Mary-Anne Holfve-Sabel

Attitudes towards Swedish comprehensive school
Comparisons over time and between classrooms in grade 6

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In memory of my sister, Ulla-Britt, 1946-1974

Abstract

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The main aim of the study is to understand student attitudes towards different aspects of school using data from the late 1960s and 35 years later, and to analyze the impact both from teachers and students on classroom climate. Another important aim in order to accomplish this is to develop suitable instruments and methods. The starting point of the empirical work was a 40-item attitude questionnaire that was used in the Didactical Process Analysis (DPA) project conducted in Göteborg in the late 1960s, which comprised 60 classrooms and 1600 grade 6 students. This attitude questionnaire was reanalyzed using two-level confirmatory factor analysis (CFA), the reanalysis resulting in seven factors describing differences in student attitudes within classrooms, three factors describing attitude differences between classrooms. The original 40 item questionnaire was expanded with 31 new items concerning school environment, teaching and interaction between the students, and between the teacher and the students. This instrument was administered to 78 classes, with the participation of 1696 students and 78 teachers in Göteborg. The first objective was to compare the attitudes of students now with the DPA investigation 35 years ago using identical items. The analysis focused both on item level data and on factor scores computed from the two-level CFA model. The results showed a general improvement in attitudes. A differentiated picture was seen on the within-class level with significant changes in peer relational factors but not in school factors. The present curriculum with its focus on interaction aspects of learning may have implemented changes in relational patterns and created a more positive student attitude. On between-class level all three factors had increased their levels of attitudes, but the variation among classes was wide. The second objective was to analyze differences between the points of view of students and their teachers, and to analyze which factors explained classroom differences in attitudes. Differences in teacher-student perspectives were seen on item level. The students' attitudes emphasized the importance of positive interaction with both teacher and peers. Teachers noted the level of work ambitions, stress and disturbance among students. The factors of most importance for classroom differences in attitudes concerning work atmosphere and social relations were a sensible management of deviancy, and creation of a safe and orderly environment.

Contents

STUDY I – III

Foreword

One important thing I have learnt during my work on this thesis is that attitudes reflect the conditions in the working environment for both children and adults. This thesis could not have been written without the support of both institutions and individuals.

First, I would like to thank the more than 30 principals, who agreed to participate in the project "Classroom, student and teacher". Including the pilot study, 86 teachers and 1,700 pupils in 6th grade participated. Thank you for your fantastic cooperation. Visiting so many schools and classrooms was a real adventure. Among my memories are the perfect reception given my by a school hostess, the time I was given a lift on a front-platform moped or when I was locked in and had to call for help. There is certainly enough to fill a whole book.

A very large thanks for the financing of the whole project goes to the Swedish Research Council and the Graduate Program at the Department of Education, Göteborg University. Without their financial support, my ideas would have remained as just ideas. In this context, there is also my supervisor Professor Jan-Eric Gustafsson, an inspirer and a visionary. His support and response is the most distinct and at the same time the most lively one can imagine and I thank you warmly. I look forward to being able to joke about all the work and all the trip-wires. Who actually did lay them out?

In order to keep on course in the work on a thesis, one needs significant role models. I am thinking in particular of two women, who both accepted the role being my assistant supervisor – Professor Elisabet Öhrn and Senior Lecturer Monica Rosen. You represent true female competence combined with style and humour. My warm thanks to you both.

There is a saying that it is journey and not the destination that is worthwhile. As a doctoral candidate, one does not travel alone. My sincere thanks go to the FUR group, which, without knowing it, gave me the inspiration and energy to tackle difficult problems. For this group, there are no impossible questions or hopeless situations.

Looking back on my years as a doctoral student, there are smiles and laughter I remember particularly well my friend, Ida's grandmother. There are my colleagues Christina, Eva, Joanna, Kajsa, Ulrika, and among colleagues and neighbours Björn and Caroline; my namesake Marion, my not-my-own secretary Inga-Lill and Bo, artist and computer expert as well as Åsa and Marianne. There are my doctoral comrades from the introductory course and in particular Ingrid, whom I thank for her help at the eleventh hour.

There is also the whole student health team in Borås and especially the ones who left for France without a moment of hesitation. There are all my other colleagues and book friends who have been so encouraging come rain or shine. Thank you for your invaluable help and cooperation.

CHAPTER 1 INTRODUCTION

The origin of the idea of this thesis was my experience that the quality in classrooms during lessons was related to the composition of students within classes which seemed to have profound effects on both social and achievement outcomes. These were affected from patters of interaction among students and between teachers and students. Of similar importance on teacher work conditions were the recommendations within the curriculum. In the present curriculum, Lpo94, teachers are supposed to among other things "together with the students develop rules for the work and the being together in the classroom" and also "cooperate with the families concerning fostering of the students and thereby explain norms and rules as a foundation for cooperation".

During the teacher education I became familiar with Lgr-69 which was the second curriculum for the comprehensive school that was introduced in 1962. This curriculum and the current curriculum, Lpo94, illustrate the broad span of recommendations to which a teacher has had to accommodate. In my memory from the 1970s teacher planning was focused on the content of different subjects. Lessons were supposed to be organized within a fairly strict schedule and the aim was to teach about certain domains. The textbooks closely followed the curriculum and the teacher followed the textbooks. All students got marks reflecting their knowledge and socialization.

Today each school has its own local plans, which include descriptions of the content to be learned and trained during a certain time period. The teacher is recommended to become a mentor of the student. According to my experience during the last decade students' behavior has changed towards more interaction with the teacher and peers during work. Whether this is beneficial for schooling or for attitudes towards school is a relevant question.

The curricula thus have implications for how life in classrooms is framed and organized. The classroom processes and activities may, in turn, be expected to affect the attitudes of the students towards school as an institution, towards the teacher, and towards the peers.

This dissertation investigates attitudes of 6th grade students towards school, the teacher and the peers, using data collected in the 1960s and newly collected data. One purpose thus is to describe changes in attitudes over this 35 year period. Another purpose is to try to understand which factors are important in determining student attitudes. There are, of course, many factors which influence student attitudes, and a complete understanding of these factors and their interactions is impossible. However, through the comparison over time, and through comparisons between classrooms some insights may be gained.

In order to study the effects of the composition of students within classes and its effects it is necessary to study variability both within and between classrooms. This requires large samples of students and classes, and it requires appropriate statistical methods for analyzing these data. Using questionnaires, data has been collected from more than 1500 students. These data, along with the data collected in the Didactical Process Analysis (DPA) project (Bredänge & Odhagen, 1972) have been analyzed with multivariate statistical techniques. When differences between individuals as well as between classrooms are to be investigated it is necessary to apply methods which can handle large amount of data at the two levels. Another purpose of the dissertation therefore is to attend to methodological aspects of the study of attitudes towards school.

When the outcome of schooling is evaluated there is usually an emphasis on knowledge and skills. However, teaching includes social and emotional practices and there are many other important aims of schooling, which are not easily measured, such as attitudes and values. Such outcomes may partially be captured through evaluation of classrooms. According to Scheerens & Bosker, (1997) the main components of instruction are orderliness, good relationships, work attitude and satisfaction, which affect the climates within classrooms. These aspects of classroom climate are important outcomes of schooling and they need to be further elucidated.

Within classrooms students and the teacher have different roles. One difference is that students have a short term perspective, but their roles may still be firmly grounded within the student group. In my teacher experience a student group represents individuals and role characters. The teacher role involves conflicting demands. According to Grosin (2004) teaching is a compromise between teacher ambition and the ethos and resources of the school, and he concludes that

successful schools are able to synthesize goals of knowledge with social fostering.

The classroom climate during lessons is experienced not only by students. Teachers who are willing to use the situation in order to apprehend the students' knowledge and understanding of the actual content also become learners. Thus, the classroom environment frames a situation where students and teachers represent two different learning perspectives (Emanuelsson, 2001). To have the perspectives of two parts with parallel opportunities for development is a fruitful way to take advantage of interaction processes.

To understand classroom processes it is necessary to look at the teacher. Teacher thinking and behavior undergoes major changes during a long professional life (Hargreaves & Fink, 2006). Experienced teachers also have a more complex understanding of the classroom situation (Watkins & Mortimore, 1999). Teacher age and professional experience thus are important aspects to study.

Gipps and MacGilchrist (1999) point at three teacher competencies: subject knowledge, skills in classroom management, and an understanding of children in order to be aware of own teaching strategies. Malm and Löfgren (forthcoming) argue that teacher competences may be described in terms of overlapping components. The students are dependent on the quality of the interpersonal relationship with their teacher. A second important domain is related to chosen methods. The third component is that teachers have to structure their subject knowledge in a fruitful way. Thus, it is obvious that the teacher plays a very important role in the classroom, but there is a need to gain more knowledge about how this affects student attitudes and classroom climate.

At a general level it may thus be hypothesized that the qualities of the classrooms are related to the teacher work and the mix of students. The opinions and attitudes of the students and the teachers were gathered in order to investigate this general hypothesis more closely. Furthermore, the historical comparison offers an opportunity to make a comparison between two different curricula, even though it is difficult to draw strong conclusions about the impact of curricula on attitudes towards school, because many other things have also changed.

In summary, the main aim of the study is to understand student attitudes towards different aspects of school using data from two time periods, and to analyze the impact both from teachers and students on classroom climate. Another important aim in order to accomplish this is to find suitable instruments and methods.

Three empirical studies

The thesis summarizes and discusses results from three empirical studies.

Study I ("Attitudes towards school, teacher and classmates at classroom and individual levels: An application of two-level confirmatory factor analysis"; Holfve-Sabel & Gustafsson, 2005) investigates the measurement of student attitudes towards school, teacher and classmates, through separating variance between students within classrooms from the variance between classrooms. The empirical study is a reanalysis of data collected in 60 classes in grade 6 in the 1960s (Bredänge & Odhagen, 1972), using modern techniques of two-level confirmatory factor analysis.

In Study II ("A Comparison of Student Attitudes towards School, Teacher and Peers in Swedish Comprehensive Schools Now and 35 Years Ago"; Holfve-Sabel, 2006a) the attitudes towards school, teacher and classmates in the late 1960s are compared with data collected 2003 in grade 6.

In Study III ("Classroom Climate in Grade 6 According to Students and Teachers"; Holfve-Sabel, 2006b) the variation between classrooms in student attitudes is analyzed using new items, and attempts are made to account for the variation in terms of teacher activities and background factors.

The three following chapters

Chapter 2 has its focus on the introduction of the Swedish comprehensive school and changes of curricula. It also includes analysis of older attitude questionnaires with relevance for the present project. The chapter ends with a short summary of the present comprehensive Swedish school.

Chapter 3 has its focus on socialization and student attitude towards school. The measurement of attitudes is described. Included in the chapter are some large Swedish student attitude investigations. The selection of attitude investigations is related to the present study and my previous teacher experience. In the end of chapter 3 some examples of international reflections about effects of educational reforms on student attitudes are presented.

The selection of investigations described in Chapter 4 illustrates different perspectives, such as the teachers, the students and the investigators view of efficient teachers. Some effects of peer relationships are described. The last part includes studies with both teachers and students.

CHAPTER 2 SWEDISH EDUCATIONAL POLICY PRACTICE

The presentation will briefly describe the shifting educational policies in the decades surrounding the two student attitude investigations. These short descriptions make it possible for the reader to compare these two school periods. Some early attitude investigations with connections to the three empirical studies are also presented.

A brief background to the introduction of the comprehensive school

In 1948 a milestone report in Swedish educational policy was published (SOU 1948:27). On the basis of work conducted by several commissions during the 1940s a blueprint was laid out for a comprehensive school.

The reform was in line with the pragmatist ideas of Dewey (1999). According to Dewey (1916) the school class could be regarded as a miniature of society. A central theme for Dewey was that experiences at school affect students´ development. The best guarantee for a good society was to optimize the development of the individual within school. Student responsibility and personality was developed within social life at school and had strong impact on future society.

These ideas influenced the vision about the comprehensive school in the commission report SOU 1948:27. The idea was to integrate children from different social classes, boys and girls, talented and less talented students in the same groups in order to bring up students with shared norms of friendship and solidarity. All students were supposed to have a minimum of 9 years of schooling, and the system with a 'folkskola' and a 'realskola' was to be abolished.

Already in 1949 the National Agency of Education (Skolöverstyrelsen) had started an experimental 9-year comprehensive school. The parliament decided later in 1951 that the comprehensive school was to be introduced first on an experimental basis. In 1962 a 9 year comprehensive school was started in Sweden (Marklund, 1982; Rothstein, 1986). Interestingly enough several research studies were commissioned and funded by the government during the late 1950s, which were of importance for the introduction of the new comprehensive school.

The Johannesson and Magnusson study

One of the studies commissioned by the state was conducted by Johannesson and Magnusson (1960). Johannesson and Magnusson were assigned the task to investigate the effects on social relationships in classrooms with a homogenous or a heterogeneous composition of students. This is similarly an early example of ordered research with political demands in a pre specified direction. It is of special interest for this study to relate to this old investigation since these authors constructed the original attitude questionnaire.

Johannesson was a pioneer of investigations of social relations in school classes in Sweden (e.g., Johannesson, 1954). The Johannesson and Magnusson investigation (1960) was designed to come close to an experimental situation with comparisons of different learning environments. The individual variables investigated were intelligence and personality. Background and context variables were home environment, general environment and school environment with school organization, teacher and peers. Student attitude and interest, wishes and values were scrutinized and related to each other and to aspects of the environment.

Two attitude instruments were developed for the students. One was the 40 item questionnaire "Our class" intended to measure student attitudes concerning the school, teaching and general socialization. The other was a 20 item questionnaire investigating student attitudes towards the school day, home work, teachers, friends and marks. A socio metric instrument also was used. The latter asked each student to judge every single member of the group from three aspects of cooperation: in the classroom, outside the classroom and in leisure hours.

The teachers were asked to give their responses to attitude items as well. Two domains were covered: questions about students' upbringing and questions about teaching problems. A questionnaire also was also given to the parents with items concerning their attitude towards an extension of compulsory school, and if they discussed future education with the teacher. Items also concerned school and homework, tests and marks. About 300 teachers, 3000 parents and 3000 students took part in the study.

The conviction that individuals and their families as well as teachers could be measured and evaluated reflects assumptions from that time that the research projects funded by the government had the right to include mapping of personal characteristics and identities. From an ethical point of view some of these methods seem disturbing.

The results showed that students' attitudes towards peers were positive in the positively differentiated school ('realskola'), while the most negative peer attitudes were found among students in the public school ('folkskola'). On the other hand the attitude towards teachers was most positive among students in public schools. Attitudes towards the teacher had no correlation with student ability. The correlation was high between attitudes towards the teacher and attitudes towards school in general. The school attitude was generally more positive in the positively differentiated school. In the comprehensive school ('enhetsskola') and the positively differentiated school students attitude towards school was most positive among less successful students. Students regarded rewards of marks very important in all three school categories. The results also demonstrated that shorter school days and less homework were appreciated in the early comprehensive school.

One aim with the school reform was to restructure inner school life, which emphasized strong demands on attitudes changes among teacher and parents. However, because of the fact that many results in the Jahannesson & Magnusson study were inconclusive, it was impossible to evaluate effects of the reform pedagogy and the investigators were not able to decide if homogenous or heterogeneous groups were to be preferred. However, the results were not indicating any major obstacles for heterogeneous groups. The goal to implement an undifferentiated school was thus carried through although the investigators had been unable to answer the main research question.

The implementation of the comprehensive school

In 1961 the parliament took the decision to implement the 9 year comprehensive school. A new commission report (SOU 1961:30) was published which discussed the general implementation of the comprehensive school, and the first national curriculum for the comprehensive school (Lgr-62) was introduced. The report emphasized that the teacher's task was to encourage individual intellectual activities and to closely follow the development of each student.

The teacher education was changed in the 1960s but mainly affected teachers in primary and lower secondary school. The labour unions of the teachers were not enthusiastic about the new situation. An increased schedule for the students with 34-36 hours at school per week in grades 4-6 was introduced. As a result of the expansion of the comprehensive system there also was a shortage of teachers. The changes were affecting the educational system in all respects (Husén 1973, Marklund, 1982).

An ideology of equality characterized the recommendations (Lgr-62; Lgr-69; Rothstein, 1986). The recommendation to take the perspective of the active student was originally a contribution from Piaget (Säljö, 2003). However, the question of differentiation was problematic. Marks still were used, and students´ choices of more or less theoretical courses made the differentiation apparent. In practice only students with high marks from theoretical programs could be certain of gaining access to the prestigious upper secondary school. The question of differentiation of students became a compromise between ideology and reality. There was an urgent need to change teaching methods so as to suit heterogeneous classes (Rothstein, 1986). Class sizes and homogeneity of social background were also considered important to investigate (Marklund, 1962). In heterogeneous classes students' ideas were broader and more creative. The character of the interactions within classrooms had profound outcome effects, both positive and negative, but interaction among students was difficult to grasp from the teacher perspective. The classroom situation was negatively affected when the groups included disturbing students. Marklund (1962) also emphasized that in the more heterogeneous classes the teachers were recommended to use less plenary teaching. About 10 years later Dahllöf (1971) criticized Marklund for omitting the teaching process. Teaching resulted in differences in achievement already after the initial four years. Dahllöf (1971) concluded that the classes of the comprehensive school in comparison to selective school

classes meant that a prize was to be paid for the social climate, positive student attitudes, and the broader recruitment to higher education. More time had to be spent for general knowledge development and harder work invested from the teacher

The implementation of the comprehensive school reflects a political wish for a more democratic school system. By funding and using educational research parts of the reform were proposed to be natural consequences of investigation results. However, the results of the studies often could be given different interpretation, which is illustrated above and also by the different conclusions drawn by Svensson (1962) and by Dahllöf (1971) in a reanalysis of the data.

The Didactical Process Analysis Study

A major research project was conducted a few years after the introduction of the comprehensive school. The Didactical Process Analysis (DPA) investigation started in 1967 with the aim of describing main structures in the teaching-learning process (Bredänge, Gustafsson, Hallin, Ingvarsson, Odhagen, & Stigenbrandt, 1971; Bredänge, & Odhagen, 1972). It was also meant to study the connections between the quality of teaching, students´ abilities and the educational process within the classrooms. The idea was to find connections between processes and products and the starting point was to investigate teacher and student behavior within classrooms. This process was combined with information about the specific school environment, teacher and student characteristics, and also outcomes of schooling, including cognitive and non-cognitive student development. Using time sampling methods lessons were video recorded, and tape recording was done of complete lessons. Classroom observations were also performed during two school days. The teachers answered questionnaires concerning their attitude towards the profession and about their personality and knowledge about students. Teacher examination certificates were collected. The students' tests included intelligence, personality, as well as knowledge and study technique. The students also answered the attitude questionnaire "Our class" and socio metric judgments were performed.

The results from the DPA project showed that teachers mainly were practicing plenary teaching, and that the students were mostly listening passively. Knowledge content mostly consisted of facts. Comparisons, discussions or critical analyses were rare. Basically, knowledge was mediated from printed

material and the teacher's questions aimed at reproduction. The management of the teacher included instructions and short information. It was noted that negative feedback was twice as common as positive feed back and that teacher engagement rarely was seen. Administrative task took substantial time, while student care was uncommon. The investigators concluded that all school experience was labeled knowledge development by teachers and students. In Lgr-62 it was recommended to encourage students' activity. These activities during lessons should be related to students' intellectual level, personal needs, curiosity and interest. However, the investigators saw six years after the introduction of Lgr-62, very little effect of these recommendations, which illustrates that curriculum changes only slowly affect school practice. Reforms conducted in educational systems are long term projects. Teachers eventually change their performance according to curriculum structures which has a more profound influence than subject content or pedagogy. This does not mean that the teachers are supportive or convinced that the ideas are for the better (Helsby & McCulloch, 1996).

The cognitive aspects within classrooms were still dominating. The hypothesis was that teaching methodology was weak concerning increase of student interest and engagement. The recommendations from the large DPA project was to perform more detailed investigations in the future concerning, for example, patterns of communication in classrooms and student activity. It was considered important to investigate one problem at a time.

The DPA collected an enormous amount of interesting data using modern technology but the proper methodological instruments for analyzing the data were not yet available. However, because the data are still available they can be reanalyzed. In order to understand the present school situation it is extremely valuable to make comparisons with the past.

Also other studies showed that the teaching methods were mostly traditional and not in line with the recommendations about individualization and support of personal student development (Husén, 1973; Gustafsson, Stigebrandt & Ljungvall, 1981; Marklund, 1982). The students were caught in a competition for marks and the unfamiliar idea about the necessity of more lessons every week and with at least another year in school. The school system was in a turbulent phase and the teachers were not prepared to counteract the social inequalities. What kind of competences the teacher role has to include was

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necessary to describe in a more stringent way due to the focus on teacher performance.

The decentralised Swedish school

In the early 1990s several decisions were made which transformed the highly centralized Swedish educational system into one of the most decentralized and deregulated (Holfve-Sabel, 1994; 2000; Lindblad, Lundahl & Zackari, 2001). The national curriculum only specifies the final goals to be reached in comprehensive school, while it is up to the municipalities and schools to decide how to reach them (SOU 1992:94; Lpo94). The official educational philosophy embraces several ideas. A central theme is looking upon learning as an interaction processes. This ideology is in line with Vygotsky (1978) in addition to which it further emphasizes the social dimension. The decentralised organisation accepts private schools and specific school profiles (Falkner, 1997). Competition between schools or within schools is encouraged, in line with the analogy to the free market (Lindblad *et al.*, 2001).

The principal and the teachers have the responsibility to be involved in the development of each student. Much time and effort is spent in communication between teachers, students and their parents. The parental and student influence on teaching methods is supposed to be strong, but it still seems to be weak (Lundh & Stoltz, 2001; Selander 2003; Lundh & Borgny, 2004).

Even though the school system was decentralized the change implied a stronger central control over curriculum content and evaluation of student performance. Thus, government has increased its power to define what kind of knowledge and performance is required (Whitty, Power & Halpin, 1998). Marks are not awarded for students until grade 8 but quite large proportions of the students fail to reach a "pass" grade in all subjects. Because of the rules for entrance in the upper secondary school most teachers and students put strong effort into reaching "pass" grades in Swedish language and literacy, Mathematics and English while other subjects are neglected (Holfve-Sabel, 1998).

The older reform relied upon the commitment of the teacher to work in line with the official national curriculum (Lgr-62). The teachers nowadays have been assigned more freedom in some aspects but also increased responsibility. The

latter has increased the demands for administrative teacher work (Lindqvist, 2002; Nordänger, 2002). At the same time the school climate has become less strict and formal, which has affected teacher relations with both students and parents. However the old reform was not able to solve the differentiation problem (Rothstein, 1986) and whether the present school represents smaller discrepancies between classrooms according to teachers and students is to be investigated.

CHAPTER 3 ATTITUDES TOWARDS SCHOOL: MEASUREMENT AND DETERMINANTS

The concept of socialization is important for the understanding of classroom processes. Socialization is understood as a process where knowledge, norms, values and attitudes are conveyed from one generation to another. Within a group communication among members cause influences which can result in different expressions like conflict, cooperation, competition or adjustment. Within classrooms individuals interact and develop knowledge about each other. Student socialization involves a reproduction of culture (Aspelin, 2003). During adolescence social activities, especially with peers, are important. Reciprocal friendship between peers is a part of social adjustment to school. During the same period the conceptions of friendship are changing. Development of an identity is strongly related to the experience of social acceptance (Wigfield, Eccles & Pintrich, 1996). The development towards an individual personality makes differentiation necessary, especially during pre-puberty, and daily negotiations occur between peers. In this process the personal opinion may be revised when the evaluation of friendship is considered as more important. Norms for friendship, heterosexual approaches and relations with adults also are challenged. This cannot occur without confrontations, which are important in affecting a child's self-knowledge and development of identity (Corsaro, 1997).

Classrooms are influenced both from attitude development and socialization processes. Socialization includes that parents and teachers now and then experience student's lack of interest for school activities. Family relations have major impact on important developmental issues, but at the same time influences from peers on attitudes are substantial (Wigfield, Eccles & Pintrich, 1996). The age level of the students has to be considered. The adolescence is characterized by shifts between a need for security and a wish for change. The institutional demands on the individual also are more challenging for an adolescent student. Some students develop strategies to conform and others develop a complicated resistance (Sernhede, 1996). Often academic activities are not highly rated by adolescents. Especially low achievers who develop friendship with each other

are at risk for declining interest for school work (Wigfield, Eccles & Pintrich, 1996). It is of great importance if the classroom climate supports both socialisation and knowledge development. For example, it makes a major difference if the teacher recognizes the resources of peers and convinces the students that the contribution from each and everyone is of great value (Bransford, Darling-Hammond & LePage, 2005). When learning is considered a social process less objective outcomes in student performances tend to be acknowledged (Gipps, 2001). An inspiring classroom climate must therefore consider social and cultural characteristics of the group of students (Westling Allodi, 2001). This means that the evaluation of school quality should include subjective responses or student metacognition. A learner's personal knowledge from an "I" perspective and knowledge about other learners has to be included (Allwood & Jonsson, 2001).

Today educational policies in the Nordic countries have a fairly strong support for recognizing affective aspects of teacher-student or peer relations (Osborn, 2001). It is acknowledged that positive affections for the school environment can deepen the engagement of both the student and the teacher and that this in turn can strengthen the pupils' achievement. In this way every classroom reflects students' experience from their families and from outside school. Each student is at the same time socialized in school and within society. All these experiences influence students´ attitudes.

The attitude concept and its functions

The nature of attitudes is outlined, primarily following Eagly and Chaiken (1993). Three mental functions of the human mind have traditionally been acknowledged: conation, affection and cognition (Snow, Corno & Jackson III, 1996). In this tradition attitudes are related to the affective domain. However, attitudes may be formed on the basis of either one of these functions, or on a mix of functions (Eagly & Chaiken, 1993). Attitude is a hypothesized construct expressed by evaluating an object or entity with some degree of favor or disfavor. Attitudes are observable after responses have been given and thus each individual becomes aware of his or her personal attitude towards an object. This means that an attitude may be hidden until a response is asked for. The process includes pairing a condition with a stimulus that elicits an affective response. From inter-related mental processes attitudes are formed and repeated

associations manifest them in cognitive, affective or behavioral responses. A cognitive attitude is related to individual thoughts, either positive or negative. An affective attitude is related to emotions and, finally, a behavioral attitude is connected to prepared actions within the individual. Actions are also influenced from other sources such as habits, norms and self-perception. Expressions of attitudes are neither facts nor imaginations but what individuals evaluate to a certain degree.

In similar situations attitudes have a tendency to show stable responses (Snow, Corno & Jackson III, 1996). Attitudes and expectation towards school life and occupation are seen as kindred variables (Passow *et al.*, 1976). When a personal identity is formed both attitudes and expectations towards the future life may be of great importance. An infant by the age of one shows affective approach-avoidance responses and by the time the child enters school he or she has a repertoire of both desirable and undesirable attitudes from an adult perspective.

Attitudes are ordered in a hierarchical pattern where the most stable ones concern very important aspects in life of the individual. Both positive and negative attitudes (e. g. prejudices) are built from early childhood and contribute to shaping the unique cognitive and intellectual competencies which facilitate human collaboration in the community. The amount of personal knowledge and information affects the stability of individual attitudes. Less complicated thoughts lies behind extreme attitudes. An attitude towards an object is often related to the person who presents the information but social interaction affects the development of attitudes. Attraction occurs between individuals with similar attitudes. Changes of attitudes occur when individuals experience mutual understanding and like each other. Their psychological function is to simplify the management of the vast amount of information from the social environment and serve as stabilizing factors in understanding similar situations, and in creating and maintaining the expression of one's identity towards persons in the environment (Eagly & Chaiken, 1993).

A marked change in attitudes during adolescence is hypothesized (Kahn & Weiss, 1973). Adolescents' sense of competence and valuing of different activities are changing during this time period. It is a time when more choices and options become available. Their new believes about activities can lead to substantial effects on behavior. Social status and physical appearance are of great importance to adolescents. In early adolescence it is common with more

extensive involvement in social and sports activities, and in extra curricular activities (Wigfield, Eccles & Pintrich, 1996).

The attitude concept has been used in numerous studies (Halstead & Taylor, 2000) but still includes theoretical and operational ambiguities. One *question* is whether attitudes are related to existing phenomena or can include desires. Another perspective demonstrates that the target of attitudes is related to parts of self image, and finally intentional attitudes are suggesting that attitudes reflect cognitively structured perceptions of situations (González, 1992). This again demonstrates that attitudes can be measured. When questionnaires are used and no evaluation of the correctness of the responses has been made an attitude is acknowledged. The definition of attitudes is related to individual affective senses of phenomena. An attitude can be similar to a truth or a fact but is not scrutinized as one.

Student achievement is not so classroom specific as is student attitude (Andersson, Ryan & Shapiro, 1989). When an individual student has a positive attitude towards a subject or to schooling in general this can be treated as equivalent to interest. Attitudes are not exclusively related to a particular learning process, but a student cannot acquire a specific content in a subject without also acquiring affective predispositions (Shuell, 1996).

Measurement of attitudes

According to Himmelfarb (1993), attitude indicators or responses may be evaluated, and scales may be created which can be used to determine differences between individuals and groups. The information from an attitude instrument mirrors existing relations among the attitudes of the students measured. The instrument needs to be a reliable and a valid indicator when attitudes are measured. There are two traditions of attitude measurement in psychology; one is psychophysical where an individual is evaluating or making a judgment of a physical experience on a scale. The other tradition is psychometric measurement where mental or psychological testing is performed. Usually a series of items is supposed to measure an underlying attribute. The individual responses are transposed into one or more scales.

A problem in the construction of scales is that attitudes seldom can be ordered along an interval scale. In these cases ordinary attitude measures, also called index or non representational measures, are used, which means that there is no exact relation between the figures given to the attitudes and the relations among the attitudes. In these cases the numbers are not allowing interpretations of the exact attitude relations between individuals or groups.

When representational measurements are used a person with an attitude score of 8, for example, has 4 times as favorable an attitude as a person with a score of 2 on a ratio scale. Representational scales are ideal, but in practice they are quite difficult to construct and validate. Errors of measurement are always present due to differences in interpretation of statements in attitude measures, the specific wording of statements etc. These kinds of errors represent random fluctuations, and there may also be systematic errors, for example if individuals feel that they are expected to respond in a certain way. Bias of attitude responses can occur for instance when individuals experience an external demand to conform with the norm considered correct. Items may also be considered as controversial according to personal culture or background.

Thurstone (1928) and Likert (1932) were the first to describe measurement of attitudes. The Thurstone scaling technique is applied in two steps; first the stimulus is estimated, and then the attitude of the person is located on a scale. The aim is to create a representational measurement. In contrast the Likert method of summated ratings is a person scaling technique within the psychometric domain. The Likert scaling technique was developed in order to create a less complicated instrument. Both Thurstone and Likert items are intuitively created to reflect the chosen object. However, Thurstone items represent a continuum of attitudes, while Likert items express a degree of either positive or negative attitude. Often the Likert scale ranges from 1 to 5, the most favorable response being given the score 5.

The internal consistency between the items used in the questionnaire is typically measured by Cronbachs α. Often the inter correlations between items are examined by factor analysis, in order to identify clusters of items that measure different factors or dimensions. Factor analysis is an important tool in the development of measurement techniques and Thurstone (e. g., 1948) was also involved in its development.

Factor analysis usually assumes that the responses of an individual are independent of the responses of other individuals. However, when it comes to measurement of attitudes towards school, the teacher and classmates this assumption is generally incorrect, because there is an influence on all students within a classroom of both the teacher and the classroom environment. Thus, the responses to attitude items, or other attributes collected in groups, reflect both variation between individual attitudes and group differences in attitudes. It thus seems necessary to separate individual variability from variability between classrooms (see e.g., Raudenbush & Bryk, 2002).

In an early study Gustafsson (1979) analyzed the structure of the attitude questionnaire used by Bredänge *et al.* (1971) in the DPA investigation conducted in 1967/68. This questionnaire was based on the instrument "Our class" developed by Johannesson and Magnusson (1960). Gustafsson (1979) applied exploratory factor analysis at the item level. Following a suggestion by Cronbach (1976) how to take into account the fact that students are nested within classrooms, one matrix was computed from the deviations between the pupils' responses and their respective class means, and another correlation matrix was computed from the class means of the responses to the items. Separate factor analyses were conducted of the two different kinds of correlation matrices. The factor analysis of the former matrix showed individual variation within classrooms, while the analysis of the latter matrix captured variation between classrooms. The analysis of both matrices yielded five factors, which were labeled School, Teacher, Relations to Classmates, Class Relations and Class Discipline. The amount of variance accounted for by different factors was different in the two analyses. In the analysis of the within-classroom matrix most variance was accounted for by the factors School and Teacher, while the analysis of the between-classroom matrix showed these two factors to be reversed in importance. Gustafsson (1979) concluded that the hierarchical nature of the data made it necessary to separate variation, which was due to differences among individual students from variation that was due to differences between teachers and classrooms.

After this study was conducted there has been an important development of analytic techniques capable of dealing with multi-level data. Most of these techniques are multilevel regression models (e. g., Raudenbush & Bryk, 2002). Extensions also have been made of factor analytic models so that the dimensional structure of two-level data can be analyzed in such a way that the

hierarchical nature of the data is taken properly into account (Muthén, 1989, 1991, 1994). This has been done through extensions of modern confirmatory factor analytic (CFA) methods (e. g., Loehlin, 2004) to obtain the correct model for both the between-group and within-group structures. Muthén (1990) showed that this may be done by considering the two-level estimation problem as a two-group problem in structural equation modeling (SEM).

Multi-level CFA is likely to have many advantages in the analysis of attitude data in the school context, or other attributes collected from groups, because of the capacity to estimate separately the variance due to individuals within classes and differences between classes. The availability of latent variables also is important because they allow summarization of several observed variables in an abstract concept. Both the content and number of factors may be different in different models and there may be different factors on the two levels. Each item may load on more than one factor. One drawback of CFA is the complexity of the modeling and the heavy computations. The more items in the questionnaire, the more complicated are the modeling. Large-scale investigations are also necessary. Furthermore, the experiences of the method are limited.

It nevertheless seems important to try to take advantage of two-level SEM in the study of attitudes towards school, and one the purposes of the present dissertation is to investigate differences between the results obtained by Gustafsson (1979) and those obtained with two-level CFA.

Early Swedish investigations of student attitudes

The International Association for the Evaluation of Educational Achievement (IEA) investigated achievement and attitudes in 6 subjects in 21 countries in 1970–72. General attitudes towards school in the populations of 10- and 14-year-old students were reported. The Swedish mean was the lowest of all participating countries (Husén, 1973; Hansson, 1975). Among students in grades 7 - 9 20 % agreed to the statement "the only thing I like about school is seeing peers" and "usually I dislike schoolwork" (Husén, 1973). In the subject Swedish language and reading literacy 45 % of boys and around 20 % of the girls in grades 7 - 9 had a strongly negative attitude (Hansson, 1975).

In the Swedish UGU material about 10 000 Swedish students born in 1967 were asked how they experienced school when they were in grade 6 (i. e., in 1980). More than 20 % were afraid of incidents in school or felt discomfort when answering teacher questions. Less than 40% thought "one learnt a lot of unnecessary things" and 65% were disappointed if they failed on a test (Ek & Pettersson, 1985). These investigations reflect rather negative attitudes to the Swedish comprehensive school at that time.

Attitude investigations conducted by the National Agency of Education

The National Agency of Education has conducted four attitude investigations since 1993 using questionnaires or telephone interviews. The latter was used for students of grades 7-9. Also teachers and adults were included. In year 2000 the National Agency of Education asked parents and teachers about their confidence in school and about the decentralized government of school (Lundh & Stoltz, 2001). Among teachers in the comprehensive school the majority expressed confidence in school but teachers were extremely negative towards the decentralization, only fourteen percent were positive. A large amount of the teachers (40 %) had very low or moderate confidence in politicians as well as in the National Agency of Education. However, the national curriculum still was experienced by teachers to have large impact on the work. According to a later investigation in 2003 (Lund & Borgny, 2004) around 50 % of parents and general public had low confidence in the comprehensive school and towards teachers in general. The confidence in the National Agency of Education was very low both from teachers, parents and the general public (21, 16 and 14 %, respectively).

The proportion of students from grade 7 and upwards that stated they appreciated their school "very or fairly good" had decreased from 1993/94 to year 2000 (Lundh & Stoltz, 2001). Students with very low appreciation of their school had increased from 3 to 6 %. More than 90% of students appreciated their peers. Appreciation of teachers also had increased to 84 % and three quarters of the students stated that they appreciated schoolwork. These figures are interesting since only 6 of 10 students were regarding schooling as meaningful, and even fewer students felt enjoyment in learning. The proportion of students expressing appreciation of teaching had decreased from 1993/94 to

year 2000. The students distinguish between the teacher and teaching and between their school work and its importance. Twenty-five per cent of a group of students who did not get on well in school stated that teachers could not create engagement or interest, and even more thought that their teachers lacked confidence in these students aptitudes to learn.

Students' self-perception of their own engagement at school had increased from 60 % in 1993/94 to 78 % in year 2000. In contrast teachers thought that students' engagement has decreased. Almost two thirds of all teachers said that the number of students with special needs had increased.

In a study conducted in 2003 (Lund & Borgny, 2004) the students in grade 7 and higher grades were asked about their views of school and their attitudes towards school. The students reported commitment to schoolwork had increased quite dramatically from 60 to 86 % from 1993 to 2003, while positive responses to the question "does school increase your enjoyment for learning more" had increased from 56 to 63 % between 2000 and 2003. Almost 90% of the students agreed that school developed their talent to co-operate with others and their talent to make statements about right and wrong. These items can reflect either students´ self image or an expected answer.

Students' evaluation of different subjects showed that English, Swedish and Mathematics were considered important (81, 79 and 70 %, respectively). However their enjoyment of these subjects was weaker (66% for English, 64 % for Swedish and 52% for Mathematics). In contrast sports were regarded fun by 83 %, and important by 55 %. History was regarded fun among 61 % and important among 35 %. The students' appreciation of their school had increased to 89 %, while their appreciation of other students, their teachers and their schoolwork was similar to that in the year 2000. Student stress had increased from 25 % 1997 to 34 % in 2003, and the increase was most obvious for girls (33 % to 47%). These results indicate that students are aware of the present focus on three subjects. The discrepancy between fun and importance indicates that teachers could use more feed back from their students. Lund & Borgny (2004) concluded that the general influence of students in school had not increased. Both students and teachers had a more positive view of collaboration and school climate than in the year 2000. A large increment was noted for student commitment to schoolwork. Stress among students had increased

according to both students and teachers. Parents were satisfied with the information given by the teachers.

The National Agency of Education chooses specific areas for each attitude investigation. For example in year 2000 focus was on democracy in school. Parent influence on school practices and student development of responsibility were not considered optimal. Another discussion concerned goal fulfillment. The Agency of Education judged knowledge development to be good compared to most other countries. The lack of confidence in school politicians and school administrators was still considered a problem. Expanded communication between the professionals within school and school politicians was recommended. Improvements of the social environment in order to develop better relations among teachers and students and between students to decrease stress and harassments were considered necessary in the report (Lundh & Stoltz, 2001).

These conclusions are mainly of political and uncritical nature. The National Agency of Education concluded (Lund & Borgny, 2004) that the four attitude investigations performed during the last 10 years showed a positive trend in most areas. The teachers who are close to the students expressed lack of confidence in all four investigations. The quality of relationship between teachers and students was better. However the increased stress, especially among younger girls was considered negative. It was also noted that students with immigrant background had different attitudes in many respects. They were more worried, but demonstrated more confidence in the school institution.

In summary the studies from the National Agency of Education demonstrate positive student attitudes without deeper reflection. The Agency regarded the more negative view from the general public as a problem of confidence but with less impact on the present school. They also highlighted positive results like better relationships within school, increased student commitment and parents' appreciation of school information. None of these trends are related to knowledge performance. Few negative trends were seen, e.g. increased student stress, the discrepancies between students' subject evaluations and distance between school politicians and the professionals within school. There are some peculiarities in the reporting and discussion of these studies. Thus, small differences between years are discussed as if they were of great relevance, while very large changes, such as for example of student commitment, are not

discussed in a critical way. Changes in a favored direction get much attention even if they are small. The repeated investigations of attitudes seem inconsistent in their presentation. They are performed within short time periods which affect the quality impression. They also lack information about sample sizes and if changes are significant or not.

International investigations of Swedish attitudes and achievement

The Third International Mathematics and Science Study (TIMSS) investigated pupils' attitude towards these subjects in 1994-95 (Beaton et al., 1997a; b). Between 61-66 % of Swedish students in eighth grade belonged to the group "liked or liked a lot" when asked about attitudes towards science subjects or mathematics. But only 9 out of 39 countries had lower indices of liking mathematics than had Sweden (Beaton et al., 1997a). Thus, student attitudes may in comparison with other countries seem weak. In 2003 a new investigation was completed (Skolverket, 2004). Compared to 1995 the results in Mathematics had decreased dramatically, from a national mean of 540 to 499. In Science the mean decrease was 29 scale points. Over the same period self-confidence had increased considerably both nationally and in comparison with other countries. A larger proportion of Swedish students regarded mathematics as important in 2003 than in 1995, but this increase was even greater in other countries.

IEA conducted PIRLS (Progress in International Reading Literacy Study) in 2001. A similar IEA investigation was conducted in 1991. When Swedish students in grade 3 were judging their reading competence they were more positive in year 2001 than in 1991. However, while the self-rated reading competence had increased, their reading performance had decreased significantly between 1991 and 2001 (Skolverket, 2003). Even if students are convinced that they are performing well the evaluation of student results showed a negative tendency.

Conclusions from national attitude investigations

The student attitude investigations seem more satisfying than the performance results in an international perspective. The reports demonstrate increases of students' commitment, and at the same time teacher skepticism towards student

progress. Much teacher work is focused on the individual student during individual evaluation conferences. Each student is exposed to these conferences at least twice a year. Thus, the attention directed towards each student is substantial. The strong focus on three core subjects is seen in student attitude. There is also an attitude difference between labeling other subjects as important or just fun. This lack of congruence is expressing parts of student adaptation to the present educational policy. The discrepancies between teachers and students are obvious in many aspects. The students' appreciation of the teachers and school work but less of contents and subjects in general mirror a conditions in the Swedish comprehensive school which need further analysis.

Effects of curricula and culture

What is happening in Sweden must be contrasted with what is seen from international experiences. In a number of investigations effects from the curriculum or educational policy on student attitudes are seen.

In an extensive qualitative study Hufton, Elliot and Illushin (2002) demonstrated how school culture and student attitudes are deeply embedded in the surrounding culture. English and American youth showed a higher level of self-satisfaction than Russian students. The difference between Russian students and those from the two other countries was their emphasis on performing their best across the whole curriculum. Success in school was related to later education and prestige. The English and American students needed marks in order to get qualifications and future employment. The difference between the Russian and American students was their evaluation of what was needed from the present curriculum and what was valuable for future education. The attitudes towards schooling in England and the US demonstrated resistance against teachers as agents of a cultural edict. The negative influences from peers in the US and England and the positive ones in Russia seemed to have a significant effect on academic achievement. This study indicates that a larger freedom for students to choose subject and time on task may result in a weaker interest in knowledge development, but in higher self-satisfaction and more positive attitudes. Peer influence may be both a positive and a negative factor.

In the late 1980s both England and France had policy makers eager to improve the standards of education. The reform was towards less centralization in

France, but in the opposite direction in England. In France this also involved introduction of child centered pedagogy from a theoretical point of view. The investigation was built upon the idea that pupils' attitudes to education originate from students socio-cultural background (Planel, 1997). Student attitudes were thought to predispose learning. The result showed that there was more dissatisfaction with school among the English students, while the French students now showed more interest in schoolwork. The conclusions were that cultural values are underlying educational values and therefore have a strong impact on learning. Little is known about how a pedagogical message will be received since there are strong influences from the culture. A major difference between England and France was that French students had a better understanding of the correspondence between education and future career. The English students were more conscious about separated learning and teaching styles and they also seemed aware of the differentiation according to student ability. The French students were more motivated by extrinsic goals and they showed more appreciation of their teachers. The authors conclude that any pedagogy must be understood from a knowledge of national and student culture. Policy changes affect student outcome, but the recommendations for change seem less related to decentralization or centralization, but more with the interpretations of the recommended pedagogy by teachers.

Puurula *et al*. (2001) investigated affective domains taking both teacher and student perspectives into account. The study was focusing on education in Europe and analyzed educational system processes and outcomes. The main aim was to investigate to what extent teachers regard affective dimensions as important, and affective outcomes as relevant school results. Another aim was to investigate if teachers and students had the same attitudes to an understanding of affective education. The study focused, among other things, upon the nature and quality of interaction and quality of school climate and ethos. The investigation was performed in 12 European countries and Israel. The samples in each country consisted of 125 teachers and 180 students 11-12 or 15-16 years of age. The teacher questionnaire included information items, and affective responsibility items, along with items about satisfaction/dissatisfaction with schooling experiences and items about values. Exploratory factor analysis was used. For teachers three interpretable factors emerged: positive classroom climate, prevention and support, and parental involvement. Teachers in the different countries considered teaching to include more than the delivery of the academic curriculum. Most emphasis was put on development of social characteristics,

autonomy, and personal development among students. Both teachers and students agreed on three main teacher tasks: creating a positive classroom climate with equal learning opportunities for all students, recognizing abuse and supporting students with problems, and finally involving parents in school. Generally teachers conceived affective dimensions to be of central importance, while students were more skeptical.

Changes of educational policies may have effects on at least teachers' attitudes. A large Italian investigation was conducted after a major school reform resulting in decentralization towards financial and educational autonomy for each school (Caprara, Barbaranelli, Borgogni, Petitta & Rubinacci, 2003). The hypothesis was that individual and collective efficiency believes were the main determinants of the adults' attitudes towards school. Therefore affective commitments and job satisfaction was examined. Questionnaires were given to 726 teachers, 387 staff members and 1994 parents in 18 schools. The data had a multilevel structure, but school level was omitted because of the limited number of schools. Intra class correlation coefficients (ICC) showed very low variance between teachers, i.e. the teachers' responses were very similar. At within-school level 8 variables were identified for the teachers. Personal efficacy or the teacher ability to cope with tasks and problems was one. Perceptions of the competences of others had a positive effect on the collective efficacy believes which influenced both affective commitment and job satisfaction and these variables were highly correlated. The latter variables were not always proof of a well functioning school. The beliefs about the students and their family meant less than the beliefs of the principal and the teacher colleagues. The teacher profession was not primarily focused on interaction with students. Instead teachers' perception of their principal and their colleagues had greater influence on commitment and job satisfaction. The educational reform had not yet differentiated teacher opinions. This investigation demonstrates that teachers are strongly sensitive to the performances of other teachers. These results are also demonstrating that individual teachers do not perform in accordance with changes in curricula until their principals or colleagues react collectively.

Conclusions about studies on effects of curricula and culture

Thus, educational policies differ among countries. There may be agreement about the teacher role and the essence of schooling, but this expresses relatively little about how these aims are to be achieved. Students´ responses seem closely

related to norms and methods within schools. Teacher and student responses reveal whether implemented educational policies work in harmony with the national culture or not. To change an educational policy with pre assumption about forthcoming effects is extremely complicated. Any educational reform as expressed in a curriculum may therefore include negative effects. Student freedom has its benefits, as does order and structure. A major difference between countries may also be related to whether success in school is regarded as important for future life or not.

Chapter 4 Teacher and student perspectives

The characteristics of efficient teachers and teaching have been investigated in many studies (e.g., Berliner, 1985; Miller, 1985). Conclusions from these studies can be compared to how teachers look upon their role and students' assumptions about teacher work. The chosen studies reflect teacher challenges and student expectations. Effects of peer relationships, aspects of interaction and other effects, which influence the learning situation, are included.

The characteristics of efficient teachers and classrooms

Scheerens & Bosker (1997) have reviewed studies on effectiveness of teachers and teaching methods. In the 1960s and 70s teacher personal characteristics was a focus for research. The behavior repertoire demonstrated wide variability, which proved difficult to link to student performance. Later on process-product studies investigated observed teacher behavior and student achievement. A large number of variables were supposed to reveal significant teacher behavior through reflecting the correspondence between what was taught and what was learnt. Scheerens & Bosker (1997) concluded that the instructional effectiveness of the teacher includes three factors: the quality of work during learning time, structured teaching, and focus on students learning.

It seems that different periods have had different assumptions about the origin of efficiency in teaching. The characteristics of successful teachers are in line with the ideas about qualities in student performance. These characteristics seem to be related to views on knowledge development. The teacher has to accommodate to different ideologies. If the learning process is considered most important the teacher needs to evaluate the own teaching methodology. If, on the other hand, subject knowledge is in focus the teacher competence is related to testing development in knowledge. When the learning process and the goals of knowledge are judged of equal importance the demands on the teacher become substantially stronger.

Teachers need positive expectations for every student. There are teachers who use the knowledge about the group of students and encourage them to utilize their outside school experiences within the classroom (Darling-Hammond & Bransford, 2005). In this way teachers demonstrate their positive belief that each child has a learning capacity.

Students' key concepts are commitment and success in knowledge development. All their performances affect attitudes and achievement according to Berliner (1985). He emphasizes four climate factors which promote learning: communicating academic expectations for achievement; developing a safe, orderly and academically focused environment for work; development of sensible management of deviancy; and, finally, development of a convivial (warm and democratic) atmosphere. The first factor, concerning academic expectations, is related to how well teachers can communicate specific aims of learning. The second factor is the development of a high standard of environment. This factor is a challenge for the teacher to balance, since it is important that focus on the environment is not exaggerated. This could be counterproductive and increase anxiety. It is necessary to have awareness that orderliness and playfulness can exist together. The third factor, sensible management of deviancy, is related to teacher capacity to have students' attention and at the same time prevent deviancy. All interference is time consuming and results in less learning time. Finally, the fourth factor concerns the ability within a warm and democratic atmosphere to encourage cooperation and responsibility.

Characteristics of an effective teacher as reported above include minimizing frustrating situations. Frustration is not necessary, while confrontation between peers sometimes is (Corsaro, 1997), because socialization is not solely a smooth process. This conclusion implies that other aspects than achievement results are of importance. Thus, the teacher has to encourage both cognitive and affective outcomes. Both are necessary in creating an effective school (Jamieson & Wikeley, 2000).

The classroom context includes both a social and an academic aspect. Of value is the ability to create a safe and orderly classroom with democratic characteristics. Teacher skills are related to two broad, interrelated, domains: subject matter knowledge and practical skills in organizing and performing teaching. The latter skill concerns how to support development of knowledge,

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skills and attitudes among students (Darling-Hammond & Bransford, 2005). Classroom environment is characterized by negotiations between the students and their teacher. The teacher should use negotiations carefully as they have an impact on each individual and also on the overall working atmosphere within the classroom. However, the relation between the teacher and the students is uneven (Woods, 1990), the students being more dependent.

The teacher role according to teachers

Even if countries differ in culture, educational policy and curricula there are similarities in teachers' perception of their profession. A common result in the international investigations demonstrates that teacher ambitions include different dimensions seen in curricula. It may be of interest to see which factors novice teachers' judge to create satisfaction in their profession. Teachers' expectations reveal assumptions about the future demands of the role.

Inexperienced Israeli teachers (n=273) were asked to complete a questionnaire before their first year of teaching (Friedman, 2004). The teachers expected different kinds of intrinsic rewards. A social dimension included an expectation that students would accept the teacher as a leader. Teacher expectations were quality of collegiality, leadership from the principle and follow ship by the students and high respect from the public, including parents. The novice teachers expected to become leaders within their classes and that necessary support would be given to them. Before starting a teacher career there are expectations on receiving a respected position. This is in contrast to the Swedish comprehensive school where teachers are supposed to earn this position and respect from their students (Lundahl, 2001).

Even successful teachers have to be aware of the emotional aspects within classrooms. In an investigation of experienced teachers in the US (Sutton, 2004), 30 middle school teachers with students of ages 10-15 were interviewed. The investigator explored how the teachers regulated their emotions, as well as their beliefs, goals and strategies. Almost every teacher tried to regulate their own anger and frustration, but 11 of 28 said that they sometimes lost their temper. Many teachers also regulated humor, excitement and joy. Reasons for doing so were that they wanted to be more effective, or to focus on academic goals or role modeling. Not all teachers were able to coordinate behavior and emotional

regulation. Strategies for regulating own emotions were related to student misbehavior and lack of effort. One half of the teachers modified the way they handled discipline in the acute situation. Successful teachers seemed to react less personally towards students´ negative comments or behavior. To judge the classroom situation without being surprised also was important. The students were reported to experience teacher emotional strategies in two ways, either they reacted with better behavior or the situation became worse. Inconsistency of reactions in front of the students tended to have negative effects in the classroom. It is not surprising if students prefer teachers who react less unexpectedly. The study points at an important emotional factor, which influences teachers on a daily basis. The awareness of students' ability to affect the classroom situation in either a positive or negative direction and to change the emotional atmosphere is an important teacher competence. According to my own experience the teacher work includes a large amount of emotional stress. This study explains why emotions are positive as long as the teacher can control and behave in a consistent way.

In the Swedish comprehensive school children with individual special needs are integrated. Inclusion is seen as an important goal for equity. Problems related to inclusion are reported in an Australian investigation (Levins, Bornholt & Lennon, 2005), where teacher attitudes towards children were examined. The 77 participants were either pre-service teachers or experienced teachers. The educational needs of the children covered physical, social and cognitive disabilities. As expected implicit attitudes were more negative than explicit attitudes and feeling of guilt and worry were more expressed by the teacher than positive feelings. Attitudes were very similar in the two groups of teachers. Explicit thoughts were most positive for physical needs than towards cognitive needs. The least positive thoughts concerned students with social needs. Explicit attitudes and feelings were contributors to positive actions and intentions to gain more experience. Neither personal nor teaching experience had a substantial role for the expression of attitudes towards children. This investigation demonstrated difficulties for the teacher to interact positively with all kinds of children. This small investigation demonstrated that teachers' personal experiences of disabled children are not a guarantee for professional help. Especially interesting is the result that prejudices against socially disadvantaged children were the strongest. The same category of students is at risk for future drop out. If the teacher thinks that the student has a low ability, then the student tends to respond with low ability (Raffini, 1993).

Teaching includes role demands, which may become overwhelming. Teacher competence is a different construct than teacher attitudes (deSousa Barros & Elia, 1997, 1998). Negative attitudes may originate from poor conceptual foundations or lack of coherence between used teacher methods and teacher beliefs. Furthermore, negative teacher attitudes may be related to low expectations regarding students in negative social conditions or unfavorable working conditions. Negative teacher attitudes may affect a large number of students. However, the teacher also has the capacity to routinely communicate attitudes, believes and expectations to inspire students to be curious and regard learning as meaningful and important to their lives (Brophy, 1987). This demonstrates the risk of establishing negative teacher expectations, while positive teacher attitude produce positive results.

These studies have in common that they relate the ideas of the teacher role to three dimensions: the social, the organizational and the psychological dimension. The social dimension includes relationships with all kinds of students. The next dimension is related to the leadership of the school and the sense of belonging to a successful organization. The psychological dimension concerns among other aspects the teacher ability to reflect upon and regulate emotional situations within classrooms. Especially the organizational dimension shows that teachers are dependent on adult acknowledgements as well as good relationship with students.

Teacher work according to students

It can be of interest to reflect upon the social, the organizational and the psychological dimensions from students' perspective. Canadian students' perceptions of teacher's support or inhibit student "help seeking" were investigated by Le Mare & Sohbat (2002). The students (n=115) from 6 elementary schools participated in semi-structured interviews. Help seeking is a social interaction which requires the good will of both parties. Only 75 % of the students could describe specific teacher characteristics that encouraged help seeking. Teacher reactions included making a problem public or just explaining it in a simple way. Teacher attitudes were in some cases encouraging and connected to findings concerning classroom climate. Familiarity, mood and predictability were easy to comprehend for students. Students who knew the teacher could more easily ask for help. However, differences in academic,

affective and social experiences of the students also had impact on student responses.

 Perceptions of teacher practices and learning in classrooms among primary students were investigated by interviews with 66 children in 7 classrooms by Daniels, Kalkman, & McCombs (2001). Classroom contexts were labelled "learner-centered" (LC), and "non-learner centered" (NLC). Student interest for schoolwork and for learning was lower in NLC classrooms, and the children perceived low support and low stimulation. A typical LC teacher demonstrated positive believes that all children can learn and that teachers can support students learning, while NLC teachers were not certain of these ideas. Some children received less attention in NLC classrooms, and in these classrooms children noted both positive and negative individual treatment. These results suggest that teacher practices and motives are affecting the individual child at the beginning of its school career. The contexts in the study represented either positive treatment of all students or their differing believes concerning teacher willingness to help. According to Grosin (2004) the initial 3-4 years in school are extremely important for the future school career.

In an Australian study Richards & Fisher (1999) investigated science classes in grades 8-10 in 43 schools with a total sample of 3215 students. The students answered a questionnaire about teacher–student interaction (QTI), 7 items concerning students attitude to their class, a performance test, and questions about own cultural background. The QTI, a 48-item questionnaire, measured the students' conceptions of their teacher and included 8 variables, where 4 were regarded to demonstrate cooperative teacher behavior and 4 with teacher oppositional behavior. The analysis was done both at individual and class level. The multiple correlation between measures of interaction with the teacher (QTI) and student attitude was 0.32, but between the QTI variables and achievement it was very low (0.08).

Cooperative teacher behavior (enthusiastic leadership, helping and friendly, understanding, giving freedom and responsibility to students) was positively associated with student attitude and achievement. Oppositional (uncertain, dissatisfied, admonishing, strict) teacher behavior was negatively associated both with attitude and achievement. Students' attitudes towards their class were related to the behavior of their teacher. This is one study with a large sample of students which is analyzed on two-levels. Again the result demonstrates that

teachers represent a broad continuum of characteristics with effects on student attitudes.

Evans (2002) reported an ethnographic interview study with 14 5th year students from New York about how students define effective teachers and what kind of knowledge students have about effective teacher characteristics. The study also investigated what students' value as important teacher qualities. The small sample of students was selected to be representative of the population of Manhattan College, a district of 44 schools, and to represent differing achievement results, gender and ethnicity. The students related teacher characteristics to skills, knowledge and dispositions. An effective teacher was defined as a teacher who helps children to learn and made learning exiting and fun. It also was necessary to be able to create an orderly classroom with good behavior and strict rules. Knowledge about subject matter, teaching and knowledge about the individual students was the most important teacher qualities according to students. The majority wanted the teachers to be familiar with students' personal interests, behavior outside school, and personalities. Respectful and fair behavior towards students was judged important. An effective teacher makes students feel good, confident, motivated and secure. In contrast, ineffective teachers are difficult to understand and they have favorites. Sometimes they ignore student behavior, homework, or individual students. In conclusion the students' expectations agree with the theories presented earlier in this chapter. Certain aspects are, however, added such as being interested in students' life outside school.

In an investigation in grades 6 to 8, Wentzel (1997) reported effects of teacher caring style on student social and academic outcomes. One aim was to find supportive and caring teacher characteristics according to students. In the longitudinal part of the study 248 students answered a questionnaire in grade 6 and grade 8. When students believe the teacher to be supportive, they simultaneously experienced perceived control. These feelings reflected classroom routines in which the students felt both supported and valued. The correlations between teacher caring and social goal pursuit as well as between teacher caring and academic effort were about equal. Democratically interacting and caring teachers affected students working style, and the students showed a positive attitude towards their own work.

These five investigations with results mainly from students' perspective show the complex nature of being a positive teacher to all students. Teacher capacity to create positive relationships with each individual student seems to have effect on student evaluation and self perception. The social dimension is related to the students feeling of freedom to interact with their teachers. The psychological dimension is demonstrating if teachers' attitudes include high expectations or not. The organizational dimension shows how standards of subject knowledge and classroom structures are experienced. Thus, there are agreements between investigations on teachers and students opinions.

Effects of peer relationships

It also is necessary to include other aspects such as effects from peer interaction. Students are not independently observable units, but belong to classes with more or less shared experience. Interaction is coloured by shared norms among the participants. Besides which norms are agreed upon, it is important whether strong social networks are encouraged or not. When students are allowed to use the resources of their friends and realize that individual effort supports the welfare of the whole group, they seem to work more effectively (Darling-Hammond & Bransford, 2005).

Attitudes towards school, teacher and peers may have more complex effects on classroom climate than often assumed in educational research (Cazden, 2001). Students participate in social environments which strongly affect their goals to become diversified and not solely cognitive (Giota, 2001). Being acknowledged from peers may be such an important goal for students.

Berndt (1999) investigated 297 students in grade 7 and 8 with the purpose to show how peer influence can be understood in the context of general theories of social influence and interpersonal relationships. He hypothesized that two pathways had influence on friendship: (1) individual students are influenced from friends' attitudes and characteristics; and (2) friendships differ in features of quality and stability. High quality was defined as high frequencies of positive interactions, which were stable over time. It was found that the quality of the friendship affected interaction with teachers and classmates. Students with positive features of friendship were more involved in classroom activities, behaved better and had better achievement in English and Mathematics. The

negative influence of misbehaving friends was magnified when these friendships were stable and high in quality. The results in this study indicate that not all peer interaction is of benefit for achievement. It depends on the quality. Friendship in itself is not improving classroom climate. Students' misbehaviour increases if their friendships are high in conflicts and have other negative features. Supportive friendships in general did not help students coping with stress and challenges in school. Peer relations involve conflicts and differentiation, which are important in individual development. For some individuals the confrontations can become too severe. Students without friends in grade 6 showed lower levels of academic achievement and early asocial behaviour together with higher levels of emotional distress (Wentzel, McNamara Barry & Caldwell, 2004).

Another investigation of sixth-grade students showed that nearly 30% was belonging to the "silent" group (Jones & Gerig, 1994). These students had similar achievement results as their talkative peers but many had weaker self-confidence and fewer friends. The classroom situation was too competitive for these students who felt that their peers did not allow shy or silent students to participate in discussions. Being active was a sign of competence. A majority of the silent students in the report showed serious interest in schoolwork. This demonstrates effects due to differing student personalities. When the relationships are positive other interaction qualities are supported, but relationships among classmates may be counterproductive if the relations include unsolved conflicts, contradicting norms or too much confrontation. Teachers have to interact and communicate with shy, silent or misbehaving students. To understand the effects from peer relationships includes understanding of student socialization processes and knowledge about normal growth and development.

These few studies highlight the necessity to understand patterns in peer relationships together with student personalities.

Studies including both teacher and student perspectives

Less common are studies with both teachers and students. McManus & Gettinger (1996) investigated students' cooperative classroom activities in a study, which comprised 26 grade 3 teachers and 38 grade 3 students. The

instruments were two questionnaires, one for the teachers and one for the students, and observations on students. The majority of the teachers thought attitudes, social and academic behavior and self-esteem improved from working in groups. However, the students were not enthusiastic about the benefits of cooperative learning. Of the students 42% preferred working alone and 45% regarded social conflicts to be the worst aspect with co-operative learning. According to teachers co-operative activity was promoting social outcomes most, and according to students cooperation was promoting academic outcomes most. Both teachers and students reported positive attitude changes. The occurrence of conflicts decreased according to the researchers. This study showed positive effect on classroom climate although the teacher and the students had different explanations why this occurred.

Wheldall, Mok & Beaman (1999) investigated 1467 students in 81 classes of grade 7 to 12 with the Individualized Classroom Environment Questionnaire (ICEQ). The instrument was designed to measure personalization, participation, independence, investigation and differentiation Personalization concerned opportunities to interact with the teacher and students' opinion about teacher concern for social growth and welfare of the individual. Independence was about student control over learning behaviour and decisions. Teacher views about actual and preferred classroom environment were included. Multilevel modelling was performed. The intra-class correlation (ICC) explained as much as 18-28 % of the total variance of the five factors. The largest difference between classes concerned Independence. Personalization had the next largest ICC. This factor was also most important both on student level and class level. The explained variance between schools was lower, 2-13 %, and it was not statistically significant for any variable due to the small sample size. A specific classroom atmosphere was shown to be important. From this investigation it is also possible to reflect upon the two variables independence and personalisation and the student needs to interact with the teacher in order to get control over own learning.

A French longitudinal investigation (Grisay, 1994) among 8000 students from grade 6 through the end of grade 7 also included teachers. The paper reported results with focus on student attitude and development from grade 6 through grade 8. Academic progress was seen in French and Mathematics and a positive development related to three parts of the self-image: academic and social competence and sports skills. Several cross curricula outputs decreased, such as

study skills and attitudes, and other parts of self-image. Achievement and attitude scores were positively correlated with teacher expectations, school climate, opportunity to learn, time management, discipline and clear rules. In schools with a good climate, both academic progress and attitude scores were positive and correlated with high socio-economic status (SES). In the affective outcomes, Social Skills and Study Skills, low-SES schools had higher scores than high-SES schools. In cognitive outcomes this was reversed. Furthermore if the three factors Climate, Discipline and Time management were poor, both students' opinions and performance were extremely low. The importance of teacher professionalism and the impact from the socio-economic background of students were seen in the results. In a good school climate the student and teacher interaction supported each other**.** This investigation contributes to an understanding of the difference between affective and cognitive variables and the impact from the surrounding society.

Conclusions

The definitions of an efficient teacher can be chosen from several sources. The four climate factors (Berliner, 1985) have the advantage of being closely related to classroom activity.   The review of the literature indicates that even if descriptions of affective qualities of classrooms are rare, the social context offers information useful for understanding classroom processes (Shuell, 1996). Taking into account intervening aspects such as national culture, educational policy, curriculum and teacher professionalism would seem to be necessary.

When teachers and students responses are compared a pattern emerges. Teachers wish for collegiality and leadership. They have their professional styles which above all differentiate in expectations on students' ability. Students wish that teachers show personal interest in young individuals. Students' behaviour is related to the local norms. This show that peers and teacher can have conflicting goals. Teachers and students are able to evaluate each other but students have few opportunities to influence the tutor. The investigations on peer aspects explain complications in developing positive classroom climates.

By a consideration of both student and teacher approaches to learning it may be possible to reveal differences and similarities between the perspectives (Ainley, 2001). The investigations reported above are rarely comparing teachers and students within the same classrooms. There are obvious differences in maturity,

experience and roles between teacher and student. However in this thesis the focus is to look upon the features of the teacher-student relationship and the classroom climates. When both teachers and students acknowledge the academic goals as the most important ones at school, the affective aspects are still highly ranked (Osborn, 2001).

Aims of the dissertation

Given the previous work in the field, the aim of the dissertation is to illuminate different classroom environments. This aim is accomplished by studying three inter-related research questions:

(1)   How can measurement of attitudes towards school improve the understanding of the student perspective within and between classrooms?

(2)   What does a historical comparative investigation, using the same instrument administered 35 years apart, tell about changes of student attitudes towards certain aspects of the Swedish school?

(3)   How can the expanded questionnaire illustrate the variability among classroom and to what extent do student attitudes and teacher activities and background factors account for variation between classrooms in grade 6?

The main aim of the study is to try to understand student attitudes towards different aspects of school using data from two time periods, and also to analyze the impact both from teachers and students on classroom climate. The comparison of teacher opinions and information with the attitudes of their students means that the learning environment is illuminated from two perspectives. These are analyzed in order to find attitude characteristics of different school environments. One important aim in order to accomplish this is to find suitable instruments and methods.

The first question is approached in Study I (Holfve-Sabel & Gustafsson, 2005). This study primarily has a methodological purpose, namely to compare the results of Gustafsson's (1979) exploratory two-level analysis with the results that may be achieved with modern two-level CFA-techniques. Thus, the study is yet another reanalysis of the DPA-data collected in 60 classes in grade 6 in the 1960s (Bredänge & Odhagen, 1972). The results achieved in this study have been used in the further empirical studies, through factor-scores computed from the two-level model.

The second question is investigated in Study II (Holfve-Sabel, 2006a) in which the attitudes towards school, teacher and classmates in the late 1960s are compared with newly collected data in grade 6. This study involves two time-periods, and also two quite different curricula. The review of the literature showed that curricular factors do affect attitudes, and attempts are made to relate the changes in attitudes to changes in the curricula.

The third question is investigated in Study III (Holfve-Sabel, 2006b), where the variation in student attitudes between classrooms in the data collected in year 2003 is analyzed, and attempts are made to explain the previously identified factors on classroom level. The variation in terms of teacher activities and background factors is related to four identified environmental factors which are hypothesized to influence classroom climate.

CHAPTER 5 METHOD

In the present dissertation the questionnaire developed within the project "Didactic Process Analysis" (DPA) measuring attitudes towards the school, the teacher and the classmates is in focus. The data collected within the DPA project are reanalyzed in Study I. Study II uses the DPA data along with newly collected data with this questionnaire, and Study III is based on newly collected data with an extended version of this questionnaire, and a teacher questionnaire also is analyzed.

Participants

The DPA investigation was conducted in 1968/69. The study comprised 60 grade 6 classes from Göteborg and its vicinity, including 1601 students. Of these 1488 responded to the questionnaire (92.94%) and 113 were absent (7.06%).

A new investigation was conducted in 2003. All Göteborg schools supposed to include grade 6 classes were assembled on a list (Gravin & Olsson, 1999). This list was later modified according to new information obtained from the 21 local administration areas. Of the original 77 schools, sampling without replacement randomly drew 60 and a letter was sent to the headmasters. The project was planned to include approximately 1600 students from at least 60 classes. However, the number of students in each class was lower than in the DPA investigation, which made it necessary to expand the number of classes.

Headmasters of 30 schools agreed to participate. Some headmasters agreed immediately and others after several telephone calls and mail contacts. The participating schools represented all except three of the 21 administrative areas of Göteborg. Information to the parents was also given in a letter. The parents could refuse the student to participate by signing a special note. These students were excluded from participation.

The investigator visited every school between September and December 2003. The data collection began with information to the teachers about their specific questionnaire. The teachers and their students met the investigator within an ordinary work situation in the classroom. After a short instruction the participants were given their forms and filled in their responses to the questionnaire, which took about 30 minutes. A list of the students' first name and the initial of the surname was collected together with the forms.

In the 30 participating schools there were 80 classes in grade 6, of which 78 classes with 1695 students participated. In all 1540 students responded to the new questionnaire (90.9 %). Ill or absent for other reasons were 130 (7.7 %) students, while 25 refused to participate (1.5 %). Among the students 51% were boys and 49% girls.

Design of the extended questionnaire and information from the teachers

The original questionnaire "Our class" constructed and originally used by Johannesson & Magnusson (1960) and later by Bredänge *et al.* (1971) was used in the present project. The 40 items were kept unchanged.

To capture modern school phenomena construction of new items seemed necessary. The original 40 items were therefore expanded with 31 new statements concerning school environment, teaching and interaction. Only questions, which could be easily comprehended by students in grade 6, were included. The new part was also constructed in order to capture the teachers and the students' perspectives. The aim was to include assessment of familiar work situations and interaction patterns among students and adults and thus to cover affective quality aspects.

The 40 existing items included positively formulated items concerning attitudes towards the teacher. In these questions there are both negative and positive statements about peers and school in general. The 32 added items included the evaluation conference and aspects concerning educational recommendations in the present curriculum. Questions about patterns of interaction along with questions about student home support or stress are included among the added items.

Every item had 5 alternative responses: always, often, sometimes, seldom, never. Responses to all negatively worded items were reversed so that a value of 5 always represented a positive attitude. Value 1 is thus always a negative response. Both student and teacher questionnaires were tested in five classes and afterwards minor simplifications of wordings were performed.

In a final part of the student form a socio metric instrument was used. The students were asked to write the names (first name and the first initial of the last name) of the three peers in the class he/she preferred to work with and also three peers they preferred to play with. These interaction patterns of work cooperation and peer relations are not analyzed and reported here.

The questionnaire for teachers was composed of three parts. The items in part one asked the teacher to guess what the class attitude was on the attitude items. Part two consisted of the added items where the teachers gave their opinion about the group of students. In part three the teachers were asked to give background information on among other things, teacher age and experience, staff meetings, national test results in year 5, and written documents about student need of support, unauthorized absence, gender patterns in interaction and actual management and instructions.

Each teacher, student, class and school was assigned code numbers. Missing answers were coded by 9. Statistical calculations were computed with SPSS 12.0.

Analytical techniques

As was concluded in the review of previous research it seems essential to be able to separate student and classrooms as separate sources of variance in the responses to attitude items. The main tool for doing this is two-level confirmatory factor analysis.

The Two-Level Confirmatory Factor Analysis Model
According to Muthén (1989, 1990, 1994), the two-level confirmatory factor analysis model may be described as combining one separate factor analysis model which accounts for the structure of observations on individuals within groups, and another factor analysis model which accounts for the structure of

observed group means. The two-level model thus is a covariance structure model that is formulated in terms of a conventional factor analysis model on both "between-group" and "within-group" levels.

This approach requires a pooled within covariance matrix (S_W), which is computed as an ordinary covariance matrix except that deviations of the individual scores are computed from group means rather than from the grand means. For this matrix the actual number of observations is the total number of individuals minus the number of groups, because one degree of freedom is lost for each group mean. The other required matrix is the between groups covariance matrix (S_B), which is computed from the group means and their deviations around the grand means, and weighted by group size. The number of observations for this matrix thus is the number of groups.

To obtain the correct CFA model for the between-group structure it is necessary to take into account the disturbing influence of the within-group structure. This is because S_B is a function of the population in the between-group structure, multiplied with a constant, representing a function of the group sizes, Muthén (1990) showed that this may be done through conceptualizing the two-level estimation problem as a two-group problem in structural equation modeling (SEM). The Mplus program (Muthén & Muthén, 2004) offers several estimators of two-level models and offers a simple and convenient language for model specification. One of the estimators is a simplified estimator (MUML). With the STREAMS system (Gustafsson & Stahl, 2000) the MUML estimator may also be used with other SEM programs through pre- and post-processors which make it comparatively easy to estimate and interpret two-level structural equation models.

Two-level models are applied and evaluated in very much the same way as ordinary latent variable models (e. g., Loehlin, 2004). The covariance matrix for observed data is compared with the covariance matrix generated by the hypothesized model. χ^2 tests are made in order to compare the observed data with those of the model. In the ideal situation the null hypothesis is not rejected. However, with large sets of data the χ^2 test becomes significant even when there are small deviations between the data and the model. To avoid this, other measures of fit than the χ^2 test are used as well. The χ^2/df ratio can be used to compare results of different models. A value of 2-3 is considered acceptable. Another common measure of model fit is RMSEA (Root Mean Square Error of

Approximation). RMSEA measures the discrepancy between the data of the sample and the theoretical model taking model complexity into account, *i.e.* the number of estimated parameters. An RMSEA value below .05 indicates a fairly good model and figures above .08 indicate that the model is not acceptable.

Having fitted an acceptable model we can judge and interpret the connections between the latent variables and the different items. Each item loading is here regarded as a correlation. If the loading is high the item is a good measure of the latent variable. T-tests may also be performed to test whether the estimated parameters are significantly different from zero.

It should be emphasized that conceptually the two-level model refers to the total covariance matrix, and the model should be conceived of as a model for one population even though it is estimated as a two-group model. The model thus achieves an additive decomposition of the total variance in the observed variables into four main categories: variance due to latent variables at the group level, residual variance at the group level, variance due to latent variables at the individual level, and residual variance at the individual level.

In order to simplify further analyses of the latent variables in the two-level model factor scores may be computed with Mplus. The factor scores are the individual scores on each item weighted by the factor loading. With Mplus, factor scores may be computed even for respondents with missing responses to one or more items (Muthén & Muthén, 2004).

Other statistical procedures

When the results from the two time periods (1967 and 2003) were compared eta (η) was used. Eta is a point bi-serial correlation coefficient. Large changes of attitudes between the two periods were indicated by large eta values. The variation between classes on every specific item was computed using eta² or the intra-class correlation coefficient (ICC). A high ICC reflects a large variability between classes.

CHAPTER 6 RESULTS

Below the results of the three empirical studies are summarized. The papers will be referred to by the Roman numerals I-III.

Study I: Attitudes towards school, teacher and classmates at classroom and individual levels: An application of two-level confirmatory factor analysis

The main objective of the study was to investigate how measurement of attitudes towards school may be improved by distinguishing between the influence from students and classrooms. Two-level confirmatory factor analysis was applied on the DPA data on the 40 attitude items and a comparison was made with the previous exploratory factor analysis of the student responses (Gustafsson, 1979).

The analysis presented by Gustafsson (1979) found five factors at both the student level and the class level: School, Teacher, Relations to Classmates, Class Relations and Class Discipline. However, while the same factors were identified at both levels, the relative strength of the student- and class-level factors varied between the factors.

This model was used as a starting point for specifying a within-group model. However there was a lack of fit between the hypothesized model and the observed data. The model was therefore improved in several different steps. New latent variables were added and some items were allowed to load on more than one latent variable. All items could be used in the model. The modifications resulted in a student-level model with 7 factors, which had a good fit. Factor labels, the number of items and range of loadings are presented in Table 1.

Table 1. Comparison of the old and new within-group model: factors, number of items and range of loadings.

Factors 1979	No items	Range of loadings	Factors 2002	No items	Range of loadings
School	13	0.73-0.48	Interest in School	16	0.75-0.23
Teacher	6	0.51-0.47	View of Teacher	13	0.57-0.17
Relations to Classmates	4	0.64-0.52	Relations with Classmates	5	0.74-0.18
Class relations	5	0.58-0.28	View of Peers	4	0.69-0.39
Class discipline	5	0.43-0.23	Work Atmosphere	5	0.52-0.29
			Lack of Anxiety	3	0.66-0.28
			View of Fuss	4	0.67-0.14

The factor *Students' Interest in School* was similar to the *School* factor identified in 1979. However three items with low loadings in the old investigation now had significant loadings. The factor *Students' View of Teacher* included thirteen items compared to only six items in the 1979 model. A previously narrower factor thus was expanded into a broader one. The factor *Students' Relations with Classmates* had the highest loading on items, which asked about conflicts with classmates. It came close to the previous factor *Relations to Classmates*. The factor *Students' View of Peers* related to items, which asked about relations among classmates as a group. This latent variable was close to the factor *Class Relations* in the old model. The factor *Students' View of Work Atmosphere* had its highest loading on items reflecting discipline and task-oriented work. Three of the items belonged to the factor *Class Discipline* in the 1979 investigation.

There also were two new factors. *Student's Lack of Anxiety* was quite narrow with relations to three items only. The highest loading (0.66) was found for the item "I feel calm and secure in school". The factor *Students´ View of Fuss* was also new and concerned items about fussing, fighting, becoming enemy with classmates and being careless with schoolwork. The items in the questionnaire are in some cases constructed as a pair e.g. "it is fun" and "it is boring". These

kinds of items are demonstrating that responses are consistent. The labels of the factors were changed. By using the word "students view" it is underlined that students give their evaluations of "the teacher, the peers, the atmosphere and the fuss".

The starting point for constructing the model on the between-class level was the seven-factor within-group model. The estimation procedure for this model did not converge and several modifications of the model were conducted. A seven-factor between-group model with a good fit was finally found. It proved possible, however, to simplify this model into a three-factor model by collapsing highly correlated factors. The three-factor model had as good a fit as the model with seven class-level factors. The model with only three factors on between class levels was therefore preferred. The three class-level factors were called *Teachers and Teaching, Work Atmosphere in Classrooms* and *Social Relations in Classrooms.*

The factor *Teachers and Teaching* was dominated by items mainly recruited from factors *Students' Interest in School,* and *Students' View of Teacher* at the individual level (Fig. 1). At class level the highest loadings (0.57-0.31) were observed for items which concerned characteristics of the teacher. Fairly high loadings were observed for items which expressed general motivation for schoolwork (0.31-0.20). Thus, the importance of the teacher was stressed.

The factor *Work Atmosphere in Classrooms* was related to 6 items loading on four different latent variables in the within-group model, but mainly items from *Students´ View of Work Atmosphere* and *Students´ View of Fuss.* The items asked about different aspects of work in the classrooms with a range of loadings from 0.39-0.06. This factor came close to the factor labelled *Class Discipline* in the 1979 analysis.

The factor *Social Relations in Classrooms* was related to 6 items, which loaded on five factors on within-group level. The items asked about co-operation and relations among students in the classrooms. The range of loading was from 0.31-0.08. This factor came relatively close to the factor *Class Discipline* in the 1979 analysis. Four items were not related to any factor at class level (left side of Fig. 1). This indicated that there was no detectable systematic variation between classes for these four items.
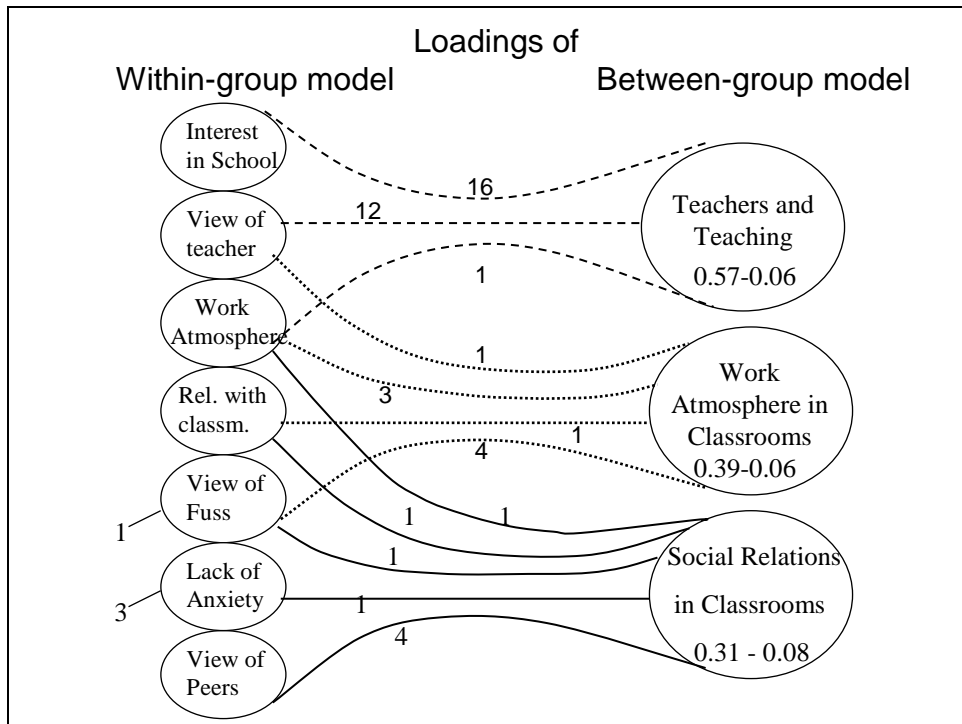
65

Fig. 1.The flow of items from within to between group level and the range of loadings on class level. The numbers in the middle of the figure are items building the between-group models.
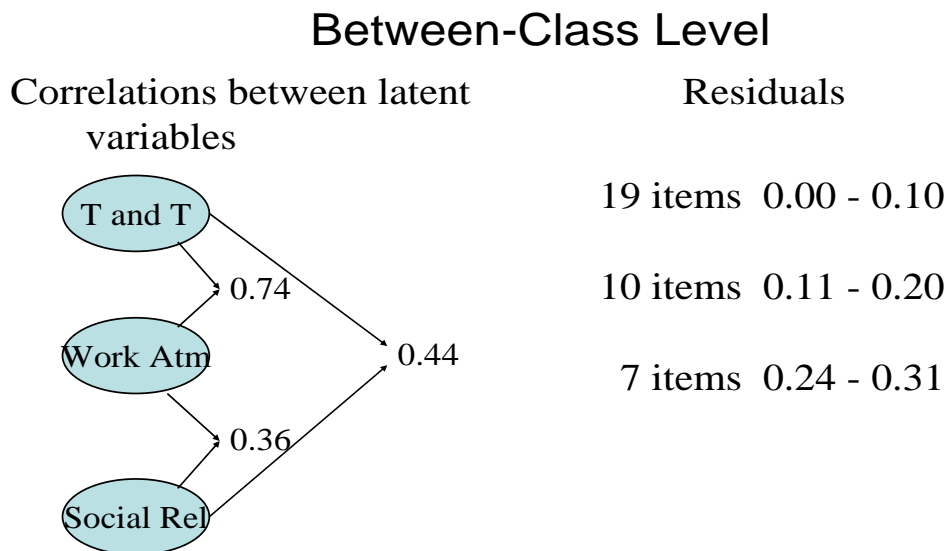
Between-Class Level

Fig. 2. Between-class level, correlations between the 3 factors; residuals of the explaining items.

As seen in Fig. 2 there was a high correlation between the factors *Work Atmosphere in Classrooms* and *Teachers and Teaching* (0.74). The correlation was considerably smaller between the remaining latent variables. The residuals were very low in 19 items. This indicated that the class level latent variables almost fully explained the variability between classes. In the remaining items there was more systematic variability between classrooms, which was left unexplained by the model.

Thus, instead of a five-factor model on both levels the new analysis revealed seven student-level factors and three class-level factors. In comparison with the 1979 investigation with exploratory factor analysis, the two-level confirmatory factor analysis resulted in a model, which revealed a more detailed structure at individual level and a more simplified structure at class level. The two-level confirmatory model achieved a separation of the individual and class level influences on the between-group matrix. Therefore the class-level factor-structure was not unduly influenced by the individual level factor structure, which was the case with the exploratory factor analysis used in 1979.

Conclusions

It was possible to build a two-level latent variable model to account for student attitudes of school and classroom environment. The analysis indicated a strong impact of the teacher on classroom differences in the early investigation. On within level the factors *Interest in School* and *View of Teachers* reflect differences between students within the same classroom in the appreciation for schooling or the teacher, respectively. Together they reflect the majority of items in the questionnaire, which is even more accentuated on between level. The five new narrow factors *Work Atmosphere*, *Relations with Classmates*, *View of Peers*, *View of Fuss* and *Lack of Anxiety* provide a deeper understanding of student responses in the DPA-investigation. These latent variables represented clusters of items where student attitudes differed within classrooms. When the groups of classes were compared there were only three factors. The use of latent constructs was offering an assessment of the school at that time, and the questionnaire was found be useful for further investigations.

Study II: A Comparison of Student Attitudes towards School, Teacher and Peers in Swedish Comprehensive Schools Now and 35 Years Ago

The purpose was to investigate if changes of Swedish students' attitudes towards school, teacher and classmates had occurred between the late 1960s and 2003 and to discuss possible changes in relation to educational policies. Another purpose was to investigate if the two-level CFA model could be used in this comparison and in particular if factor scores could be applied for further analysis of possible differences between the two time periods.

The study used the original data from the DPA-project (i. e., the same data as was analyzed in Study I) along with the data collected in 2003, as described in the Methods chapter. The analyses included comparisons of mean differences between the two occasions of measurement at the item level, a computation of intra class correlation coefficients and two-level confirmatory factor analysis on two levels. Factors scores were computed for each individual and were used in further analyses at the factor level.

The old and the new samples were first compared item by item. Generally the new sample showed a more positive attitude. The intra class correlations were higher for the new data in 28 of the 40 items. This indicated a larger difference between classes nowadays.

Study I showed that it was possible to fit a two-level CFA model for the old sample which had seven factors on within-class level and three factors on between-class level. Fitting this model to the new data it was shown that the same model could be applied on the new sample. However, in the new sample the correlations between the factors on both levels had increased, especially among relational factors.

The old and the new samples were then combined. Individual factor scores were computed for the seven within and the three between level factors using Mplus (Muthén & Muthén, 2004). All factors for the combined samples were normalized to a mean of 500 and a standard deviation of 100.

Factor scores of the latent variables for the old and the new samples were then compared. There were no significant changes in three of the student-level

factors: *Interest in School, View of Teacher* and *Work Atmosphere*. In contrast, significant positive changes had occurred in the four peer relational factors namely, *Relation to Classmates, View of Peers, Lack of Anxiety* and *View of Fuss.* One interpretation of this result is that the recommendations in the new curriculum (Lpo94) had influenced the classroom situation towards more interaction during work and breaks with impact on peer relations. The positive attitudes were nowadays most striking concerning peer relational aspects. A similarity between the two investigations of students' attitudes is seen in *Interest in School* related to traditional schooling. Students nowadays are not more engaged in these aspects. *Students' View of Teacher* had less variability in 2003. A possible explanation for this is that teachers' work in the present school is less individualistic.

On between-class level the attitude scores were significantly higher in 2003 than in 1967 for all three factors: *Teacher and Teaching, Work Atmosphere in Classrooms* and *Social Relations in Classrooms.*

Conclusions

The student attitudes are more positive now than 35 years ago. On individual student level there are positive changes in peer relational aspects. A more differentiated picture is thus seen within classes today. At class level students attitudes are considerably more positive, but there is wide variation between classes. One reason for the generally more positive attitudes may be the present curriculum with its focus on interactional aspects of learning.

Study III: Classroom Climate in Grade 6 According to Students and Teachers

The main purpose of Study III was to investigate similarities and differences between student and teacher responses to the extended questionnaire. A second purpose was to explain the three broad factors on between-class level with the new items. A third aim was to gain a deeper understanding of present classroom climates, and which patterns of interaction and background factors accounted for important quality differences between classrooms.

The student and the teacher questionnaires were first analyzed on item level and the means were compared. ICC coefficients were computed in order to describe

the variability between classes. The greatest differences between classes' concerned expensive material, teaching methods and environment. The second largest group concerned aspects of interaction during work.

All together sixteen items were significant contributors to the explained variance of the three between class factors previously found: *Teachers and Teaching* (TT), *Work Atmosphere in Classrooms* (WAC) and *Social Relations in Classrooms* (SRC). The items explaining factor TT concerned the relation to the teacher including acknowledgement and self evaluation and opportunities to make choices as a student. Factor WAC was related to student tiredness, being disturbed and bullied as well as physical experience of messiness in school. The third factor SRC concerned collaboration, harmony and wishes to change group or fear for aggressive students during lessons and breaks.

When teacher responses were tested against the same three student factors fewer items explained the three factors. The amount of explained variance was lower, again showing a discrepancy between teachers and students. Only two items were the same in the student and teacher regressions.

The teacher items were then divided into four clusters according to Berliner (1985) to represent different aspects of teacher efficiency, as described in chapter 4. Each item could belong to one category only.

Category 1, Teacher Academic Expectation included 8 items. These items concerned information to students about which material to use, personal results and homework. They also captured levels of ambition, assessment, credit and opinion about students' satisfaction.

Category 2, Teacher Safe and Orderly included 10 items. The items reflected behavior and orderliness within school. In this cluster were also items about student health and teacher instructions on schoolwork.

Category 3, Teacher Management of Deviancy included 6 items. The items concerned teacher evaluation of need of reminding students and the amount of peer conflicts and also teachers´ wish to change to another class.

Category 4, Teacher developing a Warm and democratic Atmosphere included 7 items. These items concerned opinions about interaction, friendship, collaboration and enjoyment.

Teachers´ responses formed four categories and students responses another four categories.

An overall score of teacher opinion labeled "Teachsum" had a good reliability (Cronbach's α=0.84). Because of the limited number of items the reliability was lower for the four categories. The reliability of the overall student sum was even higher (α=.89). The reliabilities for the category scales were also higher than for teachers.

Fairly high correlations between teacher and student variables were found related to familiar classroom practices and norms of behavior including conflict solving. Thus, the student attitudes towards the teacher and the teaching depended on the teacher's ability to manage deviancy and to create a warm and democratic work atmosphere. The student attitudes measured by WAC had its highest correlation with student management of deviancy which again stressed that the teacher's ability to manage deviancy was a most important factor. The students' attitudes measured by the SRC factor were also highly correlated to the management of deviancy and development of a warm and democratic atmosphere.

Fifteen of the 36 background information factors proved to be significant in comparisons between two teachers groups with high and low scores. In the High scoring group, student absence was significantly lower, while care conferences, action programs and personal assistants were more frequent. The High scoring group of teachers also used more collaborative work, less plenary teaching and less conflict negotiations with students. This indicated differing classroom climates. A notable fact was a higher number of girls in the classes of the High scoring group.

Conclusions

On item level teachers and their students focused on different aspects. The largest variability between classes concerned expensive material, teaching methods and environment, but also aspects of interaction during work. The

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relationship with the teacher was important in explaining factor *Teacher and Teaching*. Aspects of disturbance were important in explaining *Work Atmosphere in Classrooms.* A collaborative and harmonious climate was the main content of *Social Relations in Classrooms.* The differences between classrooms to a large extent were due to the ability of the teacher to deal with deviancy and to create a warm and democratic work environment. Management of administrative teacher tasks seemed to make a difference between classrooms.

CHAPTER 7 DISCUSSION

The main aim of the study was to try to understand student attitudes towards different aspects of school using data from two time periods, and also to analyze the impact both from teachers and students on classroom climate. The teacher and student perspectives were analyzed in order to find attitude characteristics of different school environments. One important aim in order to accomplish this was to find suitable instruments and methods.

Methodological issues

Student's life at school affects the group climate, which the individuals are belonging to (see e.g. Murray, 1938). It is therefore necessary to differentiate between individual variability of students´ attitudes within classrooms and the variability between classrooms (see e.g. Raudenbush & Bryk, 2002). This means that the analysis must be performed on two levels, at least. Studies using multi-level CFA in school research have been rare and have appeared during the last few years only (Wheldall, Mok & Beaman, 1999; Westling Allodi, 2002; Loehlin, 2004). One reason for this is the complexity of the technique, and also the fact that large investigations including many items and large samples of students and classrooms are needed.

The studies reported here have relied on the questionnaire "Our school" originally developed by Johannesson and Magnusson (1960). The main reason for this was that this questionnaire had also been used in the DPA investigation in 1967-68 (Bredänge *et al.*, 1971), and that the data from that study was available for further analyses. Furthermore, these data had previously been reanalyzed by Gustafsson (1979) using exploratory factor analysis (EFA) at two levels. The factors from this analysis now could be used as a starting model, and it became possible to compare the data from the EFA computation with a more developed method using two-level CFA.

In comparison with the EFA analysis the CFA analysis produced a model with a more detailed structure at individual level and a simplified structure at class level. The two-level CFA model achieved a separation of the individual and

class level influences on the between-group matrix. Therefore the class-level factor-structure was not unduly influenced by the individual level factor structure, which was the case with the EFA analysis used in 1979. All 40 items could be used on individual level in the CFA model. Four items lacked influence from class-level factors, and these questions were all very personal "I questions". The majority of the items had low residuals indicating that the latent variables on between-level almost fully explained the variability between classes.

The methodology was further developed in Study II, where the previously found CFA model was fitted to the new data from 2003. A historical comparison then became possible by comparing within- and between-class factors of the DPA-investigation with those based on the new data. The comparisons relied on factor scores computed for each individual and for the class using Mplus (Muthén & Muthén, 2004).

The original 40 item questionnaire was expanded with 31 more items (Paper III). These new items were designed in order to illuminate the current comprehensive school. In the review of the literature it was rare to find the perspectives of both students and teachers, and especially so from the same classes (Grisay, 1994; McManus & Gettinger, 1996; Puurula *et al.*, 2001). In this investigation it was considered important to have both perspectives, those of the students and of the teacher in the same class. Therefore a version was constructed with the purpose to capture the teacher's opinion about the class. The reliability was found to be high for the students' new questionnaire and somewhat lower, but quite acceptable, for the teacher version.

In paper III an attempt also was made to apply Berliners (1985) description of four characteristics of an efficient teacher. It was found possible to relate all the 31 new items to these four categories. These new variables were constructed also for student responses on class level, with the aim of comparing students' attitude with the opinions of their teachers. After correction for attenuation it was shown that the correlation between student and teacher responses was high for three of the four categories. This implies that the Berliner categories can be regarded as useful instruments for comparing students and teachers.

The historical comparison of student attitudes

The comparison of student attitudes 35 years apart (Study II) demonstrated a more positive attitude today. Development of more positive student attitudes was also seen in the investigations performed by the National Agency of Education between 1993-2003 (Lundh & Stoltz, 2001; Lundh & Borgny, 2004). In some respects there have been quite dramatic improvements over a decade, and these are mainly related to affective domains like self perception and students' own perception of commitment in schoolwork.

According to international investigations (Husén, 1973; Hansson, 1975) Swedish student attitudes towards school were very low in the 1960s and 1970s. The introduction of a new national curriculum for the comprehensive school included recommendations for teachers to introduce an individualized working method (Lgr-62; Lgr-69; Rothstein, 1986). However, in the DPA investigation (Bredänge & Odhagen, 1972) it was found that the teachers still worked with teaching styles which allowed minimal opportunities for individualization. Students' lack of appreciation may also be related to long schooldays, focus on tests and struggle for marks. Altogether, these findings revealed classroom environments where students had few possibilities of interaction with teachers or peers.

On class level student attitudes had improved dramatically in all three factors between 1968 and 2003 (Study II). Based on the results reported by the National Agency of Education we may also hypothesize that the change of student attitudes in Sweden has been especially strong during the last decade (Lundh & Stoltz, 2001; Lundh & Borgny, 2004). In 1994 a new curriculum, Lpo94, was introduced emphasizing learning from collaborative work. The view on knowledge development had left the idea of transfer of knowledge from the teacher to the student (SOU 1948:27). The official report SOU 1992:94 was arguing that knowledge develops by experiences and sharing among individuals or groups (Holfve-Sabel, 2000). Student freedom during work has increased and teachers are supposed to encourage students to create projects or own plans depending on personal interests (see for example Dovemark, 2004).

The present school situation thus involves more of both individualism and interaction. The student responses reflect this in two ways: the students

demonstrate a stronger appreciation for peers but the variability among them is greater today (Study II).

With Lpo94 communication between teachers, students and parents replaced the formal marks until grade 8. During the regularly held evaluation conferences between teachers, student and parents the development of each student is evaluated. In situations where individual students fail in achieving the set goals, teachers are responsible for constructing a modified individual study plan. In these cases much emphasis is laid upon the demands on individual student's to follow the "prescriptions" and the teacher to evaluate the fulfillment. The teacher acceptance of these recommendations differs (Study III). If students have difficulties due to weaker cognitive strategies or vulnerable physical or social circumstances (Levins, Bornholt & Lennon, 2005) they become dependent on both the school policies to follow these recommendations and teacher competence to formulate appropriate individualized study plans.

There is an increase in the mean of the relational factors. This is in line with the recommendations in the curriculum towards more communicative work in the classroom. However these attitudes are not a proof of more commitment for learning (Study II). Positive attitudes can also reflect students' hopes for the future (Passow *et al.*, 1976). One aim of the evaluation conferences is to present the achieved results but much emphasis is put on future goals and ambitions. Much emphasis is also put upon students' relation with peers. Parental commitment for their children's friends at school is very common. The teacher ambitions to follow the ideas about learning from interaction also create a mutual interest for discussing peer relationships.

 It could be argued that when the educational policy has focused on the social process (Osborn, 2001) this may have effects on evaluations of performances (Gipps, 2001). The evaluation conference between teacher and families represents a mix of expectations (Study III). The message may give unstructured information where reports on achievements are hidden among affective variables. The present attitudes reflect the work situation and the information students get from the teacher. However, according to students the teachers tend to overestimate their own clarity (Study III).

The perspectives of teachers and students

Although student attitudes seem to reflect a more homogeneous teacher style today (Study II) the separation of teachers into two groups showed differing styles (Study III). The ideas about an efficient classroom include non-traditional dimensions such as affective qualities in work, relations and attitudes (Scheerens & Bosker, 1997). Students' involvement and commitment are considered important for learning (Hargreaves, 2003). However when involvement and commitment vary considerably there are disturbing differences between classrooms. Even if we are able to draw conclusions from earlier studies concerning successful schools (see, e.g., Grosin, 2004) it is important to take a further step into classrooms. Teacher effectiveness is somewhat differently defined in the literature, for example by Berliner (1985), Hallam & Ireson (1999) and Malm & Löfgren (forthcoming). In this study Berliner (1985) has in particular been relied upon, which is because he focuses especially on such aspects which were reflected in the new items included in the questionnaire. However, the Berliner model does not encompass aspects which teachers emphasise as important motives for enjoyment in work (Caprara *et al.,* 2003), or teacher characteristics related to performance or competence (Malm & Löfgren, 2004).

In the present curriculum (Lpo-94) the assumptions about development of professionalism is simplified. In my experience increasing teacher professionalism is a complicated task. The teacher's wishes in developing personal competence are related to the principals' decisions. The local school is also economically responsible for the costs of further education among staff members. Compared to the attitudes 35 years ago the appreciation of the teachers had increased (Study II) although a more homogeneous teacher style seems to appear. Today the class differences concerning items related to the teacher role were smaller. Whether this represents a development towards more professionalism or not can not be judged from this investigation.

Investigations concerning the importance of teacher styles promoting student interest or appreciation emphasize characteristics such as caring, willingness to help, and showing personal interest for student experiences (e.g. Wentzel, 1997; Richards & Fisher 1999; Evans, 2002; Darling-Hammond & Bransford, 2005). According to the results in Study III students ask for a personal relationship and appreciation from the teachers.

The teachers seemed to concentrate upon the group situation and were worried about disturbance, stress and ambitions. The explanation of the between level factors (Study III) showed some interesting examples of items indicating differences in teacher care. For example: "There are students in school who I am afraid of", "My teacher seems to like me", "Bullying exists in our class" or "I think my teacher is nagging at me". This means that in some classrooms there is evidence that these aspects are optimal while in others the opposite is true. There are teachers who avoid supporting students or have negative expectations (Raffini, 1993; Le Mare & Sohbat, 2002). Others have a personal teaching style with more oppositional than collaborative features (Richards & Fisher, 1999). If the teacher neglects caring, it is likely that the student dependence on friendship become stronger (Study II). The teacher may accept development of interaction and relationships during lessons without being further engaged in quality aspects like increased respect for students' ideas or arguments.

In Study III classroom climates were shown to differ with respect to Berliner's quality factors. Academic expectation was less important according to both teachers and students than management of deviancy. There also was a high correlation between teacher and student attitudes in three of these four quality variables. The exception was "warm and democratic work atmosphere". The lack of agreement in the last variable may be related to the fact that teachers represent at least two different ideologies of teaching (Richards & Fisher, 1999; Daniels, Kalkman, & McCombs, 2001). A warm and democratic classroom according to students may be similar to the adult ideas about a learning environment or include characteristics that individual teachers regard as threatening the teacher role. This will have effects on behaviour and orderliness in classrooms. The learning situation puts demand on individual ability to concentrate and to conduct group management. Less successful students may develop passivity or resistance (Sernhede, 1996; Wigfield, Eccles & Pintrich, 1996).

The awareness of norms within classrooms becomes apparent from both perspectives (Study III). The teacher ability to develop a classroom climate where students are able to shift between independence and interaction is strongly related to the social welfare and security of the group (Wheldall, Mok & Beaman, 1999). The existence of different student goals has to be taken into account (Giota, 2001). Also teachers and students have different goals according to their different roles. If teachers think that students seem stressed or disturb

each other and we listen to the students' confirmation of being tired but not stressed (Study III) the analysis can explain the cause of being tired and that adolescents do not recognize their own tiredness as symptoms of stress.

There were disagreements on item level between teachers and their students but when teacher responses were clustered in the efficiency variables according to Berliner (1985) and compared with their students the agreements were seen in three of four variables. Management of deviancy and Safe and order were of high importance for both teacher and students (Study III).

The local school and the teacher staff have both opportunity and responsibility in demonstrating and expressing attitudes which prevent the occurrence of escalated anxiety or chaos threatening learning (Brophy, 1987). However according to my experience a lot of staff energy is focused on details of rule formulations and follow up. These practices are not promoting good general standards in management of deviancy. A Safe and orderly environment is today challenged by individuals who are at risk for failure in school. These students are dependent on adult care and understanding of their difficulties to concentrate in classrooms where the activities constantly are shifting. Another threat is the assumption of the less successful students that their contribution is not asked for (Bransford, Darling-Hammond & LePage, 2005).

Attitudes are reflections, which sometimes are similar to interest when they are related to schooling and supported from teachers. These positive student attitudes can promote learning. Positive attitudes towards peers seem to reflect that teachers follow the recommendations about teaching methods from the curriculum. Student attitudes have to be compared with their cognitive results before the comprehensive decentralized school can be evaluated positively. The contribution from this investigation is a deeper understanding of attitudes and their power to explain the importance of management of deviancy and that teacher and students can share this view and still be separated in other respects.

The comprehensive schools have students with a positive attitude towards peers and teachers in general but with a weak interest for traditional schooling (Study II and III). This means that knowledge development is related to the individual student's ambition or goal orientation towards future success. In practice there are still students who need more teacher attention and help in their ordinary

schoolwork. It is a rather difficult teacher task to create classroom climates where individual levels of performance and development are accepted.

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Study I

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Attitudes towards School, Teacher, and Classmates at Classroom and Individual Levels: An application of two-level confirmatory factor analysis

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Pupils' responses in Grade 6 to a 40-item questionnaire originally constructed to reveal different school attitudes were re-analysed using recently developed techniques for latent variable analysis of two-level data. One aim was to test a model for investigation of classroom environment and another aim was to compare exploratory factor analysis and confirmatory factor analysis when applied at individual and class levels. When using confirmatory factor modelling a separation of the individual and class-level influences on the between-group matrix was obtained. At class level three factors could be justified: Teachers and Teaching, Social Relations in Classrooms and Work Atmosphere in Classrooms. We conclude that the present analysis encourages further use of this type of questionnaire when investigating pupils' attitudes in a large number of classes. Two-level latent variable analysis is useful for comparing pupils' attitudes within and between classes

Keywords: *Two-level confirmatory factor analysis; School; Teacher; Classmates*

Introduction

The purpose of the present study is to analyse the structure of students' attitudes towards different aspects of school and schooling. In particular a distinction is made between variability that is due to differences among students within classrooms on the one hand, and variability between classrooms on the other hand. The data analysed were collected in the 1960s (Bredänge, Gustafsson, Hallin, Ingvarsson, Odhagen, & Stigenbrandt, 1971) and have previously been re-analysed by Gustafsson (1979). Since that re-analysis was conducted major methodological improvements have, however, taken place, which are capitalised on in the present study.

The attitude questionnaire analysed here goes back to an instrument constructed by Johannesson and Magnusson (1960). In the context of experimentation and

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preparation for the introduction of comprehensive school in Sweden, they were given an assignment to investigate whether student groups which are homogenous or heterogeneous with respect to social background, are optimal environments for socialisation. Theoretically the work was influenced by progressivistic educational philosophy represented by Dewey (1916). Since there did not exist any convenient instrument to capture the shaping of personality and values, Johannesson and Magnusson (1960) constructed a collection of instruments intended to measure correlations between environmental aspects and individual characteristics. One questionnaire intended to measure student attitudes was labelled "Our class". It included 40 items measuring opinions of the students concerning teaching and treatment of the pupils, relations to classmates and their pattern of behaviour, and adjustment to the school environment and school situation.

This and other instruments were used to compare school organisations which differed with respect to differentiation. With higher positive differentiation a more positive attitude towards school and peers was seen. Pupils remaining in public school had a more positive attitude towards the teacher, but negative to their peers. The conclusion was to carry on with the reform of undifferentiated school, even though the analysis still left many questions unanswered (Johannesson & Magnusson, 1960).

In the late 1960s a project was conducted (Didactical Process Analysis (DPA)) which had as its main aim to study relations between classroom processes and school results (Bredänge et al., 1971). The attitudes of the pupils were seen as a part of their individual emotional development, rather than as being influenced by the group and the classroom environment. Forty items from "Our class" were used by Bredänge et al. (1971) but the instrument now was labelled "School And We" (SAW). This questionnaire aimed to measure attitudes towards school, teacher, and classmates and was administered to students in 60 Grade 6 classrooms.

Gustafsson (1979) analysed the structure of the questionnaire by applying exploratory factor analysis at the item level. Following a suggestion by Cronbach (1976), of how to take into account the fact that students are nested within classrooms, one matrix was computed from the deviations between the pupils' responses and their respective class means, and another correlation matrix was computed from the class means of the responses to the items. Separate factor analyses were conducted of the two different kinds of correlation matrices. The factor analysis of the former matrix thus captured individual variation within classrooms, while the analysis of the latter matrix captured variation between classrooms.

The analysis of both matrices yielded five factors, which were labelled School, Teacher, Relations to Classmates, Class Relations and Class Discipline. However, while the dimensionality of the questionnaire appeared to be the same at the individual and classroom levels of observation, the amount of variance accounted for by different factors was different in the two analyses. In the analysis of the within-classroom matrix most variance was accounted for by the factors School and Teacher, while the analysis of the between-classroom matrix showed the factors

Teacher and School to be the strongest ones but now in reversed order. The Teacher factor accounted for 33% of the variance at the class level, and only 8% of the variance at the individual level.

It was concluded that the hierarchical nature of the data makes it necessary to separate variation that is due to differences among individual students from variation due to differences between teachers and classrooms.

This analysis was conducted more than two decades ago, and since that time several important methodological developments have taken place. Confirmatory factor analysis (CFA) has been established as a powerful and precise method for analysing the dimensional structure of a set of observed variables in terms of latent variables (see, for example, Bollen, 1989; Kline, 1998; Loehlin, 1998). There has also been a tremendous development of analytic techniques capable of dealing with hierarchical data. Most of these techniques belong to a family of multilevel regression models (see, for example, Goldstein, 1995; Hox, 2002; Raudenbush & Bryk, 2002). Extensions have also been made of latent variable models so that the dimensional structure of two-level data can be analysed in such a way that the hierarchical nature of the data is taken into account (Muthén, 1989, 1991, 1994). Thus, two-level factor analysis can now be done in a more correct fashion than was possible with the crude technique applied by Gustafsson (1979).

Here we will reanalyse the data analysed by Gustafsson (1979) using the recently developed techniques for latent variable analysis of two-level data. Such an analysis is of substantive interest given the need to develop proper models and theories to account for attitudes towards different aspects of school and classroom environments, and it is also of methodological interest because it gives an opportunity to compare the results of two different methods of two-level factor analysis.

Method

The Two-level Confirmatory Factor Analysis Model

According to Muthén (1989, 1990, 1994), the two-level confirmatory factor analysis model may be described as combining one separate factor analysis model which accounts for the structure of observations on individuals within groups, and another factor analysis model which accounts for the structure of observed group means. The two-level model thus implies a covariance structure model that is formulated in terms of a conventional factor analysis model on both "between-group" and "within-group" levels.

Muthén (1990) demonstrated how the two-level model might be estimated both with a full information maximum likelihood estimator, and with an approximate maximum likelihood estimator. The two estimators produce the same results when group sizes are equal, but not when they are unequal. However, when group sizes are unequal the approximate estimator is considerably less computationally demanding. Here the approximate estimator will be concentrated upon, because it

seems to be the only one that presently can be reasonably conveniently used in practical applications.

From the observed data two matrices of relations among the observed variables may be computed. One is the pooled-within covariance matrix (S_W), which is computed as an ordinary covariance matrix except that deviations of the individual scores are computed from group means rather than from the grand means. For this matrix the actual number of observations is the total number of individuals minus the number of groups, because one degree of freedom is lost for each group mean. The other matrix is the between groups covariance matrix (S_B), which is computed from the group means and their deviations around the grand means, and weighted by group size. The number of observations for this matrix thus is the number of groups.

As was shown by Muthén (1990, 1994) the S_W matrix may be analysed separately with CFA to yield the correct within-group structure. However, a separate CFA of S_B does not yield the correct between-group structure. This is because S_B is a function of both the population between-group structure, multiplied with a constant, which is a function of the group sizes, and of the within-group population structure. Thus, to obtain the correct CFA model for the between-group structure, it is necessary to take into account the disturbing influence of the within-group structure. Muthén (1990) showed that this may be done through conceptualising the two-level estimation problem as a two-group problem in structural equation modelling (SEM).

The model is set up in such a way that the within-group model is a subset of the between-group model and every parameter in the within-group model is constrained to be equal to the corresponding parameter in the between-group model. Thus, all the information is contained in the solution for the between-group model, and the basic function of the within-group model is, in a sense, to control for the intrusion of individual variation in the observed variability between groups.

It is, in principle, easy to specify this kind of model with any model-fitting program for SEM (e.g., AMOS, EQS, LISREL, and Mplus), even though it may be a somewhat tedious and frustrating experience to actually do the specification and obtain the estimates. However, the STREAMS system (Gustafsson & Stahl, 2000) provides pre- and post-processors to the SEM model-fitting programs, which make it comparatively easy to set up, estimate and interpret two-level structural equation models. The Mplus program (Muthén & Muthén, 1998) also incorporates the simplified estimator and offers a simple and convenient language for model specification.

It should be emphasised that conceptually the two-level model refers to the total covariance matrix, and the model should be conceived of as a model for one population. The model thus achieves an additive decomposition of the total variance in the observed variables into four main categories: variance due to latent variables at the group level, residual variance at the group level, variance due to latent variables at the individual level, and residual variance at the individual level.

Subjects and Variables

The questionnaire includes 40 items, designed to capture pupils' attitudes to the school, the teacher, and the classmates. The items measuring the attitude towards the teacher were all positively formulated, while items concerning the school and the classmates contained both positive and negative assertions. Each item offered five response alternatives (always, often, sometimes, seldom, and never). The responses were coded between 1 and 5, with a higher value assigned to a more positive attitude. Responses to negatively worded items were reversed so that a high value represents a positive attitude.

The data collection took place during the academic year 1967/1968. The questionnaire was administered to pupils in 60 classes in Grade 6. The classes comprised a total of 1601 pupils, of which 113 failed to complete the questionnaire due to absence. A few questionnaires did not have complete responses, so 125 missing answers from 82 individuals were replaced by the mean for the variable.

Results

A two-level CFA model is so complex that it must be fitted in different steps. In the first step an ordinary CFA model is fitted to the pooled within-group matrix. In the next step this model is extended to include the between-group model as well.

The Within-group Model

The five-factor model estimated by Gustafsson (1979) was used as a starting point for specifying the within-group model. The goodness-of-fit test for this model indicated a lack of fit between the hypothesised model and the observed data, however. The test statistic was $\chi^2 = 3105.2$, df=725, which gives a χ^2/df ratio of 4.28. A relatively good RMSEA value of 0.051 indicates, though, that the degree of misfit is not too severe, but that there is some room for improvement of model fit. The model was therefore elaborated upon in several different steps, which involved addition of new latent variables and allowing some items to load on more than one latent variable. The model modifications resulted in a 7-factor model, which according to the goodness-of-fit test had a good fit ($\chi^2 = 1811.04$, df=746, RMSEA=0.032). The changes not only involved addition of two new latent variables, but to some extent the relations between the latent and observed variables changed as well. Below, the latent variables of the 7-factor within-group model are described and compared with the previous results (Gustafsson, 1979).

Student's Interest in School. This factor is close to the factor School in the previous analysis. The label Students' Interest in School has been chosen because the items which are related to the factor express the degree of interest of the pupil for being at

Table 1. Standardised estimates of items related to the factor Students' Interest in School along with loadings on the within-class factor School 1979

Q no	Item	Loading 2002	Loading 1979
9	It is boring to go to school	0.75	0.73
5	It is fun to go to school	0.74	0.73
25	I find the lessons boring	0.74	0.67
22	Work at school is dull and monotonous	0.73	0.67
6	I think the work in lessons is fun	0.69	0.61
18	I think the lessons at school pass slowly	0.59	0.58
1	I think it would be nice to end school	0.58	–
21	It would be more fun if we were allowed to do what we want in the lessons	0.56	0.52
29	I want to leave school earlier in the day	0.55	0.52
37	Work at school is good and has variety	0.54★	0.55
30	I think the lessons at school pass quickly	0.53	0.50
4	In the mornings I want to stay home from school	0.53	0.50
11	It would be better to have a job than to go to school	0.50	0.47
15	In our class the lessons are fun and interesting	0.47★	0.48
36	I think we learn a lot of unnecessary things at school	0.41★	–
3	We learn a lot of useful things at school	0.23★	–

Note: –=Factor loading not reported,★=Item represented also in another factor.

school (Table 1). The results from the two models are quite similar, even though there is a slight tendency towards higher loadings in the current model. Three items with low loadings in the 1979 analysis now have significant loadings. The factor encompasses 16 out of the 40 items. The items with the five highest loadings concern the overall motivation to go to school and work there. Somewhat lower loadings are found for items reflecting experience of time, evaluation of school compared with staying at home or having a job, and usefulness of what is learned.

This factor thus represents variability among the pupils with respect to their interest in school and schoolwork.

Students' View of Teacher. This factor is related to 13 items, of which seven items with weaker loadings were not part of the exploratory analysis from 1979 (Table 2). A previously quite narrow factor has expanded into a broader one. The highest loadings are obtained for six items, but now in a different rank order. Ways of acting of the teacher are closely followed by statements about personal characteristics. Considerably lower loadings are observed for the remaining seven items, for example, giving credit. Several items with low loadings are also related to other factors.

The factor Students' View of Teacher thus reflects differences between students within classrooms in perceptions of teacher treatment and teacher characteristics.

Students' Relations with Classmates. This factor relates to five items (Table 3), and it comes close to the factor which in the 1979 analysis was called Relations to

Table 2. Standardised estimates of questions related to the factor Students' View of Teacher along with loadings on the within-class factor Teacher 1979

Q no	Item	Loading 2002	Loading 1979
35	Our teacher keeps promises	0.57	0.51
38	Our teacher treats all pupils alike	0.56	0.47
33	Our teacher is nice and kind	0.54	0.56
10	Our teacher listens to our questions	0.54	0.48
17	Our teacher is calm and good tempered	0.53	0.54
13	Our teacher helps us a lot	0.53	0.47
31	We dare to ask our teacher about everything	0.38	–
2	Our teacher gives us credit	0.35	–
8	If anybody in the class fusses I am blamed	0.31★	–
15	In our class the lessons are fun and interesting	0.27★	–
3	We learn a lot of useful things at school	0.23★	–
37	Work at school is pleasant and has variety	0.22★	–
36	I think we learn a lot of unnecessary things at school	0.17★	–

Note:–=Factor loading not reported,★=Item represented also in another factor.

Table 3. Standardised estimates of items related to the factor Students' Relations with Classmates along with loadings on the within-class factor Relations to Classmates 1979

Q no	Item	Loading 2002	Loading 1979
23	My classmates pick a quarrel with me	0.74	0.64
19	I become enemies with my classmates during the breaks	0.57	0.55
24	I feel lonely and abandoned at school	0.45★	0.54
20	All my classmates are kind to me	0.42★	0.52★
8	If anybody in the class fusses I am blamed	0.18★	–

Note: -=Factor loading not reported, ★=Represented also in another factor.

Classmates. The highest loadings are observed for items, which ask about conflicts with classmates. Three of the items are also represented in another factor. This latent variable will be referred to as Students' Relations with Classmates. The focus is on perception of class relation climate among students.

Table 4. Standardised estimates of items related to the factor Students' View of Peers along with loadings on the within-class factor Class Relations 1979

Q no	Item	Loading 2002	Loading 1979
26	In our class all the pupils are good friends	0.69	0.58
27	In our class the pupils help each other	0.58	0.49
39	In our class we stay together during the breaks	0.41	0.34
20	All my classmates are kind to me	0.39★	0.38★
32	In our class the pupils fuss with each other	¤	0.28

Note: ★=Item represented also in another factor, ¤=Not present in this factor.

Table 5. Standardised estimates of items related to the factor Students' View of Work Atmosphere along with loadings on the within-class factor Class Discipline 1979

Q no	Item	Loading 2002	Loading 1979
40	In our class we do exactly as the teacher says	0.52	0.23
34	In our class the pupils are interested in school work	0.52	–
7	During the lessons we are calm and quiet	0.35	0.27
28	I feel calm and secure at school	0.35★	–
16	In our class we are careless with school work	0.29★	0.43
14	During the breaks the pupils in our class fight	¤	0.43
32	In our class the pupils fuss with each other	¤	0.37

Note: –=Factor loading not reported,★=Represented also in another factor. ¤=Not present in this factor.

Students' View of Peers. This latent variable is close to the factor Class Relations (Table 4) in the 1979 analysis. It relates to four items which ask about relations among classmates as a group (e.g., "all the pupils are good friends" and "the pupils help each other"). This latent variable thus captures differences among students in their perceptions of the relations among the peers as a group, and it is labelled Students' View of Peers. This latent variable is reflecting positively formulated items concerning friendly interactions among students.

Students' View of Work Atmosphere. This latent variable (Table 5) shares three items with the 1979 factor Class Discipline to which it comes closest. The three items which overlap with this factor, emphasise general orderliness among the students. The items with the highest loadings, however, seem to reflect an obedient atmosphere and task oriented work (e.g., "we do exactly as the teacher says", "the pupils are interested in schoolwork"). This latent variable, which is labelled Students' View of Work Atmosphere, thus seems to represent differences among students in their perceptions of the work and the atmosphere of the classroom.

Students' Lack of Anxiety. This narrow factor consisting of three items (Table 6) does not have any counterpart in the 1979 analysis. The items capture different aspects of anxiety, or lack of anxiety (e.g., "feel calm and secure at school", "feel worried and frightened"). This latent variable, which will be called Students' Lack of Anxiety, thus reflects differences among students within classrooms in the extent to which they experience anxiety.

Table 6. Standardised estimates of items related to the factor Students' Lack of Anxiety

Q no	Item	Loading 2002
28	I feel calm and secure at school	0.66★
12	During the lessons I feel worried and frightened	0.42
24	I feel lonely and abandoned at school	0.28★

Note: ★=Represented also in another factor.

Table 7. Standardised estimates of items related to latent variable Students' View of Fuss

Q no	Item	Loading 2002
32	In our class the pupils fuss with each other	0.67
14	During the breaks the pupils in our class fight	0.48
16	In our class we are careless with school work	0.23
19	I become enemy with classmates during the breaks	0.14*

Note: *=Represented also in another factor.

Students' View of Fuss. The latent variable Students' View of Fuss (Table 7) does not seem to have any counterpart in the 1979 analysis. It has loadings on four items, which refer to conflicts and fights among the students. The highest loadings are obtained for two items, which emphasise physical incidents among students.

Correlation among the latent variables in the within model. Correlations were allowed in the model between all latent variables and also between three pairs of item residuals. These items were opposites or very closely related. Students' View of Fuss is quite highly related to Students' View of Peers (0.57). A relatively high correlation is found between the factor Students' View of Work Atmosphere and Students' View of Teacher (0.69), which indicates that it is hard to separate aspects of discipline from the perception of the teacher (Table 8). The correlation between Students' Relations with Classmates and Students' Interest in School is low, which indicates that motivation for schoolwork arises from other sources than the classmates. Students' View of Work Atmosphere is not correlated to students' lack of anxiety.

The Between-group Model

In the first step towards development of the class-level model, the seven within factors were hypothesised to exist on the class level as well. However, the estimation procedure for this model did not converge. Constraints of equality of factor loadings were put on the narrow factors, which made the estimation procedure converge. This

Table 8. Correlations among the latent variables in the within-class model

	Students' Interest in School (IS)	Students' View of Teacher (VT)	Students' Relations with Class-mates (RC)	Students' View of Peers (VP)	Students' View of Work Atmosphere (WA)	Students' Lack of Anxiety (LA)	Students' View of Fuss (VF)
IS							
VT	0.45						
RC	0.02	0.22					
VP	0.16	0.40	0.45				
WA	0.50	0.69	0.14	0.44			
LA	0.12	0.18	0.42	0.39	−0.04		
VF	0.21	0.20	0.48	0.57	0.39	0.17	

model had a fairly good fit ($\chi^2 = 3069.84$, df$=1459$, RMSEA$=0.027$). It proved possible, however, to simplify this model into a three-factor model, by collapsing highly correlated factors. The goodness-of-fit statistics for this model ($\chi^2 = 3133.88$, df$=1486$, RMSEA$=0.027$) indicated as good a fit as for the model with seven class-level factors (Delta $\chi^2 = 64.04$, df$=37$). Below the three factors in the between-group model are described.

Teachers and Teaching. The latent variable Teachers and Teaching (Table 9) represents attitudes towards different aspects of everyday schoolwork. The items with the highest loadings ask about characteristics of the teacher and these items load on the latent variable Students' View of Teacher as well. However, fairly high loadings are also observed for items which express general motivation for schoolwork, and which

Table 9. Standardised estimates of items related to the factor Teachers and Teaching along with loadings on the between-class factors School and Teacher 1979

Q No	Item	2002 Loading	1979 Factor	1979 Loading
33	Our teacher is nice and kind	0.57	teacher	0.53
17	Our teacher is calm and good tempered	0.51	teacher	0.48
2	Our teacher gives us credit	0.40	–	–
35	Our teacher keeps promises	0.38	teacher	0.41
38	Our teacher treats all pupils alike	0.37	teacher	0.37
10	Our teacher listens to our questions	0.33	teacher	0.32
34	In our class the pupils are interested in schoolwork	0.32	–	–
13	Our teacher helps us a lot	0.31	teacher	0.31
15	In our class the lessons are fun and interesting	0.31	school	0.19
37	Work at school is pleasant and has variety	0.27	school	0.19
25	I find the lessons boring	0.26	school	0.29
31	We dare to ask our teacher about everything	0.24	–	–
22	Work at school is dull and monotonous	0.23	school	0.29
5	It is fun to go to school	0.20	school	0.27
6	I think that the work in lessons is fun	0.19	school	0.21
21	It would be more fun if we were allowed to do what we want in the lessons	0.18	school	0.23
3	We learn a lot of things at school	0.17	–	–
9	It is boring to go to school	0.17	school	0.29
18	I think that the lessons at school pass slowly	0.17	school	0.25
29	I want to leave school earlier in the day	0.17	school	0.21
11	It would be better to have a job than go to school	0.15	school	0.18
36	I think we learn a lot of unnecessary things at school	0.14	–	–
30	I think that lessons at school pass quickly	0.11	school	0.20
4	In the mornings I want to stay home from school	0.08	school	0.18
1	I think it would be nice to end school	0.06	–	–

Note: –$=$Factor loading not reported.

Table 10. Standardised estimates of items related to the factor Social Relations in Classrooms

Q no	Item	2002 Loading	1979 Factor	1979 Loading
27	In our class the pupils help each other	0.31	Class Relations	0.29
26	In our class all pupils are good friends	0.21	Class Relations	0.28
39	In our class we stay together during the breaks	0.18	Class Relations	0.25
32	In our class the pupils fuss with each other*	0.17	Class Relations	0.23
			Class Discipline	0.19
28	I feel calm and secure at school	0.12	–	–
20	All my classmates are kind to me	0.08	Relation to Classmates	0.11

Note: –=Factor loading not reported,*=Represented also in another factor.

at the student level load on Students' Interest in School. In the 1979 analysis the factors School and Teacher were separated also on the class level, but here they collapse into one factor.

Social Relations in Classrooms. This latent variable is focusing on social aspects. It will be labelled Social Relations in Classrooms because it is composed mainly of items which reflect cooperation and good relations among students in the classroom (Table 10). This factor comes close to the factor called Class Relations in the 1979 study.

Work Atmosphere in Classrooms. The latent variable Work Atmosphere in Classrooms is related to items which ask about different aspects of work in the classrooms (Table 11). At the student level these items load on Students' View of Work Atmosphere and Students' View of Fuss. This factor comes quite close to the factor labelled Class Discipline in the 1979 analysis.

Table 11. Standardised loadings of items related to the factor Work Atmosphere in Classrooms

Q no	Item	2002 Loading	1979 Factor	1979 Loading
40	In our class we do exactly as the teacher says	0.39	Class Discipline	0.24
7	During the lessons we are calm and quiet	0.33	Class Discipline	0.35
16	In our class we are careless with schoolwork	0.26	Class Discipline	0.22
8	If anybody in the class fusses I am blamed	0.20	–	–
32	In our class the pupils fuss with each other*	0.10	Class Relations	0.23
			Class Discipline	0.19
14	During the breaks the pupils in our class fight	0.06	Class Discipline	0.13

Note: –=Factor loading not reported,*=Represented also in another factor.

Table 12. Item residuals on between level

Q no	Item	Factor 2002	Residual &
1	I think it would be nice to end school	TT	0.22
2	Our teacher gives us credit	TT	0.23
3	We learn a lot of things at school	TT	0.08
4	In the mornings I want to stay home from school	TT	0.13
5	It is fun to go to school	TT	0.05
6	I think that the work in lessons is fun	TT	0.00
7	During the lessons we are calm and quiet	WAC	0.34
8	If anybody in the class fusses I am blamed	WAC	0.00
9	It is boring to go to school	TT	0.04
10	Our teacher listens to our questions	TT	0.17
11	It would be better to have a job than go to school	TT	0.12
12	During the lessons I feel worried and frightened	–	
13	Our teacher helps us a lot	TT	0.11
14	During the breaks the pupils in our class fight	WAC	0.26
15	In our class the lessons are fun and interesting	TT	0.13
16	In our class we are careless with schoolwork	WAC	0.14
17	Our teacher is calm and good tempered	TT	0.13
18	I think that the lessons at school pass slowly	TT	0.05
19	I become enemy with classmates during the breaks	–	
20	All my classmates are kind to me	SRC	0.06
21	It would be more fun if we were allowed to do what we want in the lessons	TT	0.10
22	Work at school is dull and monotonous	TT	0.02
23	My classmates pick a quarrel with me	–	
24	I feel lonely and abandoned at school	–	
25	I find the lessons boring	TT	0.00
26	In our class all pupils are good friends	SRC	0.06
27	In our class the pupils help each other	SRC	0.00
28	I feel calm and secure at school	SRC	0.06
29	I want to leave school earlier in the day	TT	0.06
30	I think that lessons at school pass quickly	TT	0.00
31	We dare to ask our teacher about everything	TT	0.21
32	In our class the pupils fuss with each other	SRC+WAC	0.08
33	Our teacher is nice and kind	TT	0.10
34	In our class the pupils are interested in schoolwork	TT	0.15
35	Our teacher keeps promises	TT	0.26
36	I think we learn a lot of unnecessary things at school	TT	0.11
37	Work at school is pleasant and has variety	TT	0.09
38	Our teacher treats all pupils alike	TT	0.23
39	In our class we stay together during the breaks	SRC	0.20
40	In our class we do exactly as the teacher says	WAC	0.00

TT=Teachers and Teaching, SRC=Social Relations in Classrooms, WAC=Work Atmosphere in Classrooms.
–=Excluded items on between level.

Class-level residuals. Four items were not related to any factor at class level. This indicates that there is no detectable systematic variation between classes concerning these items. Nineteen items have residuals between 0.00 and 0.10, indicating little class-specific variability which is not explained by the class-level latent variable. Ten items have residuals between 0.11 and 0.20 and seven items have residuals between

0.21 and 0.34. For these items there is systematic variability between classrooms which is left unexplained by the model. It would carry too far to discuss these items here.

Correlation. Correlation among the latent variables at class level were: Work Atmosphere in Classrooms versus Teachers and Teaching 0.74, Social Relations in Classrooms versus Teachers and Teaching 0.44 and Social Relations in Classrooms versus Work Atmosphere in Classrooms 0.36.

Discussion and Conclusions

One purpose of the present study was to investigate if application of new methods for two-level factor analysis would yield a different pattern of results concerning the dimensional structure of the SAW instrument. In the two-level exploratory factor analysis conducted by Gustafsson (1979) a Teacher and a School factor was identified at both individual and class levels, but the expected Classmates factor split into three factors which were labelled Relations to Classmates, Class Relations and Class Discipline. While the same factors were identified at both class and individual levels, it also was found that the factors accounted for different amounts of variance at the two levels.

There are both differences and similarities between these results and the results obtained in the present analysis. At the individual level, basically the same five factors as were established in the original two-level analysis were also found in the current model. The factor, which here is labelled Students' Interest in School, corresponds to the factor called School in the previous analysis, and the factor called Students' View of Teacher corresponds to the previous Teacher factor. The factors Students' Relations with Classmates, Students' View of Peers, and Students' View of Work Atmosphere correspond to the previously identified factors Relations to Classmates, Class Relations, and Class Discipline, respectively. However, to obtain a reasonable level of fit of the CFA model it proved necessary to add two more factors, which have been labelled Students' Lack of Anxiety and Students' View of Fuss. These two factors are quite narrow factors, which concern relations between the individual student and different aspects of life at school. It is reasonable to assume that the greater power and precision of the CFA technique used here, as compared to the exploratory technique used in the original analysis, makes it possible to identify these additional factors. The general impression, however, is that there is good agreement between the results of the original analysis and the current results at the individual level.

The results at the class level show less agreement, however. In the current study only three factors could be identified. The factor Teachers and Teaching is a broad factor, which partially overlaps with the Teacher factor of the 1979 analysis. This factor has a focus on the characteristics and activities of the teacher, which seem to be of decisive importance in shaping the perception of differences between

classrooms. The narrow factors Social Relations in Classrooms and Work Atmosphere in Classrooms correspond quite well with the Class Relations and Class Discipline factors of the previous analysis. Thus, at the class level a simpler factor structure is established in the current model than in the original analysis. The most striking difference is that in the CFA model there is no class-level factor, which corresponds to the individual-level factor Students' Interest in School. Instead some of the items involved in this factor have loadings on the broad factor Teachers and Teaching.

In conclusion, then, the CFA analysis resulted in a somewhat more elaborate set of factors at the individual level, and a simplified set of factors at the class level. This outcome may be explained by the fact that in the original analysis of the between-class matrix, proper account was not taken of the influence from the individual level on the between-class matrix. In the analysis, the within-class variance was regarded as fixed. However, as has been shown by Muthén (e.g., 1994), the within-class variance must be regarded as random, which also implies that it affects the observed between-class matrix. The two-level CFA model achieves a separation of the individual and group-level influences on the between-group matrix, and therefore the class-level factor structure is not unduly influenced by the individual-level factor structure.

Westling Allodi (2002) also used two-level CFA to investigate classroom climate in relation to social context, and group composition, among other variables. She used the "Individualized Classroom Environment Questionnaire (ICEQ)" (Fraser, 1985) and "My Class Inventory, MCI" (Fraser, Anderson, & Walberg, 1982) to construct a combined instrument, which was used with children of age 8–12 years. The modelling resulted in six factors at the student level: Cohesiveness, Competition, Satisfaction, Personalisation, Friction, and Work Support. At the class level three climate factors were found: Class Friction, Class Satisfaction, and Class Cohesiveness. The factor Class Friction is similar to our factor Social Relations in Classrooms, and it is interesting to observe that items which refer to teacher attitudes towards children in the class, have loadings between 0.17 and 0.26 in the broad class-level factor Class Satisfaction. The loadings are somewhat lower compared with those obtained in the current study. Teacher items in the present study come closer to personal characteristics and these items get the highest loading.

The present study shows that it is possible to separate class- and individual-level sources of variance in responses to attitude items. It may, of course, also be asked if it is possible to identify the school level as a source of variance. This question cannot be answered with the methods applied in the present study, because it is restricted to two-level data. However, Wheldall, Beaman, and Mok (1999) applied three-level regression analysis to data from the five subscales of the ICEQ to investigate the relative contribution of variance from school, classroom, and individual levels. For none of the scales was there any significant contribution from school level, but for all the scales the classroom level contributed a substantial amount of variance (around

20%). The authors therefore concluded that the ICEQ, as intended, does capture classroom differences.

There is thus no support in this study for the notion that school variability is an important source of variance. However, Hufton, Elliott, and Illushin (2002) reported an extensive qualitative study comparing attitudes towards schooling in the UK, Russia, and the USA, which suggests that there may be cultural differences. They used detailed interviews in order to examine key factors behind educational motivation and engagement. In Russia the attitude was task-orientated at school and at home but the students were less satisfied with their performance in relation to the demands. In the UK there were lower formal demands and tolerated "off-task peer interaction" was more frequent. Even with comparatively lower achievements the students were more self-satisfied. In USA the students had more time available to exercise choice of their own with less demanding elements.

The results of the present analysis and the investigations discussed provide an improved basis for further development of instruments designed to measure students' attitudes towards school. The fact that students' responses to questionnaire items are always influenced by the classroom context and by characteristics of the individual student cannot be escaped. It does seem essential, however, that items intended to measure classroom- or group-level characteristics do not make reference to the individual student, because this will increase the variance due to individual level factors. In a similar fashion, items designed to measure individual characteristics should not refer to phenomena at the classroom level, because this will increase the variance due to group-level factors. It also seems that the SAW instrument could be extended in a number of different ways, in order better to capture both individual and group-level differences in the attitudes towards school, teacher, and classmates.

Acknowledgement

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Study II

A comparison of student attitudes towards school, teachers and peers in Swedish comprehensive schools now and 35 years ago

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Background
This investigation focuses on student attitudes and looks at school quality from the perspective of affective variables rather than students' knowledge or abilities. The concept of attitude includes ways of feeling, thinking and behaving and maintaining an expression of one's identity within the environment. The analysis focuses on student attitudes 35 years apart between the late 1960s and 2003. During this period, major changes in the Swedish national curricula occurred, although the goal orientation has remained that of equity and democracy.

Purpose
The purpose of the paper was to investigate whether major changes in Swedish student attitudes towards school, teachers and classmates had occurred between the late 1960s and 2003, and to discuss possible changes in relation to educational policies. In addition, a recently described CFA model was examined in relation to the investigation in order to see if development of the method using factor scores could be applied in further analysis of the possible differences between the two time periods.

Sample
In 1967/68, 1488 pupils from 60 classes in the Gothenburg area in the compulsory 6th grade responded to a questionnaire. In 2003, 1540 pupils from 78 grade 6 classes in Gothenburg City responded to the same questionnaire.

Design and methods
The questionnaire consisted of 40 items with five alternatives and was originally constructed in 1960. Confirmatory factor analysis was used with previously described latent variables at two levels, within and between classes. Factor scores were computed for the factors at both levels. At the within level, seven factors were found and four of these were relational factors; at the between level, three factors were identified.

Results
In general, the attitudes on item level were more positive today. The differences between classes had increased. Factor scores at the individual level showed no significant changes in the factors 'interest in school', 'view of teacher' and 'working atmosphere in the classroom'. Significant positive changes had occurred in all four peer relational factors: 'relation with classmates', 'view of peers', 'lack of anxiety' and 'view of fuss' (disturbances). At the class level the means of the three factors: 'teacher and teaching', 'working atmosphere' and 'social relations with classmates', had all increased. The investigation 35 years ago showed a rather negative Swedish student attitude also on an

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international perspective. By comparison, the present investigation shows a general improvement in attitudes on class level. Within classes the pattern is differentiated. Significant changes in the within-class level were seen in peer relational factors.

Conclusions

The student attitudes towards school, teachers and classmates are found to be more positive now than 35 years ago. Most striking are the changes in peer relational aspects. The earlier compulsory school with its focus on theoretical knowledge did not achieve all the goals of the curriculum. The present curriculum with its focus on interactional aspects of learning may have implemented changes in relational patterns and created a more positive student attitude at class level, but the variation among classes is wide. An even more differentiated picture is seen within classes. Current national and international investigations are unable to relate a positive school attitude to greater achievement.

Introduction

Two distinct ways of examining the quality of schooling are either to investigate knowledge and abilities or affective variables, such as attitudes, values, interests, motivation, anxiety, appreciation and adjustment (Kahn & Weiss, 1973). This investigation focuses on affective variables—i.e. pupil attitudes towards school, teachers and classmates from two time periods, the late 1960s and the early 2000s. In these periods, among other things, the view of teaching methods and aspects of the organization of a comprehensive school in Sweden differed. The main purpose of this paper is to discuss observed changes in student attitudes in two time periods within a comprehensive school, with the same goal orientation of equity and democracy. First, the attitude concept and its impact on students is examined. The historical frame surrounding the introduction of the comprehensive school is described, followed by reviews of earlier investigations where affective variables and achievement were often linked together. The Swedish results from later years are also compared with modern international investigations concerning student attitudes. The focus here is on the comparison of results from the same 40-item questionnaire given to students then and now.

The attitude concept

This paper is written from the perspective examined by Corsaro (1997), according to which students' social interaction with peers is as important as the interaction with, for instance, parents. A change of attitude is hypothesized during adolescence, which has relevance for the present investigation (Kahn & Weiss, 1973). This change is due to a greater differentiation among peers during this period (Corsaro, 1997); the individual identity is also influenced by responses and attitudes within the environment (Polkinghorne, 1988).

Attitude encompasses ways of feeling, thinking or behaving. It is an 'emotional readiness' to think or behave; and an individual's attitude foregoes the acting

(Halstead & Taylor, 2000). Attitudes serve as stabilizing factors in understanding similar situations, and also in creating and maintaining the expression of one's identity in the environment. The attitude concept is, in practice and in investigations, often judged as being as important as cognitive variables: the conclusion is that student attitudes may be investigated independently of student achievement. However, investigations concerning attitudes and their hypothesized relation to achievement are also enlightened.

Attitudes within classrooms

The attitudes of pupils have an impact on each individual and also on the overall working atmosphere within the classroom. In this atmosphere, individuals are constantly ranking one another on a spectrum from highly ranked to being marginalized (Evaldsson, 2001); however, pupil attitudes are more classroom specific than is student achievement (Andersson *et al.*, 1989).

The pupils are familiar with the attitudes of their peers but have little knowledge about the attitudes of students in other classrooms, school or districts (Garpelin, 1997). Experience of external factors—i.e. curriculum, economic resources and principles for awarding marks—is gained or modified through classroom processes (Woods, 1990). In democratic, integrative or group-centred classes the students hold a more positive attitude towards general participation in school (Khan & Weiss, 1973). Without knowledge about the mediating processes in school practice, that is pupil attitude, there is a risk of failure within theoretical reflections concerning classrooms (Hammersley, 1994); from these results, then, follows the understanding that the atmosphere in the classroom from the student perspective is of importance.

The historical frame

The main purpose of the first Swedish democratic comprehensive school, from the perspective of educational theorists, was that of equity (Lundahl, 2001). A central idea in the modernization of schools was built upon teachers' capacity to individualize teaching within the classroom. The parallel need for a reconstruction of teacher education, however, could not be as easily realized (Marklund, 1982; Rothstein, 1986).

The official report, SOU 1961:30, emphasized that the teacher should encourage individual activities and attend to the development of each pupil. Where pupils did not succeed within the class, specific subject instruction and extra work were considered (Dahllöf, 1971). The first National Curriculum for the comprehensive school was proposed in the law of 1962, Lgr-62, later followed, in 1969, by Lgr-69. The new emphasis was to take the perspective of the active and working pupil, a contribution from Piaget (see Säljö, 2003). From the perspective of educational theorists, four dimensions were considered of equal importance: developmental psychology, learning psychology, didactics and social dimensions (Husén, 1982). In educational policy a contradiction existed between individualization, including changes in working methods, and the traditional awarding of marks in lower secondary school (Rothstein, 1986).

Possible sources of student disappointment may have arisen from the competition for marks, together with the unfamiliar notion of the necessity for more lessons every week and at least another year of schooling. Teachers were not prepared for countering social inequalities; and the changes were affecting the educational system in all respects (Husén, 1973; Marklund, 1982; Rothstein, 1986).

More than 30 years later, the National Curriculum guided a decentralized, deregulated goal-oriented educational model (see SOU 1992:94; Lpo94, 1994; Lundahl, 2001). The notion of learning as an interaction process was in line with Vygotsky's (1978) view, and it demonstrated that the social dimension had been further accentuated. The government has delegated responsibility for school quality to the local school level; the reforms also concerned aspects of decentralized and delegated economic powers and interpretation of the curriculum (Holfve-Sabel, 1994, 2000; Lundahl, 2001). A third level is represented by the professionals within the school, and local politicians have evinced their interest in implementation of the local school educational goals. Students are required to reflect continuously on their own progress, their failures and on social behaviour; and the notion of the decentralized school has accepted specific school profiles, together with independent schools (Falkner, 1997). A communicative information system between teachers, students and their parents has replaced the marking system in the 6th grade, and today marks are not awarded until the 8th grade. Students lacking subject marks have experienced difficulties in entering further education programmes.

Parental and student input and influence concerning teaching methods have been intended to be strengthened, but have been shown still to be weak (Lundh & Stoltz, 2001; Selander 2003; Lundh & Borgny, 2004). Educational policies have been changed in order to create a certain school climate and ethos and, from one decade to another, different assumptions made about implementing a specific educational system. However, the practice in the school may differ from the intention.

Comparative investigations and attitude

In 1970–1972 the International Association for the Evaluation of Educational Achievement (IEA) investigated six subjects in 21 countries, including Sweden. General attitudes towards school in the populations of 10- and 14-year-old pupils in the final year of full-time secondary courses were reported, while the Swedish mean was the lowest (Husén, 1973; Hansson, 1975). The responses to two of the items were of special interest: 'The only thing I like about school is seeing peers' and 'Usually, I dislike school work'. As many as 20% of pupils in grades 7–9 agreed to both of these statements (Husén, 1973). Affective factors like interest and attitude were examined. In Civic Education support for democratic values was not related to achievement. Attitudes and achievement were initially thought to be either two-way influential or circular, but in Civic Education they were not correlated (Walker, 1976). Deeply embedded attitudes concerning democracy, for instance, cannot easily be trained for in school. Reynolds and Walberg (1992) examined achievements and affective attitudes in mathematics in grades 7 and 8. An early attitude towards

mathematics, either positive or negative, was consistent with, although not related to early or late achievement.

The Third International Mathematics and Science Study (TIMSS) investigated pupils' attitudes towards these subjects during 1994–1995. Between 61% and 66% of Swedish students in the 8th grade belonged to the group 'liked or liked a lot' when asked about their attitudes to science subjects or mathematics. In comparison with other countries, only nine out of 39 countries had lower indices of liking mathematics than Sweden (Beaton *et al.*, 1997a, 1997b), and these results indicate that Swedish students' attitudes were quite negative around 1970. It is also obvious that the relation between attitude and achievement is complicated.

Modern attitude investigations

Both England and France introduced educational reforms in the late 1980s (Planel, 1997); in France the reforms implied less centralization and in England more centralization of the school system. In France the reforms included a child-centred pedagogy, whereas the English tradition emphasized that ability was more important than effort. The responses of English pupils showed more dissatisfaction towards school, whereas French pupils showed a greater interest towards school work. The French teacher was more authoritarian, while the English teacher showed a more caring, informal approach in the classroom. Large educational reforms may give both small and strong effects with unpredictable directions.

The Programme for International Student Assessment (PISA) studied the future expectations of 15-year-old pupils. Reading literacy was the focus in 2000 (Skolverket, 2001); pupils' own attitudes towards reading literacy were presented as an index. The results of the Swedish pupils were close to the mean of the normal distribution.

The IEA conducted the Progress in International Reading Literacy Study (PIRLS), following a similar IEA investigation in 1991. When Swedish pupils in grade 3 judged their own reading competence, they were more positive in 2001 than had been the case in 1991. However, the results of self-esteemed reading ability were reversed to formal reading ability, which had decreased significantly (Skolverket, 2003); in this case, attitude concerned a specific ability.

During 2003, the National Agency of Education examined student general achievement in grades 5 and 9 (Skolverket, 2004); in several subjects student ability had decreased since 1992, but this did not correspond to the generally positive national attitude investigations (see e.g. Lundh & Borgny, 2004). Several other investigations have pointed to student attitudes as separate from academic performance (DaCosta, 1995; McManus & Gettinger, 1996; Webb & Palincsar, 1996; Park & Coble, 1997; Veenman *et al.*, 2000). Attitude is a complex psychological entity. The international investigations have not so far been able to demonstrate a strong positive correlation between attitudes and achievement, and some recent examples have pointed to an opposite situation. Conclusions about individual attitude responses need to be aggregated to students' class or school level.

From the above investigations, it may be concluded that a positive student attitude reveals more information about classroom atmosphere and interaction than about achievement. Some results point to an inverse relation between attitude and achievement.

Earlier results

Johannesson (1954) was one of the Swedish pioneers in studying social relations in the school. An instrument for attitude investigation was constructed as a personal questionnaire called 'Our class' (Johannesson & Magnusson, 1960), and part of the questionnaire instrument was used in the DPA investigation by Bredänge *et al.* (1971). Gustafsson (1979) reanalysed the data by applying exploratory factor analysis, and a further method development using two-level confirmatory factor analysis (CFA) of the previous data has recently been described (Holfve-Sabel & Gustafsson, 2005).

Purposes of the present study

Our purposes in this study were:

1. To investigate whether major changes in Swedish student attitude have occurred between the late 1960s and 2003, and to discuss the possible changes in relation to educational policies.
2. To investigate if the recently described CFA model (Holfve-Sabel & Gustafsson, 2005) could be used in investigation of the 2003 data, and if development of the method using factor scores could be applied for further analysis of possible differences between the two time periods.

Method

The instrument

In the CFA model the items were allowed to aggregate to latent variables (Holfve-Sabel & Gustafsson, 2005). Data were computed for two levels: the within-class level where the deviations of the individuals from group means were computed, and the between-class level which was computed from the group means and their deviations around the grand mean (Muthén, 1994); the models were constructed using the STREAMS programme (see Gustafsson & Stahl, 2000). On the within-class level, seven factors emerged; these were: *Students' interest in school* (IS) (16 items); *Students' view of teacher* (VT) (13 items); *Students' social relations with classmates* (RC) (5 items); *Students' view of peers* (VP) (4 items); *Students' view of working atmosphere* (WA) (5 items); and *Students' lack of anxiety* (LA) (3 items). On the between-class level, a three-factor model had as good fit as a model with seven class-level factors; the three factors were: *Teachers and teaching* (T&T) (25 items); *Social relations with classmates* (SRC) (6 items); and *Working atmosphere in classrooms*

(WAC) (6 items). The use of latent variables is intended to facilitate the comparative analysis of the great number of items and responses from around 3000 students. In the present investigation individual factor scores will be included.

Design

The questionnaire was constructed using items 1–40 of the DPA investigation, with slightly modernized syntax (Holfve-Sabel & Gustafsson, 2005), and adding 32 more items. All items carried five alternative responses for each statement: *always*, *often*, *sometimes*, *seldom* and *never*. A list of 77 schools in Göteborg with grade 6 classes was composed (Gravin & Olsson, 1999) and 60 of these were randomly drawn by sampling without replacement. The primary goal was to investigate approximately 1600 pupils from 60 classes. A letter was sent to the headmasters of the 60 schools. After phone calls and mail contact, headmasters of 30 schools agreed to participate. The schools represented 18 of the 21 administrative areas of the city. A letter containing information on the project was given to the parents of pupils in grade 6 of the participating schools. Those who did not wish to participate delivered a signed note back to the teacher and were excluded from participation.

Data collection took place between September and December 2003. The investigator visited every school, informing the teachers and the pupils and attending when the pupils and their teacher responded to the questionnaire, which took about 30 minutes. The forms were collected, together with a list of the students' first names and the initial letter of the surnames.

Participants

The 30 schools selected 80 classes in grade 6, of which 78 classes with 1695 pupils participated. The number of classes with grade 6 pupils varied between 1 and 6 in each school. A total of 1540 students responded to the questionnaire (90.85%), while 130 (7.67%) were ill or absent and 25 did not wish to participate (1.47%). In comparison, the DPA investigation comprised 60 classes from different administrative areas with 1601 pupils in grade 6, of which 1488 responded (92.94%) and 113 were absent (7.06%).

Analysis

The results were coded in an SPSS file, using 5 as the most positive alternative and 1 as the least positive statement; items with negative statements had reversed coding. Statistical calculations were computed with SPSS 12.0, and missing pupils were then excluded from the data file. Re-evaluation of the CFA with latent variables (Holfve-Sabel & Gustafsson, 2005) was performed with the Mplus programme (Muthén & Muthén, 2004); Mplus was also used to calculate the correlation between latent variables in the two investigations. In this computation, missing data of items resulted in exclusion of the student in question. Factor scores were computed as individual scores on each item weighted by the factor loading. For each factor (latent

variable) of the combined materials the mean was set to zero both for the within- and the between-level factors. In this calculation, single missing responses were included using the procedures implemented in the Mplus programme (Muthén & Muthén, 2004).

Results

As seen in Table 1, all mean values of the 40 items were higher in the present investigation ('now') than in the earlier investigation ('then'). Using *t*-tests, all differences were shown to be statistically significant. It is realized that this simple test does not take into account the clustered nature of the data and therefore underestimates the standard errors by approximately 50%; however, most of the differences were significant. Histograms of the distribution of scores 1–5 were constructed and compared. Many items showed a skewed positive distribution already in the older investigation, which was even more striking in the new. In order to express differences between the responses from the two time periods in a metric comparable over items, eta (η) was computed. High η-values indicate large differences between the two investigations (i.e. a large change in attitudes). This point bi-serial correlation coefficient (η) was further used (multiplied by 2) as a measurement of effect size. Effect sizes of 0.82–0.52 corresponding to η-values of 0.41–0.26 were considered large changes over time; medium effect sizes 0.50–0.34 (η 0.25–0.17); and small effect sizes 0.32–0.08 (η 0.16–0.04) (Cohen, 1988).

Large changes of attitudes were seen in 17 of the 40 items (Table 1). The largest were observed for item 28 ('I feel calm and secure at school'), item 13 ('Our teacher helps us a lot') and item 5 ('It is fun to go to school'), indicating a positive attitude change of pupils. Medium effect sizes were found for items concerning interest in school work, for example, item 34 ('In our class pupils are interested in school work'), item 37 ('Work at school is good and has variety') and item 16 ('In our class we are careless with school work'). Thus, in aspects concerning the enjoyment of school work, the changes of attitudes are less marked.

The smallest effect sizes were seen for item 15 ('In our class the lessons are fun and interesting'), item 3 ('We learn a lot of useful things in school'), item 4 ('In the mornings, I want to stay home from school'), item 7 ('During the lessons, we are calm and quiet') and item 8 ('If anybody in the class fusses, I am blamed'), which reflect aspects of school quality, work order and personal motivation without changes between the time periods.

Intra-class correlation coefficients (ICC) understood as explained variance between school classes and the 40 items for the two separate investigations were also computed using the Mplus programme (Table 2); missing responses were excluded. An increase in ICC means that the variability between classes increased relative to the change in variability within classes. The differences of intra-class correlation between 'now' and 'then' were estimated and showed positive values in 26 of 40 items.

The highest intra-class correlation 'now' was observed for item 14 ('During the breaks, the pupils in our class fight'), item 7 ('During the lessons we are calm and quiet'), item 32 ('In our class the pupils fuss with each other'), item 35 ('Our teacher keeps promises'), item 38 ('Our teacher treats all pupils alike') and item 33 ('Our

Table 1. Responses to items in the questionnaire in the investigation 2003 ('now') compared to 1967–8 ('then')

Item no.	Item	Mean Now	SD Now	Mean Then	SD Then	Mean diff.	Effect size
1	I think it would be nice to leave school	3.04	1.21	2.38	1.04	.66	.56
2	Our teacher gives us credit	3.40	.81	2.88	.76	.52	.63
3	We learn a lot of things at school	4.05	.79	3.81	.80	.24	.30
4	In the mornings, I want to stay home from school	3.05	1.21	2.71	1.16	.34	.29
5	It is fun to go to school	3.47	.98	2.75	.95	.72	.70
6	I think the work in lessons is fun	3.33	.85	2.89	.79	.44	.52
7	During the lessons, we are calm and quiet	2.94	.91	2.74	.96	.20	.22
8	If anybody in the class fusses, I am blamed	4.21	.97	4.03	.99	.18	.19
9	It is boring to go to school	3.35	1.06	2.75	.97	.60	.57
10	Our teacher listens to our questions	4.15	.87	3.79	.92	.36	.39
11	It would be better to have a job than go to school	3.62	1.25	3.16	1.21	.46	.37
12	During the lessons, I feel worried and frightened	4.61	.68	4.18	.82	.43	.55
13	Our teacher helps us a lot	4.17	.77	3.51	.89	.66	.74
14	During the breaks, the pupils in our class fight	3.74	.87	3.36	.83	.38	.45
15	In our class the lessons are fun and interesting	3.35	.87	3.07	.83	.28	.32
16	In our class we are careless with school work	3.84	.80	3.45	.75	.39	.49
17	Our teacher is calm and good-tempered	3.76	.89	3.32	.97	.44	.46
18	I think the lessons at school pass slowly	2.77	.97	2.44	.93	.33	.34
19	I become an enemy with classmates during breaks	4.19	.74	3.86	.67	.33	.45
20	All my classmates are kind to me	4.06	.94	3.57	.82	.49	.54
21	More fun if we were allowed to do what we want	2.91	1.27	2.80	1.16	.11	.09
22	Work at school is dull and monotonous	3.35	1.01	2.77	.90	.58	.59
23	My classmates pick a quarrel with me	4.02	.84	3.94	.70	.08	.11
24	I feel lonely and abandoned at school	4.56	.76	4.13	.84	.43	.52
25	I find the lessons boring	3.26	.92	2.86	.84	.40	.44

(continued)

Table 1. (*Continued*)

Item no.	Item	Mean Now	SD Now	Mean Then	SD Then	Mean diff.	Effect size
26	In our class all pupils are good friends	4.03	.82	3.55	.84	.48	.55
27	In our class the pupils help each other	3.83	.85	3.25	.83	.58	.66
28	I feel calm and secure at school	4.37	.83	3.58	.95	.79	.81
29	I want to leave school earlier in the day	2.37	1.13	1.86	.91	.51	.49
30	I think lessons at school pass quickly	2.62	.98	2.50	1.01	.12	.12
31	We dare to ask our teacher about everything	3.96	1.00	3.40	1.04	.56	.53
32	In our class the pupils fuss with each other	3.79	.84	3.26	.78	.53	.62
33	Our teacher is nice and kind	4.13	.86	3.49	1.00	.64	.65
34	In our class the pupils are interested in school work	3.35	.83	2.94	.78	.41	.50
35	Our teacher keeps promises	3.84	.94	3.74	.98	.10	.11
36	I think we learn a lot of unnecessary things at school	3.63	1.00	3.07	.94	.56	.55
37	Work at school is pleasant and has variety	3.41	.88	2.97	.86	.44	.50
38	Our teacher treats all pupils alike	3.87	1.12	3.34	1.18	.53	.45
39	In our class we stay together during the breaks	3.58	1.02	3.41	.91	.17	.17
40	In our class we do exactly as the teacher says	3.46	.84	3.40	.90	.06	.08

teacher is nice and kind'). These items concerning attitudes among peers or towards the teacher showed the greatest actual variability today.

The highest intra-class correlation 'then' was also seen in item 33 ('Our teacher is nice and kind'), item 17 ('Our teacher is calm and good-tempered'), item 7 ('During the lessons, we are calm and quiet'), item 35 ('Our teacher keeps promises'), item 2 ('Our teacher gives us credit') and item 38 ('Our teacher treats all pupils alike'). In the DPA investigation the class variability was even greater in these items as seen by a higher intra-class correlation. These items all concern interaction with the teacher.

Intra-class correlation differences between 'now' and 'then' are presented in Table 2. The largest positive differences were seen in item 32 ('In our class the pupils fuss with each other'), item 14 ('During the breaks, the pupils in our class fight'), item 9 ('It is boring to go to school') and item 6 ('I think the work in lessons is fun'). The difference has increased in items concerning styles of behaviour between peers

Table 2. Intra-class correlation of items in the 2003 ('now') and the 1967–8 ('then') investigations; computed in Mplus, missing values excluded

Item no.	Item	Intra-class correlation now 78 classes $N = 1397$	Intra-class correlation then 60 classes $N = 1406$	Intra-class correlation difference
1	I think it would be nice to leave school	.128	.081	.047
2	Our teacher gives us credit	.164	.211	−.047
3	We learn a lot of things at school	.092	.052	.040
4	In the mornings, I want to stay home from school	.074	.040	.034
5	It is fun to go to school	.135	.071	.064
6	I think the work in lessons is fun	.127	.050	.077
7	During the lessons, we are calm and quiet	.199	.246	−.047
8	If anybody in the class fusses, I am blamed	.052	.045	.007
9	It is boring to go to school	.150	.073	.077
10	Our teacher listens to our questions	.140	.154	−.014
11	It would be better to have a job than go to school	.055	.048	.007
12	During the lessons, I feel worried and frightened	.000	.009	−.009
13	Our teacher helps us a lot	.104	.121	−.017
14	During the breaks, the pupils in our class fight	.204	.094	.110
15	In our class the lessons are fun and interesting	.130	.130	.000
16	In our class we are careless with school work	.126	.094	.032
17	Our teacher is calm and good-tempered	.174	.288	−.114
18	I think the lessons at school pass slowly	.057	.065	.008
19	I become an enemy with classmates during the breaks	.042	.029	.013
20	All my classmates are kind to me	.089	.027	.062
21	It would be more fun if we were allowed to do what we want in the lessons	.063	.070	−.007
22	Work at school is dull and monotonous	.138	.085	.053
23	My classmates pick a quarrel with me	.056	.030	.026

(continued)

Table 2. (*Continued*)

Item no.	Item	Intra-class correlation now 78 classes $N = 1397$	Intra-class correlation then 60 classes $N = 1406$	Intra-class correlation difference
24	I feel lonely and abandoned at school	.014	.021	−.007
25	I find the lessons boring	.124	.093	.031
26	In our class all pupils are good friends	.110	.071	.039
27	In our class the pupils help each other	.152	.117	.035
28	I feel calm and secure at school	.038	.023	.015
29	I want to leave school earlier in the day	.107	.054	.053
30	I think lessons at school pass quickly	.050	.039	.011
31	We dare to ask our teacher about everything	.022	.110	−.088
32	In our class the pupils fuss with each other	.188	.078	.110
33	Our teacher is nice and kind	.180	.355	−.175
34	In our class the pupils are interested in school work	.164	.149	.015
35	Our teacher keeps promises	.182	.230	−.048
36	I think we learn a lot of unnecessary things at school	.078	.047	.031
37	Work at school is pleasant and has variety	.133	.094	.039
38	Our teacher treats all pupils alike	.182	.204	−.022
39	In our class we stay together during breaks	.088	.087	.001
40	In our class we do exactly as the teacher says	.167	.165	.002

and general motivation towards school. This shows that a larger variability may exist among classes nowadays concerning friendship and school motivation.

The largest negative differences were found for items 33 ('Our teacher is nice and kind'), 17 ('Our teacher is calm and good-tempered') and 31 ('We dare to ask our teacher about everything'). As seen in Table 2, most of these items represented larger class variability in the previous investigation. A negligible difference of intra-class correlation between 'now' and 'then' was found for item 15 ('In our class the lessons are fun and interesting'), item 39 ('In our class we stay together during breaks'), and item 40 ('We do exactly as the teacher says'). The intra-class correlation differences of the items were not significantly correlated to mean differences.

Model comparison using two-level confirmatory factor analysis

The described model was used with seven latent variables on individual level ('within') and three latent variables on class level ('between') (Holfve-Sabel & Gustafsson, 2005). This model had a good fit when used with the new data with the Mplus programme (Muthén & Muthén, 2004). Students who had not responded to all items had to be omitted in the calculation when Mplus was used (Table 3).

As seen in Table 4, there were several increases of correlation in the present investigation compared to the previous one. The most marked changes were between *Relations with classmates* and *Interest in school* (RC/IS), *Working atmosphere* and *Relations with classmates* (WA/RC), *View of fuss* and *Relations with classmates* (VF/RC), *Lack of anxiety* and *Working atmosphere* (LA/WA) and, finally, *View of fuss* and *Lack of anxiety* (VF/LA). The concept 'fuss' is a negative condition where pupils annoy and

Table 3. Comparison of the two investigations computed with CFA

Present investigation (2003)	Previous investigation (1967 – 8)
Number of classes, 78	Number of classes, 60
Number of students included, 1397	Number of students included, 1406
Not included (missing data), 143	Not included (missing data), 82
RMSEA, 0.033	RMSEA, 0.029

Table 4. Correlation among the latent variables in the within-class model 1967 – 8 compared to the investigation in 2003 (in bold)

	Students' interest in school (IS)	Students' view of teacher (VT)	Students' social relations with classmates (RC)	Students' view of peers (VP)	Students' view of working atmosphere (WA)	Students' lack of anxiety (LA)	Students' view of fuss (VF)
IS							
VT	0.45						
	0.43						
RC	0.02	0.21					
	0.31	**0.35**					
VP	0.17	0.42	0.55				
	0.26	**0.43**	**0.58**				
WA	0.54	0.71	0.19	0.49			
	0.68	**0.61**	**0.43**	**0.60**			
LA	0.08	0.16	0.43	0.40	− 0.02		
	0.10	**0.23**	**0.50**	**0.55**	**0.19**		
VF	0.20	0.18	0.52	0.57	0.40	0.17	
	0.29	**0.32**	**0.73**	**0.59**	**0.54**	**0.35**	

irritate one another. Four out of five correlations concern relations within the peer group. These changes of correlation underline the dependence between patterns of interaction within the classes. At the class level (Table 5), marked increases of correlation had occurred between the two investigations, especially in *Social relations with classmates* and *Working atmosphere in classrooms* (SRC/WAC). *Social relations with classmates* (SRC) also had increased correlation with *Teacher and teaching* (TT). Also, at this level, the most marked changes concern social relations in the classroom.

Factor scores

In order to evaluate the changes over time in the within- and between-class factors, factor scores were computed (Muthén & Muthén, 2004). The factor scores of the two populations combined were normalized by setting the means at 500 and the S.D. at 100. When factor scores were compared, a distinct pattern between the two investigations emerged. The student attitudes were not significantly different between the two investigations in three factors at within-class level. These factors were: *Students' interest in school, Students' view of teacher* and *Students' view of working atmosphere*. In the remaining four factors: *Students' social relations with classmates, Students' view of peers, Students' lack of anxiety* and *Students' view of fuss*, there were highly significant differences between the two investigations, $p < 0.001$ for each factor (Table 6). The largest differences within classrooms between the two investigations were seen in the latent variables *Lack of anxiety* and *Relations with classmates*, while *View of fuss* and *View of peers* had somewhat smaller differences.

In five of the seven latent variables the SD was larger in the present investigation. In *Students' view of teacher* the SD was approximately equal in the two investigations, while *Lack of anxiety* showed a reversed pattern with a smaller variation among students now.

At the between-class level (Table 5), the three latent variables *Teacher and teaching* (T&T), *Students' social relations with classmates* (SRC) and *Working atmosphere in classrooms* (WAC) showed highly significant changes between the two investigations ($p < 0.001$). At this level, 60 class means of the factor scores were compared with the present 78 class means.

Table 5. Correlation among latent variables on between-class level in the two investigations

	1967–8	2003
Working atmosphere in classroom (WAC)/Teacher and teaching (TT)	0.73	**0.70**
Social relations with classmates (SRC)/Teacher and Teaching (TT)	0.40	**0.70**
Social relations with classmates (SRC)/Working atmosphere in classroom (WAC)	0.32	**0.77**

Table 6. Comparison of factor scores of latent variables, individuals within and between class level: 2003 ('now') and 1967–8 ('then')

	Mean	SD	SEM	*p*
Latent variables within classes: Now, *n* = 1540; Then, *n* = 1488				
Interest in school				
Now	503	105	2.7	
Then	496	94	2.4	0.052
View of teacher				
Now	499	99	2.5	
Then	501	101	2.6	0.721
Relations with classmates				
Now	517	102	2.6	
Then	482	94	2.4	0.000
View of peers				
Now	511	103	2.6	
Then	489	96	2.4	0.000
Working atmosphere				
Now	501	104	2.6	
Then	499	96	2.5	0.774
Lack of anxiety				
Now	523	93	2.4	
Then	477	101	2.6	0.000
View of fuss				
Now	512	104	2.7	
Then	488	94	2.4	0.000
Latent variables between classes Now, *n* = 78; Then, *n* = 60				
Teacher and teaching				
Now	561	68	7.7	
Then	421	76	9.8	0.000
Working atmosphere				
Now	544	90	10.2	
Then	443	82	10.6	0.000
Social relations with classmates				
Now	565	69	7.8	
Then	415	64	8.3	0.000

Discussion

Method and results

The attitudes on item level were more positive today. The differences between classes had increased. Factor scores on individual level showed no changes in the factors *Interest in school*, *View of teacher* and *Working atmosphere in classrooms*. Positive changes had occurred in four peer relational factors. At the class level all variables, *Teacher and*

teaching, *Working atmosphere in classrooms* and *Social relations with classmates*, had increased.

The new investigation represents a large sample of classes from most of the administrative areas of Gothenburg, the second largest city of Sweden. The number of missing pupils is fairly low and the sample may be considered representative of the area. The questionnaire was constructed several decades ago. In the historical comparison the original items were used, and many aspects of modern teaching were therefore not illuminated. Present in the 40 items is an *a priori* assumption of the teacher's role and the classes as strong organizational units, with a traditional schedule of lessons and breaks, and also that some of the grade 6 students were engaged in their last year in school; items 1 and 11 are examples of conditions from the early period when students could choose to leave school after the 6th grade. In the modern school the schedule of lessons and breaks has less impact on student behaviour, but a number of items presume distinct division between work and playtime. The statements about the teacher and teaching are generally positively formulated, while social relations with peers are reflected with both positive and negative statements.

The attitude response on item level seen in the effect sizes showed the greatest differences in aspects of feeling safe in school, getting teacher support and having fun in school. Least changes were noted regarding norms of obedient behaviour and peer quarrelling. Other items concerning the teacher and the content of lessons showed minor changes. On the item level, the students in general seemed more satisfied today.

Looking at the variability between classes on the item level, another pattern emerged. The largest variability in attitudes among classes was seen in items concerning 'fussing' and fighting. This could indicate the existence of classes with interaction harmony as well as groups with conflicts. In this investigation some classes were from the same school and they were known to be more alike than classes from different schools due to school ethos (Woods *et al.*, 1997); this has not yet been further analysed.

Items concerning the teacher role had smaller variation today. The present decentralized curriculum may, paradoxically, have implemented a more homogeneous teaching style. A smaller difference in attitudes towards the teacher was also seen. Demands on the teacher to communicate with students and parents in place of giving formal grades is an obvious difference between the two school systems, and a consequence is that each professional needs to attain a personal appreciation (Lundahl, 2001). Thus many affective variables, including attitudes, gain in importance.

Today the intra-class correlation showed wider difference in interaction styles among peers. Decentralization has encouraged schools to develop their own profile; the risk is that this increases differences between schools. More information may be revealed by examining changes of attitude among individuals within classrooms using a two-level confirmatory factor model with latent variables (Holfve-Sabel & Gustafsson, 2005). The use of factor scores has made it possible to analyse the latent variables as between the two investigations. The model had been used on the DPA data and was now shown to be consistent on both levels when used again. There were some changes of factor loadings, but this did not affect the structure of

the model; in the present investigation the Mplus programme (Muthén & Muthén, 2004) was used and missing data on items resulted in exclusion of the student in question. In the previous investigation (Holfve-Sabel & Gustafsson, 2005), Amos was used together with the imputation of missing data. This did not seem to have any impact on the model estimates for the DPA data. Correlation among the narrow variables increased, however, in the data from 2003, but this could be as a result of student engagement in interaction among peers.

The within-class level showed a differentiated result. This was surprising since the within-class level is a subgroup of the between-class level in the computation of the model (Holfve-Sabel & Gustafsson, 2005). The results for the within-class latent variables: *Interest in school*, *View of teacher* and *Working atmosphere*, did not differ significantly from the previous investigation. The essence of schooling, where students interact and work within a learning situation, is reflected in these variables. The mean values of the three variables in the present investigation were lower than for the other four within-class variables: *Social relations with classmates*, *View of peers*, *Lack of anxiety* and *View of fuss*. These four factors indicated that students were more positively familiar with classmates and expressed less alienation. This may indicate that students within classes nowadays rated these issues lower than the factors with items related to student interaction. One may speculate that students within the classroom today have more opportunities to work together during lessons in less authoritative conditions. These results for the latent variables are also supported by changes within the items concerning peer interaction. A similar pattern concerning the interaction of aspects was seen in intra-class correlation changes on item level.

At the class level all three latent variables showed highly significant changes over time. On an organizational level the conclusion was that the attitudes confirm a positive change over time. The results must be interpreted with knowledge of the very negative attitudes prevailing at the time of the first investigation (Husén, 1973). The between-level factors in the current model are uneven with the majority of the items in the latent variable *Teachers and teaching*. The dramatic increase in between-class level seems to be encouraging from a national educational policy perspective.

Conclusion

Student personal attitudes towards school concern the individual socialization and expectations on future citizenship. Schools in comparison with parents and peers have a smaller influence on young people's attitudes (Corsaro, 1997). Children spend a lot of time in school surroundings and a large part of their relationships exist within school. Thus a dominant part of peer relationship exists and develops within school. The school class as a group has an impact on student attitudes through interaction. Such influences are working in both directions.

Generally, a more positive attitude towards school was found among pupils today as compared to the 1960s. When the different educational policies were constructed, much effort was put on ideology and aims. A theory that equity easily can be transposed from educational policy to effective and active learning in practice is too

simplified. This is especially so if the curricula are built upon separated ideologies on optimal learning processes.

In some respects, both of these reforms became a compromise. From an international perspective the attitude values at the time of the DPA investigation were low. A considerable percentage of Swedish adolescents by that time showed negative attitudes towards school (Husén, 1973; Hansson, 1975). When looking back at the organization of the previous school, one notices the introduction of more emphasis on theoretical school work, more time spent in school and difficulties in the teacher role regarding the introduction of individualization. In retrospect, some of the student attitudes can be interpreted as a reaction against an expanded theoretical school. Today compulsory schooling extends, in practice, to 12 years and students in the 6th grade accept that they must experience further years of theoretical education. The relaxation in relationship aspects within schools today may be due to the absence of awarding of marks and lack of early differentiation. Furthermore, the 6th grade represents only the half-way point in the school system.

The latest reform repeats the same democratic values, including a demand for the equal opportunity to learn within groups of peers. The same democratic ideology lies behind curricular aims, but separate curricula in the two time periods may have had an impact on student attitudes towards school. In the latest curriculum, the learning process focuses on interaction. Educational policies are deeply embedded in the culture of the society and the results arising from policy changes are therefore difficult to predict (Planel, 1997). It may also be relevant to emphasize that there have been rapid changes in society, family structures and in child upbringing during the period of 35 years that separates these changes in curricula and school policies (Ziehe, 1994).

It has been previously observed that the essence of schooling can seem to be resistant towards imposed changes (Woods *et al.*, 1997). When changes of attitudes of magnitude are seen, the indication is that a 'resistant' institution has indeed been affected. These results from the affective domain must be compared to the ability results, in order to give a more complete picture of the quality of schooling. Contemporary international attitude investigations (e.g. Reynolds & Walberg, 1992; Beaton *et al.*, 1997a, 1997b) have not confirmed that a positive student attitude is related to better achievement in school work. The National Agency of Education recently reported achievement results for 2003 and found a decrease of achievements in several subjects during the past ten years and pointed at a possible inverse relation between a co-operative working style among students and goal-oriented knowledge development (Skolverket, 2004).

In school, attitudes serve as stabilizing factors from an individual perspective (Halstead & Taylor, 2000). Although attitudes are not easily correlated to student achievement, they are connected to individual expectation (Passow *et al.*, 1976). Attitudes are characterized by fairly stable responses in similar situations (Snow *et al.*, 1996); and attitudes are supposed to have an impact on the overall working atmosphere in the classroom. A positive student attitude is not equivalent to an optimal learning environment; it may, however, support interest regarding learning if the student and teacher support each other (Wentzel, 1997; Evaldsson, 2001). It is

the mission of the teacher to develop positive interaction among students. Students continuously reaffirm their affective predisposition (Shuell, 1996). A positive school attitude is supposed to promote socialization; however, it must consciously be combined with conditions for an optimal learning environment. The challenge for the professionals is how to optimize both positive school attitude and a learning environment that fits different, individual prerequisites. There is a major problem in how to create an educational policy where each student group expresses positive affective responses towards interaction and, at the same time, is willing to maximize effort. International investigations of student attitude show that student and teacher perspective in practice are separated (e.g. Woods, 1990; Hammersley, 1994; DaCosta, 1995; Veenman *et al.*, 2000).

On the individual level there is a need for further investigation of teacher and student interaction and comparisons between schools. On the system level the local schools are supposed to work out a learning style in line with national goals. Important within a decentralized school system is in what respects the conditions within separate schools provide fairly equal student opportunities.

Acknowledgements

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Study III

Holfve-Sabel, M.-A.
Classroom climate in grade 6 according to students and teachers
Submitted

Classroom climate in grade 6 according to students and teachers

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Abstract

Background: Swedish pupils' attitudes towards school, teachers and peers are positive while, at the same time, a sharp decline in achievement in different school subjects has been reported. The two aims in comprehensive school, knowledge development and socialisation, are highly dependent on the teacher–student relationship. The focus in this investigation is on the intersection between student attitudes and teacher opinions in relation to classroom climate.

Purpose: To compare differences and similarities between students and their teachers' responses using a modernised questionnaire. With this comparison, an attempt is made to explain the differing classroom climates.

Sample: A total of 1695 students and their teachers from 78 grade 6 classes in the city of Göteborg were investigated. There were 1540 (90.85%) student respondents while 130 (7.67%) were ill or absent for other reasons and 25 were unwilling to participate (1.47%).

Design and methods: The students answered a 72-item questionnaire about school, teachers and peers. The results of the first 40 items have been reported previously. The new items focused on school environment, teaching and interaction. The teachers gave their opinion about their class in the last 31 items of the questionnaire. The teachers also were asked to give background information about themselves and their class in altogether 36 questions or graded statements. The students' attitudes were compared with the opinions and background information given by their teachers.

Results: Differences in teacher-student perspectives are seen at an item level. Classes differ in their responses to school environment, teaching and interaction. The students' attitudes confirm that they mostly appreciate peers and teachers and the importance of positive interaction with both teachers and peers. Teachers observe amount of work ambitions, stress and disturbance among students. The teachers express concern about students' interaction and work more than making observations on their own relations with students. The

students wish for class harmony and collaborative work and an appreciative teacher in a class without disruptions, bullying or nagging. According to students, the variability between classrooms was lowest in a variable reflecting Academic Expectations but highest in a variable measuring Safe and Orderly environment. The factors that were of most importance in accounting for classroom differences in attitudes concerning "Work Atmosphere in Classrooms" and "Social Relations within Classrooms" seemed to be a sensible management of deviancy and creation of a safe and orderly environment, according to the students' judgements. Developing a more positive working climate with substantial academic expectation and management of deviancy seems important.

Conclusions: Classroom climates vary widely. The teacher's capacity to manage deviancy is crucial. Teachers are aware of the students' situation and class ambitions but need to become familiar with the students' attitudes and reflect on their professional work. Student self-evaluation is strongly protected and may explain why affective responses differ from reported achievement results. A student group during communicative learning develops a strong sense of friendship and loyalty among peers.

Introduction

In a recent study, Holfve-Sabel (2006) showed that Swedish grade 6 students´ attitudes towards school, teachers and peers were generally more positive in 2003 compared to the late 1960s. In 2003, attitudes concerning peer relational factors had a greater variability between classes, while the opinions about the teacher were less differentiated between classes. Attitude investigations from the National Agency of Education support the finding that Swedish students have a positive attitude towards school (Lundh & Stoltz, 2001; Lundh & Borgny, 2004). However, several Swedish national and international studies show a considerable decline in achievement in different subjects during the last decade (TIMSS, 2003; Skolverket, 2003, 2004; Fröjd, 2005; Holmberg, Hartsmar & Pagetti, 2005). International experiences also show that the connection between pupils' attitudes and achievement is not always a positive one (DaCosta, 1995; McManus and Gettinger, 1996; Webb & Palinscar, 1996; Park and Coble, 1997; Veenman, Kentler & Post, 2000).

A classroom is a workplace which should acknowledge two perspectives, the adult's and that of the adolescents. When school quality is evaluated, student achievement is an important factor. Another way to understand the student outcomes is by comparing two affective variables, the teachers' opinion and the students' attitudes towards school. This comparison may give a more differentiated picture of the association between affective and cognitive domains and it may clarify the relations between these constructs.

Theory

Affective outcomes and efficient schools

Many important outcomes of education are difficult to capture, such as involvement in cooperative behaviour (Berliner, 1985). Even if the relations between attitudes and achievement are not simple, there is evidence of a relation between a supportive learning environment and an efficient school (e.g. Johnson *et al.*, 2001). If the social environment is to be investigated, the students' points of view and the interactions of the group are useful sources of information (Westling Allodi, 2001).

Student actions occur in a social environment, which results in students having parallel goals and not solely cognitive goals (Giota, 2001). Being acknowledged by peers may be one important goal for the student. Peer interaction also involves conflicts and differentiation, which are important for individual development. Differentiation increases during pre-puberty and daily negotiations occur (Corsaro, 1997). Thus, the learning process includes relational, symbolic and organisational aspects, which are both affective and cognitive (Westling Allodi, 2001). Individual subjective responses can reveal

important aspects of broad areas of the classroom climate without compromising the informants.

From a large survey of the literature, Johnson *et al.* (2001) concluded that academic instruction and a caring and supportive climate were the most important determinants of effective schools. The climate thus has an impact on achievement (Berliner, 1985). The climate is hypothesised to be influenced by a mix of affective and cognitive styles among adults and adolescents. The teacher and the students are constantly influencing the classroom environment through their interactions. However, a certain amount of excitement and friction in the communication between the teacher and the students is productive (Aspelin, 1999), while frustration is not. This climate can partly be influenced by the teacher although the students' impact is also strong. In a Swedish study (Grosin, 2004), it was concluded that the teachers compromise their teaching styles according to their own ambitions and school ethos and resources. Differences in student achievement and social adaptation are still described with reference to their social and ethnic background and intellectual capacity. According to this author, successful schools are able to synthesise goals of knowledge with social fostering.

The Holfve-Sabel (2006) study took as its starting point previous research in which two-level confirmatory factor analysis had been used to establish three latent attitude variables on between-class level. One of these was called "Teacher and Teaching", the second "Work Atmosphere in Classrooms" and the third "Social Relations within Classrooms" (Holfve-Sabel & Gustafsson, 2005; Holfve-Sabel, 2006). These three factors were identified on the basis of classroom differences in the structure of responses to an attitude questionnaire. It is of major interest to try to identify teacher, teaching and student relational characteristics that account for the differences between classrooms in these factors. In order to capture possible explanatory factors, information needs to be obtained both from the teachers and from the students. The attitude questionnaire was thus extended with new sets of items designed to capture quality characteristics of the classroom from both teacher and student perspectives. The idea of asking teachers and students about the same content at the same time was to promote sincere answers on the questionnaires. A set of items also was included to gather information about teacher background variables.

Hallam & Ireson (1999) suggest three definitions of an effective teacher. They represent content knowledge, extensive practical skills and a competence to evaluate one's own work. Malm & Löfgren (2004; forthcoming) define teacher competence related to three domains: effectiveness, competence and performance. Berliner (1985) emphasises four climate factors that promote learning: The first factor, concerning academic expectations, is related to teachers' ability to communicate specific aims of learning. The second factor is the creation of a high standard of the environment. Environment can become

counterproductive and increase anxiety. The third factor, sensible management of deviancy, is related to teacher capacity to retain students' attention and prevent deviancy. Finally, the fourth factor concerns the ability to encourage cooperation and responsibility by means a warm and democratic atmosphere. These four quality characteristics of teacher aims in teaching and the organisation of teaching have been shown to be related to achievement and attitudes.

Purposes of the present study

The main aim of the investigation was to account for the classroom variability in the three attitude dimensions using information from both the teacher and the students concerning different aspects of the classroom organization, teaching and teacher characteristics. Another aim was to investigate differences and similarities between the responses of the students and their teachers to comparable questions.

Method

Below, the instruments developed for the study are described and information is given about the participants and procedures used.

The teacher and student questionnaires

A questionnaire was constructed using 40 attitude items from an earlier investigation (Holfve-Sabel & Gustafsson, 2005; Holfve-Sabel, 2006) and adding 31 new items constructed to capture different aspects of the current school situation. The new items focused on the school environment, teaching and interaction between the students and between the teacher and the students.

One version of the questionnaire was constructed for the teachers and another version for the students. The teacher questionnaire consisted of three parts. In the first part, the teacher was asked to estimate the attitude within the class on the 40 attitude items (not reported here). In the second part, the teachers´ opinions about their classes were captured. There were questions about teaching methods and amount of student autonomy during lessons. The quality of the evaluation conference held with students at least twice a year was assessed by means of specific questions. Items concerning student health, their feelings of appreciation, amount of peer disturbance and collaboration were included, along with items about environmental conditions, bullying, enjoyable activities and group harmony. The teacher questionnaire thus reflects classroom organisation, resources, student work responsibility and affective aspects (see Table 1 for a listing of the items). All items offered 5 alternative responses to each statement: always, often, sometimes, seldom, never.

In part three of the questionnaires, the teachers were asked to provide background information about themselves and their class in altogether 36 items. Questions concerned, among other things, teacher age and experience, national test results in grade 5, students' need of extra support, unauthorised absence, teaching methods, student peer clusters, and working habits in groups and across genders.

The student questionnaire was similar to that of the teacher, except that the items were formulated from the pupils´ "I, my or we" perspective. It included the 40 attitudinal items, along with the 31 items covering different aspects of classroom organization and school work. These items paralleled the teacher items described above, but were formulated from a student perspective. The pupils were asked to express their general attitude about school environment, teaching and interaction (for details, see Table 2).

The student and teacher questionnaires were tested in five classes after which minor simplifications were made.

Classification of the items into categories

In order to divide the teacher responses into separate domains, the teacher items were divided into four clusters suggested by Berliner (1985) to represent different aspects of teacher efficiency. Each item could only belong to one category. The quality characteristics of teacher aims were: (1) "Communicating academic expectations of achievement"; (2) "Developing a safe, orderly and academically focused environment for work"; (3) "Sensible management of deviancy" and (4) "Development of a warm and democratic (convivial) atmosphere".

Category 1, TAE (Teacher Academic Expectation) included 8 items, Q45, 51, 53, 54, 59, 61, 65 and 66 (see Table 1 for details). These items concern information to students about which material to use, personal results and homework. They also capture levels of ambition, assessment, credit and opinion about student satisfaction.

Category 2, TSO (Teacher Safe and Orderly) included 10 items, Q41, 42, 43, 44, 50, 56, 60, 64, 67 and 70. The items reflect behaviour and orderliness in school. In this cluster, there are also items about student health and teacher instructions about schoolwork.

Category 3, TMD (Teacher Management of Deviancy) included 6 items, Q 46, 49, 55, 57, 63 and 69. The items concern teacher evaluation of the need to remind students and the number of peer conflicts and teachers´ wish to switch to another class.

Category 4, TWA (Teacher developing a Warm and democratic Atmosphere) included 7 items, Q47, 48, 52, 58, 62, 68 and 71. These items concern opinions about interaction, friendship, collaboration and enjoyment.

The four scales were positively intercorrelated, which makes it meaningful to compute an overall summed score ("Teachsum"). The reliability according to Cronbach α was 0.84 for this variable. Because of the limited number of items, the reliability was lower for the four scales: TAE α = .65; TSO α = .43; TMD α = .69; and TWA α = .53.

The sums of the class means of the student responses in the corresponding four clusters of items in the student questionnaire were labelled StAE, StSO, StMD and StWA. The reliability of the overall sum was .89 for the student responses, and for the four student scales, the reliability was: StAE α = .65; StSO α = .59; StMD α = .75; and StWA α = .78.

Participants

A list of 77 schools in Göteborg with grade 6 classes (Gravin & Olsson, 1999) was drawn up and 60 of these were randomly chosen. A letter was sent to the headmasters of these schools and 30 schools agreed to participate. The schools represented 18 of the 21 administrative areas in the city. A letter containing information was given to the parents of pupils in grade 6 of the participating schools. Those who did not wish to participate gave the teacher a signed note and were excluded from participation.

The data were collected between September and December, 2003. The investigator visited every school, informed the teachers and the pupils and attended when the pupils and their teacher responded to the questionnaire, which took about 30 minutes.

The 30 schools had 80 classes in grade 6 of which 78 classes with 1695 students participated. The number of classes with grade 6 students varied between 1 and 6 at each school. A total of 1540 students responded to the questionnaire (90.85%) while 130 (7.67%) were ill or absent for other reasons and 25 did not want to participate (1.47%). Missing students were excluded from the data file.

Analyses

The responses were coded in an SPSS file using 5 as the most positive alternative and 1 as the least positive statement. Items with negative statements had reversed coding. Statistical calculations were performed with SPSS 12.0. Statistical significance was considered to be $p<0.05$. The three class-level attitude factors "Teacher and Teaching" (TT), "Work Atmosphere in Classrooms" (WAC) and "Social Relations within Classrooms" (SRC) (Holfve-Sabel & Gustafsson, 2005; Holfve-Sabel, 2006) were used as dependent variables in analyses of the teacher and student items about characteristics of the classroom, teacher and teaching as explanatory factors. Simple regressions were

computed for each item against the three factors, respectively, and were tested one by one for significance. Stepwise multiple regressions were then performed.

Results

First, results from comparisons between teacher and student responses on corresponding items are reported.

Table 1. Teacher responses to items 41-71.The symbol* denotes items with reversed coding

Q	Item	Mean	SD
41	The students work in pairs or groups	3.59	.73
42	The class uses computers at school	2.51	.99
43*	The students shift workplaces with each other	2.91	.86
44	The school environment is clean and tidy	3.32	1.09
45	During the evaluation conference, I tell my students their results	4.89	.42
46*	There are students in school who behave aggressively	3.42	.75
47	The class experiences enjoyable activities	3.21	.75
48	I am fond of this class	4.26	.78
49*	The students become tired during the school day	2.72	.79
50	The students work on their own in the classroom	3.71	.58
51	The students get homework or tasks to do at home	4.23	.77
52	There is good harmony in the class	3.77	.85
53	The students use text books in different subjects	4.01	.90
54	I give credit to the students	4.05	.56
55*	I would like to switch to another class	4.40	.90
56	During the evaluation conference, I bring up students' behaviour towards each other	4.54	.70
57*	The students disturb each other during lessons	2.87	.84
58*	The students seem to be stressed in school	3.21	.75
59	The students seem to be satisfied after the evaluation conference	3.96	.48
60*	It is messy in the school environment	2.91	.84
61	The students seem satisfied with themselves as pupils	3.77	.56
62	I know the clusters of friends in the class	4.03	.67
63*	Bullying exists in the class	3.99	.73
64	The students are healthy	3.99	.44
65	The parents support pupils' homework and other school tasks	3.44	.79
66	The schoolwork ambitions are high in the class	3.73	.91
67	The students in the class take responsibility for free choice of work	3.47	.80

68	Girls and boys can work well together	3.48	.87
69*	The students have to be reminded	2.30	.86
70	The students know how to do their tasks at school	3.91	.65
71	During the evaluation conference, we talk about the students' hobbies	3.77	.87

Comparison of teacher and student responses at item level

The means of the teacher responses to the questions intended to capture quality aspects of the classroom, teacher and teaching are presented in Table 1. The means of the student responses to the corresponding items are given in Table 2, along with intra-class correlations and tests of significance of the difference between teacher and student means. A negative t-value reflects a teacher response which is less positive than that of the students.

The students are less afraid of other pupils than the teacher thinks (Q46), have fewer friends who are known by the teacher (Q62), get more homework help from the family (Q65) and experience less nagging from the teacher than the teachers themselves think (Q69). These items reflect student interaction with peers, parents or teachers, and may be difficult for the teacher to judge.

Compared to students, the teachers judge the students to be more stressed (Q 58), more disturbed (Q 57) and think that more bullying exists (Q 63). The teachers are generally more worried about aspects of health and work environment quality than are the students. The teachers think highly of the exactness and clarity of the information during the evaluation conference (Q 45, 56, 59 and 71). They also think that they give the students more credit than the students express (Q 54). Adults and students agree that "students become tired during the school day" (Q 49).

Differences between classes

The intra-class correlation (ICC) is the proportion of variance related to the school classes in each item (see Table 2). A high ICC value expresses a high variability among the classes. The three highest ICC values (0.50-0.27) were observed for Q 42 (Our class uses computers), Q 67 (In our class, there is an opportunity to make a free choice of work) and Q 44 (It is clean and tidy in school). The second largest group of ICC estimates (0.26-0.23) was seen for four items reflecting aspects of social interaction during work. There was a small ICC (0.064) in Q 72 (Were these questions easy to answer). This item was the only one without a significant difference between classes.

Table2. Class means of responses to items 41-72 (n=78), mean, standard deviation, intra-class correlation (ICC) and comparison teacher – class mean. The symbol* denotes items with reversed coding.

Q	Item	Mean	SD	ICC	Paired t-test Teacher-Class mean		
					t	df	p
41	We work in pairs or groups	3.14	.42	.257	5.70	77	.000
42	Our class uses computers	2.67	.77	.498	- 1.86	77	ns
43*	I change workplaces in the classroom	3.32	.42	.199	- 4.60	77	.000
44	It is clean and tidy in school	3.00	.58	.268	2.99	77	.004
45	During the evaluation conference, I become aware of my results	4.66	.19	.081	4.38	75	.000
46*	There are pupils in school who I am afraid of	4.41	.32	.114	-12.31	77	.000
47	We find enjoyable activities to do together	3.03	.53	.243	1.85	76	ns
48	My teacher seems to like me	3.71	.35	.127	6.23	77	.000
49*	I get tired during the school day	2.70	.29	.092	0.16	77	ns
50	I work on my own in the classroom	3.53	.25	.105	2.61	77	.011
51	I get homework or tasks to do at home	4.15	.43	.240	0.99	77	ns
52	We have good harmony in our class	3.69	.38	.181	0.84	77	ns
53	We use text books in different subjects	4.20	.35	.151	- 1.89	77	ns
54	I get credit at school	3.42	.32	.108	9.52	77	.000
55*	I would like to move to another class	4.15	.44	.152	2.55	77	.013
56	During the evaluation conference, I get to know my behaviour as a peer	3.61	.47	.129	9.60	75	.000
57*	I get disturbed by my classmates during lessons	3.26	.39	.150	- 4.50	77	.000
58*	I feel stressed at school	3.62	.29	.082	- 5.12	77	.000
59	I feel happy after the evaluation conference	3.54	.35	.090	6.18	73	.000
60*	I think it is messy at school	3.10	.45	.214	- 2.32	77	.023
61	I am satisfied with myself as a student	4.06	.28	.092	- 4.54	77	.000
62	My teacher knows the names of my friends in the class	4.68	.22	.114	- 8.36	76	.000
63*	Bullying exists in our class	4.33	.41	.212	- 4.10	77	.000
64	I feel healthy	4.28	.19	.065	- 5.32	77	.000
65	I get help at home with my homework and other school tasks	4.39	.26	.074	-10.79	76	.000
66	I make demands on myself in school work	3.62	.26	.065	1.00	76	ns

67	In our class, there are opportunities to make a free choice of work	2.60	.53	.277	8.89	73	.000
68	Girls and boys work well together	3.26	.51	.234	2.23	76	.029
69*	I think my teacher nags me	3.87	.34	.121	-15.90	76	.000
70	I know how to do my tasks at school	3.89	.23	.096	0.23	76	ns
71	During the evaluation conference, we talk about my hobbies	2.86	.39	.107	8.35	73	.000
72	Were these questions easy to answer?	4.27	.20	.064			

ICC (eta squared) was also calculated for the new student variables, accounting for the amount of variance explained by differences between classes. For StAE, StSO, StMD, and StWA, ICC was 0.118, 0.258, 0.183 and 0.197, respectively. Thus, the variable Safe and Orderly involves large differences between classes, followed by the variables Warm and Democratic Atmosphere and Management of Deviancy. The least amount of difference between classes is seen in Academic Expectations.

Multiple correlation between class means of student responses in comparison with teacher responses to class-level attitude factors

Ten of the 31 items were shown to be significant contributors in the multiple regression analyses (Table 3), and the student responses on the class level explained a large amount of variance (72-79 %) for all three factors. Three items were significant for two or three factors. The variance in the factor Teacher and Teaching (TT) was explained by five items. These concerned the experience of teacher appreciation (Q48, Q69) together with own tiredness during the school day (Q49). The opportunity to make a free choice of work was also a predictor (Q67). The items emphasize the importance of being recognized and feelings of being tired or afraid of pupils (Q46).

The class-level variance in the factor Work Atmosphere in Classrooms (WAC) was explained by four items: work without being disturbed (Q57), experience of bullying (Q63), and tiresome schooldays and nagging teacher (Q49, Q69). The items describe the working conditions for the class, and these conditions also reflect important school quality aspects with a focus on frictions.

The factor Social Relations in Classrooms (SRC) was predicted by five items, which concerned class harmony (Q52), co-operative work between girls and boys and work in pairs or groups (Q68, 41) together with frightening school mates (Q46) and, again, teacher nagging (Q69). The items reflect student's appreciation of classroom climate where harmony and collaboration exist without nagging or frightening peers.

Table 3. Multiple correlation between the class means of student responses to items 41-71 versus Factors on Between Class level. The symbol* denotes items with reversed coding.

Q	Item	Teacher and Teaching (TT)		Work Atmosphere in Classroom (WAC)		Social Relations in Classrooms (SRC)	
		β	p	β	p	β	p
41	We work in pairs or groups					0.122	0.041
46*	There are pupils in school who I am afraid of	0.158	0.008			0.217	0.001
48	My teacher seems to like me	0.320	0.000				
49*	I get tired during the school day	0.295	0.000	0.257	0.000		
52	We have good harmony in our class					0.459	0.000
57*	I get disturbed by my classmates during lessons			0.346	0.000		
63*	Bullying exists in our class			0.331	0.000		
67	In our class there are opportunities to make a free choice of work	0.140	0.018				
68	Girls and boys work well together					0.264	0.002
69*	I think my teacher nags me	0.385	0.000	0.268	0.001	0.177	0.004
	Multiple correlation	n=78, R= 0.89 R²=0.79, p=0.000		n=78, R=0.85 R²=0.72, p=0.000		n=78, R=0.88 R²=0.78, p=0.000	

Eight of the items were shown to be significant contributors in the multiple regression analyses of the teacher responses to the student attitude factors (Table 4). TT was explained by two items (Q55 and 57). The explained variance was low (21%). Five items contributed significantly to WAC. They emphasized work ambitions (Q66), student stress (Q58) and disturbance (Q57) and familiarity with peer clusters (Q62). It is notable that responsibility for free choice of work (Q67) had a negative contribution to WAC, although with a low significance. In classrooms with high scores for WAC, the teachers do not agree

that the students have this competence. The explained variance was 49 %. Finally, SRC was explained by four items concerning work ambitions (Q66) and individual student work (Q50), disturbing pupils (Q57) and use of computers (Q42). The explained variance was 51 %. Item 57 was shared by all factors and item 66 by WAC and SRC.

Table 4. Multiple correlation between teachers´ responses to items 41-71 versus factors on between class level. The symbol * denotes items with reversed coding.

Q	Item	Teacher and Teaching (TT)		Work Atmosphere in Classrooms (WAC)		Social Relations in Classrooms (SRC)	
		β	P	β	P	β	P
42	The class uses computers at school					0.265	0.003
50	The pupils work on their own in the classroom					0.292	0.001
55	I would like to switch to another class*	0.238	0.040				
57	The pupils disturb each other during lessons*	0.300	0.010	0.265	0.016	0.308	0.002
58	The pupils seem to be stressed in school*			0.279	0.010		
62	I know the clusters of friends in the class			0.209	0.024		
66	The school work ambitions are high in the class			0.410	0.000	0.337	0.001
67	The pupils in the class take responsibility for free choice of work			-0.245	0.043		
		N=78,R=0.46 R²=0.21, P=0.000		N=73, R=0.70 R²=0.49, P=0.000		N=77,R=0.71 R²=0.51, P=0.000	

In conclusion, the students' explanation of the three factors is highly related to their need of being acknowledged by the teacher and be able to work in a classroom climate without any disturbance and harassment. The teachers emphasize individual student work, work ambitions and lack of disturbance. The disparity among the significant items reflects less congruence in teachers'

opinions. Only item (Q57) is common for both perspectives, which emphasize the occurrence of disturbance. Item Q67 represents a differing opinion between class and teacher concerning responsibility for free choice of work. For factors WAC and SRC, the perspectives are quite different in terms of the content of items. The explained variance for all three factors was substantial for students (72-79 %), but much smaller for teachers (21-51%). One reason for this is that the class means computed from the student responses are more reliable than the teacher responses.

Comparison between teacher and class mean student responses in different variable scores

Table 5 presents correlations between the scales derived from the student and teacher variables as described in the Methods section. The highest correlations between teacher and student perspectives are observed between Teachsum and Work Atmosphere (WAC) (0.57) and for Teachsum and Social Relations (SRC) (0.53), respectively. Almost the same amount of correlation is obtained between teacher and pupils responses to the variable "Sensible management of deviancy", (TMD and StMD) (0.52). All three correlations seem to reflect classroom practices concerning norms of behaviour and conflict solving.

The correlation is low between the scales concerning TWA and STWA reflecting warm and democratic atmosphere (0.34), as well as TSO and StSO reflecting safe and orderly environment (0.38). This result indicates a lack of agreement between teachers and students as regards these climate factors. However, the low observed correlations are also due to the fact that these scales have a low reliability. This is in particular the case for the variables computed from the teacher questionnaire, which are based on only a single observation. When correction for attenuation was performed, three of four instruments were found to have good correlation (0.74 – 0.72) while the correlation between teacher and student in the variable warm and democratic atmosphere was still weaker (0.53; see Table 6).

As is seen in Table 5, there are several very high correlations between the measures of quality aspects derived from the Berliner (1985) model on the one hand, and the three attitude measures TT, WAC and SRC on the other and particularly for the measures derived from the student questionnaire. For TT, the highest correlations (0.75) are observed with the StMD and StWA variables, which indicate that the students' attitudes towards the teacher and the teaching to a large extent depend on the teacher's ability to manage deviancy and to create a warm and democratic work atmosphere. It is also interesting to note that the students' attitudes towards the work environment of the classroom as measured by the WAC factor have their highest correlation with the StMD measure (0.81), which again indicates that the teacher's ability to manage deviancy is the most important factor. The attitudes towards the social relations

in the classroom as measured by the SRC factor are also most highly correlated with the StMD and StWA factors. It thus seems that the differences between classrooms in all three attitude factors to are a large extent due to the ability of the teacher to deal with deviancy and to create a warm and democratic work environment.

Table 5 Correlation between different variables from teacher and student perspectives

	Tsum	TT	WAC	SRC	TAE	TSO	TMD	TWA	St AE	St SO	St MD	St WA
Teachsum	1.00											
TT	.43	1.00										
WAC	.57	.69	1.00									
SRC	.53	.68	.78	1.00								
TAE	.75	.26	.40	.40	1.00							
TSO	.86	.26	.38	.37	.49	1.00						
TMD	.81	.35	.55	.47	.51	.64	1.00					
TWA	.85	.28	.49	.37	.48	.71	.67	1.00				
StAE	.48	.57	.59	.58	.48	.29	.35	.22	1.00			
StSO	.47	.70	.55	.63	.24	.38	.40	.31	.57	1.00		
StMD	.51	.75	.81	.75	.37	.30	.52	.35	.62	.74	1.00	
StWA	.51	.75	.62	.74	.27	.36	.44	.34	.62	.77	.71	1.00

Table 6 Correction for attenuation between teacher and student variables.

	TAE	TSO	TMD	TWA
StAE	corr. .74 (.48)			
StSO		corr. .74 (.38)		
StMD			corr. .72 (.52)	
StWA				corr. .53 (.34)

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Effects of teacher background variables

As has been described in the Method section, the teachers also responded to 36 questions concerning background information. This information was tested against Teachsum (Q41-71) and the class means of TT, WAC and SRC computed from the student questionnaires. There were few items shown to be significant, and they were not particularly discriminating between the dependent variables (Table 7).

For the TT factor, the number of semesters that the teacher has spent with the class is a strong predictor. Keeping the same teacher promotes students' positive attitudes. The causality can also be reversed so that teachers and students tend to stay together for a longer time when the students have a positive attitude towards the teacher and the teaching.

When there are students who avoid each other, all three attitude variables tend to be low, especially the attitude towards the work atmosphere. For teachers who think that there are too many staff meetings, the student attitudes towards the teacher and the teaching is more positive than in the case of teachers who think that there are too few staff meetings. One possible interpretation of this finding is that the teachers who are not in favour of staff meetings tend to be more oriented towards their students, and regard content during meetings as less important. In classrooms where plenary teaching is used, the attitude towards the work environment is often less positive than in classrooms in which plenary teaching is used less frequently.

Table 7. Multiple regression on background variables

Background variable	Teachsum Q 41-71		TT		WAC		SRC	
	β	p	β	p	β	p	β	p
No. of semesters with the same teacher	.326	.001	.330	.003				
No. of semesters in the present class	.237	.020						
Are there groups of pupils in the class avoiding each other (yes=1, no=0)	-.275	.004	-.227	.035	-.406	.001	-.266	.024
How often is plenary teaching practised (5-1, 5=every day)	-.222	.021			-.300	.012		
Do you negotiate with pupils to solve conflicts (1-5, 1=always)	.315	.002						

Staff meetings (1-3) (1=too few, 3= too many)			.266	.017			
Number of boys having failed national test in English language					-.242	.040	
	R=0.71,n=67 R²=0.51, p=.000		R=0.55, n=68 R²=0.30, p=.000		R=.55, n=58 R²=0.30, p=.000		r=0.27, n=72 r²=0.07 p=.024

In order to take a closer look at possible differences among teachers, each of the quality variables TAE, TSO, TMD and TWA were used. Cut scores were used to divide teachers into a High group for each variable (Z-scores $\geq +1.0$) and a Low group (Z-scores ≤ -1.0). Of the 36 background information items, 15 were significant between teachers in one or more of the High and Low groups defined for the four variables. Six of the information items were identical to the items in Table 7. However, 9 more information items were different between the groups of teachers. They belonged to three categories: a) student absence; b) number of care conferences, action programs and personal assistants; and c) teaching methods. In the High group, student absence was significantly lower, while care conferences, action programs and personal assistants were more frequent. The High group of teachers also used more collaborative work, less plenary teaching and less conflict negotiations with students. This indicated differing teaching styles in three domains: student presence, student health care and methods. A notable fact was a higher number of girls in the classes in the High group.

Discussion

The main aim of the current investigation was to account for the classroom variability in three different attitude dimensions using information from both the teacher and the students concerning different aspects of the classroom organization, teaching and teacher characteristics. Another aim was to investigate differences and similarities between the responses of the students and their teachers to comparable questions. This investigation thus demonstrates aspects of classroom climate, which students and teachers judge to be important and investigates whether their responses are in agreement or not (e.g. DaCosta, 1995; Hammersley, 1994; Veenman *et al.*, 2000; Woods, 1990).

The comparisons of the means of the responses of the teachers and the students showed several significant discrepancies at the item level. According to the current Swedish curriculum (Lpo94), the teachers have to be aware of the quality in student relations. According to this investigation, the teachers are observant when it comes to students´ negative behaviour. Time spent on tasks may be reduced if the teacher needs to neutralize disturbances while the students, instead, feel that the teacher is nagging. Teachers' tools for counteracting these symptoms could be much more effective if they became aware of students' strong desire for structure and order.

The results from the item level analysis also indicate that the attitude towards the teacher is related to a large extent to whether students feel they are seen and appreciated by the teacher. According to Johnson *et al.* (2001) teachers must have a capacity to be fond of students and give them opportunities to make individual choices. Another indication that an orientation towards the student is an important determinant of the student attitude toward the teacher is that the attitude is more positive for teachers who think that there are too many staff meetings.

Analyses at the item level of classroom means of the student responses showed that 10 of the items contributed a high degree of explained variance in the three attitude factors "Teacher and Teaching", "Work Atmosphere in Classrooms" and "Social Relations within Classrooms", with a fairly easily interpreted pattern of regression coefficients. As regards the teacher responses, 8 items contributed to the multiple regressions and the amount of explained variance was lower. The teacher responses are computed based on 78 individuals in comparison with 78 class means. However, the teacher responses are reflections and opinions based on a mean of 15 professional years. The students' responses indicate that they desire class harmony and collaborative work and an appreciative teacher in a class without disturbances, bullying or nagging.

In line with Berliner (1985), items were constructed to measure four different quality characteristics of teacher aims in teaching and the organisation of teaching, and these were included in both a teacher questionnaire and a student questionnaire. Each item was assigned to one of the four quality variables describing a teacher's work in classroom, and this was done for both the teacher and the student responses. However, the limited number of items on each scale caused the reliability of the scales to be rather low, making it necessary to correct correlations for attenuation. After correction for attenuation, the correlations between teacher and student responses were very high for three of the four scales (.72 - .74). However, for the scale Warm and Democratic Atmosphere, the correlation was relatively low (.53) even after correction for attenuation. It thus seems that teachers and students agree to a high degree on the variable level about several aspects of the characteristics of the classroom, but that there is less agreement about the extent to which the atmosphere is

warm and democratic. One possible explanation of this may be that these aspects are difficult to judge because they are to a large extent judgments of relations between the teachers and the student where the roles are different. This discrepancy may become problematic when creating an environment that is orderly, civil and free from hazing (Rubin, 2004). The discrepancies between the two perspectives may be explained by the fact that the adolescents want teachers capable of creating classroom orderliness. This suggests that they are also likely to demonstrate resistance in situations where the teacher must be uncompromising, such as when bullying occurs. The teachers are aware of student behaviour and ambitions indicating the differences in norms between classes.

According to the students' judgements, the factors that were of most importance in accounting for classroom differences in attitudes concerning "Work Atmosphere in Classrooms" and "Social Relations within Classrooms" seemed to be sensible management of deviancy and creation of a safe and orderly environment, without bullying but with collaboration across gender categories. Some of these factors can be influenced by the teacher, and there were obvious differences between the classrooms concerning demands, methods, activities and physical environment. Other factors are characteristics of the school. In the present study it has not been possible, however, to separate classroom factors from school-level factors.

The scales based on the teachers' responses all had lower correlations with the three student attitude dimensions than the scales based on the students' responses. Interestingly enough, this is particularly pronounced in the case of the correlations with the attitudes towards "teacher and teaching" rather than in the case of the other two attitude dimensions. Attitudes towards "teacher and teaching" have weak correlations (around .26) with the scales based on teacher judgements, the only exception being "management of deviancy" for which the correlation is somewhat higher. It thus seems that the teacher judgements are more predictive of the qualities of students' inter-relations than of their own relations with the students. This could be due to teachers' lack of feedback and self-reflection. Building relations with pupils is strongly related to personal knowledge (Broadhead, Cuckle & Hodgson, 1999) and requires plenty of time, which unfamiliar teachers do not have. In this context, it is interesting to note that the number of semesters the teacher had been responsible for the class was the background variable with the strongest relation to the students' attitude towards "teacher and teaching." From a teacher perspective, it may also be easier to evaluate student patterns and behaviours rather than teaching methods or teacher-student relations.

The challenges of the teacher role (Dovemark, 2005) include how to create and support student knowledge development (Holmberg *et al.*, 2005) in an optimal communicative learning environment with good social relations. The structure of practices in classrooms is important (Jamieson & Wikeley, 2000) for

students' future achievements and includes managing student groups or e.g. counteracting unauthorized absence. Some of the questions analyzed in this investigation concern the teacher role. These information items were difficult for the teachers to answer, which possibly indicates institutional resistance**.** The teachers, for example, seemed unfamiliar with students' prior results or whether there were any written action programs in earlier grades. These are two examples of tools and recommendations from the National Agency of Education but perhaps not generally acknowledged by the professionals. Also, the small but significant differences in teaching methods, student absence and individual student support need further investigation before major conclusions can be drawn. They indicate, however, differences in school cultures. An earlier study showed that students are more interested in peer relational factors than judging the teacher or the content of lessons (Holfve-Sabel, 2006) which makes patterns of peer clusters important since these could further explain highly positive or negative attitude scores. The students' positive attitudes nowadays show that they mostly like peers and teachers. However, it is possible that they are not aware of the teacher's information concerning results or behaviour during evaluation conferences. Whether or not the student's level of performance is over- or underestimated, this has implications. The evaluation conference is individual and therefore a comparison with other students is complicated. It is natural that an adolescent listens to teacher messages and reinforces the positive affective statements (Child, 1997). Student self-evaluation is strongly protected and may explain why affective responses differ from reported achievement results.

The main result of the current study is that management of deviancy is what is most important when developing a more positive working climate. What is very interesting is that this recommendation is clearly suggested by the students themselves.

Acknowledgements

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Attitudes towards Swedish comprehensive school
Comparisons over time and between classrooms in grade 6

This Ph.D.thesis is about student attitudes in relation to different time periods and classrooms. Two large materials have been analyzed using two-level confirmatory factor analysis.

Students nowadays have more positive attitudes than students had 35 years ago. However, their attitudes towards school, teacher and peers demonstrate wider variation today. There are great discrepancies between classroom environments among the 78 investigated classrooms in Göteborg. The students in the new investigation appreciated peers but agreed that there are problems with harassment and disturbance within schools.

The capacity of the teacher to handle disturbance and create a safe and orderly environment was crucial for students' perception of the teacher and the work atmosphere. Similarly teacher's talent to create a warm and harmonious classroom climate was highly important.

The teachers' opinions about their classes focused on student stress, disturbance in interactions and cooperation. Teachers paid less attention to their relations with students. The factors of most importance for classroom differences in attitudes concerning work atmosphere and social relations were a sensible management of deviancy, and creation of a safe and orderly environment.

Mary-Anne Holfve-Sabel is a teacher with research interest in educational policies and patterns of classroom interactions. Teacher work and measurements of attitudes are special domains of interest. She is giving courses in statistics at the Department of Education, Göteborg University.

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