EFFECTS OF SOCIO-ECONOMIC STATUS ON READING ACHIEVEMENT AT COLLECTIVE AND INDIVIDUAL LEVELS IN SWEDEN IN 1991 AND 2001

Kajsa Yang Hansen, Gothenburg University, Sweden
Monica Rosén, Gothenburg University, Sweden
Jan-Eric Gustafsson, Gothenburg University, Sweden

Abstract

The main aim of the study is to examine the changes in the strength of the effects of socio-economic status (SES) on reading achievement at the school, class and individual levels over the last decade in Sweden. This aim is pursued through comparisons between the IEA Reading Literacy Study 1991 (RL 1991) and the repetition of this study in the so called the 10-Year Trend Study (RL 2001). Three aspects are focussed upon, namely changes in the measurement properties of reading achievement, changes in the measurement properties of SES, and changes in the strength of SES effects on reading achievement. Attempts also are made to explore the factors that account for such variations and changes. One of the central questions is whether or not the decentralization reform in education and other social and economic changes in Sweden during the last decade influence the variance distribution and measurement properties of reading and SES, and the strength of SES effects on reading achievement? It is hypothesized that the reading variance between classes and schools may be greater in RL 2001 than in RL 1991, and that the strength of the school SES effect increases over time. These hypotheses will be tested with data from RL 1991 and RL 2001 studies. Data analyses will be carried out by two-level multi-group models in the context of structural equation modelling.

INTRODUCTION

The Swedish school system has undergone a radical change during the last 15 years, making it one of the most decentralized educational systems in the OECD countries (England, 1996; OECD, 1998). The consequences of educational decentralization and resource cuts in the recent educational reform are highly contentious issues (Chapman, 1996). However, little is known about the effects of this decentralization on educational inequality, such as the family SES influences on academic achievements.

The main aims of the decentralization in education are to increase educational efficiency and quality (Chapman, 1996). A series of changes has been made in the Swedish educational systems in order to realize such aims, such as decentralized decision-making on school funding, curriculum and other school practices, and a voucher system with free choice of school. One of the consequences of the decentralization might be an increasing social cultural differentiation and stratification both in schools and society (Gewirtz, Ball & Bowe, 1996; Lindblad, Lundahl, Lindgren & Zackari, 2002).

Previous studies have found that schools with a greater percentage of students from high SES family backgrounds provide more effective learning environments and lead to a higher school average achievement (see among others, Rutter, Maughan, Mortimore & Ouston, 1979; Thrupp, 1999). Since the school SES expresses the socio-demographic characteristics of the community, such as economic, ethnic and social class composition, one may speculate that the community or neighbourhood that the school serves has a great impact on school outcomes. In a comparative study of multilevel effects of family background on academic achievement, Yang (2003c) found a higher school SES effect on academic achievement in the countries with a decentralized educational budget and differentiated administrative policies, compared to centralized ones (see also, Burstein, Fischer & Miller, 1980; Yang, 2003a, 2003b; Yang & Gustafsson, 2003). It can be argued that educational systems under local control and financing may strengthen the impact of community wealth and attitude on school administration and practices through schools' varying ability to recruit better teachers, to attract highly performing students and to seek better learning materials and physical facilities. Consequently, "wide variability in educational standards and resources can also lead to inequality of educational opportunity and insufficient attention to long-term national needs" (p. 111, OECD, 1997).

Accordingly, the main aim of the present study is to examine changes in the strength of the effects of socio-economic status (SES) on reading achievement at the individual and class/school levels over the last decade in Sweden. This aim is pursued through comparisons between the IEA Reading Literacy Study (RLS 1991, Elley, 1994) and the repetition of this study in the 10-Year Trend Study (RLS 2001, Martin, Mullis, Gonzalez & Kennedy, 2003). Three aspects are focused upon, namely changes in the measurement properties and variance distribution of reading achievement, changes in the measurement properties of SES, and changes in the strength of SES effects on reading achievement. Factors that may account for such variations and changes are also discussed.

DATA

Data used in the current study are from both RLS 1991 and RLS 2001. Table 1 shows the number of students, classes and schools involved in the two studies. The sample size at each level is large enough to ensure stable estimation in two-level structural equation modelling (Hox, 2002).

Table 1: Number of Students, Classes and Schools in the Current Analysis.

	Number of cases		
	Students	*Classes*	*Schools*
RLS 1991	4300	234	123
RLS 2001	5361	366	148
Total	9661	609	267

In the RLS 1991 study (Elley, 1992; 1994), every 9-year-old participant was given a set of reading tests, in which three types of text are included, namely, narrative, expository and document (for a detailed description of the text types, (see e. g., Elley, 1994; Yang, 1998). Altogether, there are 15 reading passages in the reading test, among which 4 passages are narrative, 5 are expository and 6 are document. In each reading passage, there are several multiple-choice questions relating to the content of the text. In some of the reading passages, there also are open questions asking the participants to construct a longer answer with their own words. These 15 reading passages were divided into two booklets (i.e., Booklet 1 and Booklet 2) and administered to the participants in two test sessions, with a short break in between. In the first test session, a word recognition test of 40 words was also given. This test instrument and procedure was administered to a 9-year-old sample in the 10-Year Trend Study for the purpose of monitoring the changes and progress in children's reading literacy (Martin, Mullis, Gonzalez & Kennedy, 2003; Martin, Mullis & Kennedy, 2003).

In the current study, the reading passage scores are used for the investigation of the properties of the reading achievement test. Each passage score is achieved by totalling the item scores of the passage. It should be noted that the open question is not included in the passage score. The word recognition test score is taken to be one-tenth of the total score of the 40 test items.

The indicators of Socio-economic Status (SES) are selected from the student questionnaire (StQ), where each participant was asked to answer some questions on the ownership of a set of household items and their own things. Among these material possessions, two categories can be distinguished. One category is, according to Bourdieu (1984; 1997), the objectified state of cultural capital, signified by an individual's cultural preferences. These home possessions are piano, music instrument, encyclopaedia, number of books at home (BOOK) and newspaper at home (NEWS). The RLS 2001 Home Questionnaire (HQ) contributed information about father's and mother's education level, which variables also belong to this category. Another category of possessions is related to family wealth (i.e., economic capital), such as summerhouse, sailing boat, and, cars etc. listed on the StQ. Information on family annual income from RLS 2001 HQ (HINCM) is also used as an indicator of economic capital. Since the two types of capital are convertible and interrelated (Bourdieu, 1997), it may be expected that the two categories of possession variables share a commonality.

It should be noted that not all possession items in RLS 2001 are the same as those in the RLS 1991. The differences are mainly found in the economic capital indicators. It can be

assumed that the cultural preference of a family is rather stable over time. The manifestation of the family economic situation however is rather sensitive to the economic development of the society. It is thus essential to apply indicators that can capture the economic changes and variation over the decade. Some of the economic indicators in RLS 1991, such as microwave oven and computer, have become too common household items to be able to represent the current economic differences among families. Accordingly, a new set of economic capital indicators has been developed and used in the RLS 2001 (for a detailed review of the items, see Appendix A).

Except for the family annual income variable (HINCM) in RLS 2001, the economic capital indicators are scaled into two variable sets; one is the sum of all the home possession items excluding the cultural indicators (HOMP), the other is the sum of all the student's own possession items (STUDP). The cultural capital indicator, parents' educational level (HEDUP), is derived from variables of father's education and mother's education. The rest of the cultural indicators are used at item level.

Table 2 shows the mean, standard deviation and intraclass correlation (ICC) of the 15 reading passage scores and the SES indicators of the RLS 1991 and 2001. As is shown in the Table, the differences in the descriptive statistics for RLS91 and RLS 2001 are rather small. However, the mean differences of these variables for the two populations are significant except for E1CARD, E2SND, and D2BUS. In general, the RLS 1991 sample achieved higher mean reading passage scores and the achievement differences among students in RLS 1991 are smaller, compared to those in RLS 2001. For the SES indicators, the mean economic indicators tend to be higher in RLS 2001 while the opposite is true for the cultural indicators. Greater differences are found in the economic capital indicators in RLS 2001.

The ICC expresses the degree of homogeneity of individuals in the same cluster (see e.g., Koch, 1983). Thus, students from the same class may expect to be more similar in, for example, their achievement than the students from a different class in the same school. The class-level ICC should be higher than the school-level ICC, which is true for most cases in Table 2 for both RLS 1991 and 2001. Given that the observed variances of reading achievement and SES indicators are inflated by measurement errors, while the population estimates of between-variances are not, the ICCs a are most likely to be underestimated (Harnqvist, Gustafsson, Muthén & Nelson, 1994; Muthén, 1991, 1994).

METHOD

A stratified multi-stage cluster sampling design was applied in the IEA RLS 1991 (Elley, 1994) and the 10-Year Trend Study RLS 2001 (Gustafsson & Stahl, 2001). For both studies, schools, which were initially stratified by geographic region (i.e., County) or school type (private and public school), were selected by the PPS (probability proportionate to size) sampling technique at the first stage. At the second stage, all students in the target grade classrooms of the sampled schools were selected. Data collected in such a way has a hierarchical and interdependent nature, e.g., students within the same classrooms being similar and classrooms within schools being similar. Moreover, stratified sampling causes an unequal inclusion rate of the elements in different strata.

Table 2. Mean, Standard Deviation and Intraclass Coefficients for Reading Passage Scores and SES Indicators in RLS 1991 and RLS 2001.

Indicators	RLS 1991				RLS 2001			
	Mean	St. D	ICC class-level	ICC school-level	Mean	St.D	ICC Class-level	ICC school-level
E1CARD	1.93	.30	.025	.024	1.94	.27	.044	.024
N1BIRD	3.67	1.27	.064	.060	3.61	1.30	.052	.048
D1ISL	3.15	1.06	.072	.063	3.04	1.10	.064	.044
D1MRA	1.74	.52	.057	.050	1.72	.55	.041	.044
N1DGS	4.12	1.79	.057	.052	4.10	1.86	.091	.076
E1WLR	4.65	2.00	.047	.042	4.48	2.00	.087	.077
E2SND	2.48	.79	.046	.050	2.48	.79	.063	.053
N2SHK	3.73	1.23	.061	.065	3.59	1.31	.059	.055
D2BTT	3.07	1.17	.078	.077	3.22	1.07	.079	.057
D2BUS	2.63	1.11	.088	.083	2.67	1.16	.114	.091
D2CNT	2.57	.88	.073	.070	2.55	.88	.069	.053
E2MRM	2.20	1.33	.053	.059	1.98	1.36	.059	.053
E2TRE	2.97	2.00	.070	.069	2.68	2.04	.073	.053
N2GRP	4.21	2.11	.052	.051	3.84	2.25	.069	.057
D2TMP	2.40	1.24	.061	.052	2.50	1.23	.065	.048
WORD	3.34	.82	.247	.198	3.39	.73	.167	.105
BOOKS	5.12	1.15	.116	.094	4.93	1.20	.162	.137
PIANO	.85	.36	.074	.065	.49	.50	.071	.052
ENCY	.35	.48	.068	.058	.85	.35	.063	.041
NEWS	1.90	.51	.039	.029	.87	.34	.090	.066
HEDUP[1]	-	-	-		9.12	3.95	.171	.162
HOMP	3.82	1.74	.091	.085	4.73	1.73	.171	.132
STUDP	3.84	1.70	.056	.047	4.57	1.35	.073	.068
HINCM[2]	-	-	-	-	3.89	1.54	.178	.182

Note, "ICC" = Intraclass Correlation Coefficient. "1" and "2" = variables HEDUP and HINCM are only available in RLS 2001 data.

In the Structural Equation Modelling (SEM) context, it is normally assumed that the observations are sampled with same probability and are independent of one another (see e.g., Bollen, 1989; Hox & Bechger, 1998). However, data in the present study has violated these assumptions. Consequently, the population estimates may be incorrect and test statistics will be inflated (Muthén, 1994; Stapleton & Hancock, 2001). To control the stratification and cluster effects in the data and to make an accurate estimation of population parameters, two-level structural equation modelling with case weights was carried out by Mplus (Muthén & Muthén, 2001), which is implemented and operated in STREAMS (Gustafsson & Stahl, 2001).

Raw data is required in two-level modelling in Mplus, where a weight variable (e.g., house weight) and a cluster identification variable (e.g., school ID) are also included. The sum of house weights of students within each country will be the actual sample size of the country, and it should be applied when significance tests and parameter estimation of the population are being performed, so that the different subgroups of the sample are accurately and proportionally represented (Martin, Mullis & Kennedy, 2003).

In principle, the total sample variance can be broken down into the components of two orthogonal parts: the within- and the between-parts. And the variance of each level can be further broken down into the variance components of the factors underlying the covariance matrix (Hox, 2002; Muthén, 1994). In estimating population parameters in the two-level structural equation models, two covariance matrices are computed, i.e., a pooled-within covariance matrix S_{PW} and a between covariance matrix S_B, both of which are weighted by the house weight variable (Muthén & Muthén, 2001). Muthén (1994) showed that SPW is an unbiased estimate of the population within a covariance matrix. S_B is, however, a function of both the population within and the population between covariance matrices. Muthén's Maximum likelihood estimator (MUML) is used in two-level model estimation, which can be undertaken using conventional multi-groups structural equation software.

RESULTS

To examine the effect of changes in the SES on reading achievement for RLS 1991 and 2001, three steps have been taken in the data analysis. In the first step, the differences in the measurement property and variance distribution of reading achievement in RLS 1991 and 2001 were explored. In the second step, a comparison of the dimensionality of SES in RLS 1991 and 2001 were made. Finally, changes in the relationship between reading achievement and SES were studied by linking the dimensions of reading achievement and SES together in a structural model.

Changes in the Measurement Properties of Reading Achievement

According to previous studies (Balke, 1995; Gustafsson, 1995, 1997; Yang, 1998), a two-level nested-factor model could be fitted to the Swedish reading achievement data in RLS91. At student-level, two narrow factors could be identified, namely a document reading factor (DocW) measured by all the document domain tests, and an end-of-test factor (i.e., reading speed factor, EotW) measured by the passages at the end of each booklet. These two factors are nested under a general reading

achievement factor (ReadW) that relates to all the reading passages and the word recognition test. At the aggregated level (e.g., class or school level), however, only an end-of-test residual factor (EotB) was identified along with the general reading factor (ReadB). This two-level model structure has been found to be consistent with 25 countries' data from RLS91 (Yang, 1998). In the current study, the same model structure was applied to the Swedish data of both the RLS 1991 and 2001 at individual and aggregated levels. Four models have been fitted for the comparison of reading variance distributions at different levels of observations as well as between the two samples. The fit of each model was evaluated through chi-square goodness-of-fit tests. Another key model fit index is RMSEA (Root Mean Square Error of Approximation). A RMSEA estimate below 0.05 has empirically been shown as indicating good model fit (Browne & Cudeck, 1993). The two-level reading achievement models in this study all fit the data very well, as shown in Table 3.

Table 3: Evaluations of the Four Two-Level Reading Achievement Models.

Reading achievement Models	χ^2	df	RMSEA
1. at class and student levels in RLS 1991	1286.86	388	.024
2. at class and student levels in RLS 2001	1594.58	474	.025
3. at school and student levels in RLS 1991	1268.08	388	.024
4. at school and student levels in RLS 2001	1587.68	474	.025

Based on the factor structure of reading achievement, the total reading variation can be decomposed into the variance of each factor and measurement error at the corresponding level. Table 4 presents the variance components estimated from the reading achievement models for both RLS 1991 and 2001.

An increase of variances is observed in all the components at class-level in RLS 2001, compared with RLS 1991, namely ReadB and EotB, and the class-level measurement error, ErrorB. The variance increment causes an increase in the total class-level reading variation. At individual-level, however, the total within-level variation decreases, and the main source of the variance drop is found to be the general reading achievement factor. The variances of the two narrow factors DocW and EotW, and the within-level measurement error (ErrorW) increase somewhat in the RLS 2001, the largest increment due to EotW. Since the increase of class-level variance and the decrease of student-level variance offset each other in RLS 2001 variance estimates, the total reading achievement variation is rather similar for the RLS 1991 and 2001 samples. The same pattern of changes in reading variance is also found between the models at school vs. student levels for the two samples.

Table 4: Estimates of Contributions of Factors to Total Score Variance at School-,
Class- and Student- Levels.

Source of Variance	Class vs. student level		School vs. student level	
	RLS 1991	*RLS 2001*	*RLS 1991*	*RLS 2001*
Between level				
ReadB	15.41	16.81	14.94	15.29
EotB	1.00	2.22	.94	1.80
ErrorB	.34	.35	.31	.23
Total between level	16.74	19.37	16.18	17.33
Within level				
ReadW	123.02	115.95	123.44	117.33
EotW	19.26	22.59	19.47	23.43
DocW	3.00	3.79	3.04	3.86
ErrorW	12.24	13.02	12.27	13.15
Total within level	157.51	155.34	158.23	157.78
Total	174.26	174.72	174.41	175.11

In sum, the reading achievement differences did not change between 1991 and 2001. However, the reading achievement gap between different schools and classrooms becomes greater and students within the same school or classroom become more similar in their reading ability. It should be noted that reading speed differences increase between schools and classes as well as between students. This may be due to the fact that in the reading literacy trend study in Sweden, the test time for Booklet B varied in the different participating school classes. Some schools instructed their students to finish the test in 35 minutes while others stipulated 40 minutes.

Changes in the Measurement Properties of SES

Socio-economic status is a multi-dimensional concept and functions at different levels of social milieu (see among others, Bourdieu, 1997; Thrupp, 1999). Accordingly, a two-level measurement model of SES has been tested and proven to be stable for the data of different countries in RLS 1991 (Gustafsson, 1998; Yang, 2003a; Yang & Gustafsson, 2003). Applying a set of household possessions as indicators, an economic capital factor and a cultural capital factor were identified at the individual level of the model, while at class-level only a general capital factor was found. In this study, the two-level model was tested against the background data from RLS 1991 and 2001.

The general modeling process was taken in several steps for both RLS 1991 and RLS 2001 data. In the first step, a one-factor model (i.e., general capital factor) was fitted
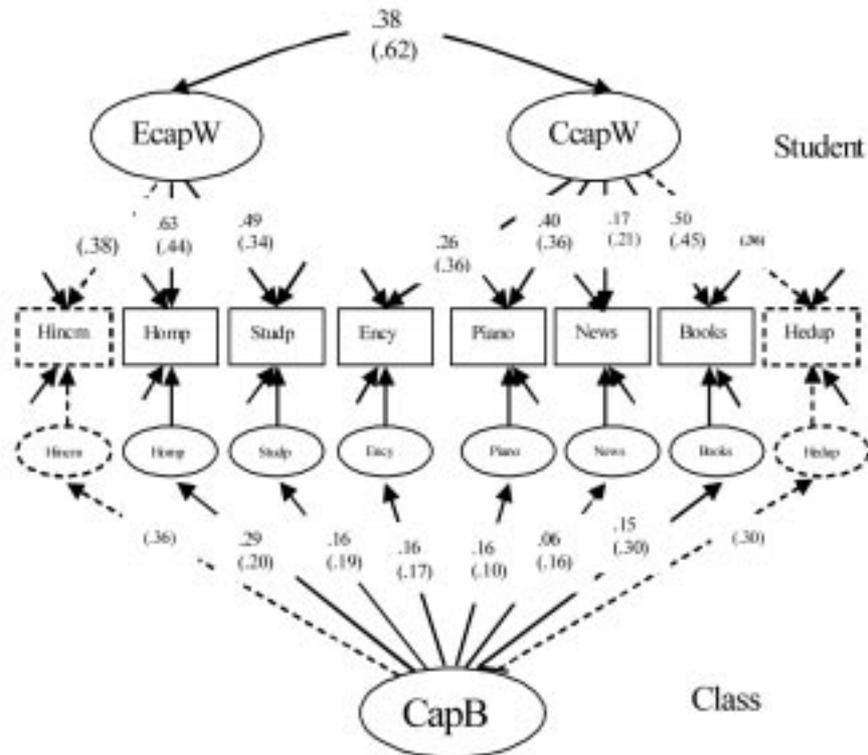
to the pooled-within covariance matrix. This model, however, did not fit the data. A second factor, the cultural capital factor was added. Since the family cultural and economic dimensions are convertible (Bourdieu, 1997), an oblique model structure was applied for the two-factor model, where the cultural capital factor (CcapW) and the economic capital factor (EcapW) were correlated. Model fit indices of the two-factor oblique models for both RLS 1991 and 2001 are acceptable. This one-level model was, in a later step, extended to a two-level model by bringing in a general capital factor to explain the collective level variances and covariances. The path diagrams with factor loadings and model evaluation are presented in Figure 1 and Figure 2. All the factor loadings presented in Figure 1 and 2 are statistically significant.

A common pattern can be observed in the factor loadings of the two models in Figure 1. At individual-level, among the indicators of economic capital factor (EcapW), the home possession variable (HOMP) holds the highest factor loading. The number of books at home variable (BOOKS) has the highest loading on the cultural capital factor (CcapW). At class-level, the highest loading on the general capital factor (CapB) is from the family annual income variable (HINCM) in RLS 2001 and the home possession variable (HOMP) in RLS 1991. The same pattern of factor loadings is also found in the SES measurement models of individual vs. school level in Figure 2.

The CapB factor may be interpreted to represent the economic well-being of the whole class or school. It can be assumed that there is a strong link between the CapB factor and the community resources, since children normally go to a school that is close to their residential neighbourhood. In this way, we can make some inferences about community characteristics and its effects on school achievement through, in our case, measuring the effects of CapB on school reading achievement (Brooks-Gunn, Duncan, Klebanov & Sealand, 1993; Datcher, 1982).

The two individual-level capital factors represent family economic situation and cultural preference, respectively. It should be noted that the economic capital factor and the cultural capital factor are correlated. The interpretation of the correlation is that, in Sweden, those who have a better economic situation are more likely to be cultural goods consumers and the holders of cultural capital, and vice versa. This correlation increased from .38 in RLS 1991 to .62 in RLS 2001, which may indicate a change in Swedish society meaning that the overlap between the holders of economic capital and the holders of cultural capital has increased during the last 10 years. It may also be due to the fact that in RLS 2001model two correlated indicators, parents' education level variable and family annual income variables are added to measure the cultural capital factor and the economic capital factor, respectively. This may make the correlation between the two factors stronger. The effect of including the two additional SES indicators in the RLS 2001 model may also be reflected at the factor loadings at the aggregated level.

Note, the parameter estimates in parentheses are for RLS 2001. Path and variables marked in dotted lines exist only in RLS 2001.
Chi-square = 59.95, df = 17, p < .00, RMSEA = .025 (Model fit for RLS 1991)
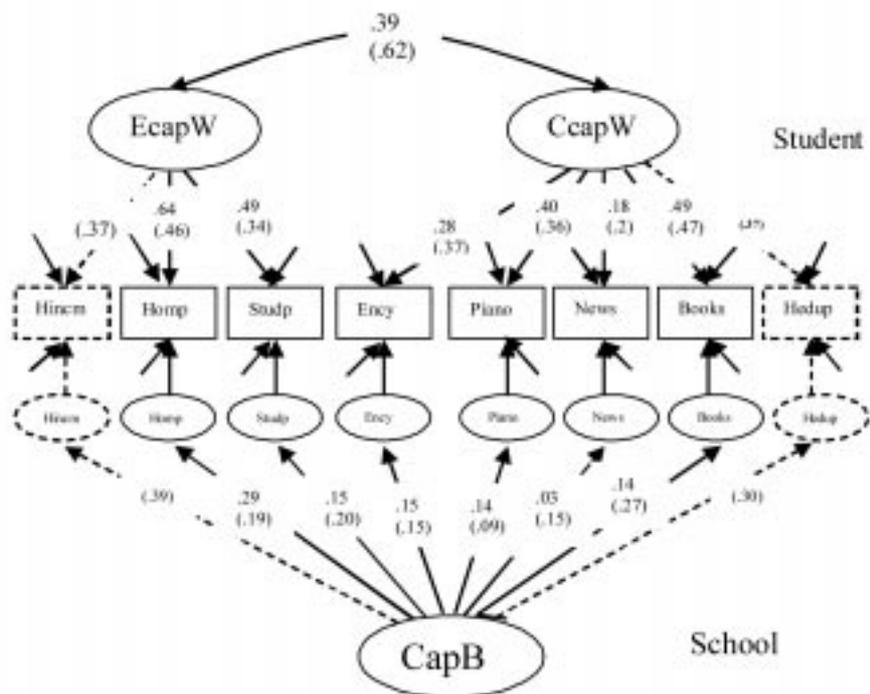Chi-square = 158.95, df = 38, p < .00, RMSEA = .029 (Model fit for RLS 2001)

Even though the CapB factor is defined to represent the collective economic well-being in both the RLS 1991 and the RLS 2001 models, differences could still be observed in the factor loading of CapB for RLS 1991 and 2001. In the RLS 2001 model, the typical cultural capital indicators, such as BOOKS and HEDUP, load rather highly on CapB, compared to the factor loading of BOOKS on CapB in the RLS 1991 model, which may indicate a greater commonality shared among economic and cultural capital indicators. The additional SES indicators HEDUP and HINCM may have strengthened the factor loadings of CapB and its indicators.

In brief, the same SES factor structure was found in both RLS 1991 and RLS 2001, where two correlated factors, the economic capital factor and the cultural capital factor, were identified at student-level; at collective-level, however, only a general capital factor explained the aggregated level SES variation. In general, the factor loadings at both the individual level and the aggregated level are higher in RLS 2001

than in RLS 1991. Both social changes and differences in the SES indicators may account for such measurement changes between RLS 1991 and RLS 2001.

Figure 2: Two-Level Measurement Model of SES at Individual and School Levels for Both RLS 1991 and RLS 2001.

Note, the parameter estimates in parentheses are for RLS 2001. Path and variables marked in dotted lines exist only in RLS 2001.
Chi-square = 61.45, df = 17, p < .00, RMSEA = .026 (Model for RLS 1991)
Chi-square = 163.58, df = 38, p < .00, RMSEA = .029 (Model for RLS 2001)

Changes in the Strength of SES Effects on Reading Achievement

It is of great interest to investigate the relationship between socio-economic status and reading achievement and the changes in this relationship over time. This can be achieved by combining the measurement models of reading achievement and SES. A structural model was thus achieved by regressing SES factors on the reading achievement factors at the respective levels. Table 5 shows the beta coefficients between reading and SES factors in RLS 1991 and 2001. It should be noted that only the coefficients that are statistically significant are presented. As shown in the table note, the four structural models fit their data very well. The ratio of χ^2/df is around 3 and RMSEA is much lower than .05 for each of the models.

At individual-level, the beta coefficient estimates are very similar for the school vs. individual model and class vs. individual model of the same data. It should be noted that these beta coefficients are partial correlations, and can be interpreted in the same way as ordinary correlations with the other variables kept constant. In both RLS 1991 and 2001 models, the general reading achievement factor was negatively related to the economic capital factor, and highly positively related to the cultural capital factor. The CcapW factor has no effect on the two narrow reading factors, DocW and EotW. The EcapW factor has a significant but low correlation with the end-of-test factor only in the RLS 2001 model and no relationship with the DocW factor in either of the samples. Of these significant correlations, the estimates of RLS 2001 models were higher than those of RLS 1991 models by about .10 on average.

Table 5: The Beta Coefficient between Reading Dimensions and SES Dimensions at Individual and Collective Levels in RLS 1991 and 2001

Beta Coefficient		Individual vs. Class level		Individual vs. school level	
		RLS 1991	RLS 2001	RLS 1991	RLS 2001
Individual - level	EcapW → ReadW	-.15	-.28	-.15	-.26
	EcapW → EotW	*ns*	.15	*ns*	.17
	EcapW → DocW	*ns*	*ns*	*ns*	*ns*
	CcapW → ReadW	.40	.51	.39	.49
	CcapW → EotW	*ns*	*ns*	*ns*	*ns*
	CcapW → DocW	*ns*	*ns*	*ns*	*ns*
Collective - level	CapB → ReadB	.58	.67	.56	.75
	CapB → EotB	.55	*ns*	.49	*ns*

Note, "NS" = not statistically significant.
Model fit for the four structural models:
Chi-square = 1286.86, df = 388, p < .00, RMSEA = .024 (RLS 1991, individual vs. class-level)
Chi-square = 1594.58, df = 474, p < .00, RMSEA = .025 (RLS 2001, individual vs. class-level)
Chi-square = 1286.08, df = 388, p < .00, RMSEA = .024 (RLS 1991, individual vs. school-level)
Chi-square = 1587.68, df = 474, p < .00, RMSEA = .025 (RLS 2001, individual vs. school-level)

At the collective level, a change was observed in the beta coefficient for the general capital factor and the general reading ability factor at school-level. It increased from .56 in RLS 1991 to .75 in RLS 2001. The beta coefficient for ReadB and CapB was higher in RLS 2001 than 1991 at class-level, but the difference between them was not as greater as that at school-level.

CONCLUSION AND DISCUSSION

The present study explored the effects of changes in SES on reading achievement in Sweden in RLS 1991 and 2001 in three steps. In the first step meansurement of

reading achievement was investigated. The same latent dimensions of reading achievement were identified for both RLS 1991 and 2001. The overall reading achievement differences remained rather constant in RLS 1991 and 2001. Compared to RLS 1991, greater differences in the collective level reading ability was found in RLS 2001. Students in the same school or classroom also became more homogeneous in RLS 2001. This may be due to the the free school choice policy and within-school screening of students.

The same latent SES structure was found to account for the variance and covariance of a set of home possession variables in both RLS 1991 and 2001 samples, even though these variables are somewhat different. The similar pattern in factor loadings estimated in the RLS 1991 model and RLS 2001 model confirmed that the factors identified by the data in both samples carried same meaning. The changes in the covariance of the economic capital factor and the cultural capital factor at individual level, and the factor loadings of the general capital factor at the collective levels may be interpreted to reflect the social changes in Sweden in the last decade, which indicate that the distinction between the economic capital and cultural capital is becoming blurred, and that those who possess economic capital had a greater chance to hold cultural capital in 2001 than in 1991.

Generally, the family economic well-being is negatively related to students' reading achievement, while family cultural capital has a positive influence on children's reading. The present study also found that SES factors had a stronger impact on reading achievement in 2001 than in 1991 at both individual level and collective levels. An interesting change in the correlation between school SES and school reading achievement in 2001 showed that the school SES differences explains more than half of the difference in the average school reading achievement in 2001, compared with about 31% in 1991. In a comparison study of the relationship between SES and reading achievement in RLS 1991 (Yang & Gustafsson, 2003), school SES effects in Sweden belonged to a low to medium group, along with other Nordic countries that were characterized as rather homogeneous in their education quality and equality. With the high estimate of school SES effect in the current study, Sweden has made its way into the high-effect group, where the US, New Zealand, Singapore, the Netherlands, and Trinidad-Tobago were found in the previous study, and it has become a more educationally stratified country in 2001 than it was in 1991.

To fully understand the changes found in the current study, we need to take a close look at the decentralization reform in the Swedish educational system during the last decade. Sweden has launched a voucher system with free choice of schools in addition to the shift from an extremely centrally controlled system to a decentralized school finance and decision-making system (Lindblad, Johannesson & Simola, 2002; Lindblad, Lundahl, Lindgren & Zackari, 2002).

Parents' preferences and choice of schools are often constrained by the family SES (Bourdieu & Passeron, 1977). The priorities in choice of schools are differentiated between different social classes, and "the members of capital-owning classes or class fractions tend, consciously or unconsciously, to maintain or improve their position

in the structure of class relations" (p. 198, Bourdieu & Boltanski, 1978). The Swedish National Agency for Education has carried out studies to evaluate the effects of school free choice reform (Skolverket, 1996, 2003), which concluded that the free school choice is used productively only by the highly educated; as a consequence, it affects the homogeneity of school intakes. "School choice has had segregating effects, particularly in the matter of ethnic composition" (Skolverket, 2003, p. 20). As a consequence, large social-class based variations in school choice may thus be observed, and socio-economically better-off families are more likely to take advantage of the school market system (Waslander & Thrupp, 1997). Children's education is thus more and more dependent on the wealth and will of parents (Brown, 1997). Students who suffer from such policy changes in educational decentralization may be those in need of remedial help, among which immigrant children and children of low social class are over-represented. These students are more likely to become school dropouts and remain at low social strata in the future.

Moreover, the current social changes in Sweden, such as a rising unemployment rate and social inequality, have made educational stratification more pronounced than it was 10 years ago (Lindblad, Lundahl, Lindgren & Zackari, 2002). Bénabou (1996a; 1996b) predicted that decentralized school funding would lead the society towards heterogeneity and economic inefficiency in the long run, in contrast to centralized educational funding. It seems to be a too high a price to pay for educational efficiency and quality, in exchange for educational equality, equal opportunity and economic growth. Thus, serious thought has to be given in educational policy-making and reforms, regarding the balance of drawbacks and advantages in both centralized and decentralized educational system.

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APPENDIX A

The home possession items and student own possession items in RLS 1991 and 2001.

RLS 2001		RLS 1991	
Variables	*Variable labels*	*Variables*	*Variable labels*
HOME1	One computer	HOME1	Summer house
HOME2	Two computers or more	HOME2	Motor or sailing boat
HOME5	One car	HOME3	CD player
HOME6	Two cars or more	HOME4	Video player
HOME7	One mobile phone	**HOME5**	**Encyclopedia**
HOME8	Two mobiles or more	HOME6	Dishwasher
HOME9	**Piano, music instrument**	HOME7	Microwave oven
HOME10	Summer house	HOME8	Computer
HOME11	Boat (sail or motor)	HOME9	Video camera
HOME12	Fax	**HOME10**	**Piano, music instrument**
HOME13	**Encyclopedia**	**News**	**Newspaper at home**
News	**At least 1 newspaper at home**	**Books**	**No. of books at home**
Books	**No. of books at home**	STUDP1	Own room
Hincm	Family annual income	STUDP2	Own camera
Hedup	**Parents' education level**	STUDP3	Own TV
STUDP1	Your own room	STUDP4	Own tennis racket
STUDP2	Your own desk	STUDP5	Own slalom skis
STUDP3 = HOME15	Your own books	STUDP6	Own Walkman
STUDP4	Own mobile phone	STUDP7	Own computer
STUDP5	Own computer	STUDP8	Own telephone

In this table, only those possession items that were used in the analysis are presented. The variables in the shadowed cells are cultural capital indicators. Variables "Hincm" and "Heduf" of RLS 2001 are from the home questionnaire and are used as indicators of economic capital and cultural capital, respectively. Student own possession items "Piano and music instrument" and "Encyclopedia" in RLS 2001 are excluded. The same for the RLS 2001 home possession item "HOME14" (i.e., desk for your own use). The reasons for such exclusions are first, to get a distinct identification of an economic capital factor and a cultural capital factor; second to reduce the repeated use of indicators. The cultural capital indicator "News" in RLS 2001 is a derived variable from "HOME3" (one newspaper at home) and "HOME4" (2 or more newspapers at home).