

SOCIAL COMPARISON IN THE
CLASSROOM: THE RELATIVE
IMPACT OF ACADEMIC
STANDING AND ABILITY
GROUPING IN THE CLASSROOM

CENTRE FOR NEWFOUNDLAND STUDIES

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SOCIAL COMPARISON IN THE CLASSROOM:
THE RELATIVE IMPACT OF ACADEMIC
STANDING AND ABILITY GROUPING
IN THE CLASSROOM

by

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A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Education.

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August 1979

ABSTRACT

The theory of social comparison processes (Festinger, 1954) assumes that the group(s) available to the individual are appropriate for making comparisons in terms of his/her self-concept. However, in the classroom setting, it has not been clear which group(s) form the basis for comparison, especially where assignment to classes is based on academic standing.

Data were collected on 157 Grade Four students in rural eastern Newfoundland schools. Three classes were homogeneous; three classes were heterogeneous. Information on the academic performance of each student was provided by the Canadian Tests of Basic Skills. A self-concept scale was administered and cluster scores were obtained through the use of factor analysis. A composite achievement score was calculated for each student and dummy variables were used to represent class membership.

Results of regression analysis indicated that within-class achievement level and class membership were significant predictors of self-concept in homogeneous classes. In the heterogeneous classes, there was no significant relationship between self-concept and academic achievement; however, within-class academic standing was not a significant variable.

ACKNOWLEDGEMENT

The author wishes to acknowledge the guidance and assistance of his thesis chairman, Dr. Michael Ragan, as well as those who constituted the thesis committee.

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CHAPTER I

THE PROBLEM

Introduction to the Problem

Festinger (1954) has put forward a theory of social comparison processes which claims that "to the extent that objective, non-social means are not available, people evaluate their opinions and abilities by comparison respectively with the opinions and abilities of others" (p. 118). This means, in effect, that for both opinions and abilities, subjective judgements of one's opinions and subjectively accurate assessments of one's ability depend upon how one compares with other persons. Those "others" with whom such social comparisons are made are referred to in the literature as "reference groups"; the term "significant other" is also used in this context. The two terms have similar meaning, although "reference group" has a group connotation and "significant other" more commonly has an individual connotation.

The relevant reference group may vary from one situation to another. For any given evaluation, it is not always clear who the significant others are, or which is the relevant reference group. Most research on schooling has assumed that students' age-grade peers, or more specifically, their classmates, provide their dominant point of reference. However, this might vary depending on the manner in which students are organized into classes.

In schools where children are assigned to classes based on their academic performance, it is not clear if the importance of academic achievement for self-concept lies in the child's perception of how his level of achievement compares with that of his classmates, or if between class comparisons are more salient. Rogers et al. (1978) presented evidence that the self-concept/academic achievement relationship was most manifest when academic standing within immediate peer-reference groups (i.e., classrooms) was incorporated into the theoretical model. Research on the effects of streaming, e.g., Schafer and Olexa (1971) suggests that a child's "attitudes towards himself, others, and the future...are all shaped by his locus in the system's sub-parts and roles" (p. 15).

Jensen (1973) suggests that self-concept scores are "merely a reflection of the pupil's more or less objective appraisal of his own scholastic standing and aptitudes." What remains puzzling, however, is who provides the basis for this appraisal.

In this study, then, attention is focused on the degree to which variance in measured self-concept can be attributed to within-class academic achievement and class membership, in classes where assignment to classes is based on academic standing. The purpose of this study, in other words, was to identify the relative effects of ability grouping and within-class academic standing on the student's self-concept.

The Rationale

Traditionally, schools have directed their effort towards the cognitive development of students. However, as Rubin (1974) points out, "the scant concern for affect has worked its own havoc, breeding a sizable number of unhappy people" (p. 5). In a review of attitudinal studies, Jackson (1968) found that from a fifth to over a half of the respondents expressed boredom, discontent, or mixed feelings about going to school. Bogcock (1972) says that "the reward system of the classroom seems designed to produce anxiety, antagonism and alienation in the teacher-student relationship" (p. 164).

The idea that children have feelings, and that these feelings are important, is certainly not new. It is surely obvious to anyone who has observed children at school, at home, or at play, that youngsters can experience love, hate, anxiety, confidence, and the entire gamut of personal feelings. What is new is the growing awareness among educators of the importance of these feelings to the learning process.

Bloom et al. (1964), Holt (1964), Cohen (1972), Nash (1965), to name just a few, have contributed to the awareness of the affective domain. Fox (1965) says:

for the large majority of pupils, the evidence is that he who sees himself as well liked by his peers, finds his values and attitudes consistent with that of his peer group and his teacher ... will develop a positive concept of self and will utilize his potential for academic achievement at a higher level than will the pupil who is less positively related to the social environment. (p. 177)

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This is similar to the sentiment expressed by Ambrose and Meil (1958):

environmental conditions may thwart a child's purpose ... giving rise to such negative learnings as ... mistrust of self, uncertainty in his relationships with others, and timid, fearful, or otherwise inadequate approaches to the outer world. (p. 27)

Each child needs to know that school is a friendly place where he is accepted. Acceptance is spelled out in his interpersonal relationships at school; relationships which let him know and feel that he is accepted and wanted. In the school and classroom environment, the child finds a social environment which affords him/her many people with whom to interact and with whom to identify in a variety of direct and indirect interactions. The school, of all the institutions in society, is the one place where the environment can be specifically structured with the needs of the children and the demands of their society in mind. But the task of structuring and using the school environment to maximize the benefits to the students can only be achieved when a fuller understanding of the effects of the characteristics of schools and classrooms, on particular student behaviors is more fully realized.

It has become abundantly clear, from research and from reason, that how a person feels is a more important determinant of "quality of life" than what he knows (Epstein and McPartland, 1975). The "quality of life"

concept remains somewhat vaguely defined, but three basic aspects have been discussed at both the individual and societal levels. -- general feelings of well-being, opportunity to fulfill one's potential, and feeling positive social involvement (Flanagan, 1975; McFarland, 1975). It has been demonstrated that experiences in the classroom and school do influence students' feelings about themselves, about school, and school related objects. Epstein and McPartland (1975, 1976) show that scores on the Quality of Life scale (QSL) are sensitive to changes in school organization; students actually increase their QSL scale on subscale scores over time in innovative settings which have been designed to upgrade the quality of school life. Hallinan (1976) provides evidence of "how classroom social structure affects human social development", (p. 263) and argues that organizational characteristics of the classroom including physical arrangement, grouping practices, and pedagogical techniques, constrain student interactions, which in turn affect the formation and development of friendship. Education can no longer have these very important affective outcomes occur as accidents or unintended effects of the curriculum and school life in general (Khan and Weiss, 1973, p. 789).

Significance of the Study

How a child feels is equally as important as how well he performs academically. It seems reasonable, then, to

assume that a desirable schooling outcome is that children develop good feelings about themselves and others, and the skills to relate effectively with others; neither an individual nor a group can maintain a healthy existence without a large measure of good feeling. Also, of course, the classroom can either foster or inhibit positive self attitudes. Though educators are prone to pay little heed to the affective aspect of schooling, they cannot hope to attain the social learning goals so often touted under "aims of education" without making conscious effort in this regard (Eisner, 1973; Epstein and McPartland, 1976; Glovers and Marston, 1972; Rubin, 1973).

Perhaps the most important point for the educational practitioner to realize is that aspects of most children's self-concepts are not unalterably fixed, but are modified by life experiences, both in and out of the classroom. The influence of the classroom in the narrow sense of the term, or schooling, in the broader sense, may have a positive, negative, or neutral effect on the child's concept of self. Schools may have an even greater potential for influence in this regard than has traditionally been the case because as Glasser (1969) reports, the breakdown of so many families has meant that teachers are now "overwhelmed with children who need affection ..." (p. 19). Whether planned or unplanned, the influence of the classroom may have a great deal to do with the development of self-concept.

The Dependent Variable

The dependent variable in this study is self-concept. Brokenshire (1977) reviewed the major theories of self-concept and concluded that, while in a broad sense there was much commonality in their various perspectives, the dimensions of self-concept emphasized by the different theorists varied considerably. LaBenne and Green (1969) said that a person with a negative self-concept "can generally be described as one who lacks confidence in his abilities" (p. 122). According to Lewis (1936) the self-concept is represented by a life span region, which determines present belief about the self; he used the term "life span" as a psychological concept which included the individual's universe of personal experiences. Definitions of self-concept are imprecise and vary somewhat from one study to the next. By integrating various features that are common to the definition, and by extending the definitions when necessary, Shavelson et al. (1976) gave a working definition of self-concept that was consistent with most current research. They described self-concept in a very broad sense as a person's perception of self, formed through experience with the environment and significant others.

Gordon (1969) attempted to develop four subjective "senses of self", one corresponding to each of the functional problems held in action theory, i.e., the senses of competence,

self-determination, unity and moral worth. However, the operationalization efforts did not provide any solid empirical validation for such an extension of action theory.

Brookover, Shailer and Patterson (1964) made a distinction between global self-concept and academic self-concept. Coppersmith (1967) likewise recognized the possibility that self-concept might vary as a function of situational factors. It is possible, then, that a student who exhibits a low self-concept at school may have a very high self-concept at home, or vice versa.

Combs (1962) introduced a further distinction in the study of self-concept that must be acknowledged. He distinguished between self-concept and self-report. The difference, in Combs' words, is that self-concept is "what an individual believes he is". The self-report, on the other hand, is "what the subject is ready, willing, able or can be tricked to say he is" (p. 52). Clearly, these two concepts may not always be the same.

While the distinction between self-concept and self-report is a valid one, the operational definition this research will employ is what Combs (1962) would prefer to call self-report. In this study the term self-concept will refer to a school-related psychological disposition which is the result of a person's assessment of how well he feels

he is liked by others, how much self-confidence he has, whether he feels inadequate in various situations, and whether he thinks he is doing well on the tasks he attempts.

The Independent Variables

There are a great many influences which impinge upon students' self-concept. Some of these influences are the learner's own characteristics and background factors, such as sex, socio-economic status and ability. Others are school-related influences such as the teacher, the reward structure, grouping and practises. In this study, however, the two independent variables are within-class achievement level and ability group membership.

(i) Achievement Level

As traditionally used, the term "academic performance" refers to some method of expressing a student's scholastic standing. Usually this is a grade for a course, an average for a group of courses in a subject area, or an average for all courses expressed on a 0 to 100 quantitative scale. On the elementary school level, performance is often evaluated on a verbal scale ranging from "excellent" to "poor". Another measure of performance sometimes used instead of grades is the standardized achievement test. One such measure of performance, and the one this research will employ, is the grade equivalent score obtained from the Canadian Test of Basic Skills (CTBS). For example, a grade equivalent score of 4.3 on the CTBS means that the child is

performing at the third month of Grade Three relative to his classmates, depending on which norm is used - local, regional, provincial or national.

Many educators feel that the primary aim of schools is "cognitive skills" - that is, the ability to manipulate words and numbers, assimilate information, make logical inferences, and so forth. While these skills, acquired through the educational process, are crucial in the educational development of students, one must not lose sight of the importance of the affective development of the individual as well.

The "cognitive skills", earlier referred to, are not acquired in isolation (Bloom, 1966). He argues that one-fourth of the variance on relative cognitive achievement can be accounted for by affective entry characteristics. Proponents of Mastery Learning advocate that student achievement is a goal of education possible only through the interaction of:

- (1) the student's inherited capacities to learn
- (2) the learning experiences of students
- (3) the external resources used by students
- (4) the students' desires to achieve, and
- (5) the students' self-concepts of ability to achieve.

(Pope and Grandy, 1979)

They further report that:

"In schools, however, it is likely that each student will be judged many times each day in terms of his adequacy relative to others in his class, group, or school. These judgements are made so frequently because schools have for so long stressed competition as a primary motivational technique." (p. 19)

This seems to suggest, then, that a child's classmates are an influencing factor in his academic performance.

It may be argued that as a student encounters tasks, he gains a sense of adequacy or inadequacy about his learning tasks. As these learning experiences accumulate, and if they are positive, he is likely to develop generally positive feelings about his capabilities. If the results are generally negative, however, and his learning is inadequate, he is likely to develop a negative view about himself, his school and the whole learning process.

(ii) Ability Grouping

While there is no question of the great variations among children, the strategic question for the educators is whether a wide or narrow range of student abilities is most effective in a classroom. Do children learn more when they are grouped according to ability than when they are grouped heterogeneously? Do some ways of organizing an elementary school make a greater difference than others in what children learn, the quality of their learning, how much and how well?

There are no easy answers to these questions. They require knowledge and understanding of the educative process and of many interrelated factors in educating children to meet the increasingly difficult demands of a rapidly changing interdependent world. A major purpose of education is to help every child reach his fullest potential for a creative and useful life, lived in dignity and freedom (Franseth, 1962).

In response to this challenge, then, educators must need to recognize the importance of identifying the goal or purpose the school is attempting to accomplish.

The term "ability grouping" has been used to include grouping according to I.Q.'s, mental maturity ratings, levels of reading achievement, teacher judgements or a combination of these. British studies tend to employ the term "streaming" when referring to grouping practises while some American studies opt to use the term "tracking". For purposes of this research, it is understood that the terms are interchangeable.

It appears that human variability and a wide range of individual differences constitute a normal phenomena in schools. In a classroom the less able will have the example of the more able to encourage them; the brighter students, by helping their classmates, will gain a deeper understanding of the subject. However, those favouring grouping practises

in the schools accept the notion that homogeneity inflates academic gains.

Although grouping practises were more common in the first half of the 19th century, recent studies have shown that, except for a limited and short-time basis, it is unlikely that dividing children into ability groups can actually be accomplished with any assurance of accuracy, (Franseth, 1962).

Scope and Limitations

Some aims of education are secondary -- secondary in the sense that responsibility for their achievement is shared by the school with other institutions, or in the sense that their achievement is not the result of direct instruction. Some educators see these secondary objectives as including personality development, moral and spiritual development, socialization, development of originality and creativity, development of a satisfying personal life. The broad scope of secondary objectives makes selection and classification difficult; it may relate to almost every facet or phase of human growth and development.

Even within a specialized area such as affective outcomes of schooling, the diversity of subject matter is so great as to require concentration on only certain aspects of the broad phenomenon of interest. This study will attempt to explain, then, variability across classrooms in the

students' acquisition of ideas and attitudes about themselves, or in the student's self-concept.

It need not be stressed that the individual is influenced by all the social structures in which he participates; in his school, his peer group, his family, his community, and that the kinds of attitudes or ideas, and the rate at which he acquires them may be determined by the social position of his family, the racial and religious composition of his community, and an almost endless list of factors. Current concepts and research in the behavioural sciences affirm that the social setting which an individual confronts on a day-to-day basis serve as an important determinant of the pattern of his social and psychological growth and development (Brim, 1968; Orth, 1963). However, for the purposes of this paper, certain limits must be placed on the number of influences to be considered. As has already been indicated, the major emphasis of this research is to identify the relative effects of ability grouping and within-class academic standing on the student's self-concept.

Furthermore is the design this research employed imposed certain limitations. This is a cross sectional study rather than a longitudinal one; this type of design, which relies on static statistical relationships is vulnerable to the criticism that any finding of school effects, for example, may be a function of differences

in a host of factors not included in the analysis. Nevertheless, the methodology employed in this research meets all the criteria (Astin, 1970) required for obtaining definitive results regarding school impacts except one, longitudinal data. This research has rigorous data on student achievement and student affective outcomes & data which are analyzed by powerful statistical techniques.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter will review the relevant literature along three dimensions: (1) the relationship between self-concept and academic achievement; (2) the relationship between grouping and self-concept; and (3) ability grouping and academic achievement.

1. (1) Self-Concept and Academic Achievement

Numerous studies have examined the relationship between students' academic achievement and self-concept (Purkey, 1970). Although many studies have reported a significant relationship between the two variables (Black, 1974; Bledsoe, 1967; Coppersmith, 1959; Pink, 1962; Lamy, 1965; Williams and Cole, 1968), others have failed to find any substantial relationship between academic achievement and self-concept (Lewis, 1972; Wattenbug and Clifford, 1964; Williams, 1973). However, studies that reported significant academic self-concept relationships typically reported low correlations between the two variables (Rogers et al., 1978).

A study conducted in the early sixties concluded that the self-concept of one's ability is associated with academic achievement at each grade level (Brookover, Patterson and Thomas, 1964). There appears to be a relationship between boys' self-concept and their academic achievement but less of a positive relationship for girls (Campbell, 1965;

Bledsoe, 1967).

Caplin (1969) found that black students who professed a more positive self-concept tended to have higher academic achievements. Purkey (1970) reported that successful students are ones who are likely to see themselves as positive individuals. He reported a study by Gowan that indicated high achievers are characterized by self-confidence, self-acceptance and a positive self-concept. Farls (1967) studied intermediate level students and found that high achieving students reported higher self-concepts than low achieving boys and girls.

Extensive research conducted by Brookover et al. (1962, 1965, 1967) showed a significant relationship between self-concept of ability and academic performance, even when measured I.Q. was controlled. Singh (1972), using Brookover's methodology, also reported significant relationships between self-concept and academic achievement.

Caplin (1969), in a study comparing the self-concepts of segregated and desegregated children, concluded that children attending segregated schools (white and negro) had less positive self-concepts than those in desegregated schools. His study also indicated that children with more positive self-concepts showed higher academic achievement. Smith (1972), working with black college students, also showed a significant positive correlation between academic achievement and the self-concept.

Lunn (1972) and Wall et al. (1963), have reported studies in which pupil attitudes were significantly related to school success. The finding that the brighter child has more positive attitudes is not surprising - this type of child is likely to obtain greater satisfaction, has less to be anxious about, and should possess a better self-image than his less able peers. It has been shown from sociometric studies that the brighter child is more popular, partly because of his greater self-confidence, and the speculation is that his greater popularity contributes to the formation of more positive attitudes (Bowd, 1974).

The work of Brookover and his colleagues at Michigan State University (Brookover, Erickson and Joiner, 1967; Brookover, LePere, Hamacheck, Thomas and Erickson, 1965; Brookover, Thomas and Patterson, 1964) includes both longitudinal and experimental studies on the relationship between self-concept and academic achievement among teenagers. They found that change or stability in the self-concept was positively associated with change or stability in grade point average.

While many of the studies relating to self-concept and achievement are correlational studies and do not suggest cause and effect, they imply that successful students see themselves as positive individuals and that the failing students do have poor self-esteem. Although the research does not provide evidence as to which comes first the

positive self-concept or scholastic success, it does suggest a strong relationship between the two (Millard, 1979).

The question of the causal relationship between academic achievement and the self-concept has long been a problem in educational research. In education, the recent upsurge of child-centered philosophy surrounding the open classroom movement includes the belief that a child's feelings about himself are a key factor in his ability to achieve in school. Scheirer and Kraut (1979) concluded that "several studies have found positive correlations between self-concept and educational achievement; the causal direction, if any, of this relationship cannot be ascertained from such cross-sectional studies" (p. 132).

A pervasive problem in self-concept/academic achievement investigations has been a relative lack of concern with theoretical models, often resulting in technically adequate but conceptually weak investigations, potentially masking rather than clarifying any existing relationship (Rogers et al., 1978). They concluded that "researchers examining the relationship have seemed to assume that this relationship is invariant and is manifest independently of other environmental or psychological factors" (p. 50). A further conclusion was that little attention is paid to other factors such as the academic or social environment from which samples are drawn. In any research effort, however, certain simplifying assumptions are required: This research,

then, assumes that success or failure in school significantly influences the way in which students view themselves, that students who experience repeated success in school are likely to develop positive feelings about themselves, while those who encounter failure tend to develop negative view of themselves.

(2) Grouping and Self-Concept

Yamamoto (1972) reported that people perceive and identify themselves as they believe others perceive and identify them. It is important, therefore, that a child be seen in a positive light. Butler (1970) reported that a child's classmates have far greater consequence on the child's intellectual, emotional, and social development than was once believed. Such studies point out that a positive environment enhances the development of a positive self-image.

There is evidence that those placed in average and below average ability groups may be stigmatized as inferior or incapable of learning. The data reported by such studies as McPartland (1969) and Mayerke (1970) clearly indicate that the practise of homogeneous ability grouping represents an educational policy which reinforces and perpetuates the separation of children along ethnic and socioeconomic lines.

The theory of a positive self-image (Festinger, 1954) which was further developed by Hyman and Singer (1967) concluded that the self-concept "is constructed on an edifice

of social comparisons". Rogers et al. (1978) reports "the process by which the individual develops and maintains self-regard is critically dependent on the social group in which the individual resides" (p. 50). They further concluded that self-concept/academic achievement relationship can best be understood within the context of the person's immediate social environment (i.e., classroom).

A large-scale study by Borg (1966) investigated a number of academic and personality variables as they relate to ability and random grouping for children ranked as superior, average and low. He found that random grouping favoured concepts of self, acceptance, of self feelings of belonging, and reduction in antisocial tendencies for all ranks. While ability grouping slightly favoured achievement scores for the students ranked as superior in elementary school and those ranked as superior and average in the junior high school, there was a negative relationship for all the students ranked as slow. Borg remarked that the achievement differences over the four years were small.

Most studies relating to ability grouping use gains in academic ability as the major criterion. It is entirely possible, however, that while a student is gaining in academic performance, he is losing something in his development of self. In the light of such studies, then, ability grouping is a questionable practise for academic concerns, and appears to be frankly unfavourable for the child's

developing personality (Labenne and Greene, 1969).

In terms of the effect of group membership on the self-concept, it is not clear which group forms the basis for social comparison. Rogers et al. (1978) have found support for within class peers. However, a study by Fagan (1978) suggested that between class comparisons may be more important.

This study, then, will attempt to provide some evidence as to the nature of this social comparison that takes place when children who belong to "streamed" classes form estimates of their self worth.

(3) Ability Grouping and Academic Achievement

One of the greatest concerns for educators is whether a wide or narrow range of student abilities is most effective in the classroom. There is no conclusive evidence in either direction; some studies favour homogeneous, others heterogeneous grouping (Kirp, 1974; Hadermann, 1976).

Goldberg, et al. (1966) reported that ability grouping alone does not have a strong impact upon the performance of most students. Atkinson (1965), using students of about the same age as those in the Goldberg study and incorporating the personality variables of need for achievement and test anxiety, found that performance in homogeneous classes varied with different levels of these personality variables.

Educators who favour a broad range of ability in the classroom argue that the less capable are helped by the more capable. On the other hand, it may be argued that, in classes with a broad range of abilities, the less able students are put in the undesirable position of making comparisons with their more able peers; that bright students will be held back by the slower ones, and that it will be difficult for the teacher to adapt his teaching style to the needs of his students.

Further arguments can be put forth for either side of this controversy. One would have hoped that previous research in ability grouping would have clarified and settled some of these issues. However, a comprehensive review of these studies done by Finley and Bryan (1971) suggested that this simply is not the case. Esposito, (1973) reviewing the results of ability grouping research, noted that among the studies showing significant effects, the slight preponderance of evidence favouring the learning of high ability students in homogeneous groups was coupled with evidence of unfavourable effects on the learning of average or below average ability groups, particularly the latter.

Whether we group children on the basis of age, achievement, or mental tests, wide differences still persist. Olson's (1959) survey of grouping practises indicated that children learn in accordance with their unique and personal abilities and the experiences provided for them, irrespective

of how they are grouped.

Franuseth (1962) in researching the effects of ability grouping stated that "children supposedly grouped according to ability seem no more likely to make greater achievement gains than their counterparts in heterogeneously grouped classes" (p. 20).

Another study by Ferri (1971) on the effects of streaming found little difference in the academic progress made between children in a non-streamed setting and those who were grouped according to their ability. They were, however, influenced in their feelings about themselves and about school.

There are numerous studies which have shown that streaming is generally detrimental in both the higher and lower ability classes (Yates, 1966; Finely and Bryan, 1970; Kirp, 1974; Hadermann, 1976). It seems reasonable to conclude, therefore, that simply streaming students would not seem to be the answer to improving students' learning.

Thompson (1974) studying the effects of the abandonment of streaming in some British schools said that:

"...this affected children of all abilities inevitably the greatest effect was apparent in boys of below average ability, but there was a marked effect at all levels" (p. 27).

Some of the effects referred to were: (1) a tendency for pupils to remain longer in school; (2) improved academic performance; (3) reduction of behavioral problems; and (4) increased satisfaction of pupils with school.

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A weakness of much ability group research according to Boocock (1972) and a possible reason for the overall inconsistency of results, is that few studies are based upon a general model of classroom dynamics.

Despite the lack of conclusive evidence of the impact of ability grouping or streaming on students, 1967 National Educational Association (U.S.) survey found that tracking was fairly common at the elementary level, with 27 percent of all districts reporting that they grouped all elementary school pupils (Jencks, 1972).

CHAPTER III

METHODOLOGY

The purpose of this chapter is to present the design of the study and to describe the procedure used in conducting the research. The chapter is divided into the following four sections:

- I. General Design of the Study
- II. Sampling
- III. Operationalization of the Variables
- IV. Data Analysis

I. General Design of the Study

This study was a cross-sectional analysis of the self-concepts of Grade Four students in homogeneous and heterogeneous classes. The variables studied were:

(1) self-concept, (2) academic achievement and (3) homogeneous grouping.

There was no attempt to manipulate any of the research variables in this study; it could perhaps be best described, then, as an ex post facto design (Kerlinger, 1973). The measure of academic achievement (CTBS) was administered in May 1979, and the self-concept instrument was administered in early June, 1979. The classroom groups referred to in this research are the regular home-room classrooms to which the students were assigned at the beginning of the school year.

II. Sampling

The sample consisted of 157 Grade four students, attending two elementary schools in a rural school board district in eastern Newfoundland. Each school had three classes of Grade four students. (For identification purposes, the schools will be designated School 1 and School 2 for the remainder of this study.) Information received from the schools indicated that School 1 practised homogeneous ability grouping and School 2 practised heterogeneous ability grouping.

III. Operationalization of the Variables

Self-Concept

A complication in self-concept research is the fact that there have been almost as many measuring devices as there have been self-concept studies. Investigators have employed numerous approaches in their attempts to measure the self-concept (Fitts et al., 1971). Wylie (1961) cites almost 200 instruments that have been employed through 1959, and many others have been devised since then. For purposes of this research, the McDaniels - Piers' Young Children's Self-Concept Scale (McDaniels et al., 1978) was chosen because of its suitability for the grade level being studied.

The instrument was developed to measure the self-concepts of children from grades 1 to 5. It is a downward extension of the Piers - Harris Children's Self-Concept Scale (Piers, 1969). The revised scale consists of 40 items chosen

from the parent, instrument (80 items) because of their relevance for younger children (McDaniels et al., 1978). Wording was simplified where necessary. Items were chosen in clusters to represent three components of self-concept: feelings, behavior, and perceptions related to school adjustment.

The McDaniels - Piers Young Children's Self-Concept Scale consists of 40 items of the declarative nature (e.g., "my friends like the things I think up") to each of which the respondent circles yes or no. Approximately one-half of the statements are positively worded, and the remainder are negatively worded. In this study, participants were tested in their classrooms and the items were administered orally, a procedure that has been suggested for administration to children functioning at or below the fifth-grade level (McDaniels et al., 1978). The forty items are listed in Appendix A.*

In the construction of measures of the self-concept, the distribution of the students' responses to each of the 40 items in this study were examined. Six of the items, MP12, MP15, MP22, MP33, MP34, and MP40 (see Appendix A) were judged to be poor

* It is interesting to note that the McDaniels - Piers Young Children's Self-Concept Scale is presently being employed by the "Teaching Strategies Project" being undertaken by the Faculty of Education, Memorial University of Newfoundland.

discriminators since more than 85 percent of the students responded in some way to these items; for this reason, then, these items were dropped from the analysis.

The next step in developing the affective measure was to compute correlations among the variables and then to factor analyze the 34 x 34 matrix to reduce it to a manageable number of substantively meaningful dimensions. The factor model employed in this is the principal-factor model as originally developed by Pearson (1901) and extended by Hotelling (1933). It is similar to the method of principal components except that in the principal-factor method communalities replace the ones in the principal diagonal of the correlation matrix. Communality is defined as the proportion of the variance of a variable that is shared in common with other variables in the set. Initial estimates of the communalities are given by the squared multiple correlation between a given variable and the rest of the variables in the matrix (Nie et al., 1970).

The objective of principal-factor analysis, according to Lawley and Maxwell (1963) is "to account for, or 'explain' a matrix of covariance by a minimum, or at least a small number of hypothetical variates or 'factors' (p. 2). The computer program used to carry out the analysis was the Statistical Package for the Social Sciences (SPSS) developed by Nie et al. (1975).

Three factors were extracted, then, using the SPSS Factor Analysis procedure, and any variable which did not

load substantially on any factor was dropped from the analysis.* The correlation matrix, then containing 28 items, was factor analysed using the same procedure; this correlation matrix is shown in Table 1.

Table 2 is the unrotated factor matrix. The columns define the factors, the rows refer to variables. In the intersection of the row and column is given the loading for the row variable on the column factor. The three independent sets of relationships in the data as shown in Table 2 may be thought of as evidencing three different kinds of influence on the data, as presenting three categories by which the data may be classified. The first unrotated factor delineates the largest pattern of the relationships in the data; the second delineates the next largest pattern that is independent of the first, and so on. Thus, the amount of variation in the data described decreases successively with each factor; the first factor contains the greatest amount of variation, the last factor the least.

The column in Table 2 headed "Communality" indicates the total variance of each variable accounted for by the combination of all the common factors. This value indicates the amount of the variance of a variable that is accounted for by the factors.

* A loading of .4 or more on the Factor Pattern Matrix was arbitrarily taken to be a significant involvement of an item in a factor.

TABLE 1
Correlation Coefficients for Self Concept

VARIABLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38				
1	1.000																																									
2	.244	1.000																																								
3	-.084	-.115	1.000																																							
4	.084	-.115	1.000																																							
5	.084	-.115	1.000																																							
6	.084	-.115	1.000																																							
7	.023	-.035	-.031	1.000																																						
8	-.138	-.166	.121	.152	.221	1.000																																				
9	-.082	-.161	.114	.283	.152	.273	1.000																																			
10	-.082	-.161	.114	.283	.152	.273	1.000																																			
11	.049	-.103	-.081	.182	.176	.383	.351	.062	.079	1.000																																
12	.049	-.103	-.081	.182	.176	.383	.351	.062	.079	1.000																																
13	.049	-.103	-.081	.182	.176	.383	.351	.062	.079	1.000																																
14	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
15	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
16	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
17	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
18	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
19	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
20	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
21	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
22	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
23	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
24	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
25	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
26	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
27	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
28	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
29	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
30	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
31	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
32	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
33	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
34	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
35	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
36	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
37	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
38	-.038	-.055	-.021	.169	.160	.227	.246	.056	.056	.230	1.000																															
Mean	1.70	1.62	1.51	1.35	1.23	1.20	1.24	1.43	1.17	1.52	1.25	1.31	1.71	1.60	1.45	1.39	1.30	1.54	1.32	1.76	1.32	1.74	1.70	1.29	1.16	1.60	1.12	1.15	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46		
S.D.	.46	.49	.50	.48	.40	.40	.43	.38	.38	.46	.45	.44	.46	.45	.46	.45	.44	.46	.45	.46	.45	.46	.45	.44	.46	.45	.46	.45	.44	.46	.45	.44	.46	.45	.44	.46	.45	.44	.46			

These variable numbers refer to items from the Minnesota-Plus-Battle Self Concept Scale.

Table 2
Factor Matrix for Self-Concept

Variables	Factor 1	Factor 2	Factor 3	Communality
1	-.302	.397	.071	.254
3	-.250	.322	-.108	.178
4	-.192	.320	-.050	.142
6	.440	.003	.219	.241
7	.278	.175	.140	.127
8	.452	-.003	.058	.208
10	.536	-.013	.022	.289
11	-.253	.341	.319	.282
12	.137	-.171	-.194	.086
13	.443	.158	.158	.246
14	.451	.400	-.184	.397
16	.369	.147	.171	.188
17	-.366	.455	.453	.547
18	-.262	.334	-.025	.181
19	-.378	.395	-.180	.331
20	.540	.450	-.193	.532
21	.534	.495	-.266	.601
23	.466	.159	.309	.338
24	.579	.441	-.336	.642
25	-.232	.384	.346	.320
26	.383	.016	-.049	.149
29	-.349	.279	-.186	.234
30	-.388	.131	-.214	.214
31	.491	.084	.187	.283
32	-.352	.262	.022	.193
35	-.503	.065	-.075	.263
36	.661	.063	.116	.454
38	-.409	.330	.016	.277
Eigenvalues	4.744	2.324	1.130	
% of Variance	57.9	28.4	13.8	

The three factors reported in Table 2 were rotated obliquely in order to achieve a simpler and theoretically more meaningful factor pattern. With the oblique solution, as opposed to the orthogonal one, axes are allowed to rotate freely to best summarize and clustering of variables; the final factors are allowed to become correlated. If the clusters of relationships are in fact uncorrelated, then oblique rotation will result in orthogonal factors. Therefore, the difference between orthogonal and oblique rotation is not in discriminating uncorrelated from correlated factors but in determining whether this distinction is empirical or imposed on the data by the model (Rummel, 1970, p. 476).

Oblique rotation is justified as well on the grounds that the real world should not be treated as though phenomena coagulate in unrelated clusters; phenomena can be interrelated in clusters, so the clusters themselves can be related.

Oblique rotation allows this reality to be reflected in the loadings of the factors and their correlations (Rummel, 1970, p. 477).

However, as Harman (1968) points out, "certain simplicity of interpretation is sacrificed upon relinquishing the standard of orthogonality" (p. 273). As well, orthogonal factors are mathematically simpler to handle (Nie et al., 1975; Rummel, 1970). The basic reason for employing either rotational method is the same: to achieve simpler and theoretically more meaningful factor patterns. Nie et al. (1975) suggest that there is no compelling reason to

favor one method over another. The choice should be made on the basis of the particular needs of the given research problem.

The choice of rotational method best suited to the several factor analyses performed in this research is not altogether clear. There is some reason to believe, however, that the kinds of affective characteristics the student questionnaire was designed to measure are not independent of each other, that a student who has a positive attitude towards school may well be expected to have a good attitude towards others, and a good self-concept. For this reason, then, oblique rotation was used for the affective items. All other factor analyses performed in this research, where rotation of factors is required, employs oblique rotation.

The factor pattern which resulted from the oblique rotation of the factors in Table 2 is shown in Table 3. This matrix was examined by columns in order to interpret the meaningful content of the factors. The parameters in the table define the patterns of the data and give a measure of the degree of involvement in the pattern, of each variable.

The factor structure matrix (Table 4) gives the correlation of each item with each factor. The loadings are strictly interpretable as correlations. The factor pattern is recommended for use in identifying the variable most highly involved in a factor (Rummel, 1970, p. 468).

In order to construct meaningful composite scores representing the factors, factor score coefficients had to

Table 3
Rotated Factor Pattern of Self-Concept

Variables	Factor 1	Factor 2	Factor 3
1	-.133	.154	.403
3	-.227	.242	.193
4	-.142	.214	.219
6	.504	-.047	.029
7	.344	.090	.125
8	.400	.068	-.111
10	.441	.106	-.176
11	.071	-.052	.557
12	-.051	-.053	-.311
13	.486	.160	.071
14	.289	.524	-.067
16	.435	.071	.102
17	.092	-.097	.776
18	-.177	.188	.272
19	-.369	.314	.222
20	.360	.587	-.076
21	.311	.670	-.106
23	.610	.004	.189
24	.289	.693	-.213
25	.113	.036	.597
26	.273	.140	-.164
29	-.367	.244	.136
30	-.440	.151	.037
31	.534	.045	.035
32	-.257	.114	.262
35	-.443	-.026	.152
36	.616	.122	-.096
38	-.267	.119	.354

These variable numbers refer to items from the McDaniels - Piers Self-Concept Scale.

Table 4
Rotated Factor Structure of Self-Concept

Variables	Factor 1	Factor 2	Factor 3
1	-.238	.210	.471
3	-.256	.250	.306
4	-.183	.236	.300
6	.489	.018	-.134
7	.317	.154	.035
8	.442	.095	-.222
10	.508	.127	-.292
11	-.106	.056	.525
12	.051	-.009	-.286
13	.477	.177	-.059
14	.372	.546	-.062
16	.413	.141	.020
17	-.157	.054	.730
18	.238	.216	.360
19	-.400	.309	.391
20	.454	.617	-.081
21	.424	.688	-.082
23	.553	.111	.002
24	.437	.690	-.177
25	.074	.084	.556
26	.340	.113	-.222
29	-.380	.224	.293
30	-.433	.105	.199
31	.529	.115	-.121
32	-.324	.130	.361
35	-.493	-.050	.284
36	-.660	.179	-.263
38	-.361	.151	.458

These variable numbers refer to items from the McDaniels Piers Self-Concept Scale.

be calculated: they are reported in Table 5. The SPSS factor analysis program calculates the factor-score coefficient matrix F from the formula:

$$F = S^T R^{-1}$$

where S is the rotated factor structure matrix and R is the correlation matrix. A composite scale f s then built for each factor in the final solution. For each data case a vector of factor scores may be computed using

$$f = Fz,$$

where F is the factor score coefficient matrix and z is the vector of standardized values of the variables which have been factor analyzed (Nie et al., 1975). It should be noted that the factor-score variable thus produced by SPSS includes a term for each variable in the factor analysis. However, as Nie et al. (1975) suggest, "It has been customary to build factor scales employing only those variables that have substantial loadings on a given factor" (p. 486). In this analysis, then, a factor-score variable which included terms only for the highly loaded variables was created using the COMPUTE statement of SPSS.

Factor 1 may be termed General Self-Concept. The 15 items which comprise the first factor, in order of magnitude, are presented below.

<u>Item No.</u>	<u>Factor Loading</u>	<u>Content</u>
36	.616	I am smart.
23	.610	My classmates like the things I think up.
31	.534	I am lucky.
6	.503	I am often sad.
13	.486	I am an important member of my class.
35	-.443	I wish I were different.
10	.441	I am good in my school work.
30	-.440	I am the last to be chosen for games.
16	.435	My friends like the things I think up.
8	.400	I am an important member of my family.
19	-.370	I feel left out of things.
29	-.367	It is hard for me to make friends.
20	.360	I have nice hair.
7	.344	I am strong.
21	.311	I have a nice looking face.

Seven of the items (8, 13, 16, 19, 23, 29 and 30) refer specifically to the child's relationship with his family, friends and classmates. Four of the items (35, 6, 21 and 20) refer to the child's confidence in himself, in the class, or how he believes he is assessed by those about him. The remaining items (7, 10, 31 and 36) seem to deal

Table 5
Factor Score Coefficients of Self Concept

Variables	Factor 1	Factor 2	Factor 3
1	.030	.079	.132
3	-.053	.079	.055
4	-.041	.052	.056
6	.110	-.046	.019
7	.060	.005	.023
8	.084	.002	-.015
10	.092	.005	-.032
11	.024	-.014	.155
12	-.010	.001	-.068
13	.105	-.004	.024
14	.038	.146	.003
16	.077	.021	.042
17	.041	-.002	.379
18	-.046	.070	.079
19	-.106	.141	.097
20	.081	.202	.001
21	.058	.285	.003
23	.163	-.011	.073
24	.037	.345	-.066
25	.024	.015	.181
26	.037	.046	-.045
29	-.088	.094	.047
30	-.094	.066	.022
31	.117	.012	.015
32	-.053	.054	.076
35	-.082	.044	.027
36	.183	-.001	-.042
38	-.058	.072	.112

These variable numbers refer to items from the McDaniels - Piers Self-Concept Scale.

with the child's feelings about his ability and achievement, and how he feels others rate his ideas and achievements. This set of items has an internal consistency reliability (Cronback, 1951) of .91.

Factor 2 may be termed The Physical Self. Of the items originally included in the analysis the following six loaded significantly on this factor:

<u>Item No.</u>	<u>Factor Loading</u>	<u>Content</u>
24	.693	I am good looking.
21	.670	I have a nice looking face.
20	.587	I have nice hair.
14	.524	I have pretty eyes.
19	.314	I feel left out of things.

Four of the items (14, 21, 24 and 20) are all indicative of how the child views himself physically. Item 19 does not seem to relate to the others in the factor but it must be considered at least mathematically. This set of items has an internal consistency reliability (Cronback, 1951) of .87.

Factor 3 may be termed The Behaving Self. Of the items originally included in the analysis the following eight loaded significantly on this factor:

<u>Item No.</u>	<u>Factor Loading</u>	<u>Content</u>
17	.776	I often get into trouble.
25	.597	I get into a lot of fights.
11	.557	I do many bad things.
1	.403	I am often sad.
38	.355	When I try to make something, everything seems to go wrong.
18	.272	I am often upset.
32	.262	My parents think I should do better.

The items comprising this factor are all negative statements, so that the presence of this factor as described would indicate a negative self-concept. This should be considered when examining the table of factor correlations, Table 6. This set of items has an internal consistency reliability of (Cronback, 1951) of .88.

The coefficients of interrelationship among the factors are shown in Table 6. Each of the factors has, in the positive manifestation of each factor, a positive correlation with each of the other factors.

Although the three affective measures developed in this section are important in the schooling process and ought to be studied, it is beyond the scope of this analysis to pursue them all in detail. The major focus, as has already been indicated, is on the notion of the general self-concept, so the dependent variable will be the self-

Table 6
Coefficients of Correlations of Self-Concept

	1	2	3
Factor 1	1.000		
Factor 2	.120	1.000	
Factor 3	-.307	.180	1.000

concept measure developed in Factor 1; the other two factors will not be part of any subsequent analysis.

From the factor-score coefficient matrix (Table 5) a composite scale representing Factor 1 was constructed for each case as follows:

$$\begin{aligned} \text{Self-Concept} = & .110z_6 + .060z_7 + .092z_{10} + .105z_{13} \\ & + .077z_{16} + -.106z_{19} + .081z_{20} + \\ & .058z_{21} + .163z_{23} + -.088z_{29} + \\ & -.094z_{30} + .117z_{31} + -.082z_{35} + \\ & .183z_{36} \end{aligned}$$

where z_i represents the standardized values of the variables involved in Factor 1. This set of items has an internal consistency reliability (Cronbach, 1951) of .91.

Achievement

The Canadian Tests of Basic Skills were administered to all Grade four students in the Province of Newfoundland in May, 1978 and grade equivalent scores were computed for all students in each school. These tests are used by the provincial government each year to obtain information on educational standards in basic subject areas. They are also chosen to establish provincial norms as a basis for future comparison by the province, by school districts and by schools. The tests appeared to adequately suit the objectives of education and had been normed in Canada with Newfoundland students included in the norming sample. No other test appeared to provide the advantages of this test series.

The Canadian Tests of Basic Skills (CTBS) are a version of the Iowa Tests of Basic Skills, adapted, normed, and validated for Canadian use. They consist of eleven sub-tests, viz. Reading, Vocabulary, Spelling, Capitalization, Punctuation, Usage, Maps, Graphs, Reference, Math Concepts and Math Problems. The coefficients of interrelationships among the sub-tests are shown in Table 7. These tests have an internal consistency reliability (Cronbach, 1951) of .99.

To obtain a composite achievement score for each student, the average grade equivalent score on the eleven sub-tests of the CTBS was computed.

Because this research considers within class achievement level, the composite achievement then had to be adjusted by subtracting the class mean from each individual score; students were then effectively ranked relative to other students in his/her class, and each class had a mean score of zero.

Grouping

Information on the grouping practise employed in each school was obtained from the principals involved; there are two grouping categories, viz. homogeneous grouping and heterogeneous grouping. According to the information provided by the principal of the school practising homogeneous groupings, students were assigned to classes based on past academic performance and teacher ratings. Homogeneous grouping refers to the practise of assigning students to classes based on their academic performance; in such a school there would typically be a slow class, an average class, and a high achieving class, depending of course, on the school enrolment. Schools

Table 7

Pearson Correlation Coefficients - CTBS

	V	E	S	C	P	U	M	G	RF	MC	MP
V	1.000										
R	.813	1.000									
S	.681	.721	1.000								
C	.645	.659	.661	1.000							
P	.592	.616	.593	.662	1.000						
U	.714	.731	.653	.607	.655	1.000					
M	.735	.731	.633	.577	.541	.596	1.000				
G	.606	.688	.521	.552	.608	.609	.630	1.000			
RF	.603	.608	.612	.468	.560	.516	.559	.483	1.000		
MC	.584	.592	.466	.512	.456	.534	.492	.498	.629	1.000	
MP	.573	.588	.490	.507	.523	.561	.492	.623	.622	.723	1.000
Mean	4.46	4.60	4.75	4.84	5.08	4.33	4.63	5.18	4.42	4.57	4.65
S.D.	1.08	1.15	1.29	1.33	1.22	1.26	1.02	1.30	1.21	1.07	1.01

Note: V = Vocabulary

P = Punctuation

RF = Reference

R = Reading

U = Usage

MC = Math Concepts

S = Spelling

M = Maps

MP = Math Problems

C = Capitalization

G = Graphs

that have only one class per grade cannot practise this form of grouping.

The second category, heterogeneous grouping, refers to the practise of arbitrarily assigning students to classes. The existence of heterogeneous or homogeneous classes in the schools studied was confirmed by an examination of the CTBS results for each class.

IV. Data Analysis

The procedure used to analyse the relative influence of (1) academic standing within a class and (2) class membership (i.e., high or low ability group) upon self-concept was multiple regression. The application of this procedure is not altogether straightforward, however, since one of the variables was measured on a nominal scale. The numbers assigned to the nominal variable "group membership" is not assumed to have an order or unit of measurement; they cannot, therefore, be treated as "scores" as they would be in conventional regression analysis.

To overcome this difficulty, a set of dummy variables was created by treating each category of the class membership variable as a separate variable and assigning an arbitrary score for all depending upon their presence or absence in each of the categories.

The class membership variable, then, may be conceived of as three separate dichotomous variables. All cases in the sample who belonged to one class were scored 1 on the dummy

variable representing membership in that class; all others were scored zero on that variable. The newly created dichotomous variables are called dummy variables because their scores have no meaning other than representing or standing for a particular category of the original variable (Nie et al., 1979). Since the dummy variables have an arbitrary metric of 0 and 1 they may be treated as interval variables and inserted into the regression equation. However, as Nie et al. (1979) point out, "the inclusion of all dummies created from a given nominal variable would render the nominal equation unsolvable because the K th dummy variable is completely determined by the $K-1$ dummies entered into the regression equation" (p. 374). As indicated in Table 8, then, one of the categories of the dummies was excluded for a reference category.

Table 8
Scores for Dummy Variables

Classroom	Names for dummy variables		
	D ₁	D ₂	D ₃
One	1	0	0
Two	0	1	0
Three	0	0	0

In order to provide a contrast of the relationship among the variables described in homogeneously and heterogeneously grouped classes, the regression procedure described above was carried out separately for each type of school.

CHAPTER IV

PRESENTATION OF RESULTS

This chapter includes the presentation of the data collected on the three variables studies, viz., achievement, self-concept and within-class membership. It is broken down in two sections:

I. Descriptive Statistics

II. Inferential Statistics

I. Descriptive Statistics

Figure 1 shows the mean grade equivalent score for each of the six classes involved in the study. For the homogeneous classes, the mean scores range from a mean of 3.9 in the lowest class to a high of 5.5 in the highest group, a difference of 1.6 grade equivalent. In the heterogeneous school, classes are much more similar with respect to achievement, ranging from a mean grade equivalent of 4.3 to a mean grade equivalent of 4.5, a difference of .2 grade equivalent.

Figure 2 contains the distribution of the achievement scores for the homogeneous and heterogeneous classes. The two curves differ substantially in their kurtosis or "peakedness". The curve for School 1 (homogeneous) is relatively flat (such curves are called platykurtic); the curve for School 2 (heterogeneous) is closer to a normal distribution, but is positively skewed, i.e., there is a greater spreading out of scores to the right of the mean.

Figure 3 shows the ranges of within class achievement scores for each of the homogeneous and heterogeneous classes.

Figure 1

Between-Class Achievement

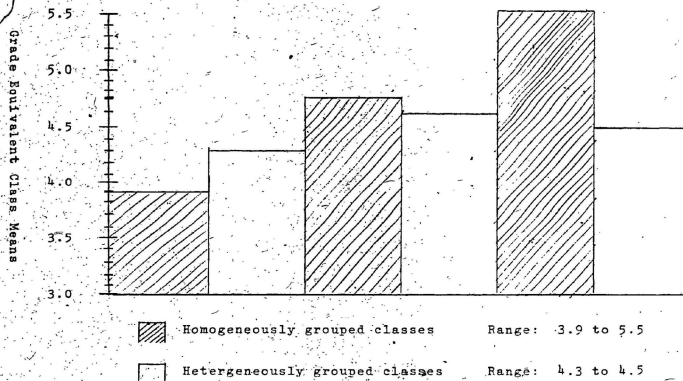
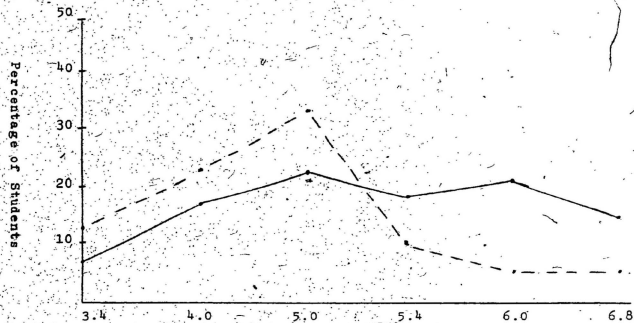


Figure. 2

Within-Class Achievement Scores



Grade Equivalent

School 1 $\bar{x} = 4.85$ S.D. = 1.06

School 2 $\bar{x} = 4.60$ S.D. = 1.30

Figure 3

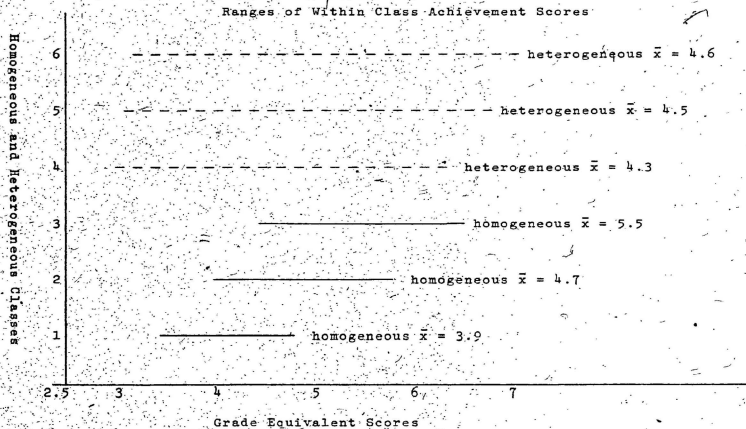


Figure 4 shows the distribution of the self-concept scores in both schools studied. Both distributions have somewhat different shapes; the distribution of scores in the homogeneous classes is fairly flat, while the scores in the heterogeneous classes have close to a normal distribution.

II. Inferential Statistics

Since this research attempted to investigate the development of self-concept within homogeneous classes as opposed to heterogeneous classes the regression procedure, which constituted the major part of the analysis, was carried out separately within each type of school.

Table 9 shows the correlations, means, and standard deviations for the homogeneous classes; Table 10 presents the results of the regression analysis. The B coefficients in Table 10 are partial regression coefficients, and may be considered as a measure of the influence of each independent variable upon self-concept, with adjustments made for other independent variables. For example, the partial regression coefficient for within-class achievement is .032, i.e., for each unit increase in self-concept there would be an associated increase in achievement of .032 units. However, since the independent variables are not all measured in the same metric, it is difficult to determine the relative importance of each independent variable on the basis of the B coefficient. The standardized Beta coefficients reported in Table 10 yield this kind of information and indicate that, of the three variables reported, within-class achievement level would introduce the greatest associated changes

Figure 4

Within-Class Self-Concept Scores

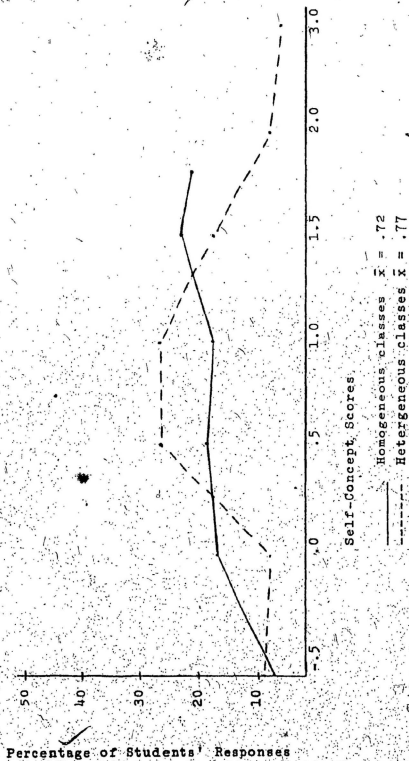


Table 9
Correlations Within Homogeneous Classes

	S	A	D1	D2	\bar{X}	S.D.
S	1.000				.717	.784
A	.358	1.000			-.007	8.664
D1	-.138	.000	1.000		.247	.434
D2	-.123	.002	-.421	1.000	.351	.480

Note: S = Self-concept

D1 = Dummy for Class 1

A = Achievement

D2 = Dummy for Class 2

Table 10

Results of Regression Within Homogeneous Classes

Explanatory Variables	B Coefficient	Beta Coefficient	Standard Error	R ² Change	F	Significance Level
Achievement	.032	.358	.009	.128	11.56	p < .001
D1	-.417	-.231	.209	.044	3.95	p < .01
D2	-.358	-.220	.189	.015	3.57	p < .05
Constant	.945					
Standard Error of Estimate = .721						
R ² = .187						

in self-concept.

The overall accuracy of the predicted equation is reflected by R^2 , the proportion of variation explained. Prediction accuracy in absolute units is reflected by the standard error of estimate of the regression equation. Table 10 shows the standard error of estimate to be .721. The standard error of estimate may be interpreted as the standard deviation of residuals (Nie et al., 1975), and indicates the extent to which the predicted self-concept score may vary from the actual score. To predict a student's self-concept score from the three variables reported in Table 10, the following equation would be employed;

$$\begin{aligned} \text{Self-concept} = & .945 + .358 (\text{Ach.}) - .231 \\ & (D1) - .220 (D2) \pm .721 \end{aligned}$$

Table 11 contains the correlations among the variables being considered for the heterogeneous classes; Table 12 contains the results of the regression analysis. The numbers reported in this table (Table 12) are to be interpreted in the same manner as the numbers in Table 10; for the sake of parsimony, then, they are not described here. As Table 12 indicates, none of the variables considered were significant indicators of self-concept.

Table 11

Correlations Within Heterogeneous Classes

	S	A	D1	D2	\bar{X}	S.D.
S	1.000				.769	.815
A	.078	1.000			.040	12.751
D1	-.045	-.001	1.000		.338	.475
D2	.169	.000	-.495	1.000	.325	.471

Note: S = Self-concept

D1 = Dummy for Class 4

A = Achievement

D2 = Dummy for Class 5

Table 12

Results of Regression Within Heterogeneous Classes

Explanatory Variables	B Coefficient	Beta Coefficient	Standard Error	R^2 Change	F	Significance Level
Achievement	.004	.007	.007	.006	4.78	ns
D1	.087	.051	.222	.002	1.56	ns
D2	.337	.195	.224	.029	2.265	ns
Constant	.629					

Standard Error of Estimate = .815

 $R^2 = .037$

Note: ns = not significant

CHAPTER V

DISCUSSION AND CONCLUSIONS

This chapter provides an overview of the procedures employed in the study, an interpretation and discussion of the results, and a discussion of the implications of the study for educational practice.

I. Overview of Procedures

The purpose of this research was to determine the influence of within-class academic standing and class membership upon the development of the self-concepts of Grade Four students in homogeneous and heterogeneous classes. The dependent variable was self-concept; the independent variables were within-class academic standing and class membership.

One hundred and fifty-seven Grade Four students were administered a self-concept instrument specifically designed to measure the self-concepts of young children. Information on the academic achievement of each student was provided by the Canadian Tests of Basic Skills. The principals of the schools involved in this study provided information in the manner in which students were assigned to classes (i.e. homogeneous or heterogeneous classes).

A measure for self-concept was constructed through the use of factor analysis. To obtain a composite achievement score for each student, the average grade equivalent on the eleven subtests was computed. Since within-class achievement level was considered, the composite achievement

score was then adjusted by subtracting the class mean from each individual score, thereby effectively ranking each student. The class membership variable was determined through the use of "dummy" variables since there were no "scores" as such. All cases in the sample who belonged to one group were scored 1 on the dummy variable; all others were scored 0 on that variable.

Regression analysis was employed to investigate the influence of within-class academic standing and class membership on the self-concept.

II. Interpretation and Discussion of Results

Two schools were considered in this study. School 1 had three classes of homogeneously grouped Grade Four students; School 2 had three classes of heterogeneously grouped Grade Four students. Figure 1 shows the mean grade equivalent scores for each class. In the homogeneous classes there was a fairly broad range of academic achievement when between class achievement means were examined (3.9, 4.7 and 5.5 grade equivalents). On the other hand, School 2 (heterogeneous) had a narrower range of academic achievement means (4.3, 4.6 and 4.5). These small differences may result from random fluctuations in achievement scores of heterogeneously grouped classes.

As Figure 2 indicates, the distribution of achievement scores were fairly similar in shape for both schools. At the lowest end of the continuum was approximately 10

percent) the same proportion of students and they both peaked slightly to the right of their means. However, a greater percentage of students in the homogeneous school had higher grade equivalents beyond 5.4 than those in the heterogeneous school. It must be noted that there is no evidence to show that any differences indicated by Figure 2 were a function of the grouping practises employed.

Cognizant of great variations among children in achievement scores, educators must decide whether a wide or narrow range of student abilities is more desirable in the classroom. As Figure 3 indicates, the three heterogeneous classes had a fairly wide range of student achievement scores. The greatest range was in class 6 which had students ranging from grade equivalent scores of 3.0 to 7.0 (4 grade equivalents). The homogeneous classes had narrower ranges, the greatest being class 3 which had students ranging from 4.3 to 6.5 (2.3 grade equivalents).

For many reasons, the most important of which is perhaps random errors in test scores, there was some overlap in the scores from the 3 homogeneously grouped classes. As Table 3 shows, some students in the lowest achieving class had higher test scores than some students in the medium, or even high achieving class. If, as appears to be the case, the objective of homogeneous ability grouping is to separate children into groups of similar abilities; then this objective is being met only to a certain extent. Some of

the students in the highest achieving class had lower test scores than some students in the lowest achieving class; - this seems inconsistent with the criterion for class assignment used by the school involved, and suggests that true ability grouping may be difficult to realize.

The distribution of self-concept scores (Figure 4) was somewhat different for the homogeneous and heterogeneous schools. In the heterogeneous classes, the distribution of scores was close to a normal distribution (where approximately 70 percent of the scores clustered around the mean and 15 percent were at each extreme end of the continuum). In the homogeneous classes, only a small percentage of the students had extremely low scores. However, the distribution of scores for the homogeneous classes did not taper off for the higher scores as it did with the heterogeneous classes. This means, then, that in the homogeneously grouped school, there was a fairly large number with moderately high self-concept scores, but none with extremely high scores. As was pointed out with respect to the distribution of achievement scores, there is no evidence that the particular form the distribution of self-concept scores has taken has anything to do with the grouping practises employed in the schools. It might be argued, though, that since approximately 15 percent of the students in the heterogeneously grouped classes had higher self-concept scores than the highest score obtained by students in the homogeneously grouped classes (see Figure 3), this possibility is indeed suggested.

The theory this thesis advanced was that the practise of ability grouping had a significant impact on the self-concept of students so grouped. Data were collected from two schools - one that grouped students by ability and one that assigned students randomly to classes. Table 9 shows the correlations among the variables considered in the homogeneous classes and the means and standard deviations of these variables. The correlations indicate the amount of shared variance of any two variables, but to answer the kind of question this research proposed, it is necessary to go beyond this type of bi-variate relationship.

Table 10, which shows the results of the regression of self-concept scores on achievement and the dummy variables set up to represent class membership, contains the main outcome of this research. As this table indicates, within-class achievement level was by far the best indicator of self-concept, accounting for 12.8 percent of the variance in self-concept (R^2 change). Class membership, however, was also a significant indicator of self-concept, accounting for 5.9 percent of the variance. Together, both variables accounted for 18.7 percent of the variance explained.

Table 11 and 12 contain the correlations and regression results for the heterogeneously grouped classes. Contrary to the results obtained for the homogeneously grouped classes (Tables 9 and 10), none of the variables

considered (Tables 11 and 12) proved to be significant indicators of self-concept.

☞ A comparison of the results presented in Tables 10 and 12 suggests that the development of self-concept in homogeneously grouped classes may be quite different from the process that takes place in heterogeneously grouped classes. In a school where academic achievement position is quite prominent, where it forms the basis for assignment to classes (Table 10), the relationship between academic rank and self-concept is quite substantial. In a school where academic rank is not that prominent (Table 12) there is no significant relationship between those two variables.

☞ It seems reasonable to conclude that the more desirable situation is one in which the development or level of one's self-concept is not tied to one's level of academic achievement. While this research has no evidence that the different results shown in Tables 10 and 12 are not the result of other variables not considered here, the results must be taken at least as tentative evidence of different influences on the development of self-concept in the two kinds of schools considered.

In heterogeneously grouped classes (Table 12), where assignment to classes is perhaps based on nothing more than "the luck of the draw", there is no significant relationship between class membership and self-concept. In homogeneously grouped classes, on the other hand (Table 10), where assignment to class is based largely on academic achievement,

there is at least a moderate relationship between those two variables.

While it may be argued that the practise of homogeneous grouping has some advantage for some students as far as academic achievement is concerned, it may well be deleterious to the development of self-concept.

In terms of the hypothesis this research advanced regarding the social comparison process in homogeneously grouped classes, it can be stated that the process does appear to be different from that which takes place in heterogeneously grouped classes. As to who forms the relevant "reference group" or who the "significant others" are as far as the development of self-concept is concerned in homogeneously grouped classes, the answer appears to be that both within and between classroom comparisons are made, with the within-classroom comparison being more salient.

III. Implications for Education

What this study has demonstrated in terms of the students surveyed is that the grouping practise employed in an elementary school may have a very substantial influence on the student's self-concept.

If the findings of this research are correct, then further steps are necessary if the objective of equality of educational opportunity is to be approached. One such strategy might be the consideration of the elimination of ability grouping in the schools.

This present study, and some of the research cited, has established that a person's ideas about himself are a function of experience; the conclusion then, that young people acquire self-concepts in the classroom is inescapable. The possibility of some intervention strategy to boost self-concepts of students in schools appears real enough. Such an attempt at equality of educational opportunity would focus on equality of outputs, rather than equality of inputs, or expenditures, as is usually the case.

Although such has not been the practise in the past, it seems that the increasing emphasis on self-actualization and interpersonal skills, schools will need to specify affective objectives and to evaluate their accomplishments. Developing positive self-concepts can significantly improve the quality of school life and decrease problems in classroom and school management.

The self-concept has important implications for achievement as well. This research placed achievement level causally prior to self-concept, i.e., achievement was considered a determinant of self-concept. However, the relationship between these two variables may perhaps best be described as reciprocal.

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Appendix A

SELF-CONCEPT SCALE

NAME _____

Here are a set of statements. Some of them are true of you and so you will circle the yes. Some are not true of you so you will circle the no. Answer every question even if some are hard to decide, but do not circle both yes and no. Remember, circle the yes if the statement is generally like you, or circle the no if the statement is generally not like you. There are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

1. I am often sad..... yes no
2. Meeting new people scares me..... yes no
3. I am afraid when we have tests in school..... yes no
4. I am often blamed when something goes wrong..... yes no
5. I cause trouble to my family..... yes no
6. I am strong..... yes no
7. I think up good things to do..... yes no
8. I am an important member of my family..... yes no
9. If I have a hard time doing something, I stop doing it..... yes no
10. I am good in my schoolwork..... yes no
11. I do many bad things..... yes no
12. I behave well at home..... yes no
13. I am an important member of my class..... yes no
14. I have pretty eyes..... yes no
15. I am mean to the other children in my family..... yes no
16. My friends like the things I think up..... yes no
17. I often get into trouble..... yes no
18. I am often upset..... yes no
19. I feel left out of things..... yes no
20. I have nice hair..... yes no

21. I have a nice looking face..... yes no
22. I am often mean to other people..... yes no
23. My classmates like the things I think up..... yes no
24. I am good looking..... yes no
25. I get into a lot of fights..... yes no
26. I am a good reader..... yes no
27. I sometimes think about doing things that I know I shouldn't... yes no
28. My classmates make fun of me..... yes no
29. It is hard for me to make friends..... yes no
30. I am among the last to be chosen for games..... yes no
31. I am lucky..... yes no
32. My parents think I should do better than I do..... yes no
33. I am happy..... yes no
34. My family is disappointed in me..... yes no
35. I wish I were different..... ~~yes~~ no
36. I am smart..... yes no
37. I want my own way most of the time..... yes no
38. When I try to make something, everything seems to go wrong... yes no
39. I hate school..... yes no
40. I am always dropping or breaking things..... yes no

