done on this issue (NEC, 1977).

It is not clear whether the effect of students' background in Thailand is homogeneous among different regions or not. NEC (1977: 37, table) observed that contrary to expectations, family SES had a lower impact on student achievement in Bangkok than in the other regions of the country. In addition, Setapanich (1982: 128-129) found that in the Southern region (where the religion, language, as well as the ethnic origins of the majority of the population are markedly different from the rest of the country), SES seemed to have a stronger impact on student achievement in Thai language than in mathematics. She

postulated that the Muslim resistance to the Thai central government (and thus to government-run schools) in the South may be higher among lower SES groups (e.g. fishermen, farmers) than among higher SES groups (mostly government officials) who foresee greater benefit of education. On the other hand, Raudenbush *et al.* (1991: 264) found that the effects of SES and age on achievement in Thai language and mathematics were quite homogeneous across schools. They also found that the average SES in the school was significantly positively correlated with maths and Thai language achievement in both urban and rural areas (Raudenbush *et al.*, 1991).

A possibility that the measures of family SES may not be valid in all regions of the country poses a major difficulty to previous Thai studies in estimating the influence of family socioeconomic background on students' achievement. Setapanich (1982: 133, table) discovered that the mean scores of students from each paternal occupational category varied among geographic regions. She postulated that the status of government officers may be relatively lower in Bangkok, but higher in the Northeast where the majority of the population are in the agricultural sector. In a preliminary survey in both urban and rural areas of Thailand (Larphananon and Wongkiattirat, 1992), the observed SES indicators (education, occupation, and income) did not seem to represent the differences among rural populations to the same degree as they did in the urban areas (i.e., when using those indicators, the distribution of population in the urban areas was normal, while it was highly skewed in the rural areas). There is also a wide range of differences in socioeconomic status within each occupational category. For example, the category 'farmer' may include large landowners, tenants, or agricultural labourers (Setapanich, 1982: 59, 79, 132).

It is not clear how well socioeconomic status predicts students' achievement in different regions of Thailand, due to specific social, economic, and cultural



conditions in each regions. A number of questions thus arise regarding the effects of family socioeconomic background on students' achievement in Thailand:

1. Does aggregate students' SES predict average achievement scores?
2. How well do other measures of students' background (e.g., dialect, absenteeism rate) predict the average achievement scores?
3. Do the effects of SES (or other measures of social origin) vary among regions (e.g. Bangkok vs. the South, the Northeast)?
4. Do the effects of SES (or other measures of family backgrounds) vary by school subjects: Thai vs. mathematics, life experience, work experience, and character development?

## **2. The influence of school and teacher characteristics on students' achievement**

### **Results from research in industrialized countries**

General findings from American research show that the differences in school and teacher characteristics between schools are quite small; moreover, these small differences do not seem to exert a significant influence on students' academic achievement, when their family backgrounds are controlled (Coleman *et al.*, 1966). Research in other industrial societies tends to support the results of American studies (Peaker, 1971).

Large-scale survey research has examined the effects of both materials (school equipment, textbooks) and personnel (mainly teachers' qualifications, experience, and teaching methods) (Bridge *et al.*, 1979: 235-283; Fuller, 1986: appendix a). In order to assess the impact of certain school variables across a large number of schools in large-scale survey research, most of these measures have to be general and thus are rather crude.

Most large-scale survey research on the effects of schools in America usually relies on school average characteristics and thus may underestimate the effect of school-related variables on students' performance. Heyns (1986: 311-312) pointed out that most research that uses the between-school variance in achievement scores to determine the effect of a particular school variable, such as the Coleman report, will tend to underestimate the effect of school characteristics since it assumes that all students in the school are similarly affected by the school variables. On the other hand, individual-level characteristics, such as socioeconomic background, are bound to have greater "effects" on achievement than school-level variables, since only 15 to 25 per cent of the total variation in achievement lies between schools, while 75 to 85 per cent is within any one school (Heyns, 1986).

School and teacher quality appear to have only a small impact on students' achievement. Most research thus generally supports the notion that an improvement in provision of certain 'desirable' school resources, such as the number of books available, the student-teacher ratios, and the qualifications of teachers, will not necessarily improve the performance of students. Jencks *et al.* (1972: 109) argued that equalizing the quality of elementary schools would reduce the disparities in achievement scores by only 3 per cent or less, while equalizing the quality of high schools would reduce the disparities by only 1 per cent or less.

Although large-scale survey research in the United States tends to find only minor effects of school factors on students' achievement, the results are not clear and conclusive. School effects seem to vary among different ethnic groups, areas of residence, and level of schooling.

School resources appear to have relatively greater effect on the achievement of ethnic minority students, who tend to come from low socioeconomic

backgrounds (Coleman *et al.*, 1966). Integrating high-achieving students with the low-achieving ones seems to have a more positive effect on black students than on white students (Thornton and Eckland, 1980: 247-250; Meyer, 1970: 59-70).

The Coleman report (1966: 305) also found differences between urban and rural areas in the effect of the social composition of the student body, measured here by the turnover rate of students in schools. In the Southern U.S., students' achievement in rural schools was high where the turnover rate was high, whereas in the North, the achievement of students in urban schools was low where the turnover rate was high. This implies that the school effect may vary regionally.

Finally, elementary schools seem to exert relatively more influence on students' performance than high schools, as reported in Jencks *et al.* (1972). Research on the effects of high school tracking, with controls of students' past performance, show a very small effect of tracking on students' achievement scores (Jencks *et al.*, 1972; Heyns, 1974; Alexander and Cook, 1982). On the other hand, data obtained by observing classroom interactions in elementary schools show the effect of ability grouping assignment on the level of reading skills of students (Eder, 1981; McDermott, 1977). Although this line of research suffers from a small number of cases and difficulty in controlling the initial characteristics of students, it reveals the cumulative effect of teachers' expectations on students' performance. Rist (1970) and Mackler (1969) found that once the initial ability group assignments had been made, they were likely to be permanent with little or no mobility between groups even in higher grades (see also Eder, 1981; McDermott, 1977).

Research in industrialized countries has generally observed a small effect of school and teacher quality. However, the school effects may vary among

students from different socioeconomic backgrounds, regions, and level of schooling.

### **Results of research in developing countries**

Despite a relatively large quantity of research on school effects in America (Jamison *et al.*, 1981; Heyneman, 1986) which leads to a pessimistic view about schools' ability to moderate the influence of students' family backgrounds (see Simmons and Alexander, 1979), some findings from studies recently conducted in developing countries question the general results of American research about the small effects of school-related variables. Comparing the effects of school and teacher characteristics across 29 high- and low-income countries, Heyneman and Loxley (1983) found that the effects of school-related variables appeared to correlate negatively with the level of economic development of the country (see also Fuller, 1986; Fuller and Heyneman, 1989). Assumptions about research methods, differences in the distribution patterns and availability of school resources, as well as the roles of modern (often Western-styled) schooling in the developing countries raise the possibilities that the effects of school and teacher attributes on students' achievement there may be stronger than would be the case in the Western industrialized countries.

An assumption that family or school-related variables should have similar effects on students' achievement in all societies may lead to an underestimation of some potential variables. Heyneman and Loxley (1982) re-analysed the data from the survey by the International Association for the Evaluation of Educational Achievement (IEA) in 18 high- and low-income countries, and estimated the effects of school-related variables for each country separately. They found a substantial increase in the effect of school and teacher variables among the low-income countries (cf. Passow et al., 1976).

An assumption about linear relationships between school-related variables and students' achievement may also underestimate the effect of school and teacher characteristics. Most of the school resources in developing countries are still below the standard considered minimum in industrialized countries (Jamison *et al.*, 1981; Fuller and Heyneman, 1989). Some school variables may have certain threshold effects beyond which their variance does not contribute to any substantial increase in students' achievement (Mosteller and Moynihan, 1972; Schiefelbein, 1979: 139-140; cf. Bridge *et al.*, 1979: 22-25), which may result in the small effects of school resources found in American research. Schiefelbein (1979: 138) suggested that while American research such as Jencks *et al.* (1972) may assume that every student in American schools had at least a minimum number of textbooks and thus was more interested in their 'quality,' as measured by the prices of the books, the availability of textbooks itself may be important for the academic achievement of students in less industrial societies.

There seems to be little difference in the availability of educational resources between different schools and for students from different socioeconomic backgrounds in the U.S. (see Coleman *et al.*, 1966), which may partly explain the low degree of school effects. On the other hand, school resources in the developing countries seems to be more unevenly distributed (Schiefelbein, 1980: 137-139; Inkeles, 1979: 401; Heyneman and Loxley, 198), and thus they may be more effective in influencing student achievement.

It is not known whether the distribution of school resources in developing countries is more biased toward students from higher SES backgrounds than in industrialized countries or not. Heyneman and Loxley (1983b) found that the correlation of GNP per capita and the school quality/SES coefficients was not statistically significant, which means that there seem to be no significant differences between high- and low-income countries with regard to students'

access to school resources. On the other hand, the skewed distribution of school resources may still pose a serious problem of multicollinearity between two major sets of independent variables, if the school and teacher attributes are highly correlated with students' socioeconomic status (see Coleman, 1975). Students' SES may correlate with the amount of educational resources in the schools that they attend. For example, Heyneman (1975: 56-57, 60, table) found that in Uganda the location of schools (whether they are near urban centres or not) and the average socioeconomic status of the school was highly correlated with the amount of textbooks received by each school (cf. Niles, 1981). It may not be possible to resolve the problem of multicollinearity (Pedhazur, 1982), and thus the interpretations of school effects will have to be extremely cautious. However, in light of the recent claims by governments in Third-World countries on redistribution of educational resources as part of the programmes to reduce disparities in educational outcomes (for example, see the Educational Reform programme in Thailand mentioned in the first chapter), it is important to investigate first, whether the allocation patterns of school resources have become more equal or not, and second, what effects they have on students' achievement.

Although it is suggested by American research that in order to properly assess the effect of school and teacher characteristics on student achievement, these variables should be matched to each student in a school, Heyneman and Jamison (1980: 212) argued that using aggregated data for school variables may be appropriate for the educational system in Uganda (and thus to other developing countries with similar systems), because, pedagogy, curriculum, teachers and other specialist personnel, school equipment and materials were controlled by the central government and the differences that occurred were between schools, rather than within them. Also, in such cases, schools are

usually the basic unit for the central government to plan and decide on how to allocate educational resources.

Formal schooling, which many developing countries adopted from the Western societies, may be foreign to local traditions, and thus family or community may not be able to assist students in homework (Saha, 1983). Many parents in rural communities do not question what is taught in schools because they feel that they are not qualified to criticize teachers' knowledge or the curriculum that is planned from the central government (see Chantavanich *et al.*, 1990: 164). (Lareau [1993] noted similar situations with respect to lower-class parents' participation in school activities in the United States.) In such cases, the differences in family socioeconomic backgrounds may not be as influential as the characteristics of schools and teachers in predicting the academic achievement of children.

General findings from large-scale survey research in developing countries indicate stronger impact of school and teacher attributes than would be found in American research. Also, some experimental studies on the influence of availability of textbooks on students' achievement in developing countries (e.g., Nicaragua, Philippines) have found a small but significant impact for this school-related variable (Jamison *et al.*, 1981; Heyneman *et al.*, 1984). Reviews of studies on the influence of teacher characteristics on student achievement in developing countries (Husen *et al.*, 1978; Avalos and Haddad, 1981; Saha, 1983) showed that teacher characteristics (e.g. sex, qualifications, experience, personality) may be more influential than would be the case in Western industrial societies.

Results from research in developing countries on the influences of specific school and teacher variables are still few in numbers and in many cases, inconsistent (Simmons and Alexander, 1980: 77-95; Schiefelbein and Simmons,

1979; cf. Heyneman, 1980: 150-155). Some research yields similar findings to those found in industrialized countries, about the small effect of the school-related factors, such as class size (NEC, 1977; Heyneman, 1980: 155). However, other research has detected greater effects of other school and teacher attributes, although the evidence appears inconsistent. For example, Carnoy (1971, cited in Heyneman, 1980: 151) found a positive relationship between teacher's experience and student's achievement at the primary level in Puerto Rico, while Heyneman (1976) found no significant relationship between the two variables for Ugandan students. In addition, a teacher's cognitive ability was found to have moderate but significant impact on students' learning in Uganda (Heyneman, 1980: 152), but not in Thailand (Fuller and Chantavanich, 1976). The availability of books seems to be more consistently associated with the higher achievement of students in developing countries (Husen *et al.*, 1978, Heyneman, 1980: 153-154).

The effects of school-related variables seem to vary among students of different socioeconomic status. For example, the relationship between the availability of textbooks and higher achievement appears to be stronger among students from low socioeconomic backgrounds in Thailand and Chile (NEC, 1977; Schiefelbein and Farrell, 1977, cited in Heyneman, 1980: 153). This finding is reminiscent of the results obtained by the Coleman report about the impact of availability of science laboratories on achievement of ethnic minority students in the United States (Coleman *et al.*, 1966: 22).

Findings from research in some developing countries raise a possibility that an equal distribution of school resources may be able to reduce disparities in achievement of students from different socioeconomic backgrounds, owing to three main reasons, 1) school resources are still scarce, 2) a high degree of variance in resource availability between schools, and 3) the curriculum of



schools may be too recent for the family or community to prepare the children for. However, a larger number of case studies are needed to estimate the effect of school and teacher attributes in different conditions.

### **Results of research in Thailand**

As elsewhere, research on the relative effects of school-related variables in Thailand has obtained somewhat mixed results. The effects of schools and teachers' characteristics on students' achievement appear to vary among geographic regions, subjects, and types of residence.

The overall impression about the effects of school and teacher attributes in Thailand appears rather pessimistic: two nation-wide studies conducted in 1973 and 1979-1980 (NEC, 1977: 63-65; Chantavanich *et al.*, 1990: 88-89, 180) indicated that despite the existing disparities in educational resources between schools, programmes to equalize these resources would not significantly reduce the differences in achievement among students from different socioeconomic backgrounds. On the other hand, Leonor (1982: 120-121, table) using a different statistical method (canonical correlation) to reanalyse data from the 1973 survey, found a slight increase in the effects of teachers' scores in teaching methods. In another reanalysis of the 1973 survey, Setapanich (1982: 127, table) found that school-related variables had a relatively stronger impact than students' SES on student achievement in Thai language and mathematics, in all regions. Most of these studies also suffer from a small sample size and an under-representation of certain socioeconomic groups (Setapanich's data came from a sample of two students from each school, and students from low-educated parents in most regions were under-represented, see Setapanich, 1982: 53, 54), or limited to the national level only (Chantavanich *et al.*, 1990). Moreover, all of these studies were conducted prior to changes in curriculum content and administrative

systems, as well as to implementation of programmes to redistribute school resources during the Educational Reform (see Chapter 1).

The impact of specific school variables remains ambiguous and inconsistent. Thai research on the effects of availability of school textbooks did not yield consistent results for this school variable (as did research conducted in developing countries). Lockheed *et al.* (1986) found that teachers' regularity in using textbooks had a small but significant impact on mathematics achievement of lower secondary school students. On the other hand, NEC (1977) did not find that availability of textbooks had a strong and statistically significant impact on primary school student achievement, which may be partly due to a small degree of variance of this variable.

The roles of modern (Western-styled) schooling in a rural village may indirectly influence students' academic achievement; however, very few studies have examined the relationships between a school and the community where it is located, and how this may affect the average achievement of students in that community. Chantavanich *et al.* (1990: 53, table) found that the attitudes of community residents toward school seemed to directly exert a small but significant effect on students' achievement. An anthropological study of four villages in the Central region and the Northeast found that, regardless of school's impact on students' achievement in academic subjects, schools seemed to have a significant impact on students' social manners (Chantavanich *et al.*, 1990: 155). A study of the role of teachers in a Northeastern village (Gurevich, 1972: 227-230) noted a lack of participation in school activities among most villagers. However, the study was limited to one village and its main purpose was to investigate the leadership roles of teachers, and thus it could not explore how school-community relations influence students' achievement.

Some previous studies found that the effects of school and teacher quality seemed to vary among different regions, groups of students, and types of residence (rural vs. urban). Setapanich (1982: 156-158) found that in Bangkok the impact of school-related variables was greater for achievement in mathematics than in language; while in the other regions, school-related variables had greater influence on student achievement in language than in mathematics. Setapanich postulated that schools may help to improve the verbal achievement of students whose mother tongue is not Central Thai.

Raudenbush *et al.* (1991: 268) observed that the effect of pre-primary school attendance on student achievement in Thai language was more pronounced for high- than for low-SES students, and for the rural areas only. They contended that the pre-primary schools that high-SES students in the rural areas attended may be more effective in teaching the Central Thai dialect, and thus preparing these students for primary schooling. No data were available on the quality of pre-primary schools, however. On the other hand, low-SES students in the rural areas who do not use the Central Thai dialect in their daily life and did not attend pre-primary school may have greater difficulty in learning the Central Thai dialect at school (Raudenbush *et al.*, 1991). A lack of pre-schooling effect on achievement in mathematics found in their study may be because learning mathematics do not require as much verbal communication as learning the Central Thai dialect.

Lockheed and Longford (1989) asserted that the effects of lower secondary schools on student achievement in mathematics were much more uniform than previous research in developing countries would have suggested. However, their assertion may not apply to the primary level of schooling because: 1) the backgrounds of primary school students may be more varied than those of secondary school students due to the very low rate of continuation to the

secondary level (about 30 per cent for the national average, and about 10 per cent for the rural areas), and 2) the administrative agencies in charge of primary schools are much more varied, which may result in a larger range of quality.

The impact of school and teacher attributes on primary school students in Thailand is highly related to differences in socioeconomic and linguistic backgrounds among regions and areas of residence of the country. A number of questions arise with regard to the influence of school and teacher attributes on students' achievement in Thailand:

1. How well do the school and teacher characteristics predict students' scores?
2. Do the effects vary among regions?
3. Do the effects vary among different school subjects?

Research on factors affecting academic achievement in the developing countries has raised questions about the generality of findings from research in the industrialized countries. The present research is in part an effort to test the applicability of models derived from American studies to situations in Third-World countries such as Thailand.

### **Chapter 3**

#### **Research Methodology**

The data for this study were collected by the National Education Commission of Thailand (NEC), in cooperation with other government agencies, as part of a multi-purpose assessment of primary school quality in 1987-1988 (Project BRIDGES - Basic Research and Implementation in Developing Education Systems) (NEC,1990).

#### **Sample Population**

The population under consideration in this study consists of all primary schools, their staff, and their students, situated in 72 provinces or 13 educational regions throughout Thailand. In 1987, there were 34,098 primary schools under the authority of different administrations, mainly the Office of the National Primary Education Commission (ONPEC), the Private Education Office, some municipal governments, and the Bangkok Metropolitan authority (NEC, 1992b).

Schools were selected for participation in Project BRIDGES by a multi-stage stratified random sampling method. The first step involved the random selection of 25 per cent of the provinces in each educational region (with a minimum of one province in each region). Seventeen provinces and the Bangkok Metropolitan area (as the thirteenth educational region) were chosen in this way. Next, in each selected province, 20 per cent of all districts were randomly selected. For the Bangkok metropolitan area, 25 per cent of the 13 sub-administrative districts were selected. (See Appendix A for the names of educational regions, provinces and districts where the samples were selected.) Within each administrative district, a simple random sample of schools was selected, whereby about 20 per cent of each type of school (or at least one school of each type) in that district was chosen. From each school, data were collected from the school principal, all

Grade-six teachers and one teacher from each of the five other grades (chosen through simple random sampling), and all sixth-grade students who participated in the national standardized tests in 1987 (organized by the Ministry of Education and the ONPEC). Twenty per cent of the parents of those students in the sample were also selected by random sampling to participate in the survey.

### **Data collection**

A pilot study was conducted between 24-25 December, 1987, in order to test and improve the questionnaires before putting them into use in 1988. The pilot study was done at three schools in Ang Thong province (in the Central region), through 4 different questionnaires administered to 3 school principals, 36 teachers, 110 students, and 24 parents of students. All four types of questionnaires were then redesigned based on the data collected in the pilot study.

Data collection for the main study took place between 8 February and 15 March, 1988. Representatives from the four educational administrative authorities, namely the ONPEC, the Private Education Office, the municipal educational offices, and the Bangkok Metropolitan educational office, were invited to attend a meeting where the objectives and procedures of the research were presented. In the Bangkok metropolitan area, the researchers from the NEC were in charge of the distribution and collection of questionnaires from the sample schools. Government officers in charge of education at the provincial and district levels implemented the survey in the rest of the country. The data for the present study were drawn from 415 schools, 415 principals, 3,808 teachers, and 9,768 students.

## **Research Instruments**

In the BRIDGES Project, four types of questionnaires were administered to four groups of people, namely school principals, teachers, students, and parents. (For this study, the information collected from the parents is not available. See NEC [1992] for more details.) Standardized achievement tests in five subject blocks were conducted with Grade-6 students in 1987.

The questionnaires for school principals asked about their personal background, such as sex, age, marital status, religion, educational qualifications, experience as school principal in general and in the particular sample school, attendance at academic-related training programmes in the past three years, as well as their working conditions, such as the proportion of time school principals spent per week on teaching and administration, in-service training for school personnel, activities in human resource development, provision of services for the students, and activities within the local community. The questionnaires for school principals also asked about general conditions of the school and community, such as the size of school, location of the school, school equipment and facilities, teaching facilities, and the access to community infrastructure.

The questionnaires for teachers were about their personal background, including age, income, educational qualifications, in-service training over the past three years, as well as about their working conditions, including the proportion of time teachers spent per week on preparation of lessons, counselling, and remedial lessons, about the availability and utility of teaching facilities, in-service training programmes held inside or outside school, and allocation of time to various activities per teaching hour.

The questionnaires for Grade-6 students covered their background characteristics, such as dialect, education and occupation of parents, number of years students attended pre-primary schools, record of repetitions in previous

grade(s), previous grade average (Grade 5), record of absence from class(es) for the term when the questionnaire was administered, doing homework after school, assistance with homework from other family member(s) or friend(s), parental encouragement (in reading books), students' assisting with parents' work, amount and regularity of students having pocket money to take to school, sufficiency of food, report of sufficiency of textbooks and exercise books at home.

The achievement tests were conducted by the ONPEC and the Ministry of Education (MOE) with Grade-6 students in 1987, in five subject areas, namely,

1. the Thai language, including listening, reading comprehension, grammar (language usage), and writing (spelling),
2. mathematics, including concepts, problem solving, and applications of mathematic skills,
3. life experience, including understanding health and how to achieve good health; understanding the importance of the nation, religion, and monarchy; understanding the existing pattern of democracy in the country (constitutional monarchy); understanding the economy and different kinds of occupations; understanding science and technology, and (basic) scientific skills,
4. work experience, including basic skills for work,
5. character development, including self-discipline, how to live and work with other people, motivation for work, certain desirable habits such as diligence, frugality, honesty, tolerance, loyalty to the nation-religion-monarchy, and a sense of appreciation for the national art and culture.

The achievement tests have been tested for their reliability (Cronbach's alpha is 0.89, indicating that the tests results are consistent with each other) (Personal communication with Bhumirat, 1992).



The data analyzed in this study were supplied by Dr. Chinnapat Bhumirat, of the National Educational Commission of Thailand (with the permission of the Secretary General of the NEC). A selection of variables aggregated to the school level was provided in the form of an SPSS/PC+ file. Because this data set was compiled for another study (NEC, 1990a, 1990b, 1992), some of the relevant variables collected are not available in the data set.

### **Research Variables:**

The research questions first focus on how the two major sets of variables, namely, students' background, aggregated at the school level, and school conditions, may influence average students' achievement, and second, on how the effects of these two sets of variables may vary among regions with different economic and cultural conditions. To answer those questions, a number of variables (Table 3.1) have been selected from the available data to represent aggregate students' backgrounds, school conditions, and students' achievement.

Table 3.1 Variables selected for this study

<u>Independent Variables</u>	
<u>Variables related to Students' Backgrounds:</u>	
Aggregate students' SES	
Proportion of students speaking Central Thai	
Average absenteeism rate	
Proportion of students receiving assistance with homework	
<u>Variables related to School-Conditions:</u>	
School size (number of classrooms)	
Percentage of teachers with B.A. degrees, in 1987	
Average student-teacher ratios, in 1987	
Number of available teaching aid categories	
Proportion of teachers' time spent teaching (% per week)	
Proportion of teachers' time spent checking homework (% per week)	
<u>Overlapping variables:</u>	
Average number of textbooks per student	
Average number of years students spent in pre-primary schools	

Table 3.1 (cont'd) Variables selected for this study

<u>Dependent Variables</u>
<u>Average Students' Achievement:</u>
Thai language
Mathematics
Life experience (general knowledge)
Work experience
Character development

These variables are described and discussed below.

### **1. Variables representing aggregate students' background**

Previous research in industrialized and developing countries has obtained opposing results about the effect of students' background on achievement (see Bridge *et al.*, 1979: 213-227; Heyneman and Loxley, 1983). In addition, studies in developing countries (Lockheed *et al.*, 1989; Moock and Leslie, 1986; Hess *et al.*, 1980) have suggested that non-material variables may better reflect students' backgrounds and that they operate independent of SES. The following variables (Table 3.1) are selected to represent both the material and non-material aspects of aggregate students' backgrounds, that have been observed, or suggested by previous research, to contribute to students' achievement.

#### **a. Aggregate students' SES**

Use of students' socioeconomic status (SES) as an independent variable is problematic. The BRIDGES project data on aggregate students' SES, compiled from information on parents education and occupation, and the amount of pocket money the students took to school, are questionable because they showed that the average SES of the Northeast was higher than that of the Bangkok Metropolis, which according to the extant evidence (Ikemoto, 1991: 60, table; Knodel *et al.*, 1987: 47, table) is unlikely. Use of other variables in the BRIDGES

database as a proxy measure of aggregate students' SES is likely too subjective to be reliable; for example, asking the students about their nutritional status; whether they have had enough food or not. Therefore, in this study aggregate students' SES is represented by the only available alternative data, the gross provincial product (GPP) per capita in 1987, as reported to the National Economic and Social Development Board (NESDB) of Thailand (NSO, 1991: 364-367, table). Although the NESDB data on GPP are collected at the provincial level - not the school level, and thus do not show the variations within each province, this measure of aggregate students' SES appears to be a more objective, and reliable measure than the BRIDGES SES data, and will suffice.

For the Bangkok Metropolitan region, average household income for the three major zones (i.e., core, suburbs, and fringe areas), obtained from the National census (NSO, 1986), will be used because the single GPP datum for Bangkok does not allow calculation of variance, which is essential for the regression analyses.

Since both GPP per capita and average household income are being used as proxy measures for the aggregate socioeconomic status of the students', these variables will be referred to by the single name "aggregate students' SES" in the following discussions. It should be noted that GPP per capita in fact reflects the level of economic development in a province rather than the average level of SES of students in a school, therefore, "aggregate students' SES" can only be used for comparisons at the province or region levels and will not provide information about individual schools or students within the province.

#### b. Proportion of students speaking Central Thai

The proportion of students in a school who speak the Central Thai dialect at home reflects the compatibility between language used in school (i.e., Central

Thai dialect) and at home. Schools with a large proportion of students who speak Central Thai may have advantages in that students in those schools can learn subject material and communicate with teachers more easily, thus resulting in higher achievement levels.

c. Average absenteeism rate

The average absenteeism rate may reflect the overall degree of poverty of students in a school, lack of students' motivation for studies, or even school policies on students' attendance. Hence, average absenteeism rates (measured at the school level) may show a correlation with averaged achievement scores for schools.

d. Proportion of students receiving assistance with homework

Students in a school who receive assistance from their family members or friends with school work may benefit from improved understanding and academic achievement. The proportion of students in a school who report that they receive assistance from their family members or friends with school work may thus be correlated with averaged achievement scores for their schools.

Other measures of aggregate students' background such as housing conditions, students' opinions about their ability, or reports of how students actually spend time, may better predict their academic achievement. However, these measures are not available in the data set. In addition, personal characteristics of the students, such as sex, age, or tested ability, will not be examined, since this study compares the influence of students' contextual backgrounds with the influence of school resources.

## **2. Variables representing school conditions**

While research conducted in industrialized countries is generally pessimistic about the effectiveness of school resources in enhancing students' achievement (Coleman *et al.*, 1966; Jencks *et al.*, 1972; Bridge *et al.*, 1979; Peaker, 1971), more recent studies in developing countries suggest that certain material aspects of schools (i.e., school conditions and personnel), which are largely controlled by the central government, may be more influential than originally expected (Heyneman, 1986; Fuller, 1987; Fuller and Heyneman, 1989).

### **a. School size**

School size is measured by the number of classrooms. Research in developing countries has indicated that school size has a positive effect on students' achievement scores (Fuller, 1985: 26; Chantavanich *et al.*, 1990: 53, table). This may be because larger schools are better equipped and thus provide a better opportunity to learn.

School size may also correlate with or act as a proxy for other school variables relating to the administration and management of school resources, and the provision of a learning conducive atmosphere, that are not directly measurable or present in the data set.

### **b. Percentage of teachers with B.A. degrees, in 1987**

The educational qualifications of the teachers may reveal their levels of knowledge and skill, which in turn may affect the students' achievement.

### **c. Average student-teacher ratios, in 1987**

Average student-teacher ratios may reflect the teachers' work load and ability to pay attention to each student, and thus influence the students' achievement.

d. Number of available teaching aid categories

Teaching aids (e.g., teachers' instruction manuals, textbooks and supplementary reading materials, chalk, paper, posters, maps, scientific instruments, kitchen utensils, carpentry tools, agricultural tools, etc.) may assist teachers' work, and thus affect students' achievement.

e. Proportion of teachers' time spent teaching (% per week)

The proportion of time per week that teachers allocate to teaching reflects the amount of contact students have with their teachers.

f. Proportion of teachers' time spent checking homework (% per week)

A similar variable to number 5, the proportion of time per week that teachers allocate to checking homework may reflect the amount of attention that teachers pay to students' work.

Additional school related variables such as the teachers' subject specialization, teaching styles, degrees of motivation and responsibility, cognitive ability, and the students' peer group conditions, may have a significant impact on the students' achievement. The present data set does not provide information on these variables.

### 3. 'Overlapping' Variables

The average number of textbooks and average number of years that students spent in pre-primary schools (both aggregate school level measures), can be considered as components either of the aggregate students' backgrounds or of school resources, and are thus called overlapping variables. On the one hand, most studies consider them school-related variables (Jamison *et al.*, 1981;

Heyneman *et al.*, 1984; Raudenbush *et al.*, 1991), largely because educational administrators can reduce inequalities in school resources by providing free textbooks and / or pre-primary school programmes to students from low income families, or who live in less developed communities. On the other hand, these variables may reflect the aggregate students' backgrounds, as some parents may be more able than others to provide students with preschooling or additional textbooks and exercise books. This dichotomy must be considered in discussion of these variables.

#### **4. Variables representing average students' achievement**

In this study average student achievement (hereafter called students' achievement) is represented by five dependent variables. Previous research suggests that the influence of aggregate students' background and school resources may vary among different school subjects (Coleman, 1975; Kostakis, 1987). Students' achievement is represented by the average standardized scores that Grade-6 students in each school obtained on tests in five different subject areas, specifically: Thai language, Mathematics, Life experience (or general knowledge), Work experience, and Character development.

#### **Units of Analysis**

Previous research has differed in the units of analysis used to represent student achievement, students' background, and school characteristics. They depend on the researchers' objectives and interests, as well as on the availability of data. Some researchers have used aggregate data for both dependent and independent variables (Armor, 1972; Hanushek, 1972; Bidwell and Kasarda, 1975; Heyneman, 1977). The larger proportion of researchers have used individual-level data to represent student achievement and background, while

data on schools are aggregated and averaged or are about the overall characteristics of school itself (Coleman *et al.*, 1966; Heyneman and Loxley, 1983a and 1983b; see Heyns, 1986: 311-312). This imbalance in units of analysis has been mentioned as a factor contributing to the small effect of school-related variables relative to student background found in previous research (Coleman, 1975: 377; Heyneman and Loxley, 1983b: 1172; Heyns, 1986) (see Chapter 2).

In this study, only aggregate data (averages, proportions, standardized scores) are available for students' achievement, background, and school characteristics. The dependent variables, achievement scores, are averaged from the individual scores of students in each school and then standardized. Independent variables related to aggregate students' background are averaged (e.g., average absenteeism rate), are only proportions of students in the school who fall into certain categories (e.g., speaking Central Thai, receiving assistance with homework), or are averaged across the province where the school is located (e.g., the average income of residents estimated as gross provincial product per capita). School-related variables represent resources available to all students in the schools; they do not account for differential access among the students to those resources. In short, these aggregate measures do not show the characteristics of each individual student in a school.

Using aggregate data as in the present study means that while the results pertain to the students as a group (school in this case), they do not necessarily provide information about individual students. Robinson (1950) has described the problem of 'ecological fallacy' which is an error that occurs when using 'group level' data to make inferences about relationships between variables at the individual level (see also Goodman, 1959; Duncan *et al.*, 1961; Blalock, 1964: 97; Dogan and Rokkan, 1969; Selltiz *et al.*, 1976: 439-440; Kidder and Judd, 1986:



318-319, 371-372; Lam and Quattrochi, 1992: 89-90). For example, a high positive correlation between the percentage of immigrants and the percentage of illiterate population in an area does not mean that immigrants are illiterate, i.e., the correlation between the two variables at the individual level may be low or even negative. In addition, aggregate data obscure the variations among individuals within the schools when information about the distribution of individual attributes within the school is not available, i.e., when we do not know how widely dispersed a particular sample is from the central tendency or averages. Finally, the correlations between variables obtained from analyses using aggregate data tend to be stronger than those obtained from individual-level data (Robinson, 1950: 356; Bridge *et al.*, 1979: 90-92; see Hannan, 1971: 489-490).

Due to the aggregate nature of the BRIDGES data, the research questions outlined in Chapter 2 must be modified, as follows:

1. How does aggregate students' SES affect the average standardized scores of students in the school?
2. How do the aggregate non-material characteristics of students in a school affect the average scores of students in that school?
3. How do school characteristics affect the average scores of students in that school?
4. Do the effects of either aggregate students' background or school characteristics on average scores vary by region?
5. Do the effects of either aggregate students' background or school characteristics on average scores differ from subject to subject?

There are two points that need to be emphasized before discussing the results in the next chapter. First, the relationships between variables in this study will pertain to the school level (and in the case of aggregate students' SES, to the

provincial level) only, because relationships between variables tend to be specific to a particular scale or unit of analysis (Lam and Quattrochi, 1992: 89-90; Harvey, 1968: 71-72), and so far it has not been possible to predict a priori which sets of relationships will be influenced by the change in units of analysis of variables (Fotheringham and Rogerson, 1993: 6; Blalock, 1964, cited in Hannan, 1971: 491). Second, it should be noted that the differences in levels of aggregation between aggregate students' SES and other variables make it impossible to reliably compare the effects of aggregate students' SES with other independent variables.

In spite of the limitations inherent in using aggregate data, the results of this study will still be useful in providing information on the relative impact of aggregate students' background and school conditions on average achievement scores of students, at the school level. Although Armor (1972) has observed similarities in the relative strengths of the effects of students' background versus school conditions on achievement, whether the units of analysis are individual or aggregate; the lack of individual-level data in the present study does not allow examination of such similarities. However, the results of aggregate-level analyses may be useful for policy planners interested in increasing the overall achievement levels of students since the school is generally considered the basic unit for (re)allocation of resources in most government-run redistribution programmes.

### **Analytical procedures used in this study**

The procedures used in this study were the analysis of variance (ANOVA) in order to determine whether there are in fact regional differences in achievement to be explained, and multiple regression analyses in order to estimate and

compare the relative effects of the selected independent variables on students' achievement.

First, the students' achievement scores in five subjects was subjected to ANOVA, to see if they vary significantly across regions or not. Regional variations in aggregate students' background and school conditions were also examined. Second, a preliminary ANOVA was done to identify the presence of effects on achievement from the selected independent variables. This was done using one representative variable from each of the three independent variable groups, namely, aggregate students' SES, school size, and average number of textbooks available to each student in the school. These three variables have been suggested by previous research to affect students' achievement (Coleman *et al.*, 1966; Fuller, 1985; Heyneman, 1980).

Since some of these independent variables may correlate with each other, leading to under- or over-estimation of other variables effects, ordinary least squares (OLS) regression analysis was conducted, whereby all variables are entered simultaneously into the regression equation. Standardized regression coefficients were used to determine the relative effects of aggregate students' background and school conditions on students' achievement. The analyses were done at both the national and regional levels, and for each of the five different subjects.

### **Treatment of missing values**

In this study, listwise treatment of missing values was used, whereby cases with missing values for any of the variables were excluded from the analysis. Except for two school-related variables, teachers' qualifications and student-teacher ratios, the number of missing values for each of the variables included in the analysis is lower than 5 per cent. However, the missing values are

distributed randomly across the cases; therefore, of the 415 primary schools sampled in the BRIDGES survey project, complete data for the analyses were obtained from 342 cases (or 82 per cent of the total sample).

## **Chapter 4**

### **Results and Discussion**

#### **4.1 The quality of data**

Averaged students' achievement scores in three academic subjects (Thai, mathematics, life experience) and two non-academic subjects (work experience and character development), which are the dependent variables in this study, were first tested for reliability. Cronbach's Alpha, which measures the reliability and consistency (see Bohrnstedt, 1970: 89-91) of the achievement scores was .911 (on a scale of 0 to 1), indicating that the values obtained from the achievement scores are highly consistent with one another. In other words, in schools where students' averaged scores are high in one subject, they are usually high in the other subjects too. However, achievement scores in character development have slightly lower correlations with scores obtained in the other subjects.

Due to the aggregate nature of the available data, the following discussion pertains to variations in achievement only at the school level, and thus cannot assess how aggregate students' background and school conditions affect academic achievement at the individual level.

#### **4.2 Regional variations in achievement scores**

Students' achievement scores are the outcomes of various factors, principally aggregate students' background and school conditions. There has been a debate between research conducted in Western industrial countries and research in developing countries on which of the two sets of factors, students' background or school conditions, has greater impact on students' achievement (see Coleman *et al.*, 1966; Jencks *et al.*, 1972; Heyneman and Loxley, 1983). Rather than comparing countries I begin by examining within country regional variation. The

variations in students' achievement scores across the five regions of Thailand will be discussed first.

Table 4.1 shows the distribution of average achievement scores among the five regions of Thailand. The differences in achievement scores between regions, as indicated by the F-ratios, are large and statistically significant ( $p < .05$ ). Regional variation in achievement is higher for the three academic subjects than for the two non-academic subjects, as reflected in the higher F-ratios for the former.

Table 4.1: Average standardized achievement scores\* in five different subjects for the five regions in Thailand +

Subject	Region					F-ratio
	Central	North	Northeast	South	Bangkok	
Thai	-.00 (.541)**	.08 (.542)	-.32 (.516)	-.38 (.728)	.38 (.500)	20.69 ( $<.000$ )***
Mathematics	.03 (.621)	.02 (.689)	-.30 (.571)	-.35 (.551)	.37 (.737)	13.76 ( $<.000$ )
Life experience	-.03 (.479)	-.07 (.637)	-.25 (.584)	-.29 (.606)	.32 (.555)	10.95 ( $<.000$ )
Work experience	.00 (.525)	-.03 (.536)	-.07 (.598)	-.30 (.480)	-.01 (.374)	3.28 (.012)
Character development	-.04 (.406)	-.08 (.599)	-.10 (.593)	-.10 (.368)	.13 (.398)	2.46 (.045)

\* Achievement scores are standardized, with a mean of 0 and standard deviation of 1.

\*\* Standard deviations

\*\*\* significance levels for the F-ratio

+ The average scores reported for the Central and Northeast regions have excluded two outlier provinces, Sing Buri and Loei, respectively, see Appendix B.

The rank ordering of achievement scores is generally similar for academic and non-academic subjects. The differences in students' achievement between Bangkok and the rest of the country observed in previous research (NEC, 1977; Sudaprasert *et al.*, 1982; Chantavanich *et al.*, 1990) continue to be evident. Schools in the Bangkok Metropolitan region have the highest average scores,

except in work experience. Schools in the South and the Northeast have the lowest scores. Schools in the Central and North regions rank in the middle.

#### **4.3 Regional variations in aggregate students' background and school conditions**

Regional variation in achievement outcomes may be related to differences in the social context of regions. The five regions in Thailand differ in both aggregate students' background and availability of school resources, and these may contribute to the variation in students' achievement.

As indicated by the F-ratios and their levels of statistical significance, the regional differences in aggregate students' background and availability of school resource variables are large, except for one school condition variable, the proportion of time teachers spend teaching (Table 4.2).

The rank ordering of aggregate students' background variables is similar to that of achievement scores, with the Bangkok Metropolitan region having higher average socioeconomic status (SES), and a large proportion of students speaking Central Thai and receiving assistance with homework. It is followed by the Central region. However, the average absenteeism rates of students in both Bangkok and Central regions are higher than in the other regions. In general, the average SES of Southern students is relatively high, but a very small proportion of them speak the Central Thai dialect, which is the language of instruction at school. The Northeast has the lowest SES level and proportion of students who speak Central Thai. The North has the lowest proportion of students who reported receiving assistance with homework than the other regions, but otherwise ranks in the middle for other aspects of aggregate students' background.

Table 4.2: Average values for aggregate students' background and school condition variables<sup>+</sup> in different regions of Thailand.

Variable	Region					F-ratio
	Central	North	Northeast	South	Bangkok	
<u>Aggregate students' background:</u>						
GPP /capita in 1987 (Baht)	21,040 (8,581)*	15,076 (2,797)	6,717 (260)	21,280 (9,786)	82,905 (-----)	2,225.12 ( $<.000$ )**
Students' dialect	.95 (.167)	.35 (.432)	.03 (.071)	.19 (.288)	.97 (.031)	197.26 ( $<.000$ )
Average absenteeism rate	.81 (.292)	.63 (.328)	.63 (.344)	.72 (.351)	.91 (.198)	11.39 ( $<.000$ )
Students receiving homework help	.51 (.226)	.46 (.250)	.47 (.277)	.49 (.255)	.57 (.148)	2.76 (.028)
<u>School conditions:</u>						
School size (# of classrooms)	12.18 (10.648)	11.85 (10.392)	10.15 (4.289)	13.76 (12.181)	22.24 (14.821)	13.69 ( $<.000$ )
Teachers with B.A. (%)	60.10 (20.971)	57.45 (22.072)	44.33 (18.826)	51.90 (21.046)	57.14 (29.057)	6.30 ( $<.000$ )
Student-teacher ratios	19.21 (5.793)	20.57 (6.389)	21.81 (6.135)	21.51 (4.778)	24.05 (5.063)	5.48 ( $<.000$ )
Teaching aids	24.68 (3.671)	22.02 (3.825)	21.75 (2.714)	23.14 (2.584)	23.70 (4.337)	9.19 ( $<.000$ )
Time teaching (% per week)	48.65 (8.987)	50.56 (7.021)	50.74 (7.281)	49.41 (8.213)	49.08 (6.522)	1.15 (.333)
Time checking homework (%)	12.54 (4.963)	10.41 (3.017)	9.28 (2.875)	10.93 (3.476)	14.80 (3.624)	23.50 ( $<.000$ )
<u>Overlapping Variables:</u>						
Textbooks	4.75 (.940)	4.52 (1.043)	4.08 (1.057)	4.24 (.721)	5.41 (.661)	21.53 ( $<.000$ )
Pre-schooling	.90 (.556)	.73 (.563)	.21 (.407)	.77 (.536)	.95 (.560)	26.07 ( $<.000$ )

<sup>+</sup> For a description of variables see Chapter 3.

\* Standard deviations

\*\* significance levels of F-ratios

There are also differences in school conditions among the five regions of Thailand. Schools in the Central region have a higher proportion of teachers with B.A. degrees, low student-teacher ratios, and more teaching aid categories than schools in the other regions. Bangkok schools are larger than those in the other regions; however, the student-teacher ratios are also the highest of the country.



In addition, there is a greater degree of variation in the proportion of teachers with B.A. degrees among Bangkok schools. Northeastern schools are on average of smaller size, with the lowest proportion of teachers with B.A., and fewer teaching aids available. Schools in the South and the North generally rank in the middle. Teachers in the Bangkok Metropolitan and Central regions spend a larger proportion of time per week on checking homework than teachers in the other regions, while northeastern and northern teachers spend a slightly larger proportion of time on teaching in the classroom.

The five regions also differ in availability of textbooks and pre-schooling, with students in the Bangkok Metropolitan and the Central regions having on average more textbooks available and having attended pre-schools for longer periods of time than those in the other regions. The Northeast has the lowest average number of textbooks per student, and a lower level of pre-school participation. It is not known how much these regional variations in availability of textbooks and pre-schooling result from differences in aggregate students' backgrounds or from the government's policies on allocation of these resources. For this reason they are considered "overlapping variables."

Clearly, regional differences are present in both the dependent variables (achievement scores) and independent variables. Because of these differences, the analysis of effects at the national level, while it may provide for comparisons with other studies, is unlikely to provide much useful information on how school and family conditions affect achievement scores within Thailand. From the students' perspectives schools are a local phenomenon, thus the effects of independent variables in the students' achievement will be felt at that level.

#### 4.4 Preliminary Analysis

A preliminary analysis was conducted with the national-level data in order to see how achievement scores are distributed among different groups of students, and to identify the presence of effects on achievement from the selected independent variables. Students were grouped according to their socioeconomic background, the average number of textbooks available, and the size of schools that they attend. The F-ratios and their level of significance show that these three variables all influence students' achievement scores (Tables 4.3, 4.4 and 4.5). Generally, the variations in achievement scores on the basis of SES groups are smaller than the differences among students who attend schools of different sizes and possess different numbers of textbooks. The differences in achievement are larger for academic than for non-academic subjects.

Table 4.3 : Distribution of achievement scores by provincial socioeconomic categories (using GPP per capita as a proxy measure for SES).

Subject	SES Category of Provinces			F ratio
	Low	Middle	High	
Thai	-.26 (.557)*	.01 (.783)	.17 (.568)	15.43 (<.000)**
Math	-.26 (.566)	.06 (.832)	.15 (.702)	12.56 (<.000)
Life Experience	-.27 (.565)	.03 (.910)	.15 (.559)	12.36 (<.000)
Work Experience	-.09 (.591)	.09 (.959)	-.02 (.451)	2.36 (.096)
Character Development	-.15 (.531)	.08 (.780)	.05 (.396)	6.08 (.003)

\* Standard deviations

\*\* Levels of statistical significance for the F-ratios

The general pattern in Table 4.3 is consistent with the hypothesis that as the SES of an area rises, the aggregate achievement scores of students in that area

will rise. On the three academic achievement measures this pattern is consistent. For instance, the lowest SES group scores -.26 in Thai language achievement, relative to scores at .01 and .17 respectively, for the middle and upper SES categories. This pattern is not, however, consistent for the non-academic subjects, and for work experience there is no systematic difference between SES groups.

Table 4.4: Distribution of achievement scores by school size (as a proxy measure of school resources)

Subject	School Size			F ratios
	Small	Medium	Large	
Thai	-.25 (.659)*	-.13 (.622)	.34 (.596)	31.26 (<.000)**
Math	-.11 (.672)	-.18 (.701)	.28 (.758)	14.75 (<.000)
Life Experience	-.23 (.696)	-.13 (.727)	.33 (.642)	23.09 (<.000)
Work Experience	-.07 (.750)	.01 (.7968)	.09 (.5608)	1.84 (.160)
Character Development	-.04 (.580)	-.13 (.718)	.16 (.475)	7.48 (.001)

\* Standard deviations

\*\* Levels of statistical significance for the F-ratios

School size is considered a proxy measure of availability of school resources, which are hypothesized by research conducted in developing countries to have a positive impact on students' achievement (see Fuller, 1985: 26, table). The consistent correlations between students' achievement scores and school size as shown in Table 4.4 support this claim. For example, students in small schools have lower average scores in Thai language (-.25) than those from the medium and large schools (-.13 and .34 respectively). The F-ratios also indicate that

school size has a stronger effect on academic subjects than on the non-academic ones.

The availability of textbooks has a consistent influence on students' achievement scores for both academic and non-academic subjects (Table 4.5). In the group where the average number of textbooks per student is low, the average achievement scores are also low (-.26 for Thai language, in comparison to -.08 and .27 in the other two groups.) This agrees with findings from research in developing countries, that the quantity of textbooks has a more consistent effect on students' academic achievement than found in American research (Jamison *et al.*, 1981; Lockheed *et al.*, 1986; Hanushek, 1986).

These three variables may be correlated with one another and with other variables associated with aggregate students' background and school conditions. Moreover, it is not yet clear whether aggregate students' background has more or less impact on academic achievement than school resources.

Table 4.5: Distribution of achievement scores by number of textbooks available

Subject	Number of Texts per Student			F ratios
	Few	Some	Many	
Thai	-.26 (.626)*	-.08 (.603)	.27 (.683)	24.96 (<.000)**
Math	-.21 (.618)	.08 (.675)	.24 (.820)	14.54 (<.000)
Life Experience	-.26 (.627)	-.12 (.617)	.29 (.793)	24.89 (<.000)
Work Experience	-.08 (.629)	-.14 (.522)	.19 (.879)	8.44 (<.000)
Character Development	-.16 (.510)	-.10 (.599)	.25 (.624)	19.83 (<.000)

\* Standard deviations

\*\* Levels of statistical significance for the F-ratios

#### **4.5 Comparisons of the relative effects of aggregate students' background and school conditions on students' achievement in Thailand: results from multiple regression analyses**

While research conducted in industrialized countries found that students' SES has a stronger impact on achievement scores than do school resources (Coleman *et al.*, 1966; Jencks *et al.*, 1972), recent research in developing countries has obtained opposite results (Heyneman and Loxley, 1983; see Fuller, 1985). However, due to the aggregate nature of data in this study, it is not possible to directly test these propositions. The effects of aggregate students' background and school conditions observed here will apply to students collectively, but not necessarily to individual students. Multiple regression analyses were thus conducted to examine which of these claims apply in Thailand.

Table 4.6 lists the three strongest variables affecting achievement for each subject in each region, as indicated by standardized coefficients. For the national level, all of the significant variables have been listed. Variables that have statistically significant effects on students' achievement scores are printed in bold letters. The criteria of statistical significance for this study is .05 or lower.

The aggregate nature of data may have obscured the degree of collinearity between students' background and school resources, which has been observed in previous research (Coleman, 1975). In this study, the variables selected do not appear strongly correlated with each other (see Appendix C: Correlation matrices). Moreover, the effect of each variable is assessed when all other variables in the model are controlled. Therefore, the regression coefficients obtained reflect the independent effects of the selected variables.

Table 4.6: Rank orders of independent variables for each subject, nationally and within each region. (Bold entries are statistically significant.)

Thai	Math	Life Experience	Work Experience	Character Development
<u>National</u>				
<b>Dialect</b> <b>School Size</b> <b>Absenteeism</b> <b>No. of Texts</b> <b>Teachers with BA</b>	<b>Dialect</b> <b>School Size</b> <b>Absenteeism</b> <b>Time Teaching</b>	<b>Dialect</b> <b>Absenteeism</b> <b>School Size</b> <b>No. of Texts</b> <b>Time Teaching</b> <b>Help In homework</b>	<b>Dialect</b> <b>GPP / Capita</b> <b>Absenteeism</b> <b>Teaching Aids</b>	<b>Absenteeism</b> <b>No. of Texts</b> <b>Pre-schooling</b> <b>Dialect</b> <b>Time Teaching</b>
<u>Central</u>				
<b>GPP / Capita</b> <b>School size</b> <b>Absenteeism</b>	<b>GPP / Capita</b> <b>Textbooks</b> <b>Pre-schooling</b>	<b>GPP / Capita</b> <b>Pre-schooling</b> <b>School Size</b>	<b>GPP / Capita</b> <b>Marking Homework</b> <b>Time Teaching</b>	<b>No. of Texts</b> <b>GPP / Capita</b> <b>Pre-schooling</b>
<u>North</u>				
<b>School Size</b> <b>Pre-schooling</b> <b>Gpp / Capita</b>	<b>School Size</b> <b>Students/ Teacher</b> <b>Help in homework</b>	<b>Help in homework</b> <b>School Size</b> <b>Students /Teacher</b>	<b>Help in homework</b> <b>Absenteeism</b> <b>Pre-schooling</b>	<b>GPP / Capita</b> <b>Teaching Aids</b> <b>Absenteeism</b>
<u>Northeast</u>				
<b>School Size</b> <b>No. of Texts</b> <b>GPP / Capita</b>	<b>Time Teaching</b> <b>GPP / Capita</b> <b>Absenteeism</b>	<b>Time Teaching</b> <b>GPP / Capita</b> <b>School Size</b>	<b>GPP / Capita</b> <b>Mark'g Homework</b> <b>Time Teaching</b>	<b>Time Teaching</b> <b>No. of Texts</b> <b>Mark'g Homework</b>
<u>South</u>				
<b>School Size</b> <b>Help in homework</b> <b>GPP / Capita</b>	<b>School Size</b> <b>Absenteeism</b> <b>Dialect</b>	<b>Absenteeism</b> <b>School Size</b> <b>Pre-schooling</b>	<b>Absenteeism</b> <b>School Size</b> <b>Dialect</b>	<b>Absenteeism</b> <b>School Size</b> <b>Pre-schooling</b>
<u>Bangkok</u>				
<b>Teachers with BA</b> <b>Absenteeism</b> <b>Pre-schooling</b>	<b>School Size</b> <b>Pre-schooling</b> <b>Marking Homework</b>	<b>School Size</b> <b>Absenteeism</b> <b>Dialect</b>	<b>School Size</b> <b>Dialect</b> <b>Help in homework</b>	<b>School Size</b> <b>Pre-schooling</b> <b>Help in homework</b>

General results from the national-level analyses show that the aggregate non-material measures of students' background have slightly greater impact on achievement scores than school conditions, while aggregate students' SES does not have a strong effect except on work experience scores. School conditions have a greater effect on the three academic subjects than on the non-academic ones. However, the national-level results do not apply to any single region, which may be due to regional differences in social, economic, and cultural conditions that influence how the two sets of independent variables affect students' achievement scores. Again, it should be emphasized that the effects

of students' background and school conditions variables observed here only pertains to the school level (and for aggregate students' SES, to the provincial level) (see Chapter 3).

Based on the frequency of occurrences of significant effects in each region, i.e., the bold-faced entries, it appears that for both academic and non-academic subjects, both the aggregate students' background and the school-related groups of variables are equitably effective. In other words, it is not possible to determine that one group of variables is always more important than the other. Exceptions are the Central region, where the aggregate students' SES has a much stronger effect than all the other variables, and the Northeast where school-related variables are more influential.

#### **4.5.1 The influence of aggregate students' background on achievement scores :**

##### **Aggregate students' socioeconomic status (SES)**

The first research question is whether the aggregate students' SES (measured by GPP per capita and for Bangkok Metropolitan region, average household income) affects average achievement scores or not. The variations in size of beta coefficients (and level of significance) shown in Table 4.7 indicate that this variable does not have a consistent effect across all regions of Thailand. The effect of aggregate students' SES on achievement scores reported in Table 4.3 becomes much weaker once other independent variables are controlled in the multiple regression analyses.

It should be emphasized that the measure of aggregate students' SES used in this study was collected at the provincial level, and does not show variation within the populations of the provinces, while other variables were collected at the

school level. This may have contributed to the lower effect of aggregate students' SES compared to the other independent variables.

Table 4.7: The effect ( $\beta$  coefficients) of aggregate students' background variables on achievement scores in five subjects for primary school students, in Thailand, 1987

Variable	Subject				
	Thai	Math	Life Experience	Work Experience	Character Development
<b><u>Nationally</u></b>					
GPP per capita (1987)	.02	.06	-.02	-.19	-.07
Dialect	.28*	.24*	.24*	.33*	.15*
Absenteeism rate	-.19*	-.20*	-.21*	-.19*	-.20*
Assistance with homework	.07	.05	.13*	.10	.06
<b><u>Central Region</u></b>					
GPP per capita (1987)	.46*	.55*	.51*	.44*	.28
Dialect	-.19	.12	-.05	-.05	.15
Absenteeism rate	-.25	-.15	-.10	.10	-.20
Assistance with homework	-.01	.08	.11	.03	.22
<b><u>Northern Region</u></b>					
GPP per capita (1987)	-.18	-.15	-.12	-.12	-.21
Dialect	.10	-.06	.06	.16	-.07
Absenteeism rate	-.12	-.09	-.15	-.17	-.13
Assistance with homework	-.01	.15	.29*	.25	.09
<b><u>Northeastern Region</u></b>					
GPP per capita (1987)	.19	.34*	.25*	.42*	.15
Dialect	-.12	.12	.11	.07	.09
Absenteeism rate	-.15	-.18	-.16	-.08	-.21
Assistance with homework	-.02	-.06	.04	.10	-.08
<b><u>Southern Region</u></b>					
GPP per capita (1987)	.18	-.03	.15	.07	.15
Dialect	.18	.18	.21	.35	.17
Absenteeism rate	-.12	-.39*	-.38*	-.59*	-.40*
Assistance with homework	.22	-.10	.13	-.02	-.05
<b><u>Bangkok Metropolitan Region</u></b>					
Average household income (1986)	-.22	-.14	-.12	-.17	.05
Dialect	-.10	-.04	-.20	-.19	-.02
Absenteeism rate	-.30	-.08	-.34*	.02	.04
Assistance with homework	.03	-.10	.11	.19	-.27

\* statistically significant at the .05 level.

At the national level, aggregate students' SES does not have any significant effect on achievement scores, except in work experience, where the effect is negative. In the North and the South, aggregate students' SES is among the three strongest variables; however, its effect is not statistically significant. It has



a weak and negative effect in the Bangkok Metropolitan region. Aggregate students' SES only has a significant effect in the Central and Northeastern regions. For the Central region, the beta coefficients of this variable are generally higher than all the other variables; moreover, its effect on mathematics and life experience scores is about twice as great as the next strongest variables. In the Northeast, aggregate students' SES has a significant effect on mathematics, life experience, and work experience. Its effect on work experience is stronger than that of all the other variables.

The strong influence of aggregate students' SES in the Central region may be due to the higher degree of variation (standard deviation) in SES compared to other aggregate students' background variables. Moreover, the majority of Central region students speak the Central Thai dialect, so dialect is not likely a determinant factor for students' achievement there.

Previous researchers (Heyneman and Loxley, 1983; Heyneman and Fuller, 1989) have suggested that differences in student SES will have a greater impact on achievement within more industrially advanced countries than within developing countries. Although they used individual-level data to represent SES, as opposed to school level data in this study, their suggestion appears consistent with intra-regional results for Thailand, where the Central region, a region that is relatively higher in both aggregate students' SES and school resource levels than are the other regions of the country, exhibits a greater effect of aggregate students' SES on average achievement scores among its provinces than observed in the other regions.

Results from the South raise some doubts about aggregate students' SES having a strong effect in the richer regions. The average SES in the South is similar to that of the Central region (Table 4.2); however, the GPP per capita of one of the provinces representing the South is inflated as a result of industrial

activity. This province has low average achievement scores, suggesting that, at least in this province, aggregate students' SES does not have a significant effect on achievement. The degree of urbanization in the Central and the South regions does not seem to be a factor since there is little difference in urbanization between the two regions (Knodel et al., 1987: 47, table).

The weak effect of aggregate students' SES in the South may relate to ethnic conflicts between certain groups of the Muslim population and the central government. Previous research in the South observed resistance to government-controlled schools among the Muslim population (Dulyakasem, 1990; Satha-Anand, 1987; see also Setapanich, 1982: 128-129). In the past Muslim parents tended to send their children to religious schools (Pondok schools) or abroad, to the Middle East, rather than to government-run schools (Pitsuwan, 1985: 196). Therefore, students' ethnic / religious background may have greater influence than their SES. At the same time, the Muslim populations tend to be economically worse off than other ethnic groups in that region (Satha-Anand, 1987; Pitsuwan, 1985), and thus aggregate students' SES may exert a joint effect with this ethnic / religious factor. However, the lack of data on ethnicity (e.g., the proportion of students in a school belonging to certain ethnic groups) makes it impossible to test whether aggregate students' SES is correlated with their ethnic / religious background or not, and whether these factors may jointly affect achievement.

The Northeast situation where aggregate students' SES has a positive significant effect on achievement scores appears to be anomalous. The average SES in the Northeast is much lower than that of the other regions, and has a low standard deviation, indicating that there is not much variation in SES among the northeastern provinces (Table 4.2). One possible reason that aggregate students' SES has a strong impact is because very few northeastern children

speak the Central Thai dialect, and thus dialect is not likely to be an important intra-regional factor here. However, the effect of aggregate students' SES is still weaker than that of school conditions for all subjects except work experience.

It is not possible to make a reliable comparison of the effect of aggregate students' SES between the Bangkok Metropolis and the rest of the country because data on aggregate students' SES were drawn from different sample strata in Bangkok than they were elsewhere. The measure of aggregate students' SES for the Bangkok Metropolis is the average household income, collected from three major zones - or strata, while the measure of aggregate students' SES in the other regions is gross provincial product per capita.

The weak impact of aggregate students' SES on average achievement scores in the Bangkok Metropolitan region may mean either 1) that aggregate students' SES has a weaker effect than other variables in Bangkok, or 2) that the measure of aggregate students' SES is not adequate to capture the actual variations in SES within the Bangkok population. Setapanich (1982) also observed the low effect of SES in Bangkok, however, she postulated that it may be due to the inadequacy of the SES measure (father's occupation) used in that study.

In sum, the effect of aggregate students' SES on achievement scores in Thailand appears weak and not consistent across regions. The effect of aggregate students' SES seems to relate to the level of economic development, and cultural conditions in each specific region. However, the weak impact of aggregate students' SES may also be because this variable was collected at the provincial level, thus obscuring the variations among residents within the provinces.

### **Aggregate non-material measures of students' background**

The second research question is, do the aggregate non-material characteristics of students' in a school affect the average achievement scores of students in that school? Although previous research has suggested that the non-material measures of students' background may have a greater impact on achievement than does students' SES (Schiefelbein, 1979; Lockheed et al., 1989), a proper comparison of effects cannot be done, due to the imbalance in levels of aggregation of the data.

As shown by the very high beta coefficients of the three aggregate non-material measures of students' background in the national analyses (Table 4.7), these aggregate non-material measures of students' background do have a very strong impact. In particular, the proportion of students speaking Central Thai in a school has the strongest effect on all subjects, except character development for which the effect is small but significant. The average absenteeism rate also has a significant and equivalent effect on all subjects. The proportion of students receiving assistance with homework has a low but significant effect on students' scores in life experience.

The influence of the proportion of students speaking Central Thai on average achievement scores is stronger in the national-level analyses than in the within-region analyses, perhaps because the variations in dialects between regions are greater than within regions. Since all school subjects are taught in Central Thai, schools that have a high proportion of students speaking this dialect will have advantages over schools where the majority of students speak other dialects.

The proportion of students speaking Central Thai may also be an indirect measure of differences among ethnic groups within regions. In the South, it has a positively strong effect on mathematics and work experience, while its effect is much weaker in the other regions. The relatively high variation of this variable

among southern schools may thus reflect differences among ethnic groups in that region. Although the southern population generally does not speak the Central Thai dialect, the differences in languages appear sharpest between the Muslims in the four border provinces who speak Yawi (a Malay language), and other ethnic groups.

The average absenteeism rate was found to have a significant negative effect on average achievement scores in the South and Bangkok Metropolitan regions. The average absenteeism rate may reflect the overall degree of poverty of students in a school, lack of students' motivation for studies, or even school policies on students' attendance. It should be emphasized that the aggregate nature of the data on this variable means that the significant effect of average absenteeism rate observed in this study may not hold for individuals. It is possible that at the individual level, students who are more often absent from classrooms may turn out to do better in the tests. In spite of this, it is still useful for policy planners interested in improving the average achievement level of a school to pay attention to the overall attendance rates of students and find ways to improve it.

In the South, the average absenteeism rate has the strongest effect of all variables on achievement scores, while in the other regions its effect is consistently not as strong. This may be because 1) absenteeism rate may reflect the resistance to government-controlled schooling among the Muslims in the South, as suggested by the high variations in absenteeism rates among the schools there, or 2) the effect of presence / absence from school may be greater when there are sharp ethnic differences, such as between the Muslim population especially in the four border provinces of the South and the Buddhist population in the rest of the country. Schools may be the most important place wherein Muslim children are exposed to knowledge that may not be available otherwise.

Absence from school may have a greater impact on students' academic achievement in the remote / periphery areas than in the 'central' areas because children in the remote areas can only acquire 'knowledge' (required in the curriculum and evaluated by the standardized tests) from school, while those in the 'central' areas are probably more often exposed to 'knowledge' both inside and outside school. This may be why the Bangkok Metropolitan and Central regions have the highest absenteeism rates and higher average achievement scores than the North and Northeast regions where absenteeism rates are low.

The proportion of students receiving assistance with homework is found to have a significant effect on life experience scores in the North. The life experience curriculum includes general knowledge about such topics as the society, economy, basic science, and hygiene, that children in the remote areas may only learn at school, whereas they can learn many other subjects both inside and outside of school. The North is a transitional region economically and culturally. Northern residents' average SES is higher than their northeastern counterparts, but lower than in other regions. Although the majority of northern residents do not speak the Central Thai dialect, the proportion of those who do so is still larger than in the Northeast and the South. This may be why, of all aggregate students' background variables selected in the study, the proportion of students receiving assistance with homework has a stronger and more significant impact on students' achievement scores in that region.

In sum, the national level analysis shows that the aggregate non-material measures of students' background have a strong effect on achievement scores. This suggests measures additional to SES to represent aggregate students' background for research in developing countries like Thailand. However, social, economic, and cultural conditions pertaining to each region result in variations in the effect of these measures of aggregate students' background. Aggregate

students' SES has a strong impact in the more developed Central region and the least developed Northeast region, while aggregate non-material measures of students' background have a rather strong influence on achievement in the South, where there are ethnic / religious differences from the rest of the country.

#### **4.5.2 The influence of school-related variables on students' academic achievement**

The third research question is how well do school and teacher characteristics predict students' achievement scores. Results from Thailand indicate that most school-related variables selected in this study have a much stronger effect on students' achievement than found in previous research conducted in industrialized countries (Table 4.8). The differences in results about the effect of school conditions may be due to the availability and distribution of school resources, and the role of teachers in imparting knowledge to students in a developing country like Thailand (or to the measurement problems associated with aggregate students' SES).

Both national and regional analyses show that most school-related variables have a strong and significant effect on both academic and non-academic subjects. The only exception is student-teacher ratios which does not have a significant effect on any subject in any region.

Generally, school size appears to be the most important school variable. It has a significant effect on academic subjects in all regions except the Central region. Its effect on the two non-academic subjects is generally small and not statistically significant, although it has a significant effect on students' work experience scores in the Bangkok Metropolis, and on both non-academic subjects in the South. At the national level, teachers' qualifications has a significant effect on students' achievement in Thai; while the proportion of time

Table 4.8: The effect ( $\beta$  coefficients) of school resources on achievement of primary school students in Thailand, 1987

Variable	Subject				
	Thai	Math	Life Experience	Work Experience	Character Development
<u>Nationally</u>					
School size	.22*	.21*	.21*	.07	.05
Teachers with B.A.	.15*	.05	.05	.06	.06
Student-Teacher ratios	-.02	-.07	-.08	-.07	-.04
Teaching aids available	-.01	.08	.09	.11*	.08
% time teaching	.07	.12*	.14*	.08	.13*
% time checking homework	-.01	-.01	.04	.04	.05
<u>Central Region</u>					
School size	.31	.11	.25	.04	.07
Teachers with B.A.	.13	.02	.04	-.05	.16
Student-Teacher ratios	-.16	.04	.08	.06	-.13
Teaching aids available	.01	-.17	-.20	-.14	-.11
% time teaching	-.07	-.20	-.15	-.17	-.12
% time checking homework	.13	-.27	-.13	-.23	-.04
<u>Northern Region</u>					
School size	.40*	.31*	.24	.12	.05
Teachers with B.A.	.06	.00	-.11	-.01	.05
Student-Teacher ratios	-.09	-.20	-.23	-.22	.03
Teaching aids available	-.02	.10	.18	.15	.16
% time teaching	.17	-.00	.08	.07	-.02
% time checking homework	.03	-.13	-.04	.02	.04
<u>Northeastern Region</u>					
School size	.43*	-.01	.26*	.13	.05
Teachers with B.A.	.11	-.04	.10	.04	.02
Student-Teacher ratios	.04	.02	-.02	.10	.06
Teaching aids available	.10	.07	.05	-.01	.03
% time teaching	.07	.42*	.39*	.18	.46*
% time checking homework	.01	.08	.13	.28*	.22*
<u>Southern Region</u>					
School size	.27	.40*	.34*	.43*	.38*
Teachers with B.A.	.17	-.08	.01	-.06	.18
Student-Teacher ratios	.01	-.04	-.12	-.14	-.11
Teaching aids available	-.03	-.07	.12	.20	.08
% time teaching	-.16	.07	.06	-.08	.09
% time checking homework	-.08	.09	.05	-.15	.10
<u>Bangkok Metropolitan Region</u>					
School size	.23	.48*	.49*	.55*	.31
Teachers with B.A.	.36	.09	.00	.13	-.09
Student-Teacher ratios	.09	.01	.06	.08	-.07
Teaching aids available	-.00	.13	.10	.17	.22
% time teaching	.01	.10	-.00	.17	.14
% time checking homework	-.02	.17	.12	.11	-.08

\* statistically significant at the .05 level.



teachers allocate to teaching affects students' scores in mathematics, life experience, and character development. Availability of teaching aids has a significant effect on work experience scores.

It is not clear how or why school size affects students' achievement scores. In general, the correlations between school size and other school variables are rather low, but large schools tend to have more facilities available, and are located in cities. Thus, school size may be effective through pooling and more efficient management of resources. Further, the strong effect of school size, which implies greater availability of educational resources, that is observed in Thailand may be because school resources are more scarce here than in industrialized countries (Fuller and Heyneman, 1989: 14). In general, students in Thailand have fewer school resources available than those in industrialized countries. A cross-nations comparison found that the budget per student for classroom materials and other recurrent non-salary expenditures at the primary level in Thailand is 4 US dollars, while it is over 200 US dollars in the United States (Heyneman, 1984, cited in Fuller and Heyneman, 1989:15). To some extent this may reflect differences in the cost of living, but it may also reflect the overall differences in the amount of school resources available between the two countries.

There may be a certain threshold limit to the effect school resources have on students' achievement, whereby school resources do not exert any significant effect after reaching a certain point (Mosteller and Moynihan, 1972; Schiefelbein, 1979: 139-140; cf. Bridge *et al.*, 1979: 22-25). Generally, school resources have a consistent effect on Thai students' achievement scores. The Central region is the only region in Thailand where school-related variables do not have a significant impact, which may be because the schools there are relatively large,

with more qualified teachers, and more teaching aids than schools in the other regions.

Regional analyses indicate that the proportion of time teachers spend on teaching and on checking homework has a very strong impact on students' achievement in the Northeast, but not in the other regions. The fact that northeastern students generally have low SES, do not speak the central Thai dialect, and have little assistance with homework from family members, may indicate how important teachers are as the unique source of (Western) knowledge in the rural areas (see Saha,1983). 'Modern' schools, introduced to Thailand during the colonial period have replaced the traditional monastic schools, and have introduced kinds of knowledge that are new to most villagers. Students learn both spoken and written forms of the Central Thai dialect, as well as subjects outside their daily life, from teachers educated in Western-styled colleges and universities, instead of from the local Buddhist monks. Therefore, greater contact with teachers may help the students to perform better in school.

The effect of teachers in enhancing students' achievement may also be influenced by the social contexts of each region. Researchers in the Northeast (Keyes, 1991; Gurevich,1972) observed that students usually pay high respect to their teachers and do not question their authority or knowledge. However, research in the South found that Buddhist teachers feel alienated in the Muslim pondok schools while at the same time their Muslim counterparts feel that they are discriminated against in obtaining teaching jobs (Dulyakasem, 1991: 147-148). The apparent lower degree of acceptance of schooling by community residents in the South may explain why the teacher-related variables do not have as strong an impact on achievement scores there.

The generally strong impact of school-related variables relative to that of aggregate students' SES observed in this study may be due partly to the poor

measurement of variables representing the latter (i.e., GPP per capita and for Bangkok Metropolis, average household income). The higher level in aggregation of "aggregate students' SES" may have attenuated the degree of their variation relative to that of school-related and other independent variables. The relatively strong effect of school-related variables should thus be cautioned. It appears though that this problem of obtaining reliable indicators of students' socioeconomic status for Thailand has remained consistent, as observed in previous Thai research (Setapanich, 1982; Larphatananon and Wongkiattirat, 1992) (see Chapter 2).

In sum, school conditions in Thailand appear to have a stronger effect on average students' achievement than found in previous American research. This shows that school conditions are very important, especially where aggregate students' SES is low and few school resources are available. While research conducted in industrialized countries (Coleman *et al.*, 1966; Bridge *et al.*, 1979; Fuller, 1986: Appendix A) generally presents a pessimistic view of the effect of school-related variables on achievement of students from different backgrounds, the results from Thailand indicate that a more equitable distribution of school resources may help raise the achievement levels and thus reduce the inequalities in academic achievement, at least between schools.

#### **4.5.3 The effect of 'overlapping' variables**

The availability of textbooks and pre-schooling, are considered 'overlapping' variables in this study because they seem to be indirect measures of aggregate students' background, and at the same time have independent effects. Although students of higher SES backgrounds may have greater access to textbooks and pre-schooling than those from lower SES backgrounds, these two variables are also subject to government intervention.

Nationally, the availability of textbooks has a significant effect on Thai, life experience, and character development scores, while attendance at pre-school only has a significant effect on character development (Table 4.9). Regionally, the number of textbooks has a significant effect on Thai and character development scores in the Northeast, and on character development scores of students in the Central region. It does not have any significant effect in the North, the South, and Bangkok Metropolis. Presumably there are enough textbooks available to students in the latter three regions. Pre-schooling has a significant effect on character development in the South, but not on any other subject or in any other region.

Table 4.9 : The effect ( $\beta$  coefficients) of overlapping variables on achievement of primary school students in Thailand, 1987

Variable	Subject				
	Thai	Math	Life Experience	Work Experience	Character Development
<u>Nationally</u>					
Textbooks	.16*	.10	.15*	.10	.18*
Pre-schooling	.09	.08	.09	-.03	.15*
<u>Central Region</u>					
Textbooks	.02	.24	.07	-.03	.35*
Pre-schooling	.07	.21	.27	.16	.22
<u>Northern Region</u>					
Textbooks	.02	-.04	.00	.01	.03
Pre-schooling	.20	-.03	-.08	-.17	.09
<u>Northeastern Region</u>					
Textbooks	.27*	.13	.14	-.01	.31*
Pre-schooling	-.02	.10	-.02	-.16	.09
<u>Southern Region</u>					
Textbooks	.05	.17	.12	-.05	-.10
Pre-schooling	.16	-.01	.26	.19	.34*
<u>Bangkok Metropolitan Region</u>					
Textbooks	.05	-.02	.16	.10	.08
Pre-schooling	.25	.27	.11	-.14	.37

\* statistically significant at the .05 level.

The effect of textbooks may depend on 'cultural' differences among ethnic groups. Having textbooks does not show a strong impact in the South, which may be partly due to the resistance of the Muslim populations to Thai schooling and curriculum. An anthropologist working in the South in the 1970's (Prachuabmoh, personal communication, 1993) was told by Muslim villagers that previously parents did not allow their children to take (non Muslim) textbooks inside the house after they returned home from school. In that case, the availability of textbooks may not translate into higher achievement.

The strong effect of pre-schooling on character development scores in the South suggests that there is a greater tendency among southern students who attended pre-primary schools to have adopted attitudes considered desirable in the character development curriculum. Pre-primary schooling seems to have an independent effect on achievement in character development; in other words, there is a low correlation between this variable and other aggregate students' background variables.

#### **4.6 Regional differences in variable effects**

Embedded in the previous three questions is the fourth research question, which is whether the effect of the two sets of variables differ among the five regions of Thailand or not. As the above discussion shows, specific economic and cultural conditions in each individual region result in differences in the relative effect of aggregate students' background and school resources on achievement scores. This indicates that national-level results are not likely to be useful when it comes to deciding which factors should be focused on in order to reduce the inequalities in achievement within regions.

#### **4.7 Comparisons of the relative effects of aggregate students' background and school conditions on academic- versus non-academic subjects**

The fifth research question is whether the effects of the two sets of variables differ from subject to subject. Previous research has suggested that aggregate students' background may have a greater effect on language-oriented subjects, while schooling may have a greater effect on mathematics or science subjects (Coleman, 1975: 382). In addition, it is postulated that in the Third World countries, the content of school subjects is relatively new and thus parents may not be able to help their children with school work, regardless of their family background (Saha, 1983: 85-86).

In general, there does not seem to be much difference in factors affecting students' achievement across the three academic subjects. Nationally, aggregate students' background variables, especially the proportion of students speaking Central Thai and average absenteeism rates have a consistently strong and significant effect. However, their effect is only slightly stronger than that of the school-related variables (see Tables 4.6, 4.7, and 4.8).

There seems to be a clearer distinction between the two non-academic subjects, wherein factors that have a significant impact on work experience scores tend to have a weaker or no effect on character development scores. Achievement in work experience generally depends on the ability of students (students' dialect) to understand their teachers' instructions and the opportunity for students to use the tools (absenteeism, availability of teaching aids). In turn students' character development scores depend on both school- and non-school inputs, i.e., absenteeism, availability of textbooks, pre-schooling, and the proportion of time teachers spent teaching.

One interesting observation is that SES has a consistent effect on achievement in Thai language. Aggregate students' SES generally ranks among

the three strongest variables for achievement in Thai for all regions, except Bangkok, although its effect is not usually statistically significant. This consistency in the influence of SES, and the moderate correlation between aggregate students' SES and the proportion of students speaking Central Thai (.559) suggests that high SES children may have a greater opportunity to learn the Central Thai dialect than do low SES children, perhaps through better access to television and the mass media.

That there is not much difference in factors affecting achievement scores for the three academic subjects may be due to the use of the Central Thai dialect in the classroom. The consistently strong effect of dialect on both subjects at the national level (see Table 4.7) indicates that students whose mother tongue is not Central Thai invariably have difficulties in learning, regardless of whether the subject is language-oriented or not.

School-related variables tend to exert greater influence on academic subjects than on the two non-academic subjects. This suggests that the contents of academic subjects are such that students' access to resources and to teachers' (proportion of time spent teaching) have a strong impact on their achievement scores. However, the effect of school conditions on achievement scores in work experience and character development is weaker than the effect of aggregate students' background. This may be partly due to attempts by the Central government of Thailand to make the primary school curriculum more relevant to local conditions, during the Educational Reform of the late 1970's (see Chapter 1).

Regional differences in variables affecting the two non-academic subjects suggest that the government's attempts to reduce inequalities in students' achievement may not be equally successful in all regions of the country. School-related variables have a significant effect on the two non-academic subjects in

the Northeast and the South. Perhaps, the contents of the two subjects are still foreign to the people/ students in the two regions, where few speak Central Thai. The finding that pre-schooling has a positive impact on Southern students' scores in character development suggests that there may be significant differences between local conditions and school curriculum contents, whereby preparing students' through pre-schooling programmes may raise the levels of students' academic achievement, at least in character development.

In sum, there appears to be a distinction between academic- and non-academic subjects in the factors affecting students' achievement scores. The use of the Central Thai dialect as the sole language of instruction, and the modifications to the curriculum during the Educational Reform, may be responsible for the consistent effect of aggregate students' background on all three academic subjects. At the same time, school conditions have a significant impact on students' achievement, especially in academic subjects.



## **Chapter 5**

### **Summary and Conclusions**

There is a long research tradition in the sociology of education, comparing the relative effects on students' academic achievement of students' background and school conditions. Research conducted in the United States and other Western industrialized countries has consistently found that students' background has a far greater impact than do school conditions (Coleman *et al.*, 1966; Jencks *et al.*, 1972; Rutter *et al.*, 1979), while the limited research conducted in developing countries has obtained contrary results (Heyneman and Loxley, 1983; see Fuller, 1985). As a result, opinion differs on the potential utility of using school resources for reducing differences in students' academic achievement.

This study has attempted to estimate which of the two claims apply to primary education in Thailand. However, due to the aggregate nature of available data, the analyses in this study are limited to identifying the factors that affect differences in achievement scores at the school level. While it is possible that variations in achievement may be greater within schools, the between-school analyses may still identify the school resources that can be adjusted in order to raise the level of achievement, because in most government-run redistribution programmes the school is the basic unit for (re)allocation of resources (NEC, 1990).

The research questions investigated in this study, their answers, and principal findings are as follows:

1. What is the effect of aggregate students' SES on average achievement scores?

The effect of aggregate students' SES (represented provincially by GPP per capita, and for the Bangkok Metropolis, by average household income) on average achievement scores in Thailand appears weaker and not consistent across all regions, when compared to the results of previous American research using aggregate data (Armor, 1972). This may reflect differences between centralized and decentralized educational systems (Burstein *et al.*, 1980). In decentralized systems (such as in the United States), the level of community wealth has a significant impact on achievement as wealth enables schools to acquire facilities and teaching personnel, to set up student admission policies, and to allow curriculum differentiation. However, in Thailand the central government has control of the curriculum and of the allocation of school resources in all schools except private schools. In fact the Thai government has attempted to reduce the inequalities in resources between schools, for example, by allocating more teachers to the poorer and more remote provinces (Ketudat, 1984; Fry and Kaewdang, 1982). Therefore, aggregate students' SES does not necessarily reflect the availability of school resources.

The interpretation of the effect of aggregate students' SES in this study is cautious because 1) the data representing aggregate students' SES are collected at the provincial level, thus, variations within each province, or within schools, are not evident, 2) the measure of aggregate students' SES used may not capture the actual variations in SES within the population of the Bangkok Metropolitan region (see Setapanich, 1982), and 3) aggregate students' SES may have a joint effect with other aggregate students' background variables in the South, such as ethnicity, but no data are available to test this.

2. Do the aggregate non-material characteristics of students in a school affect the average achievement scores of students in that school?

The aggregate non-material measures of students' background (e.g. the proportion of students speaking the Central Thai dialect and receiving assistance with homework, and the average absenteeism rate) have a strong effect in the South and the North. The influence of these aggregate non-material measures may partly reflect the differences in economic, social, and cultural conditions among regions. It is not possible to reliably assess the suggestion by previous research (Schiefelbein, 1979; Lockheed *et al.*, 1989) about non-material measures being more relevant indicators of students' background in a developing country, due to differences in units of analysis.

### 3. Do the school and teacher characteristics predict students' achievement scores?

Of all selected variables, only school size has a consistently significant effect in all regions, except the Central region. This finding is very significant because previous research in industrialized countries generally gives a pessimistic view about the potential of school resources, which can be manipulated by policy makers, to reduce the inequalities in achievement among students from different backgrounds (Jencks *et al.*, 1972). That school size has a consistently strong effect on achievement, net of other factors, may be because of the centralized allocation and management of resources, which remain largely scarce in a developing country like Thailand (Fuller and Heyneman, 1989). However, it is not known whether there is any threshold limit for school size. The absence of a significant effect of school size in the Central region may be because most schools in this region have more school resources and highly qualified teachers than those in the other regions. In addition, it is not yet clear exactly what the

causal mechanism may be linking school size and students' achievement scores. Larger schools, where scores are higher, do have more resources (NEC, 1990a).

4. Do the effects of aggregate students' background (including aggregate students' SES) and school-related variables vary among regions?

The variations in aggregate students' background, school conditions, and achievement scores among the five regions of Thailand are large and statistically significant. Moreover, it is quite clear that the results from the national-level analyses differ from each regional-level analysis, and that there are noticeable regional differences in which of the variables have significant impacts on achievement. This indicates that results derived from national-level analyses cannot be usefully applied to specific regions. Although the national-level results may provide a comparison of the relative effects of aggregate students' background and school conditions on achievement scores across industrialized and developing countries (Heyneman and Loxley, 1983), they may have incorrectly estimated the effect of different variables within the different regions of the country.

5. Do the effects of aggregate students' background (including aggregate students' SES) and school-related variables vary by school subjects?

For academic subjects, there is no difference in the effects of aggregate students' background and school conditions on achievement scores. This is presumably because these subjects, be they language related, or science based, are all taught in the same Central Thai dialect. The limited difference in factors that affect achievement scores is between the academic- and non-academic

subjects. For example, the effect of school-related variables is stronger for achievement in academic than in non-academic subjects. Students may learn academic subjects only at school, while the subject matter of non-academic subjects (work experience and character development) may be learned both inside and outside school. However, some of the standardized tests, such as in life experience, cover materials that can be learned both inside and outside school, making it difficult to assess which aspects of the subject are influenced by aggregate students' background or by school conditions.

Between regions there is little difference in the effect of aggregate students' background and school conditions on achievement scores. Exceptions are that aggregate students' SES is more influential in the Central region, and school-related variables are more influential in the Northeast. This indicates that if one wants to find ways to improve the achievement levels of students, both aggregate students' background and school conditions should be considered.

### **Equality of educational opportunity in Thailand**

One of the stated policies of the Thai government is to provide 'equality of educational opportunity' to every citizen regardless of sex, socioeconomic background, ethnic origins, or residence (Chantavanich *et al.*, 1990: 15; NEC, 1990). The meanings and indicators of equality of opportunity have evolved from equality of school resources to the degree of effectiveness of school conditions in moderating the effect of outside influences, especially those of student family background (see Coleman, 1990). However, in this study, due to a lack of individual-level data on student background, it was not possible to directly estimate the effect of school resources relative to that of family SES. Instead, the degree of equality of opportunity in Thai education was assessed indirectly by

looking at 1) the equality (availability) of school resources among different regions, and 2) the effect of school resources, when aggregate measures of students' background are controlled for.

The results show that the five regions of Thailand differ significantly in average achievement scores, especially in academic subjects. Moreover, there is a high degree of inequality between the five regions in availability of school resources. School resources appear to promote higher average student achievement, at least to the extent that the aggregate measures of students' background are held constant. Therefore, a more equitable redistribution of school resources may help reduce the regional differences in achievement.

For policy planners, the results of this study have pointed out several variables that have a significant impact on average achievement scores of students. The national policy that requires the use of Central Thai in school appears to have a very strong effect on students' achievement scores, especially in the South. Facilitating the learning of students whose mother tongue is not Central Thai, may be either by ensuring that teaching is done in the appropriate dialect (at least in the early grades), or by having students learn the Central Thai dialect very early (such as in pre-primary schools). Educational administrators should also consider how to improve the average attendance rate of students in their schools since it appears to have a high negative impact on average achievement scores. In addition, further investigation of the mechanisms whereby school size influences students' achievement scores would be useful since this variable has the most consistent effect of all the variables examined in this study.

In sum, due to the lack of individual-level data in this study, it is not certain how effective the Thai primary schools are in enhancing the achievement of students from different backgrounds. However, the analyses in the present study

have indicated a high degree of inequality in school resources and a strong effect by some school-related variables on average achievement scores of students. These variables can be focussed on as a preliminary step toward bringing about equality of opportunity.

### **Limitations of the data and analyses**

The interpretation of findings from the present study is conditioned by limitations in the data set. First, reliable measures of students' background in a developing country like Thailand have been difficult to obtain, as also shown in previous research (Setapanich, 1982; Larphananon and Wongkiattirat, 1992). Although both economic and social / cultural aspects of aggregate students' background are considered in this study, more detailed measures are recommended. It is not clear whether the effect of students' dialect is only due to the incompatibility of languages spoken at home and in school, or is compounded by the differences in child rearing practices associated with certain ethnic groups. It appears that students' ethnic background may be a significant factor, especially for understanding the variations in achievement in the South, but no data addressing this problem are available in this study.

Second, the data for this study are cross-sectional, and thus it is not possible to assess how the effects on students' achievement, of aggregate students' background and school conditions, may accumulate or change over time. Longitudinal data may be especially important in the case of students from ethnic minority groups, in order to understand how modern schooling has contributed to their learning over the years.

Third, academic achievement is the only school outcome of concern although it is possible that schools may influence other aspects of students' lives, such as their attitudes and social habits.

Fourth, the aggregate nature of data obscures the variations among students within schools, and thus results observed in this study do not necessarily apply to individual students. Moreover, student achievement is influenced by various factors, ranging from individual ability and effort to conditions in family, classroom, school, and community (Heyns, 1986); therefore, to reliably examine the effects of students' background and school resources, these two sets of variables should be measured at both individual and group levels (depending on researchers' objectives). However, multi-level research in sociology of education has not been conducted until very recently due to several constraints such as the availability of data and simple to use statistical programmes (see Riddell, 1989; Heyneman, 1989).

Finally, the analyses in this study are limited because it is not possible to control for students' initial ability or prior achievement. It may be the case that schools are different from one another in terms of students' ability, although this is not likely. Additional variables in the BRIDGES dataset on students' previous achievement, i.e., the proportion of students repeating in previous grades, and the normalized scores of average GPA in Grade 5, appear to be too subjective to be of use since each school has its own policies on grading and promotion of students.

### **Suggestions for future research**

Both quantitative and qualitative methods should be used to complement each other in future research. Quantitative studies, such as this one, are useful in pointing out which variables have a significant impact on students' achievement. However, they are unable to show the processes by which such variables exert influence on students' achievement (see Mehan, 1992). For example, school size has been identified as having a more consistent effect than



all the other selected variables. However, it is not clear whether the effect is due to the size of school itself, or to certain conditions associated with size. Qualitative studies can also be useful when independent variables do not have linear relationships with achievement scores (e.g., class size), or when they are difficult to quantify (e.g., interaction between teachers and students).

Each region in Thailand differs economically, socially, and culturally; moreover, these regional variations appear to influence the relative effect of aggregate students' background and school conditions on students' academic achievement. One line of future research that should be undertaken is to conduct longitudinal surveys, to investigate how the regional differences change over time. Longitudinal data would also provide information to determine whether the effect of aggregate students' SES will become stronger as a region develops economically, which is happening in the Central region and in industrialized countries. There are also regionally differing cultural factors to consider, such as the resistance to government schooling among ethnic minority groups, which may intervene the effect of SES on achievement.

There are a number of research topics, that could provide further information on factors that contribute to Thai students' academic achievement, such as the relevance of curricula to local conditions, the relationships between community residents and school teachers in different regions, and the changes in distribution patterns of school resources across regions, to name but a few.

## **Conclusions**

By examining the factors that affect differences in achievement scores at the school level this study has attempted to estimate whether aggregate students' background or school conditions more strongly influence students' achievement

during primary education in Thailand. To reiterate, the following observations have been made:

1. In Thailand, the effect of aggregate students' SES on schools' average achievement scores is weaker and not as consistent as in the United States.
2. In some regions of Thailand aggregate non-material measures of students' background have a strong effect, while in other regions aggregate students' SES has a strong and significant effect.
3. Of all selected variables, only school size has a consistently significant effect in all regions, except one, the Central region.
4. Inter-regional variations in aggregate students' background, school conditions, and achievement scores are large and statistically significant. Moreover, it is quite clear that the results from the national-level analyses differ from each regional-level analysis, and that there are noticeable regional differences in which of the variables has significant impact on achievement.
5. There is little difference between regions in the effect of aggregate students' background and school conditions on achievement scores, therefore, they both should be considered if one wants to find ways to improve the average achievement levels of students.

These results present a convincing case that the standard conceptions about factors that influence educational achievement in industrialized nations, particularly the U.S., do not necessarily apply in developing countries such as Thailand. In turn, regional variations in the effects of aggregate students' background signify that one should not assume that models or results derived from national-level analyses will apply to each region in the country. Differences in economic, social, and cultural conditions, as well as availability and distribution of school resources between regions may influence how aggregate students' background and school conditions affect students' academic achievement.

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**Appendix A: List of educational regions, provinces, and districts in the study:**

Educational region	Province	Code Number	District(Amphur)	Code Number
01	Nonthaburi	01	Muang (major)	01
			Bang Bua Thong	02
			Sai Noi	03
			Pak Kret	04
02	Pattani	02	Muang (major)	01
			Sai Buri	02
			Ya Ring	03
			Kok Po	04
			Sub-district Thung- Yang Daeng	05
03	Song Khla	03	Muang (major)	01
			Ranod	02
			Na-thawee	03
			Thaepha	04
			Haad Yai	05
			Sub-district Kuan- Niang	06
04	Ranong	04	Muang (major)	01
05	Phet Buri	05	Kra Buri	02
			Muang (major)	01
06	Sing Buri	06	Cha-aam	02
			Khao Yoi	03
			Muang (major)	01
			Inn Buri	02
07	Uthai Thanee	07	Bang Rajaan	03
			Phrom Buri	04
	Phitsanulok	08	Muang (major)	01
			Nong Khaa Yang	02
			Wang Thong	02
			Phrom Phiram	03
08	Kamphaeng Phet	09	Nakhon Thai	04
			Muang (major)	01
	Chiang Mai	10	Sai Ngam	02
			Khlong Khlung	03
			Khanuworalaksa Buri	04
			Muang (major)	01
			Phrao	02
			Chiang Dao	03
			Om Koi	04
			San Kamphaeng	05
			Doi Saket	06
			Faang	07
			Saraphee	08



Appendix A: (cont'd) List of educational regions, provinces, and districts in the study:

Educational region	Province	Code Number	District(Amphur)	Code Number
08 cont'd	Chiang Rai	11	Muang (major)	01
			Mae Sai	02
			Wiang Pa-Pao	03
			Phaan	04
			Chiang Saen	05
09	Loei	12	Muang (major)	01
			Phuu rua	02
			Chiang Khaan	03
10	Mook Dahaan	13	Muang (major)	01
			Nong Sung	02
	Roi Et	14	Muang (major)	01
			Thawat Buri	02
			Pone Thong	03
11	Si Saket	15	Muang Suang	04
			Aat Saa Mat	05
			Kaset Wisai	06
			Muang (major)	01
			Kan Tharalak	02
			Khu Khan	03
			Uthumporn Phisai	04
12	NaKhon Naa Yok	16	Sub-district Bung Boon	05
			Muang (major)	01
			Paak Phlee	02
			Ban Naa	03
			Muang (major)	01
13	Rayong	17	Baan Khaii	02
			Pluak Daeng	03
	Bangkok Metropolitan	18	Phra Nakhorn	01
			Yaan Nawaa	02
			Thon Buri	03
			Phasee Jaroen	04
			Bang Khun Thian	05
			Meen Buri	06

## Appendix B Outlier cases

An outlier or an outlying observation is a data value that is so far from the other data values that it should be presented separately in order to avoid a misleading result (see Weldon, 1986: 101, 146-147; Norusis, 1988: B211). In this study, the average scores reported for the Central and Northeast regions exclude two outlier provinces, Sing Buri and Loei. In addition, subsequent within-region analyses for the Central and Northeast regions exclude the two provinces as they may distort the results of the relative effect of students' background and school resources on achievement scores.

Sing Buri province was identified as an outlier in the Central region, since for some unknown reason, the average scores there are more than two standard deviations higher than average scores from the other provinces in the same region (Table B.1). Moreover, there appears to be a large variation in achievement scores among students in this province, as indicated by the high standard deviations. The average GPP per capita for Sing Buri (Baht 16,160) is somewhat lower than the average of other Central region provinces (Baht 21,040). 't' test results show that students in Sing Buri have attended pre-schools for a longer period of time and currently have lower average student-teacher ratios than students in the other central provinces. Pre-schooling and student-teacher ratios may contribute to high students' achievement scores. Which of these factors is / are responsible for the outlying status of Sing Buri is not clear as there are not enough cases from this province to conduct reliable regression analyses.

Table B.1: Average standardized achievement scores of Sing Buri and other provinces in the Central Region. (Standard deviations are in parentheses.)

	Sing Buri		Other Provinces	
Thai language	1.42	(.614)	-.00	(.541)
Mathematics	1.49	(.882)	.03	(.622)
Life experience	2.07	(.937)	-.03	(.479)
Work experience	2.54	(1.144)	.00	(.525)
Character development	1.70	(.945)	-.04	(.406)

Loei was excluded from the Northeast region analyses, because its' GPP per capita is much more than two standard deviations from that of the other provinces in the region. It also has lower achievement scores than the other three provinces sampled for the region (Table B.2). The high GPP per capita in Loei may be due to its tourism industry and trading activities with neighboring Laos. The relatively high average income of Loei residents may not necessarily lead to high levels of students' achievement because parents may take their children to work with them, resulting in the children not having enough time to study. 't' test results show that students in Loei have lower absenteeism rates and fewer textbooks than students in the other Northeastern provinces. It is not possible to determine what factors affect students' achievement in Loei, due to the inadequate number of cases.

Table B.2: Average achievement scores and GPP per capita (in 1987) of Loei and other provinces in the Northeastern Region. (Standard deviations are in parentheses.)

	Loei		Other Provinces	
GPP /capita (Baht)	10,170		6,717	(260)
Thai language	-.53	(.565)	-.32	(.516)
Mathematics	-.32	(.481)	-.30	(.571)
Life experience	-.52	(.472)	-.25	(.584)
Work experience	-.29	(.605)	-.07	(.598)
Character development	-.42	(.265)	-.10	(.593)

Appendix C  
Correlation matrices of variables selected in the study

Variable <sup>+</sup>	Thal	Math Exper.	Life Exper.	Work Develop.	Charact.	GPP / Capita	Dialect	Absent- eism	Help In Homework	No. of Texts	Pre- school	School Size.	Teach's with BA.	Students/ Teacher.	Teaching Aids	Time Teaching	Marking Homework
Thal	1.0000	.6846**	.7523**	.6056**	.5200**	.2912**	.4205**	-.0518	.1880**	.3088**	.3233**	.3695**	.1760**	.0491	.1330*	.0232	.2453**
Math		1.0000	.8136**	.6851**	.5848**	.2716**	.3616**	-.0749	.1786**	.2684**	.2939**	.3280**	.0957	.0109	.1705**	.0654	.2051**
Life Experience			1.0000	.8008**	.7001**	.2360**	.3631**	-.1027	.2574**	.3087**	.3419**	.3387**	.0777	-.0084	.1901**	.0745	.2366**
Work Experience				1.0000	.6440**	.0187	.2577**	-.1228	.1573*	.1489*	.1346*	.1149	.1172	-.0821	.1705**	.0400	.0820
Character Development					1.0000	.1011	.2188**	-.1369*	.1559*	.2588**	.2899**	.1607*	.0569	-.0400	.1560*	.0841	.1347*
GPP per Capita						1.0000	.5559**	.2727**	.1586*	.3490**	.2517**	.3745**	.0786	.1970**	.1015	-.0570	.4023**
Dialect							1.0000	.3260**	.1606*	.3443**	.3708**	.3564**	.2034**	.0357	.1695**	-.1220	.3943**
Absenteeism								1.0000	-.0421	.1310*	.0481	.1306*	.0277	.0862	.0067	-.0728	.1220
Help In Homework									1.0000	.0738	.2288**	.1808**	-.0649	.0272	.0696	.0662	.1489*
Number of Textbooks										1.0000	.3871**	.2342**	-.0866	-.0168	.1795**	-.0299	.2230
Preschooling											1.0000	.3869**	-.0862	.0513	.1604*	-.1078	.3902**
School Size												1.0000	-.0083	.3573**	.0525	-.0668	.4789**
Teachers with B.A.													1.0000	-.0812	.1684**	-.0155	-.0068
Students / Teacher														1.0000	-.0291	.0767	.1161
Teaching Aids															1.0000	-.0898	.0280
Time Teaching																1.0000	-.3390**
Marking Homework																	1.0000

<sup>+</sup> For a description of variables, see Chapter 3

\*  $p < .01$

\*\*  $p < .001$