SOME EFFECTS OF INTERACTION ACTIVITIES ON THE DEVELOPMENT OF CLASSROOM CLIMATE AND STUDENTS' SELF-CONCEPT IN UPPER-ELEMENTARY CLASSES

by

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Some Effects of Interaction Activities on the Development of Classroom Climate and Students' Self-Concept in Upper-Elementary Classes.

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ABSTRACT

This exploratory study focused on three questions relating to the development of classroom climate:

1. Can teachers' implementation of a series of interaction activities facilitate the development of positive upper-elementary classroom climates and students' positive self-concepts?
2. Can changes in the climate of upper-elementary classrooms be described by Tuckman's theory of group development?
3. Can humanistically oriented teachers facilitate the development of positive classroom climate and students' positive self-concepts to a greater degree than more custodially oriented teachers?

To investigate these questions, 12 volunteer teachers and 275 students were pretested on appropriate measures and then randomly assigned to experimental or control groups. The six teachers in the experimental group were given a one-day orientation workshop on the rationale and methodology of Project GROW, a series of interaction activities specifically selected for upper-elementary classroom use. Data gathered included the teacher's ratings on a humanistic-custodial scale, teacher-student interaction, and students' perceptions of themselves, their classroom, their teachers, and fellow students at various points in time.

Following a one-year implementation of these activities, statistical comparisons were made between high-implemention, low-implementation, and zero implementation classes. Few significant results were obtained, although trends suggested students from the high-implementation group of classes had more best friends, more cohesive classes and more positive

development of their sense of interpersonal adequacy than did the other two groups. The high-implementation group of classes also experienced their teachers as more empathic and higher in regard, while their classes were experienced as having less friction and difficulty than either the zero-implementation or the low-implementation group.

Tuckman's theory was usefully applied to the data and suggested that all groups of classes experienced stage-like group development, but with the high-implementation group showing visible differences in its development in contrast to the other groups.

Finally, data suggested that the more custodial-oriented the teacher, the more students perceived their class as being competitive, with higher friction levels, but more satisfying, in comparison with other students. Discussion of limitations follows, together with recommendations for further research.

DEDICATION

To my special friend, Gerardine

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Many people gave willingly of their assistance, support, cooperation and encouragement which enabled me to complete this study. To you all I say, "thank you." Your contributions were valued and appreciated. However, I would like to give specific recognition to some whose assistance was greatly appreciated: members of my supervisory committee who gave their expertise, understanding and support during this study; the teachers and students involved in the study, and especially the experimental group of teachers who provided me with invaluable feedback; those who assisted me with their technical expertise and advice: Naomi Altman, Jupian Leong and Jim Sturrock for computing assistance; Jeanette Bancroft, Sharon Lane and Cam MacDonald for their typing and word processing; my colleagues Clay Lafleur and Patricia Holborn for their suggestions and honest feedback; and many friends who made my stay in Canada a true learning experience. Finally, special thanks to Gerardine for her love and support.

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CHAPTER ONE

INTRODUCTION

The Problem

This study is an investigation into one aspect of the social process of education: the development of classroom climate in upper-elementary grades. The central question guiding this investigation is, "Can teachers' implementation of a sequence of interaction activities facilitiate group development in upper-elementary classes?". In order to explore this question, a sequence of interaction activities derived from Stanford's (1977) theory were implemented, and four times during the academic year changes in classroom climate were measured. The changes were interpreted using Tuckman's (1965) theory of group development. Further, changes in students' self-concepts were examined as another possible effect of the implementation program and the teachers' orientations towards teaching were explored as an intervening variable.

More specifically the following three questions were explored:

1. Can teachers' implementation of a series of interaction activities facilitate the development of positive upper-elementary classroom climates and students' positive self-concepts?
2. Can changes in the climate of upper-elementary classrooms be desribed by Tuckman's (1965) theory of group development?
3. Can humanistically oriented teachers facilitate the development of positive classroom climates and positive students' self-concepts to a greater degree than more custodially oriented teachers?

The researcher considered these questions to be worth investigating for the following four reasons:

First, empirical and theoretical writings of many educationalists (e.g. Dewey 1916, Dunkin and Biddle 1974 and Walbert 1976 and 1979) have contributed supporting evidence for the pervasive effects of classroom climate upon students' learning. These studies have established the importance of the influence of classroom climate, but few educationalists have specifically studied its development over the academic year and its effect upon students' self-concepts.

Second, few studies have focused on teacher effectiveness and sociometric research perspectives as they affect the development of classroom climate.

Third, no studies could be found which specifically investigated the development of elementary classroom climates over a period of an academic year.

Fourth, only one study was found which utilized Tuckman's (1965) theory to describe the development of elementary classroom climates. However, this study employed doubtful instrumentation and vague implementation procedures. Thus, there remains a lack of empirical support for relating classroom climate development in upper-elementary classes to Tuckman's (1965) theory of group development.

The Purpose

This study was designed to initiate a preliminary exploration into the development of classroom climate by investigating the three previous questions. Further, it sought to examine whether a particular sequence

of interaction activities can facilitate group development in upper-elementary classes.

To explore these questions and achieve the purposes of this investigation, twelve grade 6 and 7 teachers in a middle-class, West-Coast, Anglophone Canadian suburban school district volunteered to be involved in a year-long study of their classroom climate. In all classes both teacher and students were initially tested, then the classes were randomly assigned to treatment and control groups. The treatment group of teachers was given an orientation to a curriculum of sequentially-organized classroom interaction activities known as the Project for Group Resourcefulness and Optimal Well-being in the Classroom, (Project G.R.O.W.), by Barling (1980b). The experimental group of six teachers implemented Project GROW activities during the remainder of the academic year. On three more occasions, each two-three months apart, the experimenter revisited each classroom in the study to collect further data.

The experimental design utilized to test effects of the Project GROW intervention and the changes in the classroom climate was a quasi-experimental pretest-posttest control-group design, using measures repeated on four occasions.

Initially-tested variables were the teachers': attitudes toward pupil control, which yielded the teacher's position upon a humanistic-custodial continuum; and teacher-student interaction as measured by an observation instrument used in a teacher-directed classroom discussion session. Pupil variables measured during the first testing period were students': academic self-concept; general self-concept; perception of

the classroom climate and classroom life; attitudes toward their teacher; and the students' class friendship patterns.

During the remaining three measurement times all instruments were repeated with the exception of the self-concept questionnaires, which were included only in the fourth data collection. The fourth and final measurement time included a posttest upon the teacher attitude scale, and the observation of a classroom discussion.

All data from the four measurement times will be statistically analysed and reported in Chapter Four. However, in order to first provide a background for this study, a literature review of: teacher effectiveness, sociometry, and group development research will be undertaken in Chapter Two. After the literature review, a conceptual and methodological rationale for the three aspects of the study will be developed in Chapter Three. The experimental design and instruments utilized will also be presented and discussed within this chapter. After the presentation of data from the various statistical analyses in Chapter Four, Chapter Five will contain practical and theoretical interpretations of the results. Chapter Six will contain a summary of the study and some relevant conclusions. Finally, within the appendices there will be found: a list of definitions of frequently used terms (Appendix A); tables of data; and a detailed description of how the Project GROW resource relates to, and was derived from, earlier practical and theoretical considerations.

CHAPTER TWO

REVIEW OF LITERATURE

Introduction

The purpose of this literature review is to provide a background of relevant studies to generate both a methodological and conceptual rationale which will enable specific hypotheses to be explored.

The class as a social system will provide the general context for a review of research findings, methodology, and instrumentation. This study will seek to integrate aspects of four areas of research on the development of classroom climate. These four areas are:

1. teacher effectiveness research;
2. classroom climate research;
3. sociometric research;
4. group development research.

The Class as a Social System

While some earlier authors (Dewey 1916 and Lewin 1936) had stressed the socializing processes of education, it was not until the 1950s that the school and the classroom were actually visualized as social processes. Getzels and Guba's (1957) model of a social system provided a conceptual framework for understanding the influential processes which contribute to students' social behaviour. Their model (refer to Figure 2.1) diagrammatically represents the main elements of a social system

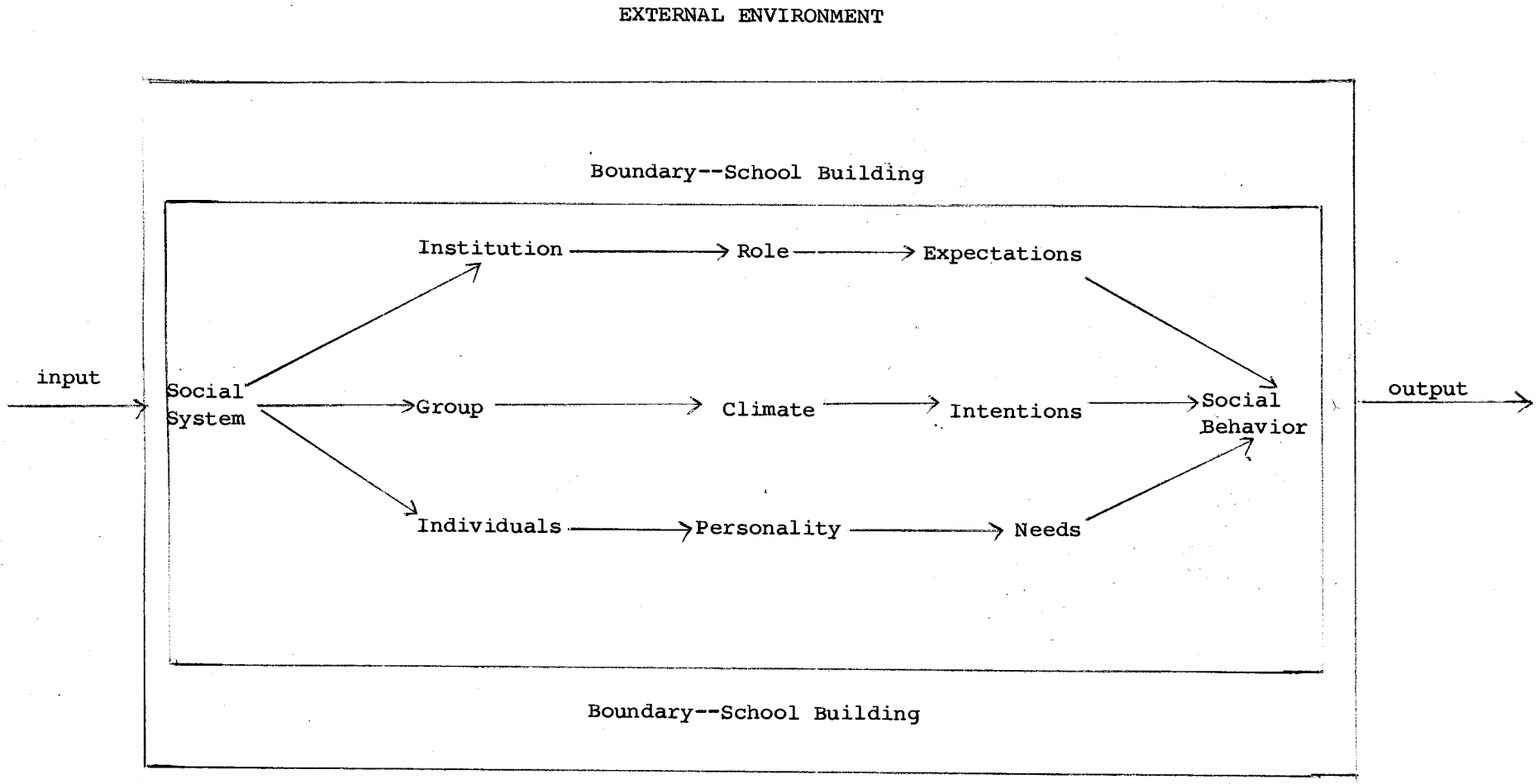


Figure 2.1: Structural Elements of Organizational Systems Model, from Getzels and Guba (1957), *reprinted in* Hoy and Miskel (1978, p. 40).

and isolates three central influences upon social behaviour: institutionally expected roles; group climate; and the individual's personality. From Figure 2.1 it can be seen that a central influence upon the individuals' social behaviour is the role which is institutionally expected of them. The chief purveyor of this influence in the classroom is the teacher, who is also a principal influence upon the development of the classroom climate. Consequently teacher effectiveness research most relevant to the development of the classroom climate must include an examination of the teacher's role.

Teacher Effectiveness Research

Introduction

The following literature review will consider selected relevant studies in order to evolve both a methodological and conceptual rationale for investigating the teacher's role as a possible intervening variable which could influence the classroom climate and students' self-concept development. The teacher's role will be explored by two types of research: studies which utilize self-report surveys; and studies which utilize observation schedules. This approach was necessary as educational findings are often difficult to discuss without reference to both the methodology and instrumentation used.

Questionnaire Studies of Teachers' Roles and Their Effects On Classroom Climate and Students' Self-Concepts

Many questionnaires have tried to measure teachers' different attitudes, personality characteristics and teaching style preferences. Some questionnaires have achieved better reliability and validity than

others and are deemed more useful. One line of research has utilized a valid, reliable and useful questionnaire, the Pupil Control Ideology (PCI) by Willover, Eidell and Hoy (1967). This instrument describes teachers' roles as being on a continuum from a custodial attitude or orientation, to a humanistic attitude or orientation. Willower et al. argue that teachers' custodial or humanistic attitudes toward student behaviour will have a pervasive influence over their general teaching style. The custodial versus humanistic continuum was operationalized by Willower, et al. (1967 and 1973), and the characteristics of the humanistic teacher's class were defined as:

> ...an educational community in which members learn through interaction and experience. Students' learning and behaviour is viewed in psychological and sociological terms rather than moralistic terms. Learning is looked upon as an engagement in worthwhile activity rather than the passive absorption of facts.... The humanistic teacher is optimistic that, through close personal relationships with pupils and the positive aspects of friendship and respect, students will be self-disciplining rather than disciplined. A humanistic orientation leads teachers to desire a democratic classroom climate with its attendant flexibility in status and rules, open channels of two-way communication, and increased student self determination. Teachers and students are willing to act on their own volition and to accept responsibility for their actions (Willower et al. 1973, p. 5-6).

The humanistically oriented teacher's class as described by Willower et al. (1973) would appear to be a drastically different environment from their conception of a custodial teacher's class, which is described as:

> Teachers holding a custodial orientation conceive of the class as an autocratic organization with rigidly maintained distinctions between the status of teachers and that of pupils. Both power and communication flow downward, and students are expected to accept the decisions of teachers without question. Teachers and students alike feel responsible for their actions only to the extent that orders are carried out to the letter (Willower, Eidell and Hoy, 1973, p. 5).

The contrasting descriptions of teacher style and roles suggests that students' perception of their classroom climate may vary between the two classes. As described, it would be expected that students experiencing a humanistically oriented teacher may perceive their classes as more friendly, cohesive, satisfying and enjoyable than students in classes with custodially orientated teachers. Several studies have empirically supported these concepts, as will be shown.

Classroom Climate. In a study by Appleberry and Hoy (1969) the researchers found that elementary school teachers with humanistic pupil-control ideologies were more likely to have open organizational climates than their colleagues who were more custodial. A later study by Pritchett (1973) found that custodialism in teacher pupil-control behaviour was associated with negative attitudes toward school on the part of secondary students who were surveyed. Also, in the same year, Hoy (1973) reported that, in general, the more custodial the pupil-control ideology of the school faculty, the more alienated the students felt. Further, the more humanistic the teachers' pupil-control ideology the more flexible their orientation and their view that students can be self-disciplining and responsible (Willower et al. 1973; Helsel and Willower, 1974).

Recently, the relationship between teacher PCI (Pupil-Control Ideology) scores and students' perception of the classroom climate has been more specifically investigated. Multhauf, Willower and Licata (1978) found that elementary teachers who exhibited more humanistic pupil control behaviour, as measured by the Pupil Control Behaviour (PCB), were reported by students to be more "full of action, interesting, exciting and powerful", than were the more custodial teachers. The

researchers defined these classroom qualities within one concept, class "robustness". The "robustness" of a class is a theoretical construct which describes the dramatic content of the class structure. In essence, it focuses directly on audience perceptions of school structure, similar to the perceptions and empathy experienced by an audience at a theatrical performance (Licata and Wildes 1980). This concept was more specifically researched by Licata and Wildes (1980) and Estep, Willower, and Licata (1980). Licata and his colleagues have described a high- and low-robust classroom in more detail and have found that low-robust classrooms tend to have teachers with more custodial pupil-control ideologies and behaviour scores than the high-robust classes. Further, they found an inverse relationship between classroom environmental robustness and classroom routinization.

These studies, while they have only commenced to explore the "robust" conception of class environment, suggest that the more humanistically oriented teachers may have a more dynamic, satisfying and enjoyable class climate than does the custodial teacher. This direction of research upon the class climate also provides avenues for future researchers to include observational instruments to study the concept of class "robustness".

Students' Self-Concepts. No published studies could be found which had directly investigated this relationship between teachers' position upon the humanistic-custodial continuum and the development of students' self-concepts. However, the humanistic-custodial teacher style continuum and its relationship with the dogmatism continuum suggests that there may be a relationship between teacher PCI scores and students' self-concept development.

A related study by Cheong and Wadden (1978) utilized a parallel concept of dogmatism (Rokeach 1956) to divide teachers into, "most-experimental least-dogmatic", and "least-experimental or most-dogmatic", groups. The researchers studied fourth-, fifth-, and sixth-grade pupils and their self-concept development when they were taught by the two extreme groups. Since Willower et al. (1973) found a close relationship between teachers' control ideologies and teachers' dogmatism scores on the Rokeach (1956) instrument, this study could be seen to approximate a humanistic-versus-custodial teacher's effect upon students' self-concepts. The results of the study led the researchers to conclude that the pupils who were taught by the "most-experimental least-dogmatic" teachers, had significantly higher self-concepts than those pupils taught by the least-experimental and most-dogmatic group of teachers. In other words, this study suggests that since teacher dogmatism is closely related to the teacher's position upon the PCI humanistic-custodial continuum, the more humanistic the teacher, the more conducive the environment for the development of positive student self-concept.

The studies reviewed in this section demonstrate congruence among their findings and all support the usefulness of the humanistic-custodial teacher style concept. However unless observational instruments are utilized in conjunction with teacher or student self-report questionnaires, researchers will have to rely upon the validity and reliability of their instruments. Further, researchers will have to assume that what the teachers report they are doing on a questionnaire is actually being done in the classroom. This assumption is often not warranted, and is one reason why research upon teacher effectiveness usually includes extensive classroom observation (Medley 1977).

Observation Studies of Teachers' Roles and Their Effects on Classroom Climate and Students' Self-Concepts

The use of observation schedules to investigate teachers' roles and their relationship to classroom climate has a history which extends back to the late 1930's. Since this early beginning the use of observational methodology has not developed sufficiently to afford reliable and detailed study of the teacher's role and its relationship to observed changes which occur in the classroom climate during the passage of the academic year. Instead, the emphasis in research has been upon the use of observation instruments that measure teachers' roles and relate these data to student outcome criteria such as student self-concept development. In this section, studies and reviews of observational studies will be discussed to support the above generalizations.

Classroom climate. In the preceding section it was argued that the measurement of teachers' roles by self-report questionnaires should be accompanied by an observation schedule to measure what actually happens within the classroom. The following discussion will demonstrate that since the beginning of teacher effectiveness research, observation studies have produced no clear-cut conclusions linking teacher style to classroom climate.

Pioneering work by Anderson (1939) and his associate Anderson and Brewer (1945 and 1946) in infant schools, and by Lewin, Lippitt and White (1939) with summer camp children, produced congruent findings which suggested that:

1) different styles of leader behaviour produce differing climates, and differing group and individual behaviour;
2) that group members in a democratic social climate were more friendly to each other, showed more group-mindedness,

were more work-minded, showed greater initiative, and had a higher level of frustration tolerance than members in the other groups.

The Lewin, Lippit and White (1939) study provided the impetus for the examination of the effects of networks of relationship and the climate in learning groups and classes. Thelen (1950, 1951), Thelen and Withall (1949) and Withall (1949) worked to re-examine the nature of interaction in the classroom. Withall (1949) developed the Socio-emotional Classroom Index as an observational instrument to explore the teacher's leadership style from a slightly different criterion of "teacher-centered" versus "group-centered" perspective. Again, Withall's investigation yielded data which supported earlier findings.

However, later in the 1950's, R.C. Anderson (1959) examined 49 experimental studies which compared authoritarian and democratic leadership styles, in an effort to synthesize the research findings. Of the 32 studies directly relevant to the classroom he concluded that neither style was associated with higher productivity or morale and that the research associated with each style had outlived its usefulness. In a later review Stern (1970) came to similar conclusions but his analysis paid more attention to non-cognitive gains. He concluded that non-directive instruction facilitated more favourable pupil attitudes towards themselves, other class members, and a subcultural out group.

Further, in contrast to Anderson's (1959) conclusions, Glidwell, Kantor, Smith and Stringer (1966) reported a number of studies conducted during the 1950's and 1960's that demonstrated that the teacher, as the classroom leader, is the main influence upon the classroom climate and the social-emotional character of the classroom. To support their

claims they argued that the teacher who is more integrative, democratic, student-centered and is able to disperse social power and emotional acceptance has been found to: stimulate more pupil-to-pupil interaction; reduce inter-pupil conflicts and anxiety; increase mutual self-esteem; increase self-initiated work; and to increase independence of opinion and responsibility.

The studies which supported these conclusions conflicted sharply with Anderson's (1959) conclusions and appeared to encourage more research studies during the 1960's. However, the studies during the 1960's tended to concentrate more specifically upon teacher "warmth" and teacher "directiveness-versus-indirectiveness" as measures of classroom climate.

Dunkin and Biddle's (1974) volume reviewed many of these studies and discussed over 100 which they classified within the area of classroom climate. They specifically classified their classroom climate studies under the headings of teacher warmth, teacher directiveness, teacher indirectiveness, teacher praise, teacher acceptance of pupil ideas and teacher criticism.

Dunkin and Biddle (1974) concluded:

> ...evidence from experiments is equivocal, suggesting that the apparent relationships found in field surveys is not causative. Thus the case for indirectness is not demonstrated (Dunkin & Biddle 1974, p. 132).

In general the research within the area of teacher style (as defined by Dunkin & Biddle (1974)) and its effect upon class climate and student learning outcomes has been, until 1974, a collection of studies which contradicted each other and thus allowed only equivocal conclusions to be drawn. Several reasons for the lack of clarity and consistency of findings can be proposed but they indicate the poor standard

of educational research in general and of teacher effectiveness research in particular.

Since 1974 educational research has become more methodologocially sophisticated and considerable progress has been achieved. However, only secondary importance has been placed on the learning environment and classroom climate, while researchers' primary emphasis has been on teacher behaviour and its direct effect on students' achievement.

Discussions of two reviews of teacher effectiveness studies by Medly (1977) and Soar and Soar (1979) serve to represent the more recent teacher effectiveness research findings in relation to teacher style and classroom climate.

Medley (1977) conducted a comprehensive review of 289 studies of teacher effectiveness from which he selected 14 which met the following criteria: correlations obtained were greater than r = .387; classroom observations of teacher behaviour were a process measure; student gains were outcome measures; and the findings had some degree of generalizability beyond the teachers in the sample.

From the 14 studies examined, Medley was able to generalize upon the effective teachers' roles in rather specific terms. He concluded:

> Effective teachers of low-SES pupils in Grade III or below: devote more class time to task related academic activities; spend less time discussing matters unrelated to lesson content; spend more time with large groups or the whole class, rather than small groups; assign more seat work; asks more questions classified within the lower end of Bloom's Taxonomy; allows fewer pupil-initiated questions or comments; use more praise or positive motivation; spend more time working with individual students during seat work; and maintain an environment that is supportive and free from disruptive pupil behaviour, than ineffective teachers do (Medley 1977, p. 78).

Slightly more specific information upon classroom climate was obtained from Soar and Soar's (1979) review of four of their own earlier

studies. They studied mixed urban and rural populations, variations in sociometric status, black and white students, and advantaged and disadvantaged students. Study number one was conducted in 1968 with 55 classes between grades three and six. Study number two was conducted in 1970 with 20 grade one classes. Studies three and four were conducted in 1975 with 59 grade five classes and 22 grade one classes. All studies included intensive classroom observations and affective measures of self-concept and attitude towards school, as well as achievement scores upon reading and arithmetic. They concluded:

> ...the results of our studies provide no support for the widely held belief that it is necessary for a classroom to provide a warm emotional climate for learning. The results do suggest that an affectively neutral classroom can be functional. What is apparently crucial, however, is that the climate not be negative (Soar and Soar 1979, p. 105)

While their conclusion appears surprising it should be remembered that their measure of classroom climate was not from the students' perspective but rather from that of a trained observer using specific observation instruments which focused upon the teacher and class behaviour. However, these findings are indicative of the teacher effectiveness research studies which have utilized only observation instruments to measure classroom climate. As a result these studies have been able to make specific statements about teachers, but only general statements about learning environments and classroom climate. The reason for this is the almost exclusive use of observation schedules which concentrate upon teacher behaviour, and do not enable the observer to make more meaningful comments beyond the recognition that a teaching-learning interchange displayed negative or positive affect. Such a general description of the class climate will not permit a study of changes within the group structures of the classroom climate, nor will

it enable an accurate portrayal of how the students feel about the climate. Thus, studies which wish to investigate changes in classroom climate should utilize more specific means of collecting such data.

Students' Self-concepts. Observational studies within teacher effectivness research have tended to concentrate on student achievement as an outcome measure rather than self-concept as an outcome measure.

While there have been some earlier studies reported by Purkey (1970) which do consider student self-concept development as a worthwhile outcome measure, these studies tend to lack a rigorous methodology. By contrast, a more recent study with a sophisticated methodology by Coker, Medley and Soar (1980) reports data which suggests that detailed observation of teachers' roles can isolate behaviour which can be related to students' self-concept development. Utilizing 100 classrooms in one school district over a period of two years, the researchers completed extensive observations of all teachers using four observation instruments. The trained observers concentrated upon 25 teacher competencies which were correlated with student achievement and student self-concept development measures. Five teacher competencies were found to be positively related to student self-concept development:

1) teacher uses feedback, verbal and non-verbal to modify teaching practices;
2) teacher maintains self-control in classroom situations and with students;
3) teacher uses praise and/or rewards;
4) teacher accepts and incorporates student ideas into lessons;
5) and teacher uses one-to-one counselling with students.

However, only the second teacher competency, "teacher maintains self-control in classrooms situations and with students" was found to be related to both student self-concept development and achievement.

Conclusions and Relevance to This Study.

This section has discussed research on teacher roles from two main research perspectives: first, questionnaire studies of teachers' roles; and second, observation studies of teacher roles. Each perspective was then discussed in relation to research upon the development of students' self-concept and classroom climate. From the preceding discussions the following conclusions are considered to be relevant to this present study:

1. The Pupil Control Ideology (PCI) is regarded as a useful research instrument to measure teacher style upon a humanistic-custodial continuum and the results suggest that humanistic teachers may: encourage more student talk in discussions; develop classroom climates which will facilitate greater development of students' self-concepts; and develop more dynamic, "robust", and enjoyable classroom climates, than more custodial teachers.

2. The PCI alone as a measure of teacher style is not adequate. Additional observational data upon class discussions would enable a complimentary measure of teacher style, as well as a measure of the classroom processes.

3. Teacher effectiveness studies which have utilized observation schedules to measure teacher style have yielded a mass of research data but equivocal conclusions.

4. Teacher effectiveness studies have demonstrated that observation instruments can identify teacher style and teacher behaviours which can be related to student's self-concept development.

5. Teacher effectiveness studies and their use of observational schedules have not provided enough specific information upon classroom climate to afford a detailed study of changes and development in the climate. This conclusion suggests that in order to study the development of classroom climate over a period of time, a research methodology other than an observation instrument will be necessary.

Classroom Climate Research

Introduction

This body of research has been included as a discrete section within the literature review because it utilizes a different methodological perspective from classroom climate studies within the teacher effectiveness section. This section will discuss research studies which have explored classroom climate from the students' viewpoint, using self-report questionnaries.

Getzels and Guba's (1957) model of the class as a social system has isolated the classroom climate as a major influence upon an individual's social behaviour. One way to investigate the development of classroom climate is to measure the climate from the participants' perspective. The previous sections of this review have elaborated upon the limitations of the use of an observational schedule to measure classroom climate. This section will argue that student self-report questionnaires can provide a reliable and valid measure of classroom climate

which is sensitive enough to enable changes in classroom climate to be investigated over an extended period of time.

Large studies of high school students and questionnaire development pioneered by Walberg (1966), Walberg and Anderson (1968a and 1968b) were followed by further innovation and a collection of congruently supportive findings reported in Walberg (1979) and by Moss (1979a and 1979b). In general, the large number of reported studies suggest that future research upon classroom climate should include a measure of the teacher's style and teaching orientation, student self-report questionnaires upon classroom climate, and observational data to support the previous two sources of data.

In this section discussion will be limited to those studies which employed the My Class Inventory (MCI) by Anderson (1973) with elementary school student populations. This discussion will establish that the MCI is a reliable and valid measure of classroom climate. Further, it will provide a rationale for investigating the teacher's pupil control orientation in relation to classroom climate development.

Elementary School Students' Perceptions of Classroom Climate

While the majority of classroom climate analyses have been completed upon high school student populations, Anderson (1973) reports some studies which have used the My Class Inventory (MCI) with elementary school pupils. The MCI has five subscales which measure the student's perception of the classes' difficulty, cohesion, competitiveness, satisfaction and friction.

In general, the studies of elementary classroom climates by Walberg, Sorenson and Fishback (1972), Talmage and Walberg (1968),

Talmage and Eash (1978) and Ellett, Capie, Okey and Johnson (1978) support the findings from the LEI (Learning Environment Inventory) and classroom climate research upon high school students. Three recent studies by Morrison (1979), Fraser and Fisher (1980), and Prawat and Solomon (1981a) have however contributed to the construct validation and usefulness of the MCI research instrument as a measure of classroom climate.

A study which investigated classroom structure and the class climate was conducted by Morrison. Morrison (1979) investigated classroom structure (as defined by the amount of child activity and proportion of activity controlled by the teacher) in relation to students' test anxiety and students' perceptions of the classroom climate. He used observers to rate the behaviours of 267 students and their teachers in each of 32 classrooms of grade four, five and six in five different schools. Morrison found that the highly-structured classrooms (low activity/high proportion controlled) contained the highest amount of work involvement. This was produced at no cost to the classroom climate as these classes had high intimacy, lower friction and similarly reported satisfaction ratings as other classes. Low-structured classrooms (high activity/low proportion controlled) had more active deviancy. The researcher also found that there were no interaction effects of classroom structure with child anxiety level or sex of child. Again this study of elementary class structure and the classroom climate is congruent with the secondary school studies conducted by Moos (1979a) and also highlights the need for a teacher style measurement within any study of classroom climate.

A major study of classroom climate and science curriculum implementation which utilized the My Class Inventory (MCI) was conducted on 100 grade seven science classes in Australia by Fraser and Fisher (1980). Data revealed that the set of MCI scales accounted for an increment of between approximately four and seven percent of the variance in different outcome posttests over and above that attributable to corresponding general ability. Further, each of the outcome measures was significantly higher in classrooms perceived as more satisfying and less difficult.

Prawat and Solomon (1981a) also utilized the MCI, but in a multiracial environment. Their study included: teacher interviews and Q sort; student sociometric and classroom environment measurement upon MCI; and classroom observation upon 10 randomly selected classes from a sample of 40. From an integration and analysis of the different sources of data the researchers concluded:

> ...it does appear that teacher goal orientations influence teacher action in the classroom and that this, in turn, impacts on students' perceptions of the affective climate of the class and on students' willingness to positively interact with opposite sex and opposite race classmates (Prawat and Solomon 1981b).

This finding, while specifically related to race relations, is consistent with Moos' (1979a) conclusions from his research in the secondary schools.

Conclusions and Relevance to This Study

The preceding research upon classroom climate has shown an increasing degree of sophistication over the years and has also enabled more accurate statements about variables which affect the classroom climate,

and in turn how these variables affect student outcome measures. The following main conclusions can be drawn from this body of research.

1. The study of classroom climate from the learners' perspective has yielded several useful, reliable and valid instruments which measure the classroom climate in high schools and elementary schools.

2. The study of classroom climate using the MCI instrument has enabled investigators to predict student outcomes. Further, favourable perception of learning environments has been related to students' achievement, and affective student outcomes.

Because the preceding studies have reported consistent statistically significant results utilizing student self-report questionnaires upon specific dimensions of classroom climate, it would appear that these instruments could be used to measure changes in classroom climate over a period of time. The repeated measurement of classroom climate by student self-report instruments could provide new insights into the changing nature of the classroom climate. However, student self-reports about their feelings, perceptions and reactions to life in their classroom are only one source of data upon classroom climate. Another specific source of data is students' friendship choices, explored through sociometric research.

Sociometric Research

Introduction

This section of the literature review will discuss studies which have investigated the distribution of class sociometric choices and related them to the development of students' self-concepts, students'

perception of the classroom climate, and the teachers' teaching style. Within the following discussion the reader should keep in mind that as most studies are correlational, no cause and effect relationships can be claimed.

The sociometric research perspective can provide an insight into the individual student's needs and personality as displayed by his or her attraction to others and inclusion within friendship groups. Thus, the sociometric perspective can provide an indication of the individual's perception of another aspect of the class as a social system.

Early Sociometric Research in the Classroom

Derived from Moreno's (1934) book Who Shall Survive, the sociometric perspective provided the methodology and rationale for allowing an "insiders" view of the interpersonal relations in a group. Moreno argued that affective relationships among people are inevitable within any formal organization and unless they are considered, then the formal organizational functioning will be limited or disrupted. In the classroom, students develop feelings about each other which, unless addressed or allowed to be expressed, may generate interpersonal conflict and tension. Tension and conflict within the class may limit the attainment of the maximum potential of teaching and learning.

Comprehensive reviews of sociometric research studies conducted in the classroom were reported by Withall and Lewis (1963), Gronlund (1959) and Glidewell, Kantor, Smith and Stringer (1966). Each review reported empirical studies which support conclusions that friendliness and popularity are positively correlated with (but not necessarily caused

by) intelligence, physical attractiveness, social awareness and social class.

Following on from Lippitt and Gold's (1959) study of high-and-low-status students, Schmuck (1962, 1963 and 1966) conducted a series of studies upon the relationships between classroom friendship structure and students' outcome measures. Characteristics of elementary classrooms which Schmuck described as being "diffuse" (a wide distribution of positive and negative choices) or "central" (a narrow distribution of interpersonal acceptance and rejection) were associated with students' achievement. He found that students in classes where the sociometric structure was characteristically centralized were able to perceive their status more accurately; moreover, if they were low status and accurately perceived this, then they were under-utilizers of their academic ability.

Research on Sociometric Distributions Within Classes

Schmuck's findings were supported by a more recent study conducted by Zeichner (1978). He studied 25 fifth and sixth grade classes in 4 elementary schools to determine the relationship between the quality of their peer group experience and their attitudes toward school, their self-concept as a learner, and their school related anxiety. The classes were classified as either central or diffuse structures (using Schmuck's 1963 definition). From simple sociometric data obtained by asking students to indicate the three students in their class that they liked the most, Zeichner calculated the degree of centrality or diffuseness of the class and the degree of students' acceptance and attraction of the class. The degree of students' acceptance and attraction to

class groups was measured by "My Classmates", an instrument which was later published by Zeichner (1980). Using an analysis of covariance procedure, Zeichner found that:

> 1. students in centrally structured classes generally had more positive attitudes toward school than students in diffuse classrooms; further, students who had high attraction to their classroom peer groups had more positive attitudes toward school than students with low attraction;
>
> 2. the social structure of the class was not statistically significant in its relationship with students' self-concept as a learner, but students with high acceptance within their peer groups had more positive self-concepts then students with low acceptance. The same relationship existed for high attraction and low attraction students (Zeichner 1978, p. 562).

While his conclusion supports Schmuck's (1966) major theory on class diffusion and centrality, there are two aspects of Zeichner's findings which deserve further comment. First, the degree of pupil acceptance and attraction to the class group appeared to be a more finite measure (than sociometric data) of group membership, as it was found to consistently relate to the other outcome measures. Second, the finding that students of centrally structured classes generally have more positive attitudes toward school is contrary to Schmuck's findings. One explanation could be that this finding was due to chance or was influenced by the particular sample studied. Either way, the present study will try to clarify this incongruity by studying students' sociometric choices.

Sociometric Friendship Distributions and Teacher Style.

Recently, a renewed interest in sociometric research has provided new data on the variables which influence students' friendship choices. One variable, the teacher's teaching style and concomitant educational

philosophy has been found to be related to the students' sociometric choice patterns.

Hallinan's (1979) publication was a more sophisticated analysis of her 1976 study of 52 classes. Both longitudinal and cross-sectional sociometric data were collected from the classes which were classified as either "open" or "traditional" upon an independent observation instrument (Hallinan 1979, p. 258). Utilizing a variation upon traditional sociometric instrumentation, participating students were asked to choose from among all the students in the class, their "best friends" (students they liked very much), and their "friends" (students they liked very much but would not classify as best friends).

Hallinan's (1979) analysis revealed that the class size, class organization and grade level all had an influence upon student friendship choices. Her major conclusions were:

1. open classes tended to reflect more peer group interaction than traditional classes;

2. traditional classes reflected a more centralized and hierarchical distribution of their friendship choices than open classes;

3. students in traditional classes tended to have more friends than those in open classes;

4. the greatest number of best-friendships appeared in the sixth and seventh grades and these students appeared to be better integrated into the friendship structure of the classroom than in other grades.

In general, Hallinan's (1979) data analysis and resulting conclusions have supported Schmuck's (1963) findings upon diffuse class structure as well as isolating the effects of traditional and open, small and large class size upon students' sociometric peer choices. Her

findings suggest that studies upon sociometric distributions within classes need to be accompanied by a measure of the teacher's style. Hallinan's findings also suggest that teachers' style will influence their structure of activities and the range of activities students will experience. This structure will in turn influence the opportunities available for students to develop friendship patterns.

Conclusions and Relevance to This Study.

The previously cited studies have comprised a number of findings:

1. the student peer group relationships can influence students' attitudes, self-concept, and achievement;

2. diffusely structured classrooms can facilitate students' positive attitudes toward school, positive self-concept development and reading achievement;

3. the class size, type of teaching-learning engaged in, the grade level and students' sex can influence their peer group choices of best friends.

Sociometric research was also argued to be a useful diagnostic tool to enable a study of class friendship patterns. Further, as friendship patterns are synonymous with the group structure element of attraction, this sociometric orientation can provide an additional source of data to help determine changes in classroom climate over a period of time.

Group Development Research

Introduction

This section of the literature review is relevant to the present study in two interrelated ways. First, the discussion of theories of group development, in particular Tuckman's (1965) theory, will be utilized to provide the basis for an explanation of the development of the classroom climate. Second, a discussion of two recent studies upon the development of classroom climate will provide the basis for consideration of methodological concerns to be discussed in the following chapter.

The previous sections have elaborated upon research perspectives which can be utilized to investigate the different aspects of the class as a social system. This section will discuss group development theory and research which can be used to describe the development and changes in a social system. The particular focus will be on classroom climate.

While the vast number of theories of group development have been criticised because of their lack of predictive validity, they can be utilized in retrospect to describe the development of various groups. Only a few theories by Mills (1964), Mann (1967), Schmuck and Schmuck (1975), Stanford and Roark (1974) and Stanford (1977) have been specifically derived for, and applied to, the educational context. They describe the development of the classroom climate as it evolves from a disassociated aggregate of students and teacher, to the development of an effective group of interdependent students and their teacher. However, only Tuckman's (1965) theory has been applied to and empirically investigated within the high school and elementary school context.

Tuckman's (1965) Theory of Group Development

While not specifically generated to describe the development of groups in education, Tuckman's (1965) theory was incorporated within this study because it has: broad acceptance as a useful tool to describe group development; a useful and precise explanation of "task functions" and "socio-emotional functions" which occur during a group's development; and use of this theory affords comparisons with the only two previously published studies of group development in educational contexts.

Tuckman's (1965) theory of group development is the epitome of armchair synthesis and analysis of previous studies and theories. Tuckman analysed 50 articles upon group development which he classified into four categories: therapeutic, T-group, natural, and laboratory-group studies. Each category of studies was defined and described by Tuckman with particular attention to its goal and type of participants. However, despite his integration of the 50 studies, Tuckman admits that his theory is a combination of his personal biases, synthesized from preceding theory and empirical studies.

Following Benne and Sheats (1948) ideas upon "task functions" and "socio-emotional functions" which a group must develop, Tuckman included these concepts within his theory but referred to them as "task activity" and "group structure" respectively. Task activity, he defined as the "content of interaction as related to the task at hand," while group structure was defined as "the way members act and related to one another as persons" (Tuckman 1965, p. 385). These characteristics were present in each of the four stages of his model which he summarized as:

Stage 1 Forming

Group Structure: Testing and dependence

Task Activity: Orientation to the task

> Groups initially concern themselves with orientation accomplished primarily through testing. Such testing serves to identify the boundaries of both interpersonal and task behaviours. Coincident with testing in the interpersonal realm is the establishment of dependency relationships with leaders, other group members, or preexisting standards. It may be said that orientation, testing, and dependence constitute the group process of forming.

Stage 2 Storming

Group Structure: Intragroup conflict

Task Activity: Emotional response to task demands

> The second point in the sequence is characterized by conflict and polarization around interpersonal issues, with concomitant emotional responding in the task sphere. These behaviours serve as resistance to group influence and task requirements and may be labeled as storming.

Stage 3 Norming

Group Structure: Development of group cohesion

Task Activity: Open exchange of relevant interpretations

> Resistance is overcome in the third stage in which ingroup feeling and cohesiveness develop, new standards evolve, and new roles are adopted. In the task realm, intimate, personal opinions are expressed. Thus, we have the stage of norming.

Stage 4 Performing

Group Structure: Functional role relatedness

Task Activity: Emergence of solutions

> Finally, the group attains the fourth and final stage in which interpersonal structure becomes the tool of task activities. Roles become flexible and functional, and group energy is channeled into the task. Structural issues have been resolved, and structure can now become supportive of task performance. This stage can be labeled performing. (Tuckman 1965, p. 396)

While Tuckman's theory is a general theory, its usefulness has been demonstrated through its incorporation within two major studies.

Recent Significant Studies Upon Group Development Within the Classroom

Only two studies could be found which tested the effects of an intervention upon the classroom climate and the group development within the class. Both studies utilized Tuckman's (1965) theory to describe the changes in group development which occurred. The first study was a major piece of research conducted as a doctoral study by Stiltner (1973). The second study reviewed in this section was an extensive empirical test of Tuckman's (1965) theory of group development, conducted in Adelaide, Australia.

The Colorado Study. Stiltner (1973) completed a doctoral study upon 20 volunteer traditional high school teachers. The teachers, who taught grade seven, eight and nine, were trained to use classroom communication activities which were selected from Human Interaction in Education, by Stanford and Roark (1974). Each teacher was required to complete all 30 activities with one of their classes, while another of their classes served as a quasi-control. Stiltner and other graduate students visited all 20 classes four times during the semester to administer student questionnaires and they also visited 11 classes to observe the teachers' discussion-leading ability. Data was collected upon the changes in classroom atmosphere and interpersonal relationships, using student inventories of class climate, the Learning Environment Inventory by Walberg (1968) (LEI), a sociometric questionnaire, and planned observations.

Stiltner's (1973) study was one of the first empirical attempts to measure changes in the classroom climate and group process elements over time. Her study produced a massive amount of data which enabled tentative speculation upon the complex interaction of group process elements within classes.

The measurable differences between the group development of the experimental and control classes were summarized by the researcher:

> ...the initial testing time showed both treatment groups to be at a similar stage of development. Both groups were experiencing the types of concerns typical of forming. At the second time, the experimental class appeared to be in a transition or norming stage which was dominated by positive feeling. In contrast, the control classes appeared to be in a more negative stage of conflict or storming. At the third time the experimental classes had entered a more negative stage where some tension was apparent. The control classes were in a more positive position, somewhat like the second time in the experimental classes. The final time saw a continuation of the time three trends with some moderation, probably as a result of the impending termination. Some of the experimental classes reached more advanced stages of development characterized by a high level of interpersonal interaction and consideration of each other, as well as task effectiveness. A few of the experimental classes experienced strong negative or hostile phases (Stiltner 1973, p. 195).

This very general description of Stiltner's findings indicates that the development of classroom climate for both the experimental and control classes can be described using Tuckman's (1965) theory of group development. Further, her results suggest that the development of the experimental classes may be different from that of the control classes. She suggests that at her second measurement time the experimental classes seemed to have progressed through the Storming stage and were starting to enter the Norming stage. In essence this finding suggests that class conflict, and emotional responses to tasks, have been compressed and the class has progressed to the next stage of Norming. In general these findings support the rationale for interventions to

facilitate class group development. They provide evidence to suggest that interventions can expedite the development of a classroom climate and maximize class time spent in the productive stages. These results also provided the empirical support for Stanford's (1977) theory of group development which will be discussed in more detail in Chapter Three.

However, while Stiltner's (1973) study was a pioneering piece of research which had a major influence upon this present study, there are limitations within the study which restrict its generalizability.

1. Stiltner's (1973) analysis revealed highly persistent teacher differences and school differences which made any generalizability of the data doubtful and which may explain her conservative interpretation of the data.

2. The use of teachers as their own controls may have meant that some teachers could have contaminated the results by enthusiastically conducting the interaction activities in both classes. Further, teachers conducting the activities in one class may have altered the way that they would normally treat the second class.

3. Within the study there was no provision to monitor teachers' quality of implementation of the different activities. Teachers may have varied the level of intensity and length of time the activities were conducted, and thus the activities would have differentially affected different classes.

To the above problems in Stiltner's design must be added the qualifications which apply to research of this type, namely: that the population was volunteer teachers and thus generalization to a non-volunteer sample of teachers should not be made; and that observations

were made at specific times and not continuously. These reservations and criticisms aside, the study did provide the stimulus and challenge for future work in this area. Unfortunately few researchers have risen to the challenges in this difficult yet dynamic domain.

The Adelaide study. One group of researchers did rise to the challenge and conducted by far the largest reported study conducted upon group processes in the classroom, in Adelaide, Australia during 1977 and 1978. Wilson, Lafleur, Brodie, Carey, Dale, Johnson and Young (1979) studied 126 classes, of which 43 were primary classes from grades two to grade seven, and 51 were high school classes. The remaining 32 were control classes. The Social Development Project researchers worked with volunteer teachers who had an interest in students' social development and who were prepared to spend some of their own time improving the development of their classes as groups. The experimental group of teachers attended inservice workshops for at least one- and one-half hours each week to: improve individual teaching skills and strategies; develop constructive intervention skills to help their class group develop together; and to discuss the project and support groups, both within and outside the classroom and school. Teachers were also exposed to a model of group development which was evolved by the research team (see Table 2.1).

The model is an integration of Tuckman's (1965) conception and Harvey, Hunt and Schroder's (1961) developmental model. The researchers' model discussed only two dimensions of group process development, power and affection. Teachers were given detailed descriptions of their role, student behaviour, student motivation, learning style and environmental conditions which characterized each of the four proposed stages

Table 2.1

Definition of Stages of Development

From Wilson et al, (1979, p. 13)

	Power	Affection
Stage 1 Dependence	Teacher makes nearly all decisions. Students carry them out in an accepting way.	Some students dislike teacher. Some students dislike other students. Students don't argue with teachers or other students (hostility is not overt).
Stage 2 Rebellion	Teacher makes nearly all the decisions. One sub group does not carry them out in an accepting way.	Two distinct sub groups of students: one doesn't like teacher or other sub group of students. Students like to argue (hostility is overt).
Stage 3 Cohesion	Students make many group decisions. Students accept group decisions and rules.	Students nearly all like each other. Students nearly all like teacher. Students don't like to argue.
Stage 4 Autonomy	Students make many group and individual decisions. Group decisions are seen as guidelines rather than rules.	Students nearly all like each other. Students nearly all like teacher. Students accept arguments (without hostility).

of group development. An activities and intervention-based program provided the impetus for facilitating the class group's movement to succeeding stages of group development.

The Social Development Project was piloted in 1977 and conducted during the 1978 academic year. The Project collected data from all 126 classes using classroom observation (on two occasions), student questionnaires (on seven occasions) and teacher questionnaires (on two

occasions). Twenty-six classes were described in detail with information from interviews (see Wilson, et al. 1979 Report No. 6). The data were collected during the second week of first term and subsequently at the middle and end of first term, three times during second term, and at the end of the third term.

From the mass of data the researchers concluded the following:

1. Data collected from the student questionnaires indicated that: (a) movement through the four stages of group development takes place in one direction only; (b) classes of teachers involved in the project were more likely to progress to later stages than were other classes; (c) cohesive and autonomous classes had higher organisation and order and interaction scores than dependent and rebellious classes.

2. Analysis of responses to the teacher questionnaire indicated that higher stages of group development were associated with a larger number of teacher interventions conducive to the development of the classroom group. Of particular interest were the facts that: (a) rebellious classes were associated with less student choice, fewer guidelines, less feedback and fewer efforts to develop students' social behaviour than classes at the other three stages and (b) the social behaviour of students in cohesive and autonomous classes tended to be of higher quality than in dependent and rebellious classrooms. (Wilson et al. 1979 Report No. 2, p. 7)

The congruence of information reported by the researchers appears to add considerable support to the empirical validation of Tuckman's (1965) model. However the study's methodology suggests that this support may not be as strong as it could have been. While the study's strength can be found in the large number of implementing teachers and classrooms throughout the school system and the use of a variety of data collection approaches, these attributes cannot overcome methodological flaws. The following limitations tend to reduce the generalizability of the findings and the study's support for Tuckman's (1965) group development theory's ability to describe the classroom climate development.

1. The lack of random selection of teachers and in particular the lack of random allocation of teachers to control and experimental groups has meant that there was no control for the teachers' predisposition to be influenced by the Project.

2. The principal instrument used for students self-report upon life in the classroom was specially designed for the study. The Stage Development Questionnaire was comprised of only eight items which were uniquely organized in a dependent pattern of two's. This meant that a response to question one, in relation to question two, together suggested the stage of group development within which the student perceived the class to be operating within. This instrument's general validity is doubtful, since an eight-item questionnaire which can predict the stage of group development within which a class is operating would only have one item per group structure element. That each of these items could detect changes during different stages of group development is also doubtful. The Social Development Project reports published no data upon the instrument's validity except to corroborate its findings with observational data (the validity and reliability of which is also doubtful).

Further doubts about the instrument's validity, and its ability to detect the stage of development through which a class is progressing is evident when the scoring system utilized by the instrument is examined. Besides being confusing, the scoring of the instrument and subsequent decision of what stage of development the class is in is rather arbitrarily based upon an intuitive guess. It appears that a class was classified at a stage if 40 percent of the students responded in the required fashion for that stage. Such arbitrary classification casts

doubt upon the instrument's discriminant validity as well as its scoring rationale.

3. A further concern regarding this Project is the general lack of control upon the teachers' inservice sessions. Any serious replication of this study is impossible since there is a lack of data concerning what actually happened in the one- and one-half hours of time the teachers spent in their treatment sessions each week. Also, the lack of data upon the observable quantity and quality of teacher interventions as suggested by the inservice sessions has limited any cause and effect conclusions.

In conclusion, the Social Development Project has served to provide: some evidence which supports the usefulness of Tuckman's (1965) model of group development within elementary and secondary classrooms; some evidence to suggest that intervention can facilitate class group development; and, finally, two major theoretical developments upon Tuckman's (1965) theory by the delineation of the dimensions of power and affection.

Conclusions and Relevance to This Study

From the discussion of the group development research perspective the following general conclusions can be drawn.

1. Classes can become groups and develop through stages of group development where elements of group processes influence their development. These changes can be described in theories of group development.

2. Tuckman's (1965) theory of group development has some empirical support as a useful model to describe group development in classrooms.

3. Stiltner's (1973) study empirically supported Tuckman's (1965)

model and suggested that her interventions facilitated classes to higher stages of group development, as well as minimizing the time spent in the Storming stage.

4. The Adelaide study by Wilson, et al (1979) also supported the usefulness of Tuckman's (1965) model. This study found that intervention succeeded in facilitating the classes' development to higher stages of group development than that reached by control classes. However, this study's use of a suspect instrument and lack of reporting of changes in group process elements over time tended to reduce the generalizability of its findings.

Overview of Review of Literature

Within this chapter, a review of relevant research and theory has established a background upon which to develop a conceptual and methodological rationale for each aspect of the present investigation into the development of classroom climate. The general conclusions from each of the research perspectives can now be integrated and related specifically to each aspect of the present study.

The first aspect of this study is an investigation into the effects of interaction activities upon the positive development of classroom climate and students' self-concepts. The preceding survey of literature and discussion indicates:

1. that classroom climate can be improved by the teacher's implementation of interaction activities and classes can develop as groups.

2. classroom climate improvement can be reliably assessed upon students' self-reports on the MCI instrument and sociometric surveys.

The second aspect of this study is concerned with an investigation into the changes in upper-elementary classroom climates and whether these changes can be described by Tuckman's (1965) theory. The preceding survey of literature and discussion suggests:

1. there is some empirical support for the usefulness of Tuckman's (1965) model and its ability to describe changes in classroom climate;

2. one study which investigated elementary and secondary classes indicates that where interventions were utilized, the classes moved toward the upper stages of Tuckman's model. However, this study did not investigate changes in classroom climate upon a reliable instrument.

The third aspect of this study will investigate the effect of teacher style and attitudes upon the development of classroom climate and students' self-concepts. The preceding survey of literature and discussion supports the following:

1. the teacher's PCI score upon a humanistic-custodial continuum appears to be a useful self-report method for determining teacher style;

2. teachers' PCI scores have been found to correlate directly with students' perceptions of classroom climate, school climate, attitudes toward their teacher and indirectly with students' self-concepts;

3. teachers' PCI scores should be accompanied by classroom observation of teaching process to further identify teacher style characteristics.

Building upon these conclusions and the preceding discussion, Chapter Three will evolve both a conceptual and methodological rationale for this present study, as well as the research hypotheses to guide this study.

CHAPTER THREE

RATIONALE AND METHODOLOGY

Introduction

In this chapter the arguments, studies, and theories discussed in the previous chapter will be utilized to evolve a conceptual and methodological rationale for each aspect of this present study. Hypotheses will be derived to guide the investigation. Further, the experimental design of each aspect and the rationale for the selection of instruments will precede an elaboration of the data analysis techniques utilized. A detailed discussion of reliability and validity of each instrument as well as some basic descriptive statistics will be presented. In conclusion, the selection of subjects, the procedures and the time-line of events during the study will be presented.

It will be argued that teachers' implementation of a sequence of interaction activities, known as Project GROW, will improve students' social skills which, in turn, will facilitate the development of a positive classroom climate, influence students' self-concept development, and facilitate the classes' development toward the criteria of an effective group while maximizing the more positive aspects as suggested by Tuckman's theory. Further it will be argued that the teacher's style or orientation will also influence and possibly modify the effects of Project GROW implementation upon the classroom climate and students' self-concept development. Each of these arguments will be specifically developed in relation to each aspect of the study.

Aspect One: An Investigation Into Some Effects of the Implementation of a Series of Interaction Activities on the Development of Classroom Climate and Students' Self-Concepts

Introduction

Within the first aspect of this study, the Project GROW intervention by Barling (1980b) will be described. The implementation of the Project GROW activities will be argued to be an educationally desirable intervention on three levels of abstraction. The first level of theoretical support for Project GROW can be found in the educational philosophy of John Dewey. The second level of conceptual support can be found to evolve from the work of Stanford (1977). The third supporting conceptual framework can be generated around the perceptual psychologists' understanding of self-concept. Each of the three theoretical frameworks will be discussed and developed in more detail. It will be argued that together they provide conceptual and empirical evidence to suggest that implementation of the sequence of Project GROW activities should positively influence the classroom climate and its development towards the criteria of an effective group, as well as improve students' self-concept.

The Project for Group Resourcefulness and Optimal Well-being in the Classroom (Project GROW, by Barling, 1980b). Project GROW has been placed in the Simon Fraser University Library. It is an initial attempt to evolve a teachers' resource book of sequentially organized interaction activities. The activities (see Appendix B-1) are taken mainly from Vacha, McDonald, Coburn and Black (1977), and have been organized into phases of classroom climate development which parallel the development suggested by Stanford (1977).

In general, the activities have been designed to facilitate the classroom climate and improve students' self-concepts by equipping them with skills of social interaction and enabling them to resolve conflicts. The activities were designed to be implemented throughout the school year in upper-elementary classes.

The general goal of the implementation of Project GROW activities is to facilitate the development of the class toward the criteria of an effective group (Barling 1980b, p. 11-12 and Stanford 1977, p. 26).

The Project GROW resource is also a manual for teachers with specific suggestions for facilitative teacher behaviour to complement the interaction activities. Each phase of classroom climate development is accompanied by a detailed description of expected student behaviour on dimensions of personal, interpersonal, process and task concerns. The "facilitative-teacher" suggestions also address these four dimensions upon which changes in the classroom climate can be facilitated. However, for the purpose of this study Project GROW is the term used to describe the collection of interaction activities. The activities listed in Appendix B-1 were implemented by the experimental group of teachers described in Appendix E-2.

It must be emphasized that the initial Project GROW from which the teachers worked is an early attempt to generate a sequence of activities which would be suitable for upper-elementary classes. In this sense, while the activities have been organized conceptually and practically into phases, it is their developmental and sequential nature that is important and not the phases and their description. Further, it is anticipated that adaption and revision will likely be necessary to

improve this resource so that it may better address teachers' practical needs and the following theoretical and conceptual rationales.

John Dewey's Educational Philosophy. The Project GROW intervention is an example of a curriculum innovation designed to address Dewey's (1916) conception of an ideal educational environment. Dewey's educational philosophy has four central premises which have influenced the construction of Project GROW and provided it with an educational rationale.

1. Educational experiences are optimal when they are organized developmentally and they have some degree of continuity.
2. Experiential learning tasks are preferred to optimize learning.
3. The teaching-learning process is essentially a social process and ideally the teacher should be a leader of group activities.
4. Education in a democracy should model democratic principles.

The sequence of interaction activities in the Project GROW curriculum resource addresses each of the principles (refer to Appendix B-2 for a specific elaboration). Because the interaction activities are specifically designed to develop social skills within a democratic classroom it is argued that classes which experience the Project GROW intervention are likely to have a more satisfying, more cohesive climate with greater group development than non-implementing classes. Students with improved social skills are also likely to develop better relationships with their peers and the teachers. With a more conducive social learning environment students are more likely to associate with significant others who will positively influence their self-concept development. This process will be elaborated on in greater depth later in this chapter.

Stanford's (1977) Theory of Group Development. A second conceptual rationale for the introduction of Project GROW activities in elementary classes can be argued from a group development perspective. This argument asserts that classes can develop from an aggregate into a group and then toward the criteria of an effective group. As development proceeds, theories of group development can be applied to describe changes in classroom climate. A theory developed by Stanford (1977) proposed that high school classes taught by traditional teachers will pass through five stages of group development if the teacher is able to address student concerns by conducting appropriate interaction activities. These activities will facilitate the classroom climate development through stages and optimize the classes' time within the most productive stage.

Stanford's (1977) theory of group development is based on Tuckman's (1965) theory, but has been adapted as a result of his and Stiltner's (1973) joint doctoral research. Stanford (1977) interpreted Stiltner's (1973) empirical results to support his model. This model can be summarized in five stages of Orientation, Establishing Norms, Coping with Conflict, Productivity, and Termination.

Stage one, "Orientation", is similar to Tuckman's (1965) theory of group development and addresses issues of inclusion, orientation to task and teacher expectations, and student dependence on the teacher. Stage two, "Establishing Norms", is seen by Stanford (1977) to be the critical stage which to a large extent determines whether a class will develop through the remaining stages. In stage two, the establishment of group responsibility, responsiveness to others, cooperation, decision making

through consensus and confronting problems are aspects of group development which will either facilitate or debilitate the class's development. Stanford (1977) argues that interaction activities will enable skills to be developed which will facilitate the class to move forward toward Stage Three of group development.

Stage three: "Coping with conflict", arises out of successfully confronting problems rather than ignoring them, students' commitment to responsiveness and their need to challenge the teacher's sincerity. Again the development of the class through this stage is facilitated by interaction activities which allow conflict to be worked through and by the implementation of various approaches to reduce and resolve conflict.

Stage four: "Productivity", occurs when the class has developed into a mature working group which oscillates between task and social-emotional concerns. Stanford (1977) again argues that activities designed to continually enable social-emotional problems to be resolved will, in turn, continue to facilitate the group's development.

Stage five: "Termination", was added by Stanford as a result of his years of experience as a high school teacher. He observed that his classes tended to react in predictable ways toward the end of their life-time and the tendency was to "decay or undo" all the group development that they had achieved during the semester or year. This stage has similar attributes to Schutz's (1958) description of the ending of a group when it recycles itself to earlier types of behaviour. In order to prevent such a decay Stanford also prescribes some activities for the class teacher to try and make the group ending a positive experience which will hopefully be repeated in the future.

While Stanford's (1977) theory has been based on Tuckman's (1965) theory, there remains considerable variation in scope, orientation, and sequence. These differences highlight both the relationship between the two theories and their fundamental differences.

In terms of "scope", Stanford's (1977) theory was based on empirical evidence from Stiltner's (1973) research on junior secondary school classes when taught by traditional teachers who implemented interaction activities. No empirical evidence from other studies or other educational levels has been forthcoming to support Stanford's (1977) theory or its generalization beyond Stiltner's (1973) sample. By contrast, Tuckman's (1965) theory has been found to be useful in describing both elementary and secondary school classroom climate development in the Adelaide study, by Wilson et al (1979) and secondary school classroom climates by Stiltner (1973). Further, Tuckman's (1965) theory has been derived from 50 articles dealing with group development and was designed for general use in describing group development, rather than development at a specific educational level.

In relation to the "orientation" of each theory, the differences become more pronounced and fundamental. Stanford's (1977) theory describes stages through which classroom climate will develop when this classroom climate is facilitated by a traditional teacher who implements interaction activities. Stanford's (1977) theory is thus an idealized theory of group development which has special relevance to secondary school classes. By contrast, Tuckman's (1965) theory does not propose that groups will develop through all stages (development may be arrested), nor does his theory suggest that interaction activities will promote a group's development. Tuckman's (1965) theory is a general

descriptive theory and may be useful in describing different groups' development.

Variation in sequence of stage-like development also highlights another fundamental difference between the two theories. Stanford (1977) proposes that stage two: Establishing Norms, precedes stage three: Coping with conflict. By contrast, Tuckman (1965) argues that stage two: Storming, precedes stage three: Norming. Stanford (1977) reasons that the difference in sequence is caused by the fact that the teacher is directive, yet facilitative through supportive action and the conducting of interaction activities. This serves to postpone conflict until after norms have been developed. Further, Stanford (1977, p. 281) argues that the conflict experienced in Tuckman's (1965) theory as stage two: Storming, is caused by the group members being forced to cope with a non-directive leader. Within Stanford's (1977) theory and its application to traditional teachers this conflict is not experienced. Another difference between theories is evidenced by the fact that Stanford's (1977) theory has five stages, the fifth one dealing with termination of the group. Tuckman (1965) does not consider that the concluding phase of a group warrants a separate stage.

However, the differences between the two theories do not suggest that they are strong enough to prohibit an intervention based on Stanford's (1977) theory to be implemented. Further, the effect of the intervention could be argued to be best interpreted using Tuckman's (1965) theory. The first proposition will be expounded here, while the latter will be discussed within the conceptual rationale of Aspect Two of this study.

Because Stanford's (1977) theory of group development has been empirically derived from an educational context and because of its prescriptive nature of suggesting interaction activities and facilitative teacher behaviour, an intervention based on Stanford's principles should contribute to the achievement of similar goals. If Stanford's (1977) theory has any validity then similar interventions should facilitate interpersonal relations, classroom climate and the development of the class to the criteria of an effective group. As a result, not only would the classroom climate improve, but the students' interpersonal relations and self-concepts could be expected to be better than in those classes where the teacher had not implemented interaction activities. Thus, the central implication within Stanford's (1977) theory and any similar intervention should be that when the predictable needs, conflicts, anxieties and fears of group members are dealt with, the class will progress to the criteria of an effective group (stage four: Productivity, in Stanford's (1977) theory). Dealing with these predictable concerns which arise for class members requires the teacher both to understand the process which is occurring and to be able to select stategies to meet the students' needs, discuss and acknowledge their needs and thus reduce their anxieties, or confront their conflicts. Stanford (1977) describes the process as:

> Changing a collection of individual students into an effective class group comes about only by teacher intervention to promote group development. In this process, the individuals learn more productive ways of working together, develop trust in one another, become open to new experiences, improve their communication, and feel freer to participate actively in classroom activities (Stanford 1977, p. 26).

In order to be able to facilitate the classes' development to an effective group the following implications drawn from Stanford's (1977)

model would have to be addressed. These implications are phrased positively as "teacher needs to" statements. They will be listed here and within Appendix B-3. Each implication will be explicitly derived and the manner in which Project GROW has addressed each implication will be discussed in detail. In general, Project GROW has been derived from Stanford's (1977) model, to address the following:

1. The teacher needs to understand the process of group development and its stage characteristics.
2. The teacher needs to organize interventions sequentially so that they promote development and build upon previous learnings.
3. The teacher needs to continue to utilize interventions to facilitate the class' development.
4. The teacher needs to recycle interventions during the class' development.
5. The teacher needs to implement activities which relate to all elements of group processes.
6. Within the initial stage of group development the teacher needs to implement interventions with the following focuses: orientation to one another, and to the teacher; orientation to the tasks, requirements and expectations; and orientation to standards of behaviour.
7. Within the second stage of class development the teacher needs to implement interventions with the following focuses: development of cohesion; examining norms; and developing relationships and development of cooperation.
8. During the third stage of group development the teacher needs to implement interventions with the following focuses: a resolution of interpersonal conflict; tolerance and acceptance; listening and

responding skills; development of cooperation; and the development of personal and class responsibility.

9. Within the fourth stage of class development the teacher needs to implement interventions with the following focuses: maintenance of class cohesion; avenues for resolution of interpersonal problems; development of interdependence and flexibility; and development of problem solving skills.

10. Within the fifth and last stage of group development the teacher needs to help students: express their genuine feelings about the class, complete unfinished tasks and resolve to reinvest their emotional energies into future group experiences.

11. The teacher as the principal influence upon classroom climate and group development will need to model congruent behaviour to the interaction interventions, in order to reinforce and optimize the effects of the interventions.

As the Project GROW sequence of activities does explicitly address each of these implications (see Appendix B-3), it is argued that classes which experience the activities will develop a positive classroom climate. Further, these classes will also experience greater group development and will evolve towards the criteria of an effective group, more so than non-implementing classes. The activities will however also directly and indirectly affect students' self-concepts.

Self-Concept Theory. Within this section the use of self-concept theory will be argued to support the implementation of Project GROW activities and to justify the selection of students' self-concepts as an outcome measure to assess the effectiveness of the interventions.

Justification for the use of self-concept measures as outcome criteria within this study can be based upon several arguments.

1. The social psychological model of the perspectives first advanced by G.H. Mead argued that a positive self-concept is related to socially desirable behaviour, and that a distorted self-concept will lead to socially inadequate or undesirable behaviour. Since one of the goals of education is to socialize people so that they function within societies' norms and can live harmoniously together, the students' achievement of a positive self-concept can be seen to be a socially desirable outcome. Combs, Avila, and Purkey (1971) go so far as to suggest that a person's self-concept is the most important single factor affecting behaviour.

While this argument has received strong theoretical support, a recent review by Scheirer and Kraut (1979) indicates that empirical evidence validating the causal role of self-concept has not been forthcoming. The authors conclude their review by stating: "...little direct evidence exists in either psychology or sociological literature that self-concept has an independent influence on behaviour (Scheirer and Kraut 1979, p. 132)" However, while a poor self-concept might not be a direct cause of socially deviant behaviour, its close relationship with socially deviant behaviour can be reason enough to strive to develop positive student self-concepts. Thus, the development of a student's self-concept can be justified as a worthwhile educational goal because of its close relationship with the socialization goals of education.

2. A person's self-concept can also be a critical influence upon his perception of reality and his learning processes. Perceptual

psychologists Combs, Avila, and Purkey (1971), Combs, Richards, and Richards (1976), and Walberg (1976) argue that a person's concept of self and reality are a combination of meaning drawn directly from experience and from meaning drawn from the appraisal or evaluation of others. Because personal meanings are influenced by our perception of reality, our self-concepts are critical determinants of personal meaning and learning. It follows then, that enhancement of students' self-concepts will also enhance their view of reality and their learning processes. Thus, improvement of students' self-concepts can be seen to be a desirable goal of education because of its concomitant relationship with the establishment of personal meaning, or the process of learning.

3. Because students' self-concepts are influenced and partly formed by their interaction with other peers and their teacher, any intervention which is designed to affect these relationships positively may also affect the students' self-concepts. The Project GROW activities are specifically designed to facilitate teacher-student and student-student interaction as well as provide students with social skills. As a result of their improved social skills it is expected that some student relationships will develop into close friendships. Further, as friends often develop into "significant others" who can be powerful influencers upon a person's self-concept, it can be argued that increasing both the probability of making friends and the quality of social skills will lead to positive student self-concept development.

Our social behaviour, our sense of reality, our processes of establishing personal meaning and our interpersonal relations with significant others are influenced by or at least related to our self-concept. Since improvement and development of our self-concept can be

considered a worthwhile educational goal, an intervention designed to facilitate the previously discussed three processes should improve students' self-concepts. The Project GROW activities are an example of one approach designed to facilitate the development of students' self-concepts. The series of interaction activities in Project GROW can be argued to be a direct influence upon the development of positive student self-concepts as they are directly related to developing students' abilities in the above areas. Within Appendix B-4, several ways Project GROW can be seen to directly influence the development of positive self-concepts are elaborated.

From the preceding discussion of Dewey's educational philosophy, Stanford's (1977) theory of group development and the perceptual psychologists' notion of the self-concept, it can be seen that Project GROW has been designed to simultaneously improve the classroom climate and improve students' self-concepts. Where the classroom climate or the students' self-concept is improved, there is expected to be a concomitant improvement upon the other. As a result it was predicted that classes which experience the Project GROW activities will:

(a) perceive their classroom climate more favourably;

(b) have more diverse friendship patterns;

(c) have more student talk in class discussions;

(d) have developed better self-concepts

than those students in classes where the teacher did not implement a planned sequence of interaction activities.

To guide the investigation of these predictions the following questions were generated:

1. Can the teacher's use of Project GROW interaction activities affect the classroom climate development?

2. Can the teacher's use of Project GROW interaction activities affect the development of students' self-concepts?

Based upon the review of literature these questions and the previously developed predictions led to the generation of the following hypotheses in their null form.

Hypothesis One: There will be no statistically significant differences between the class means of the control and experimental groups on the scales of the classroom climate inventories at any of the four measurement times.

Hypothesis Two: There will be no statistically significant difference between the control and the experimental classes in the distribution of sociometric choice scores at any of the four measurement times.

Hypothesis Three: There will be no statistically significant differences between the experimental and control groups upon the development of students' self-concepts.

Hypothesis Four: There will be no statistically significant differences between the frequencies of class behaviours observed in the control and experimental groups using the Fuller Affective Interaction Record (FAIR) categories at any of the measurement times.

Methodological Rationale For Aspect One

The previously discussed studies by Stiltner (1973) and Wilson et al. (1979) have provided a rich source of methodological insight which has guided this study. The following are some major implications drawn

from the previous discussions of each study. Each implication and how this study has addressed the methodological concern will be discussed.

1. Studies which test the effects of an intervention should specify both the interventions and the training procedures employed. This consideration was addressed by the generation of the Project GROW resource (available from the Simon Fraser University Library). The training procedure will be described later in the methodology section of this chapter.

2. Process measures should be reliable and valid instruments. The MCI instrument, discussed within the following section, is the main classroom climate instrument used in this study and has adequate reliability.

3. Studies upon the development of classroom climate should try to utilize continuous observation, a random sampling of data collection times and a fixed schedule of data collection times. This third consideration was only partially addressed within this study. Because there had been no published study upon the development of the elementary classroom climate, using reliable instruments, this study chose to initiate an investigation in this area with reliable instruments and a fixed schedule of data collection times. A fixed schedule was chosen because there were insufficient classes involved in the study to allow a random selection of observation and data collection times.

Four data collection times were undertaken and were organized so as to allow the maximum amount of time between each observation. The observation and data collections were also scheduled to minimize the interruption effects of holidays and school breaks upon the development of class social climate.

4. The use of "cohesion-building" exercises following the establishment of trust in the class was a consideration derived from Stiltner's study. This consideration was only indirectly addressed within Project GROW as it was not clear at what point in time trust would have developed in the classes. If trust is considered to have been developed before the end of Stage one, then within Project GROW the "Time Line," "A Personal Coat of Arms" and "Revolving Circles" (Barling, 1980b, p. 40, 42 and 43 respectively) will help to develop greater class cohesion. If trust were to develop at the end of Stage one, then only the "Classroom Meeting" activities would be immediately conducive to promoting class cohesion. Moreover, these activities may enable the class to be facilitated more quickly through Stage two than classes which do not participate in the interaction activities.

In general, this study has addressed most of the considerations and implications derived from both Stiltner's (1973) and Wilson et al's (1979) studies and incorporated their ideas into its design.

Design. The methodological design employed to test these hypotheses was a quasi-experimental, pretest-posttest control-group design, using repeated measures on four occasions. The design is diagramatically represented in Figure 3.1, following Campbell and Stanley's (1963) notation for describing an experimental methodology.

Each of the 12 teachers and their classes were pretested (O1) upon the questionnaires and then the teachers were randomly assigned to a control and an experimental group. Both groups were subsequently tested at times O2, O3 and O4 during the course of the academic year.

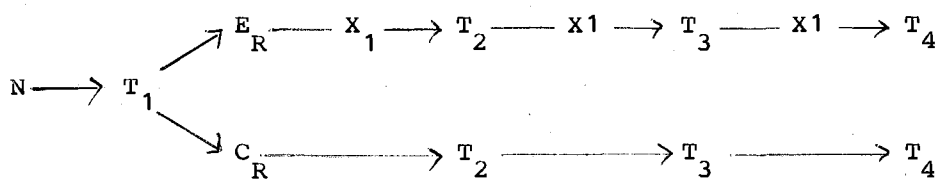


Figure 3.1 Study design using Campbell and Stanley's (1963) notation.

Key: N : 12 volunteer teachers
E_R : randomly chosen experimental group, 6 teachers
C_R : randomly chosen control group, 6 teachers
T : data collection time
X1 : treatment, Project GROW activities.

The experimental group implemented Project GROW (Barling 1980b) activities (X1) while the control group proceeded without any intervention of structured or planned interaction activities.

The rationale for this design was based upon the need to test the influence of Project GROW activities in comparison to a group of classes which did not implement the activities. The use of repeated measures on four occasions was utilized to ascertain the development of classroom climate during the year rather than just at the beginning and the end of the school year.

Within this design the number of teachers and classes included was determined by the number of teachers in one school district who volunteered to be involved in the study.

Rationale For Selection of Instruments. The literature reviewed in Chapter Two argued that changes in classroom climate can be accurately and sensitively measured by the administration of student self-report instruments. It was argued that observation schedules did not possess

the degree of sophistication to enable finite changes to be measured. Further, it was argued that the observer can only partially understand and experience the class climate as an outsider. Measurement of the classroom climate by those who experience it, and create it, will be a valuable data source if the instruments used can display reliability.

Each of the instruments utilized within this aspect of the study (with the exception of Classroom Life, CL and FAIR) were selected to measure an element of group process which could be integrated into Tuckman's (1965) model of group development. The My Class Inventory (MCI) by Anderson (1971 and 1973) was chosen as the principal instrument upon which changes in class climate would be measured. The choice of the MCI as a classroom climate measure was made upon three criteria: first, the instrument had to be a reliable one; second, it had to be a valid instrument; third, it had to include some dimensions which could be related to group processes and their development within the classroom. The MCI met these criteria and also afforded comparison with Stiltner's (1973) findings as she utilized the LEI instrument.

The Teacher Relationship Inventory (TRI) by Wittmer and Myrick (1974) was included within this present study as it provides a measure of students' perception of their class teacher's (leader of the class group) relationship with them.

The Classroom Life (CL) instrument by Fox, Luski and Schmuck (1966) was chosen to be included within this study because its items displayed high face validity with the general dimensions of classroom climate. Further, the CL was designed as a diagnostic tool whose reliability had not previously been tested. This present study sought to provide some initial reliability data upon the instrument.

A sociometric survey was also included within this study as it provides a measure of the group process element of attraction, or friendship. The choice of this particular instrument was made upon two criteria. First, the instrument provided each student's perception of their "whole class" social network, and at the same time avoided any negative choices or exclusions of students. Second the utilization of this particular form of sociometric questionnaire has afforded the opportunity to compare the results obtained from this study with recent work by Hallinan (1979).

Each of these four instruments, the MCI, TRI, CL and the sociograms was considered to measure the dependent variables. The independent variables in this classroom climate development aspect of the study were the number of Project GROW activities conducted.

The inclusion of an observation instrument within this aspect of the study was designed to provide another source of data to measure the changes in classroom processes and social-emotional tone. Fuller's (1969) FAIR observation schedule was selected for three reasons. First, the FAIR has a broad range of both student-talk and teacher-talk categories (28 categories in total). Second, the FAIR has versatility and can be used with video or audiotape. Third, the use of the FAIR in this present study will also afford a comparison between Stiltner's (1973) secondary class discussions, and this study's elementary class discussions.

In this present study, unlike Stiltner's (1973) study, classroom observations using the FAIR were only conducted at Time one and Time four. The rationale for two measures, pre and post, was twofold. First, as whole class discussions were not as prevalent a teaching

strategy for upper-elementary students as secondary students, it was decided to collect this data only upon two occasions. Second, the researcher wished to minimize disruption of all classes during Times two and three so as to allow students to concentrate only upon the questionnaires.

The choice of self-concept measures as an outcome criterion in this aspect of the study was argued earlier in this chapter. In essence the argument defended student self-concept measures as valuable in their own right. Further it was argued that self-concept measures are sensitive outcome criteria against which Project GROW intervention can be measured. Standardized achievement tests were seen to be inappropriate to measure students' abilities: to relate with their peers; or to perceive their social development or their attitude toward school.

One self-concept test selected for this present study, the "How I See Myself" (HISM) by Gordon (1968) does provide a direct measure of these student perceptions. However, the HISM instrument does suffer one major limitation, and that is that the students' responses are accepted as true and honest indications of their phenomenal field. Because there have been few widely used and validated observation instruments which can accurately measure a person's self-concept and because Gordon (1968) also had difficulty providing validity for his HISM instrument using observation schedules, it was decided to accept the limitations of a self-report self-concept instrument, but to include a general and specific self-concept measure. The HISM was chosen as the general measure and the Self-Concept of Achievement (SCA) by Brookover, Paterson and Thomas (1962) was chosen as a specific academic self-concept measure. The inclusion of the SCA was seen to be necessary to provide a

more reliable and more specific measure of students' academic self-concept than the HISM could be expected to yield.

Data Analysis. To test Hypotheses One and Two, class means from the dependent measures were analysed using a multivariate analysis of variance (MANOVA) upon the mean total scores for each instrument. Individual analyses of variance were then conducted upon the individual subscales for each instrument. The three-way analysis of variance (ANOVA) model included four time periods, three levels of treatment and three classes in each treatment level. The three treatment levels were the "high-implementation", "low-implementation" and "no-implementation" classes. The statistical model utilized is included in Appendix O-2.

While there were six control group classes, three were randomly chosen to enable the ANOVA to be computed with equal numbers of classes in each level of treatment. Refer to Appendix O-1 for a designation of experimental and control group classes.

The analyses were conducted using the ANOVA program by Greig and Osterlin (1978).

In order to test Hypotheses Three and Four the same ANOVA design used to test Hypotheses One and Two was utilized. In this case however, there were only two time periods and the dependent variable was the development of students' self-concept and the FAIR observation categories.

Aspect Two: An Investigation Into Changes in Classroom Climate As Described by Tuckman's (1965) Theory

Conceptual Rationale

The second aspect of this study is concerned with the description of changes in classroom climate and whether Tuckman's (1965) theory can

be useful. Earlier it was argued that a class could develop from an aggregate to become a group. Once a class can be considered to be a group, then theories of group development can be applied to help explain changes in group structure and classroom climate which occur during the school year. Two earlier studies which were discussed in the literature review in Chapter Two investigated changes in classroom climate and both found Tuckman's (1965) model to be useful in describing changes in classroom climate. Thus, in order to provide some comparability with these earlier studies it was decided to utilize Tuckman's (1965) theory to describe any change in classroom climate which did occur.

Besides the ease of comparability with earlier studies there are also several other reasons for the choice of Tuckman's (1965) theory to describe and interpret the changes in classroom climate as changes in group development. First, to investigate and describe the effects of an intervention based on Stanford's (1977) model, another more general theory needs to be utilized in order to prevent problems associated with a tautological exercise. Tuckman's (1965) theory is sufficiently different from Stanford's (1977) model and the former also has generalizability to groups other than secondary school classes. Second, related to the generalizability of Tuckman's (1965) theory is the fact that his theory was derived from research on therapy group, T-group, and natural and laboratory - group studies. It is theory which can be generalized to other group contexts. Thus, as a theory it is not limited by the context or the type of group which is being studied. This aspect is important since elementary classes are comprised of the same teacher and students for the whole academic year, younger and developmentally different students than high school classes, and intact

units for the whole year. Thus, the theoretically projected changes in group development may be more pronounced or different from those changes observed in high school classes. This present study sought to investigate the changes in the classroom climate in upper-elementary classes over the period of the academic year and to utilize Tuckman's (1965) theory to describe these changes.

The third major reason for the selection of Tuckman's (1965) theory is that by comparison with other theories, Tuckman's does elaborate, with reasonably broad descriptions, changes which can be expected upon "group structures" and "task activity" dimensions. These descriptions can be utilized to predict changes upon a number of dimensions which are relevant to changes in classroom climate for upper-elementary classes (See Table 3.1).

Table 3.1 is a diagrammatic representation of the projected changes upon dimensions which will be measured in this study. Each dimension and its relevant instrument will be discussed in detail within this section. The dimensions' numerical designations were derived by visualizing each dimension on a continuum from -4 to +4. Thus the numbers from the continuum express the amount of group process element (based on a standard unit of measurement (1)) likely to be present at each stage of development as predicted by Tuckman's (1965) theory. While the quantum change is an estimate, the projected direction is perhaps the more important indicator.

In general, Table 3.1 illustrates a decrease in measurements of satisfaction, cohesiveness and teacher's empathy and regard from stage one to stage two. This could be predicted from Tuckman's (1965) theory since in stage two: Storming, the central characteristic is conflict

Table 3.1

Projected Global Changes in Classroom Climate, Students' Perception of their Teacher, and Attraction to Peers as Predicted, from Tuckman's (1965) Model of Group Development

Dimension	Stage 1	Stage 2	Stage 3	Stage 4
Satisfaction	1	-1	2	3
Friction	1	4	2	1
Competitiveness	1	3	2	1
Difficulty	2	3	2	2
Cohesion	1	-1	4	2
Perception of:				
Teacher's empathy	2	1	3	3
Teacher's regard	2	1	3	3
Attraction to peers	1	2	4	3

1 A standardized unit of measurement
4 Maximum level of group process element development
-4 Minimum level of group process element

caused by interpersonal issues between the teacher and the group, as well as the members of the group. Each member is trying to find his or her own position within the classroom hierarchy and at the same time is trying to feel comfortable within the class. As a result students' satisfaction with the class, their work and their teacher is likely to decrease. The group's cohesion will also be tested as members will feel threatened and they are also likely to perceive the teacher as less than sympathetic to their needs. As a result they will blame the teacher to a certain degree and will perceive the teacher as less empathic and lower in regard than during the Forming stage.

By comparison with stage two, the class' development to stage three: Norming, will see an increase upon dimensions of satisfaction, cohesion and the teacher's empathy and regard. During this stage Tuckman's (1965) theory suggests an increase in cohesion due to the resolution of major interpersonal conflict and then the adoption of new rules and norms. As a result students' satisfaction is likely to improve and they are more likely to perceive the teacher as more empathic and more highly regarding.

Satisfaction is likely to increase still further during stage four: Productivity, since students are likely to channel their energies into the completion of tasks and as a result feel proud of their accomplishments. Cohesion may however decrease a little during the Productivity stage when frustrations and set-backs may hold up the completion of some tasks. During this stage the students' perceptions of their teacher's empathy and regard is likely to remain fairly stable and at about the same level as that achieved during the previous stage.

The dimensions of friction, competitiveness and students' perceptions of the difficulty of their work are likely to follow different developmental paths than the previously discussed dimensions. From a moderate level of friction, competitiveness and difficulty experienced during the Forming stage when students are orienting themselves to the task and each other, each dimension is likely to increase during the Storming stage. During stage two interpersonal conflict will lead to an increase in friction and competitiveness. Each student will want to secure a comfortable position in relation to everyone else in the class and to their power and leadership abilities. Students' perceived difficulty of tasks is likely to increase since interpersonal conflict

is likely to detract from the ease with which they are likely to be able to complete tasks. Friction, competitiveness and difficulty are likely to decrease when the group moves to the Norming and Performing stages. Class members should have resolved most of their conflicts, developed positive norms and learn to interchange roles in order to perform their tasks as best they can during the Performing stage.

The last variable within Table 3.1, attraction to peers, could be predicted from Tuckman's (1965) theory to undertake a different development than any of the preceding variables. From a possible tentative start with only a few friends in the class, students are likely to increase their friendships and attraction to peers until it reaches a peak during the Norming stage. Between stage one and the end of stage two the growth of friendships is likely to be small as friendships may be polarized due to the conflict over interpersonal and task issues. During stage three: Norming, the development of cohesiveness is likely to promote attraction between peers as interpersonal conflicts are resolved and members start to orient themselves to their tasks. However, during stage four the level of attraction may "fall-off" a little due to members greater commitment to the completion of their tasks.

While the preceding paragraphs have served to provide a rationale for the quantitative estimations in Table 3.1, it should be kept in mind that Tuckman's (1965) theory does not specfically elaborate on the development of each of these dimensions in each stage. Further, these estimations are open to variation due to other influences.

With these limitations in mind, in order to investigate if these predictions from Tuckman's (1965) theory could be used to describe the

development of the classroom climate, the following question was posed to guide the investigation.

1. Can the changes in the classroom climate of upper-elementary classes be described by Tuckman's (1965) theory?

This question was expected to be answered in the affirmative, with the degree of affirmation and the development of individual group process elements being the focus of this investigation. However, this question was not converted to a hypothesis as there are no objective measures of degree by which group structure and interpersonal relations patterns change to signify a class's movement to another stage of group development.

Methodological Rationale for Aspect Two

The choice of Tuckman's (1965) theory has previously been argued within this section and Chapter Two to be a desireable theory to describe the group development of the classroom climate. However, because Tuckman's theory is a descriptive account of group development there is no specification of degree of change upon any specific dimension. Within this study both descriptive changes and estimation of quantitative changes should provide a comprehensive account of changes upon group development dimensions.

Data Analysis. Examination of data produced from Hypotheses One and Two will be conducted with specific reference to statistically significant differences due to time, and time x treatment group effects. Figures of the development of each dependent variable upon time x treatment group indices will be analysed to yield descriptive as well as

quantitative estimates of changes of classroom climate which can be equated and interpreted as changes on group development stages.

Aspect Three: An Investigation into the Effects of Teacher Attitude on the Development of Classroom Climate and Students' Self-Concepts

Conceptual Rationale

This aspect of the study was included for two main reasons. First, it was argued in Chapter Two that the teacher's attitude and orientation toward teaching is an intervening variable which has been found to influence classroom climate. Second, the teacher's attitude and orientation toward teaching may influence a student's self-concept development. The class teacher is often a significant person in a student's life who can also influence the student's peer group relationships and the student's self-concept development.

Research relevant to this third aspect of the present study, as discussed in Chapter Two, suggested that a humanistic-custodial continuum of teacher attitudes may be a useful predictor of classroom climate. The humanistic teacher was described by Willower, Eidell and Hoy (1967) as desiring a democratic classroom structure and valuing close personal relations with students. By contrast the custodial teacher was described as autocratic, maintaining rigid distinctions between his status and the pupils. Control within the humanistic teacher's class was based upon individual responsibility. Within the custodial teacher's class control was directed down from the teacher to the students who were expected to obey without question.

The classroom climate of a humanistic teacher who is democratic, respectful and friendly would be likely to be perceived by students as having a more positive atmosphere than that of custodial teachers.

From the previous discussion and the examination of research studies, evidence suggests that the more humanistic teacher (by comparison with a custodial teacher) may have:

1. a more cohesive class climate;
2. a more diffuse class friendship pattern;
3. less teacher talk and more pupil involvement in class discussions;
4. students with more positive attitudes toward them;
5. and students with higher self-concept development.

In order to investigate these predictions, which would seem to have some conceptual and empirical support, the following question was posed:

Does the more humanistically oriented teacher facilitate students' perception of the class climate, attitude toward their teacher, and development of self-concepts to a greater degree than the more custodially oriented teacher?

This question and the previously developed predictions led to the generation of the following hypothesis in its null form.

Hypothesis Five. There will be no statistically significant relationship between the teachers' scores on the Pupil Control Ideology and:

(a) class means on the scales of the classroom climate inventories;

(b) the distribution of students' sociometric choice scores;

(c) the frequencies of class discussion behaviours observed using the observation categories;

(d) development of students' self-concepts.

Methodological Rationale

Design. A teacher effectiveness orientation was chosen to investigate the relationship between the teachers' attitudes to controlling students and students' self-concept. Dunkin and Biddle's (1974, p. 38) model to guide the study of research upon teacher effectiveness conceptualized the teacher presage and contextual variables interacting to affect the processes of teaching and learning in the classroom, and in turn the products of education. This present study utilized this model (refer to Figure 3.2).

In the present study the teacher presage variable was: the teachers' humanistic-versus-custodial attitudes as measured by the Pupil Control Ideology by Willower Eidell and Hoy (1973).

The contextual variables measured within this study were also seen as critical process variables. They are: the students' perception of the classroom climate as measured by the My Class Inventory (MCI) and Classroom Life (CL) inventories by Anderson (1971) and Fox, Luszki and Schmuck (1966) respectively; the students' perceptions of the teacher upon the Teacher Relationship Inventory (TRI) by Wittmer and Myrick (1974); and the students' peer group relationships, as measured by a sociometric instrument.

The product variable in this study is the pupil's self-concept measured upon the How I See Myself instrument by Gordon (1968) and the

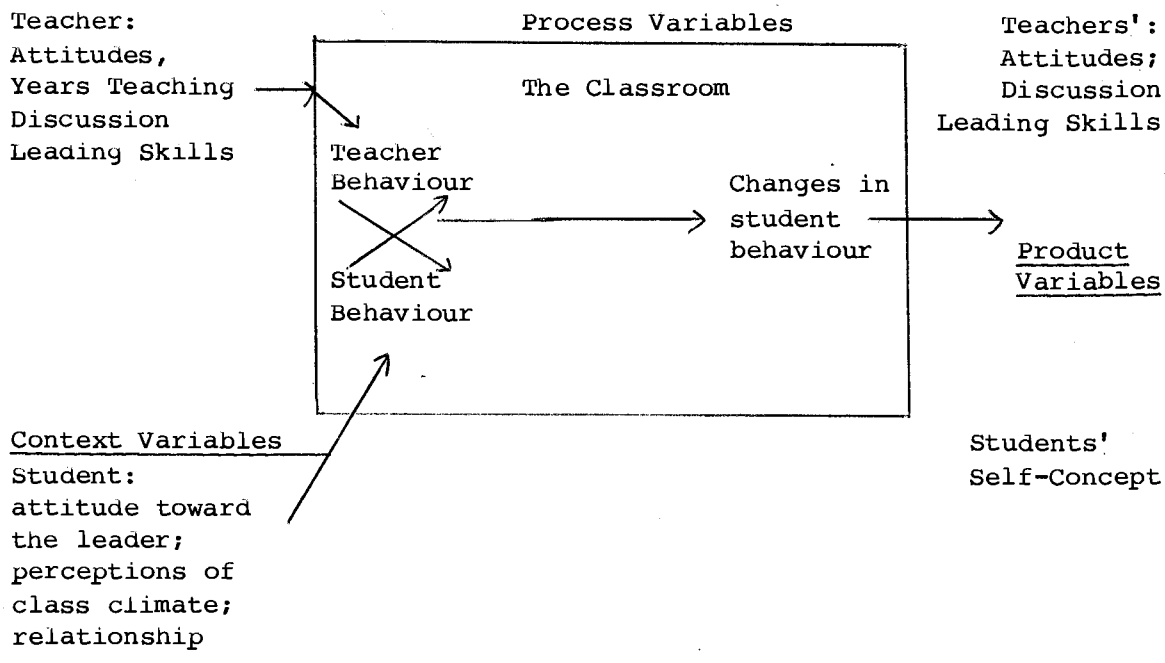


Figure 3.2: A teacher effectiveness orientation to this present study model adapted from Dunkin and Biddle (1974, p. 38).

pupil's Self Concept of Achievement instrument by Brookover, Erickson and Joiner (1967).

Besides the model evolved by Dunkin and Biddle the teacher effectiveness review was relevant to this study as it obviated the need for observations of classroom processes. Thus, this study has utilized the Fuller (1969) observation schedule to indicate what is actually happening within the classes during teacher-led class discussions.

Figure 3.2 diagramatically depicts Dunkin and Biddle's (1974) model to guide teacher effectiveness studies. Within this present study the independent variable is the teachers' pupil control attitude. The dependent variables in this aspect of the present study are the teachers' discussion leading skills and the students': development of self-concepts; attitudes toward their teacher;perception of the class climate; and relationships with their peers.

This design by Dunkin and Biddle (1974) was chosen as it provided a logical and simple model to afford the examination of a teacher style variable. Because Stiltner's (1973) findings suggested that teacher effects were a main source of statistically significant differences in her study, it was decided that one measure of teacher characteristics which may explain these differences could be the PCI, humanistic-custodial continuum. Because of its flexibility and simplicity, the Dunkin and Biddle (1974) model guided the designation and selection of variables to be utilized in this aspect of the study.

Rationale for Selection of Instruments. The Pupil Control Ideology (PCI) instrument was selected to measure teacher style upon a humanistic-custodial continuum. The reasons for selecting the PCI as a

measure of teacher style were the advantages of the PCI and its supporting conceptual and empirical evidence. The advantages of the PCI as a teacher self-report instrument are: it is easy to administer and has good reliability and validity; it has been widely utilized in research which generally reports empirically and conceptually consistent results.

In Chapter two it was argued that teacher style measured by a self-report instrument should be supplemented by observational data of how the teachers actually conduct their classes. Observational data from the FAIR instrument would provide a process measure of teachers' discussion leading skills as well as data which should provide behavioural confirmation of the teachers' PCI scores. The FAIR instrument was discussed earlier within the first aspect of this study.

Data Analysis. To test Hypothesis Five, the teachers' PCI mean scores from time one and time four testing periods were regressed upon: class means on the classroom climate inventories; the distribution of sociometric choice scores; the Logits (log f/1-f) of classroom discussion behaviour; and the development of students' self-concepts. The SPSS multiple regression program by Hull and Nie (1979) was utilized for this analysis.

Subjects

The teachers who participated in this study were volunteers from the school district of Burnaby, a West-Coast, Anglophone Canadian suburban district. The twelve teachers who taught grades six and seven were selected from five schools in this middle-class socioeconomic district. Each teacher could be considered to be experienced as the

mean years of teaching was 10 years. The most experienced teacher had taught for 27 years and the least experienced for five years. There were seven women teachers and five men teachers involved in this study.

There were five grade 6 classes, five grade 7 classes and two classes were grade 6/7 splits. Most classes had roughly an equal distribution of male and female students who were predominantly white. A total of 275 students participated in the study. Up to 25 percent of some classes were comprised of children with Asian or European parents. There were few black children in the sample. All classes were taught in English, although some classes had French lessons each week. The mean number of students per class was 24, the largest class being comprised of 29 students, while the smallest had only 18 students (refer to Appendix O-1). Nearly all the students were 11 years or 12 years old at the time of the first administration of questionnaires. The sample of students was considered to represent a normal distribution of intellectual ability for students of their age.

Within each class, students were requested to seek their parents' permission to be involved in the study. Each child was given a letter from the researcher and requested to return it to the class teacher with parents' signature, approving involvement in the study. (Refer to Appendix C). Students' involvement rate was high, varying from 100 percent in most classes to 85 percent in one class.

The following steps were undertaken to achieve the involvement of the 12 teachers. After the researcher approached the Burnaby District Research and Staff Development Director and obtained permission to conduct the research in the district, he then approached several principals and teachers and explained to each that the research was a

year-long study of individual classroom climates. The teachers were informed of the classroom climate nature of the study and were told that there was a possibility of a future workshop in this area.

Instruments

My Class Inventory (MCI). This instrument was first devised by Anderson & Walberg (1968) and was modified and published by Anderson (1971 and 1973). The MCI is a shortened and simplified version of the Learning Environment Inventory (LEI) which was also devised by Anderson & Wallberg (1968). The MCI was designed for use with school children from eight to twelve years of age, to determine their perception of the class climate. This instrument differs from the LEI in that: it contains only five of the original 15 LEI subscales; the wording of the items is simplified to enhance readability and comprehension for children at this age; and the response format is simplified to a two-point response format of "yes" or "no".

The MCI instrument as it was administered to students is attached in Appendix G-1 along with definitions of its five subscales of cohesiveness, friction, difficulty, satisfaction and competitiveness.

The MCI reliability data provided by Anderson (1973), and more recently Fraser and Fisher (1980), is presented in Appendix G-2. This data reveals that the MCI has high internal consistency, low discriminant validity and adequate reliability for this study. Appendices G-3 and G-4 report the alpha reliability coefficients for this present sample of 275 students and the correlations between MCI subscales. The alpha reliabilities range from 0.789 for the Satisfaction scale, to

0.542 for the Difficulty scale. The correlations range from 0.99 between Friction and Satisfaction, to -0.05 between Satisfaction and Difficulty.

Of particular interest is the very high positive correlation between the subscales of Satisfaction and Friction. This result suggests that both subscales were measuring the same attribute. Further, it casts doubt upon the scales' actually measuring Satisfaction and Friction as it would be expected that these scales would be negatively correlated. As these correlations stand, they indicate that the students' perception of a class as highly satisfying, is also concomitant with high friction in the class. This result is contrary to what the literature suggests the relationship between these two subscales should be. However, in spite of this incongruity the MCI scale was considered to have adequate reliability and validity to be utilized within this study.

The Teacher Relationship Inventory (TRI). This instrument was published by Wittmer and Myrick (1974) and it measures the students' perception of their teacher's interaction and relationship with them. The TRI is a 24 item questionnaire which has three subscales: the student's perception of the teacher's level of empathy; the student's perception of the teacher's level of regard; and the student's perception of the teacher's level of unconditionality of regard, or warmth. The TRI is attached in Appendix H-1.

The instrument was derived from the Barrett-Lennard (1962) Relationship Inventory (BLRI) which was designed to test a client's subjective report of his/her relationship with a therapist. Since 1962 the instrument has been adapted by changing the pronouns and slightly

varying the vocabulary to allow it to be used in other contexts, in particular the teacher-student context by Mason and Blumberg (1969).

Wittmer and Myrick (1974) selected only three of the original six variables included in the Barrett-Lennard (1962) instrument and reduced the number of items to measure these attributes. The authors also altered the response format from a +3 to -3 on the original version, to strongly agree, agree, uncertain, disagree, strongly disagree format. Despite two mail requests for information upon the TRI's reliability and validity, and two replies from one of its originators, no information or direction to any published articles which utilized the TRI was received.

As a result, the researcher has respected the face validity of the instrument, especially as the BLRI has been widely used and has considerable validity and reliability data available upon it. Appendix H-2 reports upon the BLRI and the TRI, with BLRI reliability coefficients obtained by Stiltner (1973).

The data from the TRI was treated as interval data to allow reliability and correlation coefficients to be calculated. Appendix H-3 reports the means, standard deviations and alpha reliabilities for each subscale. Since the alpha reliability of the unconditionality of regard subscale reached only 0.188 it was decided to delete it from any further analysis. In Appendix H-4 the correlations between the subscales of empathy and regard was $r = 0.85$. This revealed that empathy is highly correlated with regard and they may be measuring the same attribute. Problems associated with the measurement of empathy and regard were discussed in more detail by Barling (1980a).

Classroom Life (CL). This nine item test was originated by Fox, Luszki & Schmuck (1966) to be used by teachers to give them a general

view of their classroom climate. The CL questionnaire was designed primarily as a diagnostic tool and not as a valid and reliable predictive questionnaire. The instrument was included within this study because unlike the other instruments, CL has two items (2 & 4) which provide an insight and measure of students' motivation and committment to class work. Further, because the instrument is short, easy to administer and easy to respond to, it was included with both the MCI and TRI so that its reliability and validity could be tested.

Classroom Life (CL) required the students to select the best alternative from among four to six alternatives, to describe how they feel about their class and life in their class.

Upon examination of the items the researcher felt that item seven was more related to a student's self-concept of academic ability, rather than general classroom climate. As a consequence reliability, means and standard deviations were calculated upon this inventory both with and without item seven.

In Appendix I-2 the means, standard deviation and alpha reliabilities for the CL scale are reported. The alpha reliabilities range from 0.70 to 0.788, which indicates high reliability for the scale. The correlation matrix between the nine questions (Appendix I-3) reveals that question seven is highly correlated with question four and its exclusion could be justified on the grounds that it was not measuring anything different from question four.

While the correlation matrix provided evidence to suggest that the exclusion of item seven was justified, the correlation of the CL and the CL-7 scales with the MCI and TRI subscales suggests that the instrument's validity would suffer as a result of this deletion. Appendix I-4

reveals that the total CL instrument is negatively correlated with the MCI Satisfaction, Friction and Competition subscales, as well as with the TRI empathy and the TRI regard subscales. This suggests that the higher the student's score upon the CL instrument, the lower his perception of the Satisfaction, Friction and Competition within his class. As the high correlations suggest that the total CL instrument is more useful and a more valid measurement of classroom climate than the CL-7 format, it was decided to compute further analyses upon it. The credibility and usefulness of the CL-7 subscale is considerably reduced by its small correlation with only two MCI subscales: Difficulty and Competition.

The CL instrument is attached within Appendix I-1; the data obtained from it will be treated as interval data.

Sociogram. This instrument was adapted from Moreno's (1934) original conception of a sociogram. Hallinan (1976) used the same format as this present study, which required students to selectively describe their interpersonal relations with each student in the class. Students were required to decide whether another student was: their "best friend" (someone they liked very much); their "friend" (someone they liked but would not classify as their best friend); someone that they "know"; and/or someone whom they did "not know". The instrument had the names of all class members on it and students were requested to rate every student. A blank pro forma of the instrument is attached in Appendix L.

The sociogram was used to provide a measure of social climate of the class, in the form of either a centralized or diffuse class structure. The data from the form was treated as nominal data and only the

"best friend" category was analysed since Hallinan (1976) reports it has the greatest reliability. Sociometry and the validity of this approach to collecting data were initially elaborated and defended by Moreno (1934). More recently researchers Schmuck & Schmuck (1971) and Combs (1975) have conceptually and experimentally defended the validity and rich source of data available from sociometric testing.

Fuller Affective Interaction Record (FAIR). This observation instrument was developed by Francis Fuller (1969) at the Texas Research and Development Center for Teacher Education and is reported in Simon and Boyer (1970, p. 43). The FAIR includes 14 teacher response categories for classification of teacher talk and 14 for student talk. The FAIR was chosen for this study because of its large number of both teacher and student response categories which could be utilized in a variety of situations. Further the use of the same instrument as Stiltner (1973) would afford some comparison between elementary and high school teachers' discussion leading skills. A summary of the FAIR categories appears in Appendix F-1.

While the FAIR was designed to be utilized with videotaped class lessons, Stiltner (1973) trained observers to complete the recording manually in the classroom. Because of the interference caused by the presence of videotape equipment and the lack of reliability of live observations, the researcher in this study chose to audiotape record the teacher leading a class discussion.

The researcher and another experienced teacher and graduate were trained in the use of the FAIR upon a class discussion tape which was not from one of the classes involved in the study. Upon another tape their interrater reliability was established using Pearson's Product

Moment Correlation, at r = 0.82. The tapes from each measurement time were randomly assigned a number and both raters recorded all behaviour which occurred. The raters repeated their notation every ten seconds if the behaviour continued. Thus, both frequency and duration of the behaviour was recorded. The researcher rated 16 tapes and the graduate student rated eight tapes. The raw data were treated as nominal data and punched into computer cards, then converted into percentages by dividing the number of observations that occurred in one category by the total number of observations. This method also allowed the computation of a total percent of teacher talk and student talk. The percentages were later converted to Logits (log f/1-f)in an attempt to normalize their distribution and meet the requirements of the analyses procedures.

Appendix F-2 reports the mean frequencies and ranges for both teacher and student talk categories upon the FAIR instrument for all classes.

One characteristic of the mean frequencies and ranges of frequencies for all classes on the FAIR observation schedule is the very large "ranges of frequencies". This large range for each category often exceeds the mean frequency and indicates the differences between the interaction in the classes during the discussions.

Categories which do not appear in Appendix F-2 were excluded because their frequency of occurrence was too low and in most cases no observations were recorded for the categories.

The Pupil Control Ideology (PCI). This instrument was designed by Willower, Eidell and Hoy (1967) to measure the teachers' ideology concerning pupil control upon a custodial versus humanistic continuum. The 20 item questionnaire required the teacher to either strongly agree,

agree, undecided, disagree or strongly disagree with each statement. For example, item 7 requested the teacher to respond to, "Pupils should not be permitted to contradict the statements of a teacher in class."

Teachers' responses were scored from five if they strongly agreed, to one if they strongly disagreed. Two items (5 & 13) were reversed upon the questionnaire (see Appendix D), and the higher the score, the more custodial a teacher's pupil control ideology: the lower the score the more humanistic. The data from the PCI was treated as interval data. The split-half reliability of the PCI was reported as .91 and .95, by Willower et al. (1967) for two different populations using the Spearman-Brown formula.

The validity of the PCI has been tested in a variety of ways by the test originators and their colleagues. Willower et al. (1967) requested seven school principals to classify a specified number of teachers in their schools who were "most custodial" and "most humanistic" according to the PCI definitions. Using a T-test the authors found that teachers judged to be most custodial had significantly higher PCI scores than those judged to be most humanistic. Besides this behavioral validation the PCI has also been found to correlate with: student alienation (Rafalides & Hoy 1971); the organizational climate of a school (Hoy & Appleberry 1970); and dogmatism (Willower et al. 1967). The PCI form also is accompanied by extensive norms collected by Willower et al. (1967).

For the purposes of this study the PCI form was considered to have satisfactory validity and reliability. The PCI was also chosen to be included within this study as it provided a simple yet reliable and

valid measure upon the conceptual and behavioural dimensions of teacher style.

The teachers' responses to the PCI upon a pretest and posttest revealed mean scores which ranged from 39.5 to 55.5 with a mean of 46.4. This data meant that for this sample the teachers tended to be more humanistic than custodial.

How I See Myself (HISM). This self-report self-concept instrument was designed by Gordon (1968) in order to offer teachers an easy to administer and easy to score instrument which would yield several factor scores upon the child's self-concept.

The Gordon (1968) HISM consists of 40 items each of which requires students to think of themselves as they are most of the time and how they feel about themselves. Each item then requires the students to place themselves on a five-point continuum upon which each of the extreme positions are defined. The HISM instrument as it was administered to the students is reprinted here in Appendix J.

To determine the reliability of the HISM Combs and Gordon (1967) tested 80 high school pupils in summer make-up classes over a two-week period. Test-retest coefficient of reliability for four subscales (Teacher, Appearance, Body-build and Academic Achievement) ranged from 0.62 to 0.82. Later in that same year Yeats (1967) reported stability coefficients ranging from 0.78 to 0.89 over a nine day period for students of the third, fifth, eighth and eleventh grades. Yeats' (1967) total population was 8979 students from a north-central Florida school system.

In order to provide validity for the HISM instrument Combs and Gordon (1967) used a mixture of projective techniques and observations

in the interview setting as cues for inferences about pupils' self-concepts. The researchers found that, although positive and significantly different from zero, the correlations were generally of a low order.

Gordon (1968) concluded that the inferred measure of self-concept was somewhat different than self-concept measured by the HISM self-report instrument. This suggests that self-concept measured by the self-report instruments may be different from self-concept inferred from observations, or that observation may be measuring only one aspect of self-concept.

Because Gordon's (1968) factor analysis of his items was somewhat arbitrary and his factor loadings have been criticized by Stavelson, Huber and Stanton (1976) as well as by Marx and Winne (1978 and 1980) this researcher decided to conduct a factor analysis upon students' responses to the HISM at their first testing period. This procedure then enabled the most meaningful factors for this sample of students to be isolated and explored.

Two hundred and seventy-four student responses to the HISM questionnaire were analysed upon a principal factor analysis, using SPSS by Nie et al (1975). Fourteen principal factors were located. These factors and their questions showed only moderate agreement with the factors proposed by Gordon (1968) and low reliability. Thus, it was decided to complete further analyses using the varimax rotated factor matrix. The first three, then four, and five factors were rotated once upon the varimax rotated factor matrix. The four-factor analysis was chosen to provide the factors for further analysis for two reasons. First, the factor loadings upon factor one were consistently higher for

the four factor rotation than for three, or five rotation. Second, the eigen values justified selecting only four factors.

The four factors selected had questions with factor loadings of more than + or -0.30 and ranged up to a loading of -.75. Together the four factors accounted for 32 percent of the variance of the total HISM questionnaire. For individual factor loadings and questions which contributed to each factor see Appendix S. This table identifies the four chosen factors as a Teacher-School factor, Physical factor, an Interpersonal Adequacy factor, and a Social factor.

The HISM was considered to be an instrument of adequate reliability as the alpha reliabilities for the subscales ranged from Alpha - 0.336 for Teacher-School, to 0.625 for the Physical factor. The other two factors had alpha reliabilities of: Alpha - 0.554 for Interpersonal Adequacy; and Alpha 0.354 for the Social factor of 274 students at time one.

Self Concept of Ability Scales (SCA). This specific measure of self-concept of academic ability has been extensively used in a number of large studies conducted at Michigan State by Brookover, Paterson and Thomas (1962), Brookover, LePere, Hamachek, Thomas and Erickson (1965) and Brookover, Erickson and Joiner (1967).

The researchers defined the "Self-Concept of Ability" as referring to the evaluating definitions which individuals hold of themselves with respect to their ability to achieve in academic tasks in general, by comparison with others in their class.

The SCA scale is attached in Appendix K. The SCA is scored by reversing all the values so that the student who has the higher score

has the better self-concept of academic ability. The data yielded by the SCA is treated as interval data.

The reliability of the SCA has been reported in Brookover et al. (1962), Brookover et al. (1967), and by Paterson (1966). Using Hoyt's (1941) analysis of variance reliability coefficient, the internal consistency for the SCA upon samples of subjects drawn from grades 7 to 10, ranged from 0.82 to 0.92. The test-retest reliability reported over a one-year interval using Pearson Product Moment correlations ranged from 0.69 to 0.72 for students in grades 8 to 12. For both male and female students the test-retest reliability over the one-year interval for grades 8 to 12 ranged from 0.688 to 0.727. In general the reliabilities are high enough to permit the study of individual differences.

Shavelson, Bolus and Keesling (1981) found that for the SCA the convergent validity was in the order of 0.74. The researchers also calculated the disciminant validity coefficients which were considerably less than the convergent validity coefficients and thus the criterion of discriminant validity was met.

Thus, the preceeding validity and reliability data upon the SCA reveals that the instrument has sufficient reliability and validity to be included within this study. Further, the SCA was chosen for this study because it provided the most reliable and valid measure of student's self-concept of achievement, more reliable and valid than the previously discussed HISM instrument.

The descriptive statistics upon this instrument for 267 students at time one yielded a mean of 28.23 with a standard deviation of 3.97. The alpha reliability of the scale was 0.82. For the purpose of this study the SCA was considered to be of good reliability.

Quantity of Project GROW Activities Implemented. This measure of the number of activities conducted by the teacher was obtained by having teachers check their Project GROW books and their daily work program. The total number of activities implemented was utilized within the analyses.

Because the teachers were volunteers in a research project initially presented as a study of their class climates, their involvement in this curriculum implementation aspect of the study was also voluntary. While the researchers had an expectation of high implementation, it was not a condition of their involvement that they implement all activities. As a result there emerged two levels of implementation: the "high-implementers" and the "low-implementers." These data were considered to be vital by Charters and Jones (1973) in determining to be their level three criterion of "role performance"; they were treated as ordinal data.

The Quality of Implementation of Project GROW Activities. This measure of implementation also contributes to Charters and Jones (1973) criterion of "role performance". However, the measure is oriented toward "how well were the activities conducted". The Teacher Interaction Activity Schedule (TIAS) was designed by the researcher and consisted of twelve categories on which the observer rated the teacher conducting the activity (refer to Appendix E-1).

Each teacher from the experimental group conducted the Project GROW activity "Don't Tear Me Apart" (Barling 1980b, p. 95). The teachers were observed by two raters, the researcher and the school counsellor. A teacher's TIAS score was the average of both raters' scores upon the items.

Because the instrument had not been trial tested, there were no reliability or validity data for it. Further, when the instrument was used several items were found to lack relevance to the success of the implementation. As a result only items 11 and 12 were used in the analysis of the data. These two high-inference items enabled the researcher to again classify the teachers as "high-implementers" and "low-implementers" upon the quality criterion.

Data from both sources, the quality and quantity measures, are reported in Appendix E-3. These data were utilized in a post-hoc fashion to categorize the teachers into a high- and low-implementing group. Both sets of data were congruent with each other as the "high-implmenters" were also found to be only slightly better than the others upon the quality of implementation. Further data on teachers, classes, and groups are also provided in Appendix O-1.

Procedure

An overall matrix of the Study Design, Time-Line of Interventions, and Data Collection is presented in Appendix T-1; this should be referred to in the following discussion.

Each of the twelve teachers and their classes were pretested upon the questionnaires during the first two weeks in October 1980 (O1). Teachers were then randomly assigned to an experimental group (ER), and a control group (CR) using a table of random numbers.

The experimental group. The six teachers who had been randomly chosen were approached by the researcher who requested their involvement

in a one-day professional development workshop and subsequent implementation of the Project GROW curriculum of interaction activities. All teachers assigned to the experimental group agreed and participated in a workshop with their school counsellor on November 12th, 1980.

During the workshop the researcher explained the rationale and theoretical framework underlying Project GROW and the theory of group development proposed by Tuckman (1965). Teachers were oriented to the activities in Phase One and Phase Two of Project GROW through small group discussion and preview of each activity. Discussion of problems associated with implementation and ideas to improve the activities were also shared at the workshop.

The aim of the one-day workshop was primarily to orient teachers to Project GROW as a curriculum resource and to induce them to commit themselves to implement the activities. Because of the limited duration of the orientation workshop there was no attempt to train teachers to improve their implementation of interaction activities. The workshop was well received by both the school counsellors and the implementing teachers. The counsellors agreed to provide support and expert assistance to the teachers. The teachers all agreed to commence implementing the activities.

Several aspects of the workshop and the future implementation of the activities deserve individual comment:

1. Teachers were encouraged to select and adapt activities to suit their own and their class's needs.

2. The teachers were encouraged to conduct at least one, and hopefully two activities during the initial weeks of the Project. They

were requested to conduct the activities in the order that they appeared in the Project GROW book.

3. The teachers were given ownership of the Project GROW resource and encouraged as a group to provide the researcher with valuable feedback upon their implementation success or failure and the suitability of the exercises. This feedback was to enable future revision of the Project GROW resource.

4. The teachers who implemented Project GROW activities met as a group with the researcher on three more occasions. On these occasions the experimental group of teachers and the researcher met for approximately two hours to discuss the implementation process, teachers' problems, future goals and future adaptations of the Project GROW activities.

The preceding four aspects of the workshop and later implementation were derived from curriculum implementation literature as suggested successful strategies. Fullan (1979) elaborated upon the need for teachers to feel a sense of ownership of their resources and to feel free to adapt the material. This mutual adaptation mode for projected further development of the curriculum resource was also advocated by Berman and McLaughlin (1977) in their extensive curriculum implementation report for the Rand Corporation. The key principles and factors related to effective curriculum implementation listed by Fullan (1979) were considered and acted upon in order to increase the likelihood of successful implementation by the experimental group of teachers.

The control group. The six teachers who were randomly allocated to the control group were told that at the conclusion of the study they

would be given a copy of the Project GROW resource book and an orientation to its concepts and activities. The teachers were requested to conduct their class as they normally would, but to refrain from implementing a curriculum of interaction activities. As none of them had previously implemented many interaction activities this request was not difficult to meet. Each control group class was visited during the same week as the experimental group classes and the four data collection times were those indicated in Figure 3.3.

Duration of Study. The study commenced in October 1980 and continued until the end of May 1981. During this time there were four data collection times which are diagramatically depicted in Figure 3.3. Figure 3.3 also depicts: the specific data collection times for classes; the implementation of Project GROW activities during each data collection time; and the supplementary activities the experimental group undertook.

Implementation of Activities. All experimental group teachers conducted interaction activities during the academic year. While Figure 3.3 indicates the Phase of Project GROW the activities were chosen from and when they were implemented, Table 3.2 includes data which relates the testing time to the predicted stage of group development as indicated by Tuckman's (1965) model; and the implementation of Project GROW activities which correspond to each period of time between testing times.

When Table 3.2 is examined in conjuction with the more detailed Appendix E-3, the number of activities and the particular activity conducted between each testing time can be obtained for each teacher. In general these data indicate that all experimental group teachers

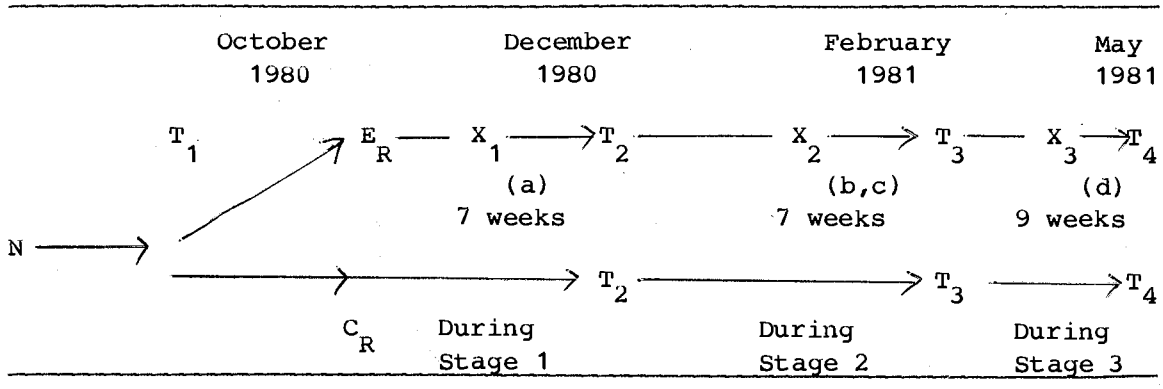


Figure 3.3: Study Design and Time Line Interventions and Data Collection

Key: E_R : randomly assigned experimental group

C_R : randomly assigned control group

T_1 : data collection time 1 - 14 October 1980

T_2 : 3 - 9 December 1980

T_3 : 23 - 27 February 1981

T_4 : 13 - 22 May 1981

(a) : the 1-day workshop, 12 November 1980

(b) : the second meeting of the experimental group, 3 December 1980

(c) : the third meeting of the experimental group, 4 February 1981

(d) : the fourth meeting of the experimental group, 22 April 1981

X_1 : implementation of Project GROW activities from Phase 1

X_2 : implementation of Project GROW activities from Phase 2

X_3 : implementation of Project GROW activities from Phase 3

Table 3.2

Predicted Stages of Group Development
(Tuckman, 1965) and Project GROW Activities

Testing Time	Predicted Stages Tuckman (1965)	Project Grow Sequence of Activities*
T1	During Stage 1: Forming	After T1, Phase 1 activities
T2	Start of Stage 2: Storming	After T2, phase 2 activities
T3	Start of Stage 3: Norming	After t3, Phase 3 and Phase 4 activities
T4	Approaching the end of Stage 4: Performing	

*See Appendix E-3 for a description of Project GROW activities conducted by teachers between each testing period.

implemented the majority of Phase 1 activities between 12 November 1980 and Christmas time. All experimental group teachers implemented the "Classroom Meeting" activity (activity number 13) as a regular feature of their class' weekly program during the remainder of the school year. During this period of time from Christmas until the end of May there emerged two distinct groups of teachers. These data were utilized to categorize the experimental group of teachers into high-implementation and low-implementation groups. The high-implementation group introduced the majority of the remaining Phase Two, Three and Four activities, while the low-implementing group of teachers introduced fewer and fewer activities as the year progressed. So noticeable was the low-implementing group's decline that, besides the classroom meeting activity, they implemented only a few activites from Phase Two, and only one from Phases Three and Four.

Questionnaire Administration. At each data collection time the researcher administered each questionnaire and conducted the class for the duration. On some occasions the class teacher left the classroom. The order of administration of the questionnaires is reported in Appendix T-2.

All students who participated in the study were administered each of the questionnaires. This strategy was adopted to allow an accurate "class perception" to be gained from each instrument. Absences at each measurement time were not followed up and generally there was a 75 percent minimum response rate from each class. The fact that there was a minimum school time of seven weeks between questionnaire administration and that there were four questionnaires within each administration would tend to minimize the probability of test-retest effects. Further, at each administration it was stressed that there were no right or wrong answers, but students should select answers to describe how they "feel" about life in their class at the present time. The directions to each questionnaire were then read to the students as they progressed from one instrument to the next.

Data processing and analysis. Data collected from all instruments except the MCI, TRI and CL were directly keypunched into computer data processing cards which were verified for accuracy.

The unit of analysis in this study is the class group. All analyses of the data as described in the previous sections were completed upon the Simon Fraser University computer. The results of these analyses are reported in Chapter Four.

CHAPTER FOUR

RESULTS OF THE STUDY

Introduction

Within this chapter data pertaining specifically to each aspect of the study and the analyses designed to test each hypothesis are presented. The results will be presented in summary form, reviewing only those which reach statistical significance at the ($p<.05$) level. Specific data pertaining to each analysis conducted will be presented in the Appendices.

While the data pertaining to Aspect One of this study are primarily concerned with time x treatment group interactions, it has been decided to represent these data graphically even if they do not reach statistical significance. The graphical presentation of data will be the basis of the interpretation to explore the question posed to guide the investigation into Aspect Two of this study.

Tests for School Effects.

The preceding literature review in Chapter two suggested that school climate variables may affect classroom variables (Stiltner 1973). In order to detect if school climate variables were statistically significant influences within this present study, a one-way analysis of variance, with school as the factor was performed. The ANOVA was performed on the data using the SPSS (Nie, et al 1975) program.

Appendix P-3 reports these data, which indicate that there were statistically significant differences ($p<.05$) between schools upon the MCI subscales of satisfaction, friction and cohesion.

Utilizing the Scheffe (1959) procedure for testing the range of differences among the schools (refer to Appendix P-1), statistically significant differences ($p<.05$) were found between School two and the other five schools upon the MCI Satisfaction subscale. Further, there was a statistically significant difference ($p<.05$) between School five and the other schools upon the MCI Friction subscale. No other statistically significant differences were detected upon the MCI, TRI or CL subscales using the Scheffe (1959) procedure.

When a second ANOVA was conducted upon the means from the three instruments to test for significant differences between the experimental group and the control group at time one, no statistically significant results were found. Refer to Appendix P-2 for the results of this analysis.

As a result of both analyses it was concluded that except for differences between schools two and five, and the rest of the schools upon satisfaction and friction respectively, differences between schools which influenced the MCI, TRI, and CL responses were insignificant. From these analyses it was concluded that differences among schools was an intervening variable which would have little consequence (except for satisfaction and friction subscales of the MCI) upon future interpretation of results. Thus, the following analyses should primarily be measuring differences in classroom climate related to the experimental and control conditions, rather than influences related to differences among schools in the experimental sample.

Aspect One: Can the Teacher's Implementation of A Series of Interaction Activities Facilitate The Positive Development of Upper-Elementary Classroom Climates and Student Self-Concepts?

Hypothesis One

There will be no statistically significant difference between the class means of the control and experimental groups on the scales of the classroom climate inventories at any of the four measurement times.

Data From Analyses To Test Hypothesis One

The first analysis completed upon the data to test this hypothesis was a multivariate analysis of variance (MANOVA). Data from this analysis are reported in Table 4.1.

Within this analysis there were three factors: time (four measurements); treatment group (three levels); and the interaction of time x treatment group.

Table 4.1 reports three statistically significant effects ($p<.05$). For the MCI there was a statistically significant difference between times. For the TRI scale the statistically significant differences were reported between times and for the interaction of time and treatment group.

In order to isolate which subscales were indicating statistically significant effects, a series of three-way ANOVA's were completed upon the subscales of the MCI, TRI and the CL scale. These data are reported in Appendices Q-1 and Q-2. A summary of the statistically significant results is reported here in Table 4.2. All probabilities have been rounded to the more conventionally used probability values.

In general the data in Table 4.2 indicates that there were statistically significant differences ($p<.05$) for all groups, on most subscales, over time. Only one treatment group effect was statistically

Table 4.1

Manova for MCI and TRI Scales

Source	Wilks Lambda		F Value		Probability	
	MCI Scale	TRI Scale	MCI Scale	TRI Scale	MCI Scale	TRI Scale
A (Time)	1.0507	2.7306	3.2538	3.0615	0.0019	0.0082
B (Treatment Group)	2.6522	6.7931	2.0562	0.2844	0.2541	0.9286
AB	1.5310	2.0159	1.1574	1.9354	0.3106	0.0372

significant, with the MCI subscale of Cohesion ($p<.025$) registering a statistically significant difference; the Empathy scale alone showed a statistically significant ($p<.025$) result due to an interaction of time x treatment group.

In order to further interpret these results each statistically significant finding will be plotted and discussed in more detail. All statistically significant effects were isolated using the post-hoc analysis known as Duncan's Multiple Range Test for Alpha=0.05. (Refer to SPSS manual by Nie, et al 1975). This analysis enabled data to be interpreted for each treatment group, at each of the different measurement times, and in relation to each other treatment group. The following Figures include details upon the three treatment groups utilized within the analyses: (E1) are the experimental classes (high-implementers of Project GROW activities); (E2) is the group of classes which implemented only a few Project GROW activities; and (C) the randomly selected three classes which formed the control group.

My Classroom Inventory (MCI) data. Figure 4.1 illustrates the development of the three treatment groups upon the MCI dimension of

Table 4.2

Levels of Significant Differences on Dependent Measures

MCI, TRI, and CL from ANOVA Analysis

Scale	Source		
	A (Time)	B (Treatment Group)	AB
MCI			
Satisfaction	--	--	--
Friction	0.0025	--	--
Competition	--	--	--
Difficulty	0.005	--	--
Cohesion	0.05	0.025	--
TRI			
Empathy	0.005	--	0.025
Regard	0.025	--	--
CL			
Total	--	--	--

Friction. The high-implementing classes (E1) maintained a low level of friction from time one-to-time three. There was an increase in the level of friction felt in these classes at time four. Both the control classes and the low-implementing classes showed an increase in friction from time one to time two, and then a slower rate of increase until time four.

There was a statistically significant difference ($p<.002$) between measurements at time one and the other three measurement times. Of particular interest in Figure 4.1 is the consistently higher level of friction in the low-implementing group. Their level of friction experienced is also consistent and parallel in its development with the control group.

This unexpected finding was also duplicated within the MCI subscale Cohesion. Figure 4.2 illustrates the change in the level of cohesion

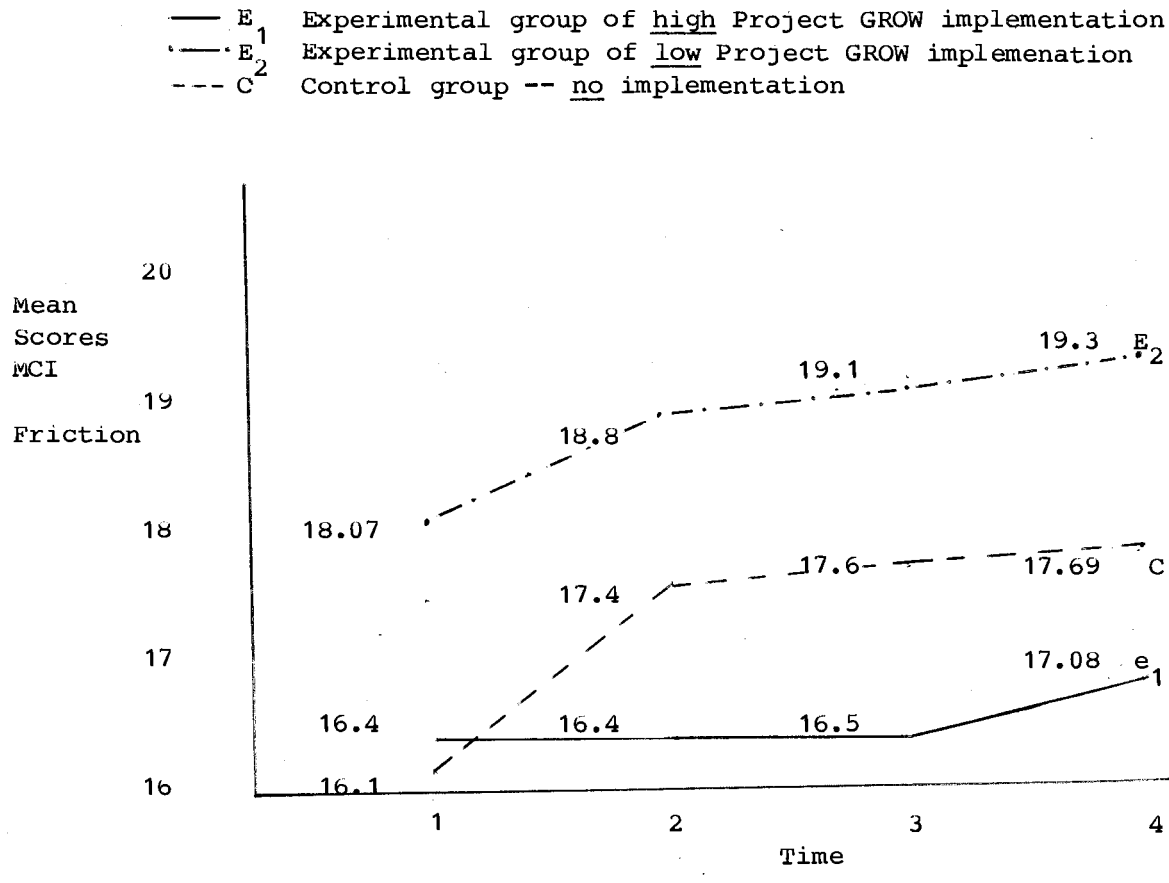


Figure 4.1: Treatment Group x Time Interaction on Dependent Variable MCI Friction across Four Time Periods.

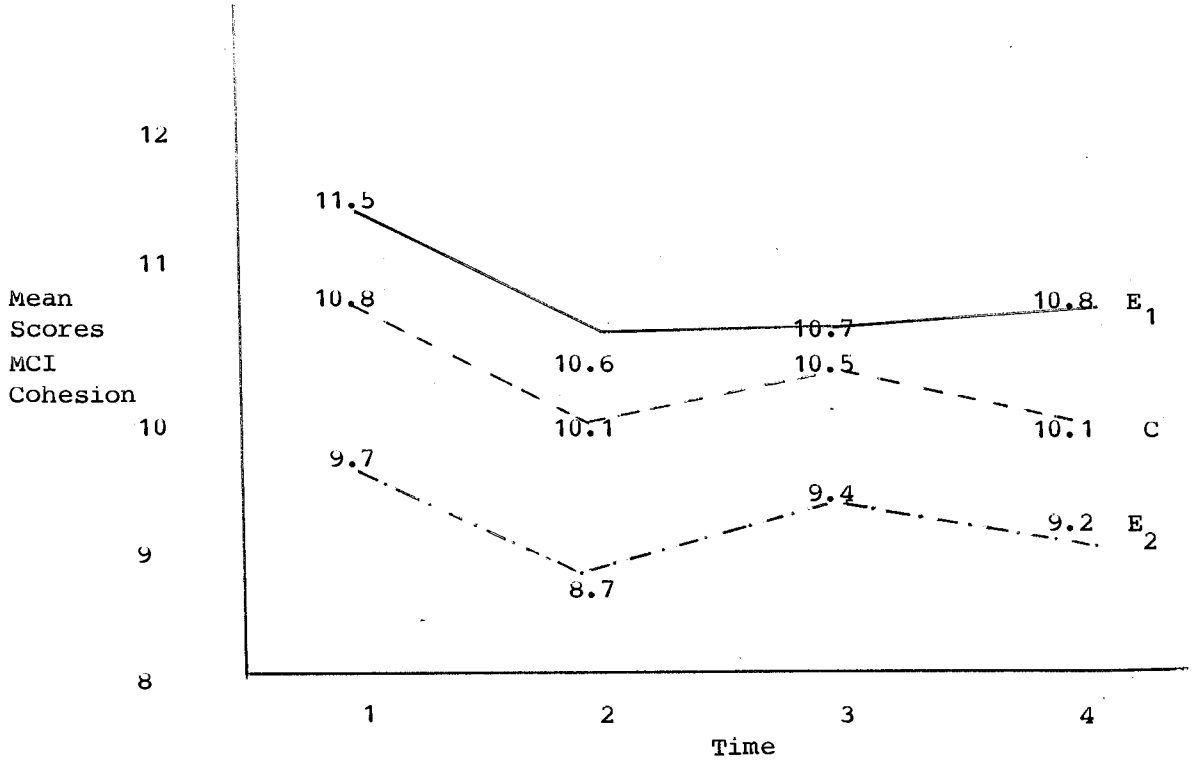


Figure 4.2 Treatment Group x Time Interaction on Dependent Variable MCI Subscale Cohesion.

experienced from times one to four. The low-implementing group maintained a consistently lower and parallel development upon the index of cohesion in relation to the control group of classes. While the high-implementers followed a similar pattern to the other groups, and showed a decrease in cohesion at time two and an increase at time three, they continued to increase their cohesiveness while the other two groups' level of cohesion decreased at time four.

Within Figure 4.2 there is also a statistically significant difference ($p<.05$) between the cohesion measurements at time one and the other measurement times. Further, there is a statistically significant difference ($p<.025$) between the high-implementing and control groups and the low-implementing group.

Within Figure 4.3 the level of perceived difficulty the students experienced with their school work is illustrated. In general, the level of difficulty decreased from time one to time two. The decrease continued but was interrupted in the low-implementing group at the fourth measurement time. The level of difficulty experienced by this group increased from time three to time four. Within Figure 4.3 there were statistically significant differences ($p<.005$) due to time. This difference was statistically significant between time one and all the other measurement times. There was also a low-level of statistical significance ($p<.10$) between treatment groups. This difference was between the high-implementing group and the control group over the four measurement times.

Teacher Relationship Inventory (TRI) data. The level of teacher empathy perceived by each group is illustrated in Figure 4.4. While the low-implementing classes and the control group classes perceived their

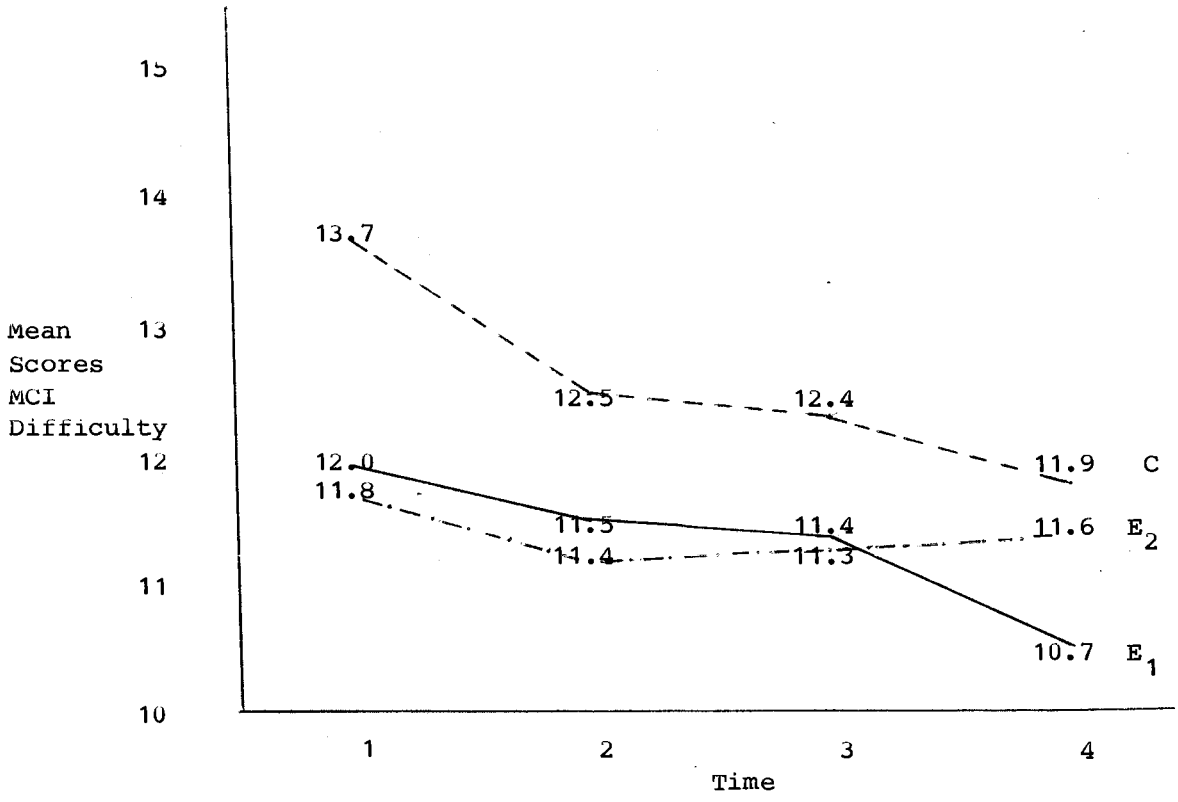


Figure 4.3: Treatment Group x Time Interaction on Dependent Variable MCI Subscale Difficulty.

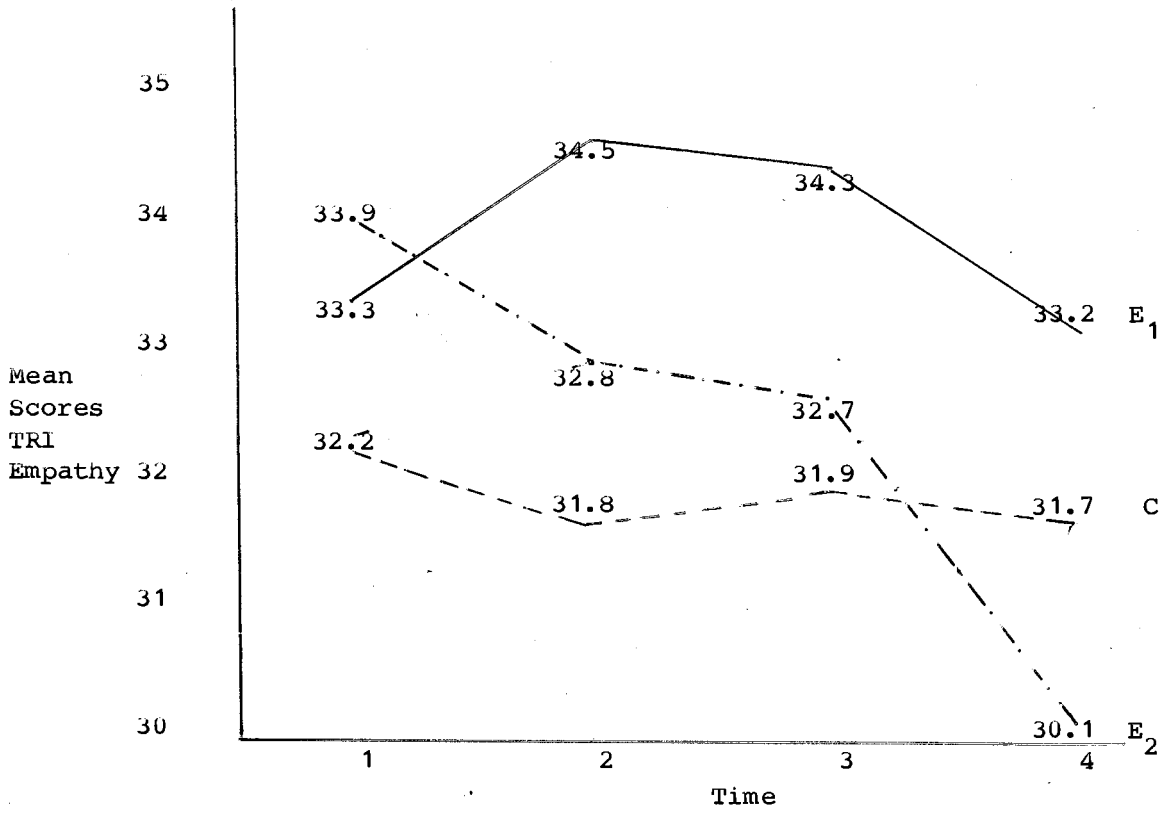


Figure 4.4: Treatment Group x Time Interaction on Dependent Variable TRI Empathy.

teachers' empathic relationship with them as deteriorating during the year, the high-implementing classes saw their teachers as more empathic at time two and time three. The high-implementing group, however, saw their teachers as being less empathic at time four than time three.

The control classes perceived only a small deterioration during the year. By contrast the low-implementing classes experienced their perception of their teachers' empathy as decreasing at a greater rate and magnitude during the year, especially from time three to time four. The statistically significant difference ($p<.005$) was found between the teachers' empathy at time four and the other three measurement times. There was also a time x treatment group interaction ($p<.025$) between the low-implementing group at time four and the control group, and the high-implementing group and low-implementing group at time two. Further, the difference also existed between the high-implementing group and the control group at all measurement times except time four. The high-implementing group was also statistically and significantly different from the low-implementing group at times two and three.

Figure 4.5 illustrates the change in students' perception of the level of teacher regard that is displayed to them during the year. This figure is somewhat similar to the previous Figure 4.4 in that the control group, and the high-and-low-implementing groups share a similar relationship to each other. However, upon closer inspection the TRI Regard scale is distinctly different from the TRI Empathy scale.

All groups showed an increase in their perception of their teachers' level of regard displayed to them from time one to time two. This increased then gently decreased during the remainder of the year for the high-implementing group and the control group. By contrast, the

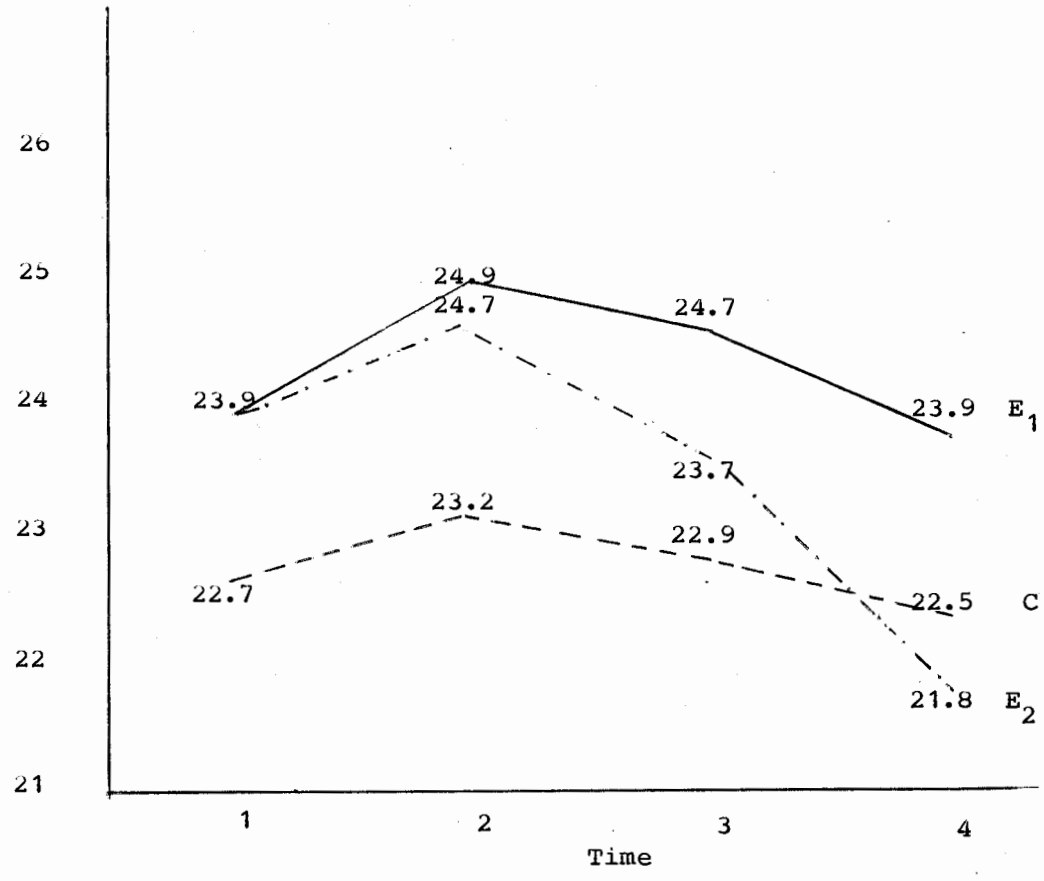


Figure 4.5: Treatment Group x Time Interaction on Dependent Variable TRI Regard.

low-implementing group and their perception of their teacher's regard fell sharply from time two to time three and then more sharply from time three to time four. This sharp "fall-off" in the level of teacher regard was also experienced by the low-implementing group for teacher empathy. Within Figure 4.5 there was also a statistically significant difference ($p<.025$) between the level of regard experienced by all students at measurement time one and four compared with the level of regard at times two and three.

Classroom Life (CL) Data. The analysis on CL data revealed no statistically significant major effects or interaction effects between the groups of classes.

Conclusion

From the preceding Figures, Tables and discussion of their data, it can be concluded that Hypothesis one should be accepted in its null form. This suggests that the data generally support the claim that there are no statistically significant differences between the class means of the control and the experimental groups on the scales of classroom climate inventories at the four measurement times.

From Table 4.2 and the subsequent Figures of each subscale it can be seen that of the eight variables there was only one which recorded a statistically significant effect due to treatment group: cohesion ($p<.025$). One other variable, teacher empathy, recorded a statistically significant time x treatment group interaction ($p<.025$). For these two variables the null hypothesis was rejected. However, while there were few statistically significant results related to treatment group effects, there were a number of dependent variables which showed changes

in the anticipated directions. In general, these changes suggest that the high-implementing group of teachers had students who experienced their classes as less difficult, having less friction, and being more cohesive. Further, their teachers were perceived as more highly regarding than were those of the control and low-implementing groups.

Hypothesis Two

> There will be no statistically significant differences between the control and the experimental groups in the distribution of sociometric choice scores at any of the four measurement times.

This hypothesis is also related to the first aspect of this study: an investigation of the effects of interaction activities upon the development of classroom climate. In order to investigate students' friendship patterns and their changes during the year, analyses were conducted upon: class mean number of best-friend (BF) choices; percentage and logit of students receiving 3 or more BF choices; the percentage and logit of students receiving 6 or more BF choices; the percentage and logit of students who received zero BF choices; and the class standard deviation of BF choices.

Table 4.3 reports the levels of significant differences from the analysis of variance conducted individually upon each sociometric measure. The complete descriptive statistics for each analysis may be found in Appendices Q-3 to Q-6.

Table 4.3 presents data that indicates that nearly all sociometric measures showed statistically significant ($p<.025$) differences. These differences can mainly be attributed to the different times the measurements were taken.

Table 4.3

Levels of Significant Differences on Sociometric Choice Data ANOVA

Scale	Source		
	A (Time)	B (Treatment Group)	AB
Mean Choice B.F.	0.0002	--	--
3 + Choice B.F. Logit	--	--	--
6 + Choice B.F. Logit	0.017	--	--
0 Choice B.F. Logit	0.0007	--	--
Deviation of B.F. Choices	0.014	--	--

Each of these statistically significant results will be graphically depicted and described in more detail in the following figures to enable both changes over time and differences between groups to be more easily recognized.

Mean number of BF choices. Figure 4.6 depicts the interaction Treatment Group x Time for the mean number of BF choices received in the classes in each of the treatment groups over the four data collection times.

Six or more BF choices. Figure 4.7 illustrates the change in the logit of six or more BF choices received by each group. In general, all three groups demonstrate adherence to a similar increase in the number of 6 or more best-friend choices received, until time three, then a levelling off, or slight decrease occurs.

Within Figure 4.7 there was a statistically significant difference ($p<.025$) between the Logit of 6 or more BF choices measured at time one, compared with time three. However, the differences between the high-implementing group and the other two groups failed to reach statistical significance.

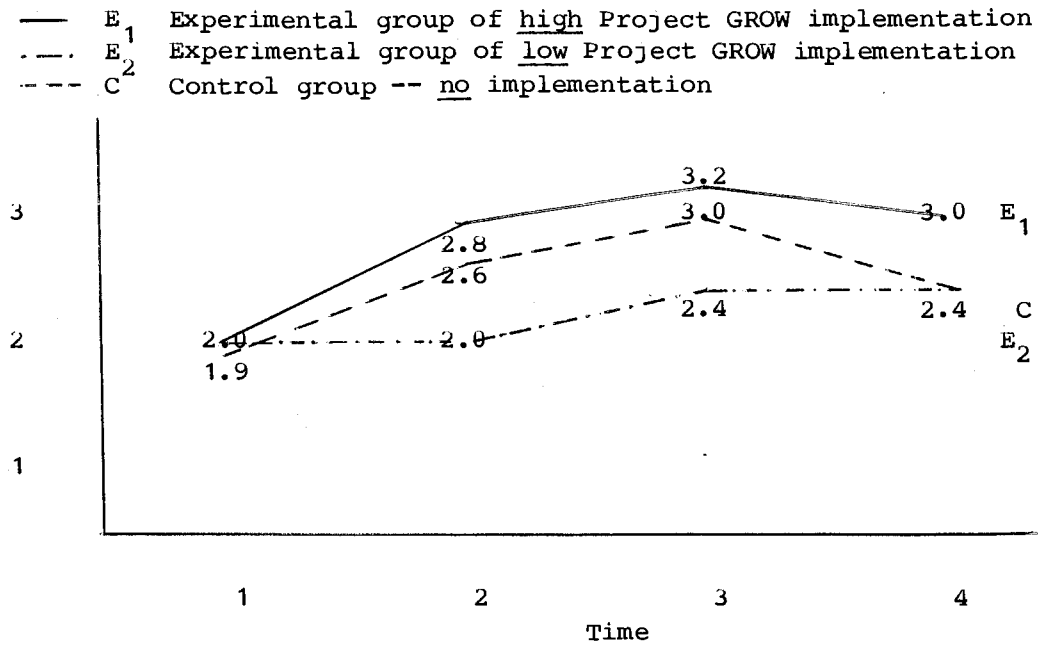


Figure 4.6: Time x Treatment Group Interaction for Mean Number of B.F. Choices Received.

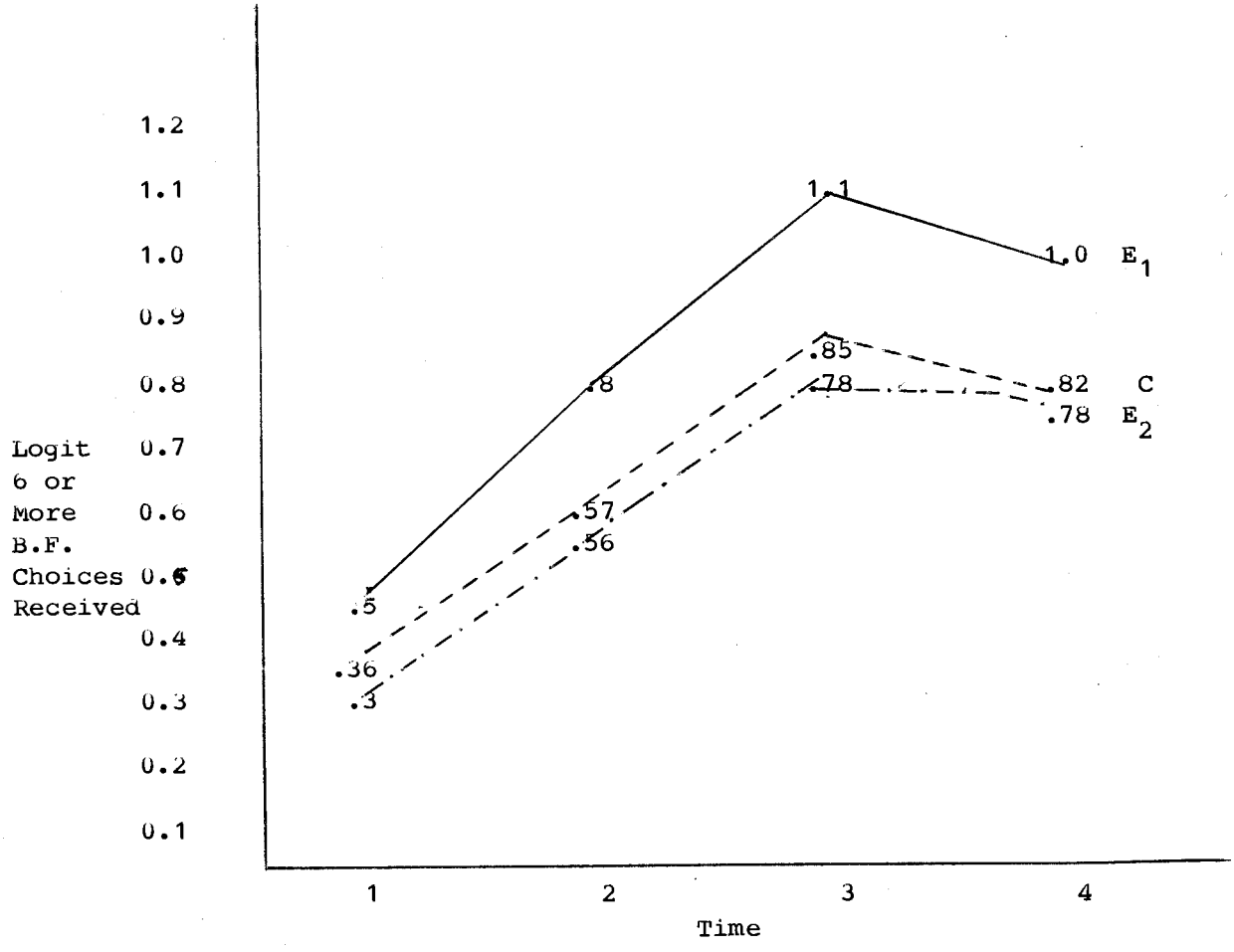


Figure 4.7 Time x Treatment Group Interaction for Logit 6 or more B.F. Choices Received.

Of particular interest in Figure 4.7 is the trend which generally applies to Figures 4.2 through 4.6 . This trend reflects consistently higher ratings by the high-implementing group, compared to the control and low-implementing groups.

Figure 4.8 illustrates that all groups showed a decrease in the number of students who did not receive any best-friend choices from time one to time two. The control group decreased its number of students who received no best-friend choices from time two to time three, however, at time four their number had slightly increased. The significant effects displayed in Figure 4.8 are differences ($p<.001$) between the measurements taken at time one and the other three times. Although not significant ($p<0.1$), the difference due to treatment level was between the control group and the high-and low-implementing groups. There was also a time x treatment group interaction ($p<.1$) indicating differences between the control group at all times and the high-implementing group at time one, two and three. The high-implementing group at time one and three also differed from the low-implementing group.

Deviation of BF choices. Figure 4.9 depicts the time x treatment group interaction for the deviation of best-friend choices (the standard deviation around the mean number of choices for each class). This figure illustrates that each group has shown an increase from time one to time four. Both experimental groups showed no change at time two, but showed a rapid rate of increase to time three. The high-implementing group maintained that level, but the low-implementing group fell sharply at time four.

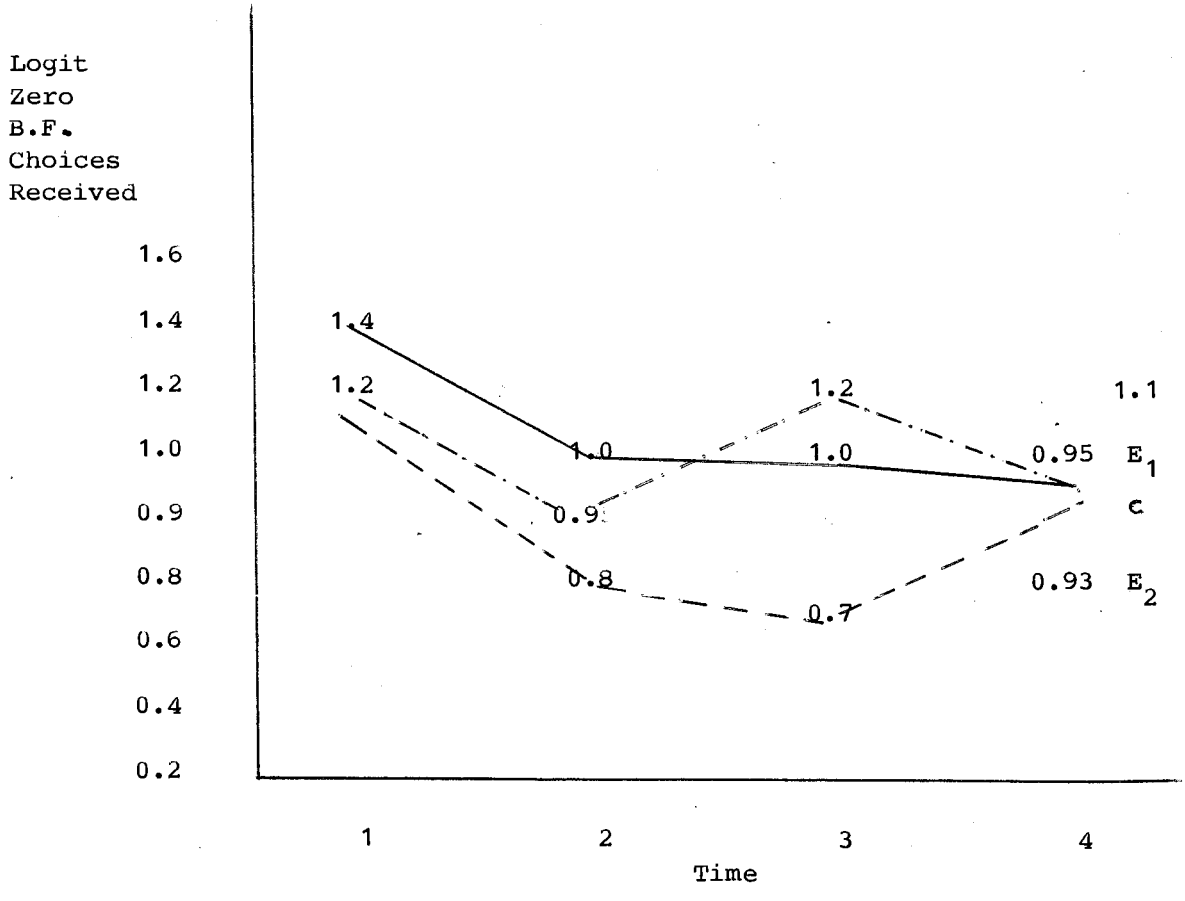


Figure 4.8 Time x Treatment Group Interaction for Logit of Zero B.F. Choices Received

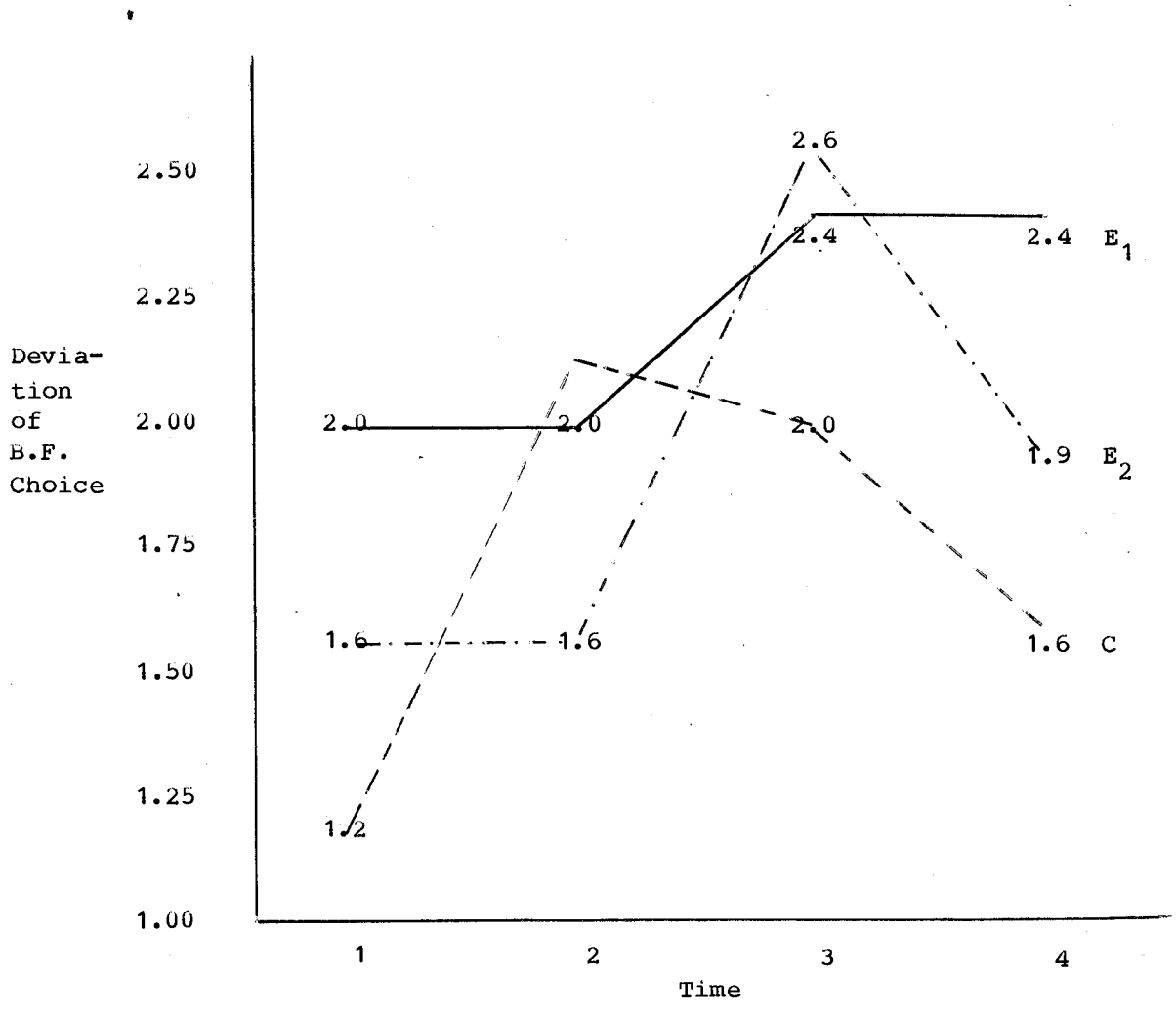


Figure 4.9 Time x Treatment Group Interaction for Deviation of B.F. Choices

Figure 4.9 also illustrates that the control group's pattern of change is different from the other two groups. The control group has a sharp increase from time one to time two and then decreases.

Conclusion

The preceding figures and table suggest that hypothesis two should be accepted since there were no statistically significant differences between the control and the experimental groups over time.

However, the analyses employed to test this hypothesis detected considerable, though not statistically significant, changes in students' friendship pattern over time. The high-implementing group tended to show consistently better results than the control group and the low-implementing group. Hence, while not significant the results indicate that within the high-implementing group students received more BF choices, and more students received six or more BF choices, than within the control group. Results upon dependent variable measures of three or more BF choices, and zero BF choices showed less clear trends of one group's consistently better performance than the others.

Hypothesis Three

> There will be no statistically significant differences between the experimental and control groups upon the development of students' self-concepts.

Data From Analyses to Test Hypothesis Three

Both the SCA and HISM were analysed using separate ANOVA's. The results of the ANOVA's upon the four HISM factors are reported in Table 4.4. In general they indicate no statistically significant main effects

or interactions except for a time effect upon the teacher-school factor ($p<.05$).

However, upon closer examination it can be seen that there are differences approaching statistical significance for the physical factor ($p<.08$) and the interpersonal adequacy factor ($p<.107$). While these confidence levels have decreased and it could not be safely assumed that the results are due to chance, they do indicate a trend which could require further investigation.

HISM data. Figure 4.10 illustrates the interaction of time x treatment group upon the HISM factor of Teacher-School.

This Figure (4.10) illustrates that all groups showed a slight decrease in their attitudes toward their school and their teacher. This difference between time one and time four was statistically significant ($p<.05$). However, closer examination reveals that the low-implementing group and the control group showed a somewhat larger decline in students' perceptions of their teacher and school. The high-implementing group by contrast showed a very slight decline in its students' perceptions of their teacher and school.

Figure 4.11 illustrates the time x treatment group interaction for the HISM factor of Physical self-concept. Figure 4.11 depicts the high-implementing group and the low-implementing group as showing a slight increase from time one to time four. By contrast the control group students and their physical self-concepts show a comparatively sharp decline from time one to time four. The low-implementing group time four scores approached statistical significance ($p<.08$) in its difference from both the high-implementing and the control groups.

Table 4.4

ANOVA for HISM Teacher-School Physical and Interpersonal Adequacy and Social Factors

Factor	Source	d.f.	Mean Square	F Value	Probability
Teacher-School	A (Time)	1	5.4230	6.7444	0.0401
	B (Treatment Group)	2	1.7695	0.5129	0.6261
	AB	2	6.4367	0.8005	0.4945
	C (Teacher)	6	3.4501		
	AC	6	8.0407		
Physical	A	1	7.9800	0.9193	0.3773
	B	2	18.3282	3.8786	0.0828
	AB	2	1.8008	2.0838	0.2051
	C	6	4.7254		
	AC	6	8.6802		
Interpersonal Adequacy	A	1	3.0422	0.0299	0.8432
	B	2	9.6796	3.3120	0.1070
	AB	2	1.2944	1.2723	0.3471
	C	6	2.9226		
	AC	6	1.0174		
Social	A	1	3.2804	0.5516	0.4904
	B	2	6.3338	0.0371	0.9527
	AB	2	2.4004	0.4036	0.6876
	C	6	1.7056		
	AC	6	5.9473		

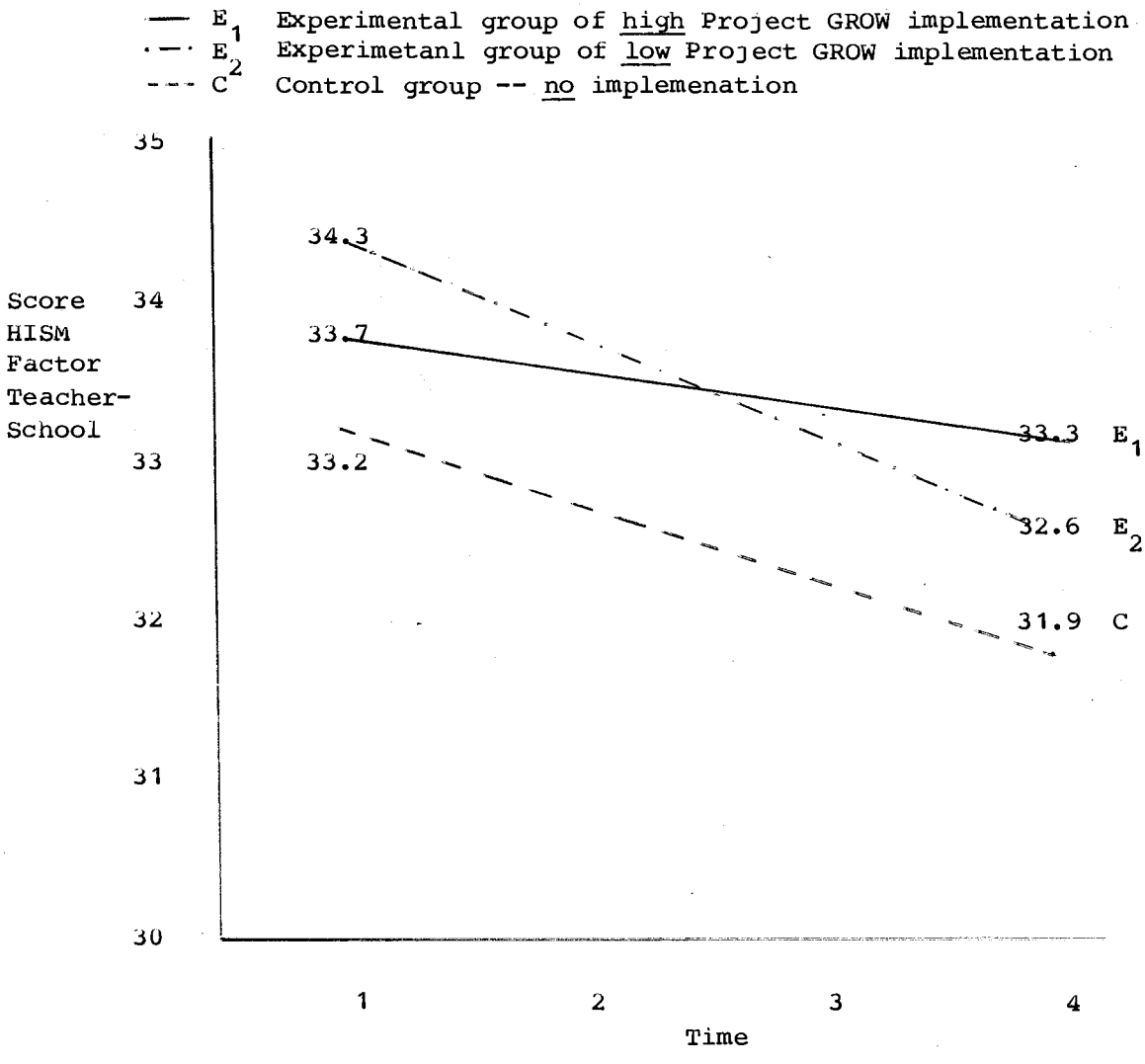


Figure 4.10 Time x Treatment Group Interaction for HISM Factor Teacher-School

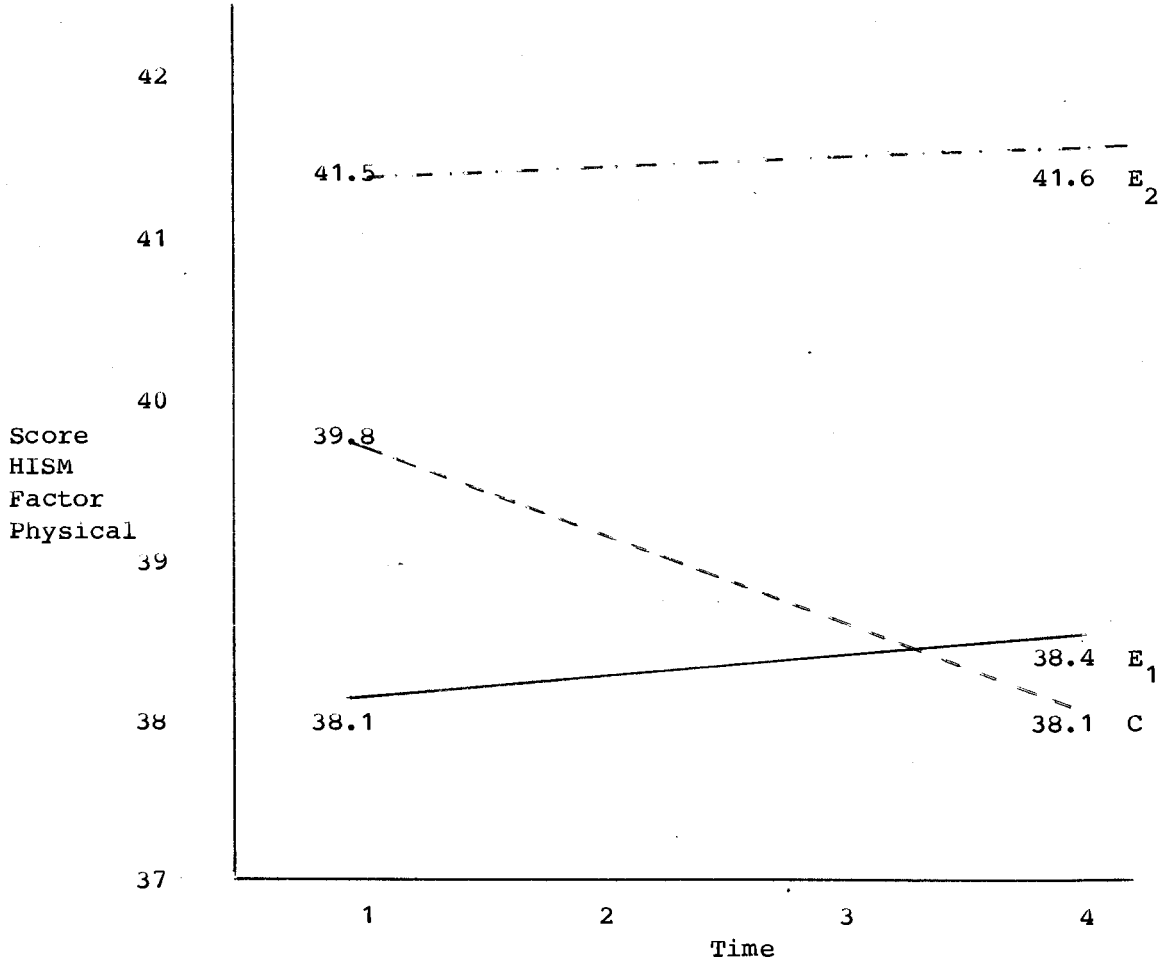


Figure 4.11 Time x Treatment Group Interaction for HISM Factor Physical

Figure 4.12 illustrates the time x treatment group interaction for the HISM factor of Interpersonal Adequacy. In general, it illustrates a decline in both the low-implementing and control groups, while the high-implementing group shows an increase from time one to time four.

This figure (4.12) depicts a small increase in the high-implementing groups' score from time one to time four. The high-implementing groups' score nearly reached acceptable statistical significance with ($p<.107$) by comparison with its difference from the low-implementing group.

SCA data. The results from the SCA ANOVA have been placed in the Appendix Q-19. This table showed no statistically significant differences between the groups due to time, treatment group or a time x treatment group interaction.

Conclusions

The preceding analyses and their results indicate that Hypothesis Three should be accepted, since the analyses revealed no statistically significant differences ($p<.05$) between the treatment groups.

The data from this ANOVA analysis indicated: one effect ($p<.05$) due to time on the Teacher-School factor; a weak ($p<.08$) treatment group effect upon the Physical factor; and a weak ($p<.107$) treatment group effect upon the Interpersonal Adequacy factor.

The trends observed in these data suggest that the high-implementing group showed slightly more changes over time than the low-implementing and control groups. However, these trends were not large enough to enable the high-implementing group's results to be statistically different from the other two groups.

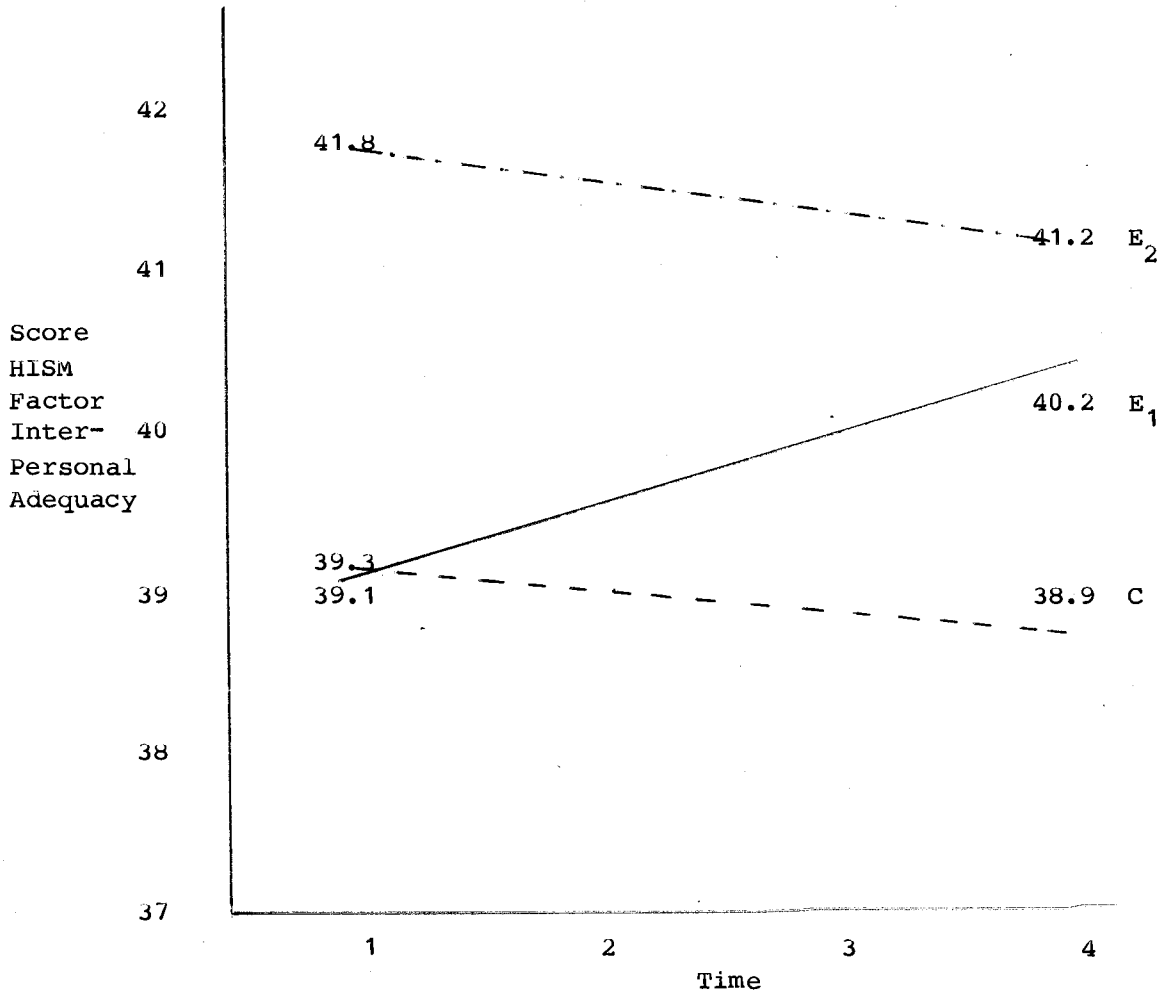


Figure 4.12 Time x Treatment Group Interaction for HISM Factor Interpersonal Adequacy

Hypothesis Four

> There will be no statistically significant differences between the frequencies of classroom behaviours observed in the control and experimental groups using the Fuller Affective Interaction Records (FAIR) categories at any of the measurement times.

Data From Analyses To Test Hypothesis Four

Table 4.5 reports the levels of statistically significant effects revealed by the three-factor ANOVA conducted upon the logits of the FAIR observation categories.

Table 4.5 indicates that there was a significant difference between times on teacher talk categories of "nurtures, and "total teacher talk". However the category of "nurtures" was not considered to be representative since on examination it was found that the significant differences were caused by only one class in each case.

Figure 4.13 shows the changes in teacher talk during discussion periods, between time one and time four. This figure has been drawn from the raw data which was converted to percentages of the total amount of teacher and student talk engaged in during the discussions. The percentage frequencies will give an estimate of the changes in classroom discussion behaviour. However, it should be remembered that the analyses to test this hypothesis were completed upon the logits of the percentage frequencies.

FAIR teacher category data. Figure 4.13 illustrates the percentage of total teacher talk at time one and time four.

Figure 4.13 indicates that in all classes the teachers decreased their amount of talk during the class discussions conducted at time four. This decrease between time one and time four was a statistically significant difference ($p < .05$). While each group shows a similar

Table 4.5

Levels of Significant Differences Upon
FAIR Observation Schedule, ANOVA

Variable	Source		
	A (Time)	B (Treatment Group)	AB
Teacher:			
Nurtures	0.05	--	--
Total talk	0.05	--	--

decline there were no statistically significant effects due to time or time x treatment group interaction.

FAIR student category data. There were no statistically significant differences reported upon any reliable categories of student talk. However, examination of raw data revealed that the "total student talk" increased from time one to time four and the number of "student questions" also increased upon the second measurements.

Conclusion

The preceding discussion and analyses of the FAIR observation instrument revealed that Hypothesis Four should also be accepted since there were no statistically significant differences between the groups over time.

The analyses of variance conducted on the FAIR observation instrument revealed that of the four reliable categories, one recorded statistically significant differences between time one and time four. Total teacher talk decreased from time one to time four ($p<.05$).

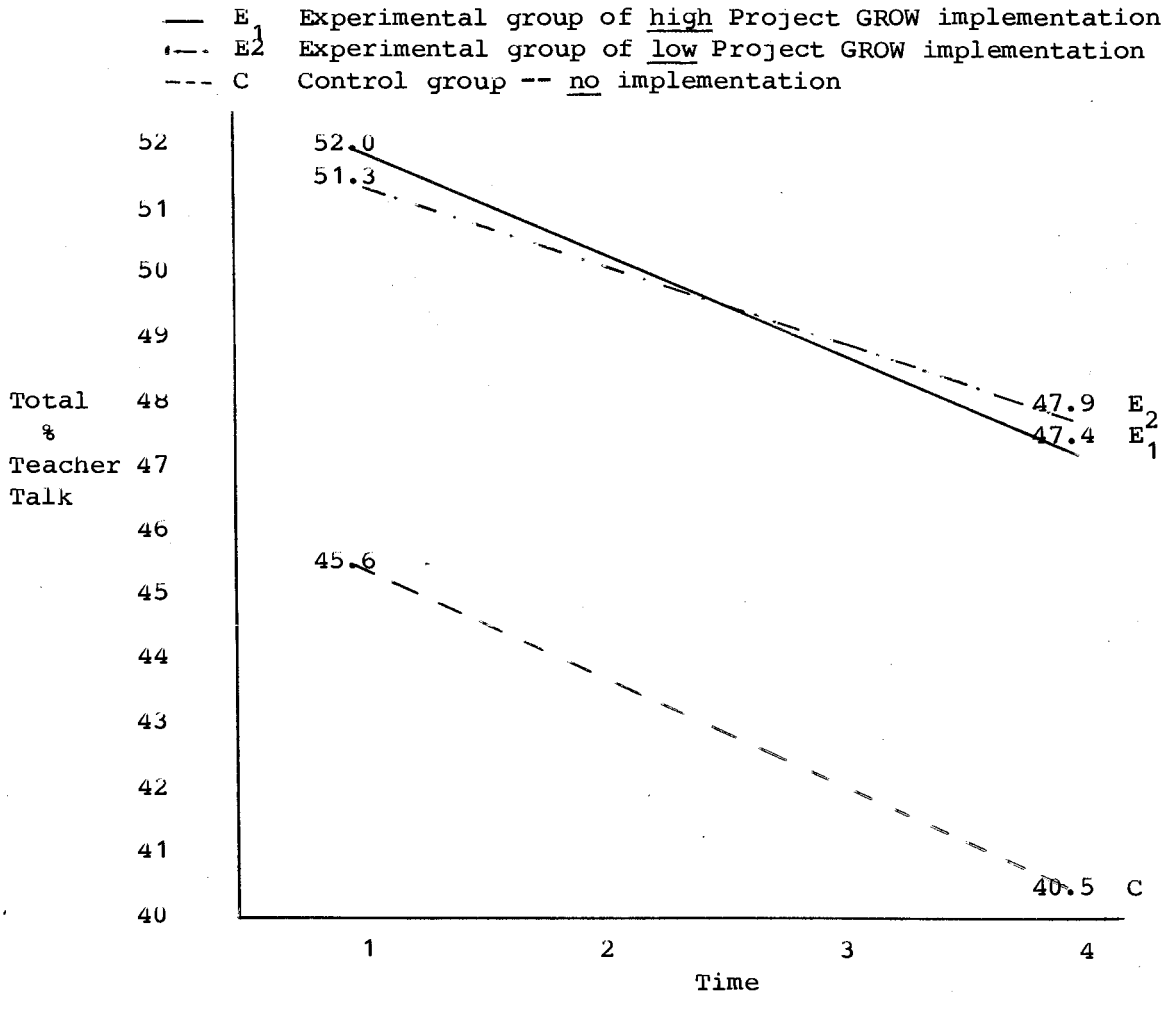


Figure 4.13 Time x Treatment Group Interaction for FAIR Teacher "Total Talk"

Aspect Two: Can changes in the climate of upper-elementary classrooms be described by Tuckman's theory of group development?

Unlike the other major aspects of investigation in this study, there were no hypotheses generated to specifically test the question which guided this investigation. Instead, data from Hypotheses One to Three were examined for changes over time. As had been previously noted and illustrated in the preceding figures the majority of statistically significant changes observed in the analyses were between measurements taken at different times. These observed changes were subsequently compared to changes which were previously predicted from Tuckman's (1965) theory in Chapter Three, Table 3.1.

Table 4.6 reports data which was a subjective estimate as suggested by Tuckman's (1965) theory and was also reported earlier in Table 3.1. The data for the high-implementing group (E1) and the control group (C) was also an estimation based upon the change in subscale data from time one to time four. The magnitude of the changes were calculated from Figures 4.1 to 4.6 by assuming that the first data collection at time one was equal to the estimated magnitude of that dimension. Changes at times two, three, and four are expressed relative to the time one measurement and a constant unit of change was developed for each dimension.

The measurement times of T_1, T_2, T_3 and T_4 were considered to correspond to measurements taken during Stage One, at the start of Stage Two; at the start of Stage Three, and toward the end of Stage Four of Tuckman's (1965) theory.

Table 4.6 can be understood when the figures for one dimension are explained in detail. On the Friction subscale for the MCI instrument

the changes were projected and a rationale for these changes was developed in Chapter Three. These figures make up the Friction: Estimate row. The magnitude of the changes on the Friction E_1 dimension was interpreted from Figure 4.1. The quantitative development was estimated from its base level (1) during the Forming stage, to remain constant until the end of the Performing stage where it increased slightly (an actual change of 0.6 and a quantum estimate of 1). These figures are expressed in the Friction: E_1 row.

By contrast, the changes in Friction within the control group of classes started off at the same base rate as the high-implementing group, but then the level of Friction increased by two units (two times 0.6, or an actual change 1.3) to +3. This level of Friction was maintained during the next two measurement times and is represented in Friction: C row. In this example, the constant unit of change was 0.6 which was equated to a quantum estimate of one unit in Table 4.6.

From Table 4.6 the data can be explained in a number of different ways: first, a level of agreement with the estimate; second, the data can be examined and the level of agreement with the direction of changes presented by Tuckman can be determined; and third, a descriptive interpretation of changes in each group across the different indices can be utilized.

The first analysis of data for the high-implementing group and the control group suggests that their respective levels of agreement with the Tuckman derived estimates are 0.36 and 0.40. The second analyses results suggests that the high-implementing group's results (using the direction of change) agree with estimated changes in group dimensions as

Table 4.6

Projected Global Changes Predicted from Tuckman's (1965) Model of Group Development (Estimate) and Changes Observed in the High-Implementing Group (E_1) and the Control Group (C) on MCI, TRI, and Sociometric Subscales (Figures 4.1 to 4.6)

Subscale	Source	Changes on Subscale Dimensions			
		During Stage 1 Time 1	Start Stage 2 Time 2	Start Stage 3 Time 3	End of Stage 4 Time 4
Friction	E	1	4	2	1
	E_1	1	1	1	2
	C	1	3	3	3
Cohesion	E	1	-1	4	3
	E_1	1	-1	-1	-1
	C	1	-1	0	-1
Difficulty	E	2	3	2	2
	E_1	2	1	1	0
	C	2	0	0	-1
Empathy	E	2	1	3	3
	E_1	2	3	3	2
	C	2	2	2	2
Regard	E	2	1	3	3
	E^1	2	4	4	2
	C	2	3	3	2
Mean	E	1	2	4	3
BF	E_1	1	3	4	4
Choices	C	1	3	4	3

E = Estimate from Theory
E_1 = High Implementing Group: Results
C^1 = Control Group: Results

suggested by Tuckman 0.16 of the time. Likewise the control group's agreement can be approximated at 0.38 of the time.

However such an analysis does not take into account those measurements which have remained static and thus failed to indicate either support or refutation for Tuckman's theory to describe the development of classroom climate. Thus a general descriptive analysis of similarities which can be integrated across dimensions may be more useful. Utilizing this method the data indicates:

1. all groups experienced statistically significant changes (due to time) upon most dimensions during the academic year;
2. during Stage Two, the high-implementing group experienced less friction and more empathy, and regard, than the control group and the estimated changes suggested by Tuckman's (1965) theory;
3. from Stage Three to Stage Four, the high-implementing group experienced less of a decline in cohesion and best-friend choices than the control group and the estimates derived from Tuckman's (1965) theory;
4. generally there is little difference between groups on each dimension, and from Stage Two through to Stage Four the level of agreement between the high-implementing group and the control group is relatively high (0.64 in quantitative terms).

CONCLUSION

When examined together, the data suggest that classroom climates did change during the academic year and that Tuckman's (1965) theory can be useful in describing these changes. However, it must be realized that similarities with Tuckman's (1965) theory were <u>not</u> present: in all

groups at each measurement time; in a high degree of agreement between theoretically derived magnitudes of change; nor was it based on standardized objective calculations explicitly cited by Tuckman (1965).

Aspect Three: Can humanistically oriented teachers facilitate the development of positive classroom climates and students' positive self-concepts to a greater degree than the more custodially oriented teachers?

Hypothesis Five

> There will be no statistically significant relationship between the teachers' scores on the Pupil Control Ideology and: a) class means on the scales of the classroom climate inventories; b) the distribution of students' sociometric choice scores; c) the frequencies of class discussion behaviours observed using the FAIR observation categories; d) development of students' self-concepts.

Data reported in this section describes results of multiple regressions upon 33 dependent variables. A multiple regression equation was utilized as a further check upon the previous ANOVA's to detect the influence of the number of Project GROW activities conducted. Thus, the equation regressed the two independent variables of the teachers' PCI score and the number of Project GROW activities the teachers conducted upon the 33 dependent variables. The following discussion will concentrate upon the teachers' PCI scores and the results of the regressions related to this independent variable.

In general the data in Appendices R-1 through R-7 indicate very few statistically significant correlations. The data can however give the percentage of variance upon each dependent measure which can be attributed to the independent variable. This data is congruent with the earlier ANOVA analyses which indicated very few treatment group effects. However, upon two regressions of the Classroom Life (CL) and the FAIR

student-talk category, there were statistically significant correlations.

CL Data. Table 4.7 reports the results of the multiple regression upon the Classroom Life Instrument (CL). A statistically significant correlation ($p<.025$) was reported for the PCI score.

The total variance accounted for was 44 percent with the teachers' PCI score accounting for 41 percent of that variance. The correlation between the teachers' PCI scores and students' perceptions of their Classroom Life was $r=-.64$ (see Appendix I-4). This suggests that the higher the teachers' PCI score (the more custodial they are) the more likely students are to score low on the Classroom Life questionnaire. A low score on the CL instrument suggests that students perceived their classrooms as high in satisfaction, competition, and friction (See Appendix I-4 for correlations between CL and MCI sub-scales).

Also depicted on Table 4.7 is the lack of a statistically significant result for the CL-7 instrument regressed upon the teachers' PCI scores. No statistics were reported for the number of Project GROW activities conducted as these failed to reach the minimum amount of variance to be accounted for in order to enable the analysis to be completed.

FAIR Observation Schedule Data. Appendix R-3 reports the teachers' PCI scores and the number of Project GROW activities conducted, regressed upon the students' talk categories of the FAIR observation instrument. All categories of student talk failed to reach a statistically significant correlation; however the "usual" category had a probability of $r=0.051$. This category was defined by Fuller (1969) as "routine feedback in response to teacher directions, questions and whether the

Table 4.7

Multiple Regression of Teachers' PCI and Number of Project G.R.O.W. Activities Conducted on the CL Scale

Dependent Variable	Independent Variable	B Coef.	F	Prob.(F)	df.	R^2	Adj.R^2
CL Total	PCI	-0.1512	7.0857	0.0238	(2,9)	0.4464	0.3234
	N^o G.R.O.W.	-0.2271	3.6292	0.0699			
	Constant	6.1821					
CL -7	PCI	0.1083	0.0693	0.7976	(2,9)	0.0068	-0.0924
	Constant	-1.1420					

response is correct or not." The correlation with both independent variables accounted for 48 percent of the variance with the teachers' PCI accounting for 21 percent of the variance. The teachers' PCI correlated r=-0.45 with the frequency of student "usual" responses, while the number of Project GROW activities the teacher conducted correlated r=0.61.

These results suggest that as the teachers' PCI increases towards the more custodial end of the continuum, students were observed to make less "usual" responses during the class discussion. This correlation r=-0.45 is however not as strong a relationship as the one between the number of Project GROW activities conducted and students' "usual" responses. With a correlation of r=0.61 there is evidence to suggest that as the number of Project GROW activities conducted increases so does the number of student "usual" responses.

Conclusions

Based upon the results of the multiple regression analyses, hypothesis five was accepted in its null form since in general there is

no statistically significant relationship between the teachers' PCI scores and the dependent variables: class means upon the MCI and TRI; the distribution of sociometric choices; the frequencies of class discussion behaviours observed upon the FAIR, and the development of students' self-concepts.

There was however one dependent variable which required that Hypothesis Five be rejected. This dependent variable was the Classroom Life (CL) questionnaire which was primarily correlated in the teachers' PCI scores. This result suggested that the more custodial the teacher the more likely students will perceive their classroom as highly satisfying, competitive, and high in friction.

CHAPTER FIVE

DISCUSSION OF RESULTS

Introduction

Within this chapter the discussion of a number of limitations of the study and possible reasons for the general lack of statistically significant effects will precede a more detailed discussion of the results.

The results of each analysis will be discussed in relation to their consistency with the theoretical arguments proposed in Chapter Three. Following this, some possible reasons to explain non-significant findings will be explored prior to a review of the theoretical implications of the results.

General Limitations of This Study

The following reasons for non-significant results in this study illustrate some main limitations which have broad application to each individual hypothesis. Because of the general lack of statistically significant treatment effects it was decided first to discuss general reasons, then specific reasons, for the non-significant results obtained.

1. Perhaps the most obvious reason for the general lack of statistically significant results in this study is the small sample size. As Nunnally (1960, p. 643) commented, "if the null hypothesis is not rejected, it is probably because the N is too small". Because there were only three classes within each treatment group any changes upon

classroom climate dimensions would have had to be considerable in order to reach statistical significance. Since differences between groups were found, an increase in the number of teachers in each treatment group may have allowed these differences to reach statistical significance.

2. The lack of statistically significant treatment effects may have been due to the differences in classroom climate due to the influence of school effects. While these effects were tested at time one, they may have been more influential at later times during the year. As a result, any effect that the Project GROW activities had within the classroom may have been modified by the pervasive school climate characteristics.

Evidence to support this explanation may be found in Figure 4.1 of the treatment group x time interaction upon the MCI subscale of Friction. The preceding tests for school effects had isolated school number five as being statistically and significantly different from the other schools upon the dimension of classroom friction. The fact that two teachers from this school were in the low-implementing group makes it quite possible that the general school climate may have had an important role in the low-implementing class's perception of friction.

3. Another limitation of the study is the practical necessity of the restriction of research of this type to volunteer teachers. The teachers in this sample may have volunteered for a number of different reasons. These could range from a genuine interest in the development of an effective classroom climate to involvement in the research because it could help their chances of promotion. For whatever reasons they involved themselves in the study, there may have been an effect upon the

way they implemented the Project GROW activities or their general approach to the development of a positive classroom climate. Because they all volunteered to be involved in this study, they may all have had good classroom climates and a predisposition toward ensuring that they were not disgraced by the results of the study. Whatever biases they brought to the study may have affected the results and consequently limited the generalizability of the results to other populations, in particular, non-volunteer populations.

4. Beside the preceding three limitations the lack of statistically significant results may also be due to the lack of coincidence between measurement times and the stages designated in Tuckman's (1965) theory (see Table 3.2). For the purposes of the interpretation of data it was assumed that there was a degree of coincidence. This may not have been the case for all groups of classes, or individual classes which could have developed at different rates. As a result, classes may not have been measured at the optimum time to display characteristics indicative of one stage or another. Because of this possibility, any significant differences between the experimental group of classes and the control group of classes which could have occurred may have been measured at a less than optimum time. With this limitation in mind it should be remembered that the interpretation of the data does assume that the measurement times did approximate those stages in Tuckman's (1965) theory as described in the earlier Table 3.2.

Further, beside these general limitations and cautions which should be applied to the interpretations of all data, more specific reasons for non-significant results will be developed for each aspect of the study.

Aspect One: Can teachers' implementation of a series of interaction activities facilitate the development of positive upper-elementary classroom climates and students' positive self-concepts?

Discussion of Results

The focus of the discussion of results in this aspect of the study is upon the differences between the groups and how these results support, or are contrary to, the theoretical frameworks evolved in Chapters Two and Three. These frameworks support the implementation of a series of interaction activities.

In general several subscales and results reported in Chapter Four (Figures 4.1 to 4.13) illustrate trends where the high implementing group reports more favourable results than the control group and the low-implementing group. These differences although small and not statistically significant can support the assertion that there may be an association between high-implementation of Project GROW activities and improvement upon some classroom climate indices. These trends will be more specifically defined and differences between the treatment groups will be discussed as they relate to each dependent variable.

MCI. While the differences between groups upon the MCI subscales are small, there are some features which suggest that there are differences between the two groups of classes. First, the high-implementing group is consistently lower upon the difficulty subscale and consistently higher upon the cohesion subscale than the control group of classes. This consistency cannot solely be attributed to the level of each dimension as measured at time one, since it was clearly demonstrated in the analysis presented in Appendix P-2 that there were no statistically significant differences between the experimental and control classes at time one on any of the subscales.

Taken together the MCI subscale results indicate some tentative support for the suggestion that the differences between groups indicate that the high-implementation of Project GROW within these classes was associated with higher cohesion and less difficulty as perceived by students in each group. These results were consistent with the aims and objectives of Project GROW, but generally there was a lack of statistically significant differences between the high-implementing group and the control group. The unexpected results associated with the low-implementing group will be explored within the next section.

TRI. Results from the TRI subscales of empathy and regard indicate that the differences between the high-implementing group and the control group were increased from time one to time two and then this difference was maintained with a slight decrease at time four. The control group changed very little upon both indices, but the experimental groups changed quite drastically from time one to time two. The low-implementing group caused statistically significant time x treatment group interactions to occur at time two with the high-implementing group, and time four with the control group upon the empathy scale. In general the trend was for the low-implementing group of students to perceive their teachers as less-empathic and less-highly regarding than the high-implementing group.

These results are again consistent with the aims and objectives of Project GROW and suggest that for this group of classes there may be an associated increase in students' perception of the teacher's empathy and regard coincidental with the high-implementation of Project GROW activities. The implementation of Project GROW activities was also

associated with greater change upon these indices than was evident with the control group of classes.

Sociometric data. Taken as a group of similar measurements of the degree of class friendship and attraction, the sociometric dimensions revealed that there was one distinct trend which emerged between the high-implementing group and the control group.

The mean number of BF choices received and the changes upon this variable between the high-implementing group and the control group followed a similar pattern of change over the school year. The difference between the two groups was quite small with the high-implementing group of students averaging 3.2 BF choices at time three, and the control group averaging 3 BF choices received also at its peak, at time three. A larger difference between the control group and the high-implementing group was found upon the six or more BF choices received dimension. Again, development of each group was parallel with a peak at time three and a gentle decrease to time four.

Another criterion upon the sociometric data was the standard deviation of BF choices. This statistic indicated the spread of scores around the mean and has been used in the past as a crude measure of class diffuseness or centrality. In essence past studies have argued that the lower the standard deviation the more diffuse the class friendship structure is, as there are fewer people with higher scores and less likelihood of a hierarchy within the class. The results from this study indicate that the high-implementation group differed markedly from the control group at times one, three and four. Times three and four are the interesting ones as they indicate opposite trends. From time two to time four the experimental group had an increasing standard

deviation to a maximum of 2.6 BF choices. The control group had a decreasing standard deviation to a minimum at time four of 1.6 BF choices received.

It was predicted that the interaction activities and their implementation would be associated with a decline in the standard deviation and a more equal spread of BF choices throughout the class. It was not predicted that the treatment would be associated with a measure of increased centrality within class friendship structures. This result was however consistent with Stiltner's (1973) findings and will be discussed in more detail in the theoretical implications section.

SCA and HISM data. The general lack of statistically significant treatment effects within these analyses suggests that there is no relationship between the implementation on Project GROW and the SCA measurements, but a slight (not statistically significant) relationship between Project GROW implementation and HISM factors was detected.

While the changes were again small, they represent an analysis of results for at least 70 students in each group. The data does however suggest that the high-implementation of Project GROW activities may be associated with students' perception of themselves as having improved upon their ability to interact with others and be interpersonally capable. As this was one of the main aims of Project GROW this result is also supportive of the theoretical framework and rationale for the interaction activities.

Taken together these results suggest some support for the high-implementation of Project GROW to be associated with improvements upon students' perceptions of their physical disposition, their interpersonal competence and adequacy, and better teacher-school attitudes than the

control group of students. However, these trends were observed as small changes upon the dependent variable measurements and the differences between groups were not statistically significant.

FAIR data. The analysis of variance conducted upon the FAIR observation categories produced data which generally supported the regression analysis conducted upon Project GROW and the FAIR categories. The results offered little support for differences between the treatment groups except upon the student "usual" category. The number of student "usual" responses increased in the high-implementing group, while this category drastically decreased in the control group. This result reinforced earlier findings by Stiltner (1973) and was discussed earlier within the regression analysis section.

When the analyses for all four hypotheses are examined together, the emergence of the previously discussed trends may suggest that the high-implementing group is consistently different from the control group and the low-implementing group. Further, these results were generally consistent with the theoretical frameworks evolved in Chapter Three.

Discussion of unexpected results. It was expected that implementation of even a few Project GROW activities may be associated with an improvement of classroom climate. In fact, the reverse seems to be demonstrated in the results: the conducting of a few Project GROW activities seemed to be associated with a decrease upon the dimensions of positive growth in classroom climate. The low-implementing group consistently scored: higher than the control group upon the friction scale; lower than the control group upon the cohesion scale; and lower than the control group at time four upon the empathy and regard scales.

At least two possibilities may explain this unexpected result. First, it may have been that infrequently conducting Project GROW activities tended to raise issues which were not satisfactorily resolved, dealt with or integrated in a meaningful way into the classroom learning situation. In essence, the few activities may have "opened a can of worms" which led to increased friction, less cohesion and fewer BF choices.

A second possible reason is associated with explanation number two of possible reasons for lack of significant results. This explanation argued that school effects may have been more pervasive than initially tested at time one. While the statistical tests did reveal that school five had students who perceived their classes as statistically and significantly higher in friction, there were no other effects which indicated a large difference among the schools. However, two of the three low-implementing teachers were from school five. Questions such as: "How is this school different from other schools in the research sample?" and "Why is it that you were only able to implement a few Project GROW activities?" were discussed with these teachers at the conclusion of the study.

The researcher learned that there was one major characteristic of school number five which distinguished it from other schools. It was smaller. This meant that the two teachers involved in the research, both of whom were senior teachers, had considerable administrative and organizational tasks to deal with each day. They felt pressured by the sum total of demands placed upon them and also saw Project GROW as an "added extra" which they seldom achieved. Another factor related to the size of the school is that in general there was only one class at each

grade level. This meant that peers usually moved through the school remaining in the same class with the same students. As a result entrenched friendships and hostilities had developed. Further, one class had well developed "anti-school" norms from the previous year and were considered a problem class.

Another factor which may help to explain the unexpected results obtained by the low-implementing classes was subjectively observed by the researcher. In two of the three low-implementing classes the teachers appeared to be less well organized and less purposeful in their teaching than did the high-implementing teachers in their classes. While these teachers were not significantly different from the other teachers on their PCI scores, they appeared to be less "robust" than the high-implementing teachers. Their classes lacked a dynamic and dramatic component which was often present in the other classes. This observed characteristic of their teaching may have influenced their students' perception of the classroom climate.

This observation and tentative conclusion may also suggest that further research into Willower et al's (1978) construct of "robustness" of classrooms should be explored from a more detailed analysis of students' perception of classroom climate. Further, this subjective observation may also suggest that future research into the organizational ability of traditional yet humanistic teachers may prove to be worthwhile.

The general trend of the low-implementing group's results to be lower or more erratic than the other groups' was also found to be present in other results. Consequently, future discussion will focus

upon comparisons between the high-implementing group and the control group results.

Possible Reasons for Non-Significant Results Related to Aspect One

In this section a brief elaboration upon some additional reasons for the lack of statistically significant differences due to treatment differences will be presented.

The possibility exists that the reason the null hypothesis was accepted was because the Project GROW treatment was ineffective. Two possibilities may explain this situation: first, the Project GROW activities may have been arranged in an inappropriate order; second, each activity may not have been implemented in such a way as to produce the expected outcomes.

With respect to the first possibility, the order of Project GROW activities may not have coincided with the particular aspect of development of classroom climate being experienced by the class at a particular time and may have limited the possibility of significant effects. As a result, when data was collected upon the classroom climate, little change had occurred. Because the order of activities was not varied between classes, there is no way of telling if this explanation has any validity.

Second, the possibility that the Project GROW activities were not implemented in the most effective way in each class may have contributed to a lack of significant effects. While an attempt was made to measure the quality of implementation of an activity, this sampling represented, in one case, a one-in-24 quality control measurement. It may have been that the teachers' implementation of the activities varied considerably

during the year, and that the one observation was unrepresentative of their general quality of implementation. Thus, it is possible that while the activities were implemented, they were not implemented in such a way that the optimal effects could be realized.

Further, while the quality and order of implementation may have been uncontrolled intervening variables, the number of activities actually implemented may also have substantially contributed to the lack of statistically significant differences between the treatment groups.

By comparison with Stiltner's (1973) study where 30 activities were implemented by each teacher, the maximum number of activities implemented in the high-implementing group was 24 and the minimum was 17. The low-implementing group conducted considerably fewer activities. This data would tend to suggest that even with the high-implementing group, associated changes upon students' self-concepts would be quite small.

Another reason for the lack of significant results in relation to Aspect One may be found in the friendship and attraction data. A sociometric measurement is a subjective measure rather than a reliable and externally validated finding. As a result of the nature of the instrument, cause and effect cannot be implied. Thus a range of variables may influence a change in students' friendship choices and this range cannot be controlled. One influential factor may be the effect of students' past relationships with their peers in earlier classes. Being in grade 6 and 7 presumably at the same school for most of this time, students will tend to build friendships which may carry through for a number of years. Thus, a student who has no best-friends in his class may not be rejected or isolated as he may have a number of

best-friends or friends in other classes. The effects of students' past relationships with their peers may have influenced and limited the effectiveness of the Project GROW activities to provide an environment where their within-class friendships could develop. Also the coincidence of the four data collection times and various class and school events may have negatively influenced the measurement of friendship patterns. The collection of data after a class week-long camp, school concert, Christmas party, excursion, awards day or St. Valentine's Day may be more a reflection of immediate friendships rather than being indicative of developing friendship patterns.

Theoretical Implications of Results

Three main implications of the previous results will be discussed: the implications of the non-statistically significant trends which support the objectives of Project GROW; agreement and disagreement with previous studies discussed in earlier chapters; and sociometric data implications.

Support for Project GROW Activity Implementation. In general the previous discussion of trends in the data from most analyses upon dependent variables provides mild support for the association of high-implementation of Project GROW activities with improvements on classroom climate dimensions. Because the changes upon classroom climate dimensions between the high-implementing group and the control group have been congruent with the aims, objectives and basic philosophy of Project GROW, they provide support for its rationale. In particular the differences between the groups (although not statistically significant) suggest that the implementation of this sequence of logically

derived activities may be associated with improvement upon classroom climate variables of friction, cohesion, difficulty, and attraction.

However, the purpose of this study was to provide an exploratory study of the area. Consequently this conclusion, although based upon data which lacks statistical significance, does suggest that a larger study may be successful in finding statistically significant differences in classroom climates between high-implementing groups of classes and a control group. Further, the support for the changes in classroom climate associated with high-implementation of Project GROW may be support for the particular activities in Project GROW, or the continual implementation of interaction activities. In order to test which aspect of this study is being supported, future studies of this type should include a placebo group which would implement a randomly organized selection of activities.

Agreement and Disagreement with Previous Studies. When specifically examined in relation to other researchers' results, this study adds additional support to their findings that interaction activities can affect classroom climates. The results of this present study share some degree of commonality with Stiltner's (1973) study, in that: (a) both report statistically significant treatment effects only for the cohesiveness dimension of classroom climate; (b) both report statistically significant effects due to time of measurement upon the dimensions of cohesion and friction; (c) both report only small changes upon classroom climate dimensions between groups.

From these similarities it can be suggested that the implementation of interaction activities in upper-elementary grades and high school classes may be associated with the increase in classroom cohesion beyond

that of a control group or a low-implementing group. Because classroom cohesion is a critical group process dimension which is a product of the integration of all group process elements, these classes can be considered to have a healthier classroom climate than the other classes.

While the previous points of comparison are few, the studies also enable differences to be compared. One major difference between the results of the two is the measurement time when groups experienced a peak or a trough in the various classroom climate indices. Within Stiltner's (1973) study the peaks and troughs were generally experienced at the second measurement time. At this time her experimental group experienced a peak and her control groups experienced a trough. Her result for the control group is consistent with Tuckman's (1965) theory and also is supportive of the power of her treatment to be associated with dramatic changes at time two.

By comparison with this study, the high-implementing group peaked at measurement time three and then slightly trailed off. The control group however often tended to decline at time two and in most cases continued to slowly decline. All of the groups in this study had a pattern of change which was less clear and more difficult to determine than Stiltner's results. The lack of a peak at time two within this study may suggest that the treatment was not optimally experienced until it peaked at time three. Further, the treatment may have been less effective in its association with improvement upon the classroom climate indices at time two than the treatment in Stiltner's study.

A second significant difference between the two studies is the degree of school effects experienced in each study. Upon most of Stiltner's dependent variables there were statistically significant

differences between schools. In this present study only two differences upon the friction and satisfaction subscales of the MCI were statistically significant. In each case one school differed from the other schools. This difference between studies may be indicative of the differences between the principal influential factors which affect classroom climates in high school as opposed to elementary schools.

The results of this present study are also supportive of the Adelaide study by Wilson et al. (1979) to the extent that they are supportive of a similar intervention and treatment associated with improved classroom climate. However, because the Adelaide study used a different and less reliable global instrument, support for their results must be very general and tentative.

By comparison with Siltner's (1973) high school population this present study failed to achieve a statistically significant difference between groups due to treatment upon the deviation of friendship choice criterion. However, there was a trend for the high-implementing group to exceed the control group during times three and four. This difference between studies may be partly explained by the different sociometric procedures utilized in each. This study required students to rate all class members while Stiltner had them select five students with whom they would and would not like to work upon a project. While the methodology was different and the results from this study did not reach significance, the findings do support each other.

Both results suggest that the implementation of interaction activities can be associated with a tendency for classes to: display a greater variability of the number of BF choices received; lead to a more uneven distribution of choices or a less diffusely structured classroom

friendship structure; and therefore tend to become more centralized in their friendship structure. This result is contrary to the findings and theoretical formulations reviewed in Chapter Two by Schmuck (1963 and 1966) and Schmuck and Schmuck (1979). The agreement between this study and Stiltner's (1973) study suggests a number of possible conclusions.

1. That Schmuck's theory is correct and the studies have been ineffective in their association with the development of a centralized friendship structure.

2. Schmuck's theory is incorrect and the more desirable classroom friendship structure is a centralized one.

3. Schmuck's theory is correct, but the crude measurement of centralized or diffuse structure by utilizing the deviation of BF choices is not an adequate measure.

Existing theory and empirical evidence cited in Chapter Two, by Zeichner (1978) would suggest that: the second conclusion should be rejected; the first conclusion is partly correct; and the third conclusion may be probable. In relation to the third conclusion it seems possible that the standard deviation of BF choices should be seen in relationship to the mean number of BF choices and other statistics in order to be a more meaningful measurement of centrality or diffuseness.

In Appendix U, statistics are presented for class four from the high-implementing group and class eight from the low-implementing group.

The data illustrates that as time goes on the mean number of BF choices received in class four tends to increase, as does the standard deviation of BF choices. However, the number of zero BF choices decreases, and the number of three or more and six or more BF choices received also increases. In short, this class has become more diffuse

with more students receiving BF choices and fewer students not being chosen. By contrast class eight has a low mean and a low standard deviation around that mean. Rather than being diffusely structured this class is hierarchical and has a rather centralized friendship structure with between four and ten students receiving more than three BF choices and a comparable number of zero BF choices.

It would appear from these data that a standard deviation of BF choices alone is an inadequate and inaccurate way to measure the centrality or diffuseness of classes' friendship patterns. Further, when data related to hypothesis number two is re-examined in this light, the high-implementing group (by comparison to the control group) has an associated improvement in class friendship patterns. This improvement is toward greater diffuseness and an increased number of BF choices during the academic year. This result also adds support to the ability of the high-implementing group upon Project GROW to be associated with the creation of a more diffusely structured classroom friendship pattern.

Conclusion of Discussion on Aspect One

The preceding hypotheses were generated in order to explore the question, "can teachers' implementation of a series of interaction activities facilitate the development of positive upper-elementary classroom climate and positive students' self-concepts?" The data from this small sample of classes does not enable us to give a definite answer to this question. The high-implementing teachers were not able to facilitate their classroom climates so that they were statistically and significantly different from the control and low-implementing

groups. Further, the high-implementing group of teachers were not associated with students who had statistically and significantly greater development on their self-concepts.

However, the purpose of this study was to provide an initial exploration into the development of classroom climate in upper-elementary classes. Thus, within the limits placed upon the interpretation of the results by the problems of internal validity, the data does reveal valuable information when several indices are examined together. Within this small sample a large number of dependent variables indicated that this particular group of high-implementing teachers taught classes which, as a group, were perceived by their students as having: higher development upon indices of cohesion and attraction; lower levels of difficulty and friction; and greater development of interpersonal adequacy, than the control or low-implementing groups. This trend, while not statistically significant in its difference from the other groups, does suggest that while the question was answered in the negative, more rigorous and larger scale research may find statistically significant differences.

However, statistically significant differences between measurement times were found to exist and were the focus of the second aspect of this study which sought to explore the question:

Aspect Two: Can changes in the climate of upper-elementary classroom be described by Tuckman's theory of group development?

As the second aspect of this study was concerned with the changes which occurred over time, rather than treatment effects, data from Hypotheses One and Two will be discussed in order to investigate the

previous question. These data were graphically presented in Figures 4.1 to 4.13 and changes in these figures were translated into standard estimates of change and recorded in Table 4.6. Both sources of data provide the information base for the following discussion.

Discussion of Results.

This discussion of changes on dimensions of classroom climate during the academic year will focus on three major findings: first, data which suggests that all groups can be described as proceeding through stages of group development which can be usefully described by Tuckman's (1965) theory; second, the high implementing group's different experience of Stage Two; and third, the high-implementing group's different experience of Stage Four.

First, the preceding data provides some evidence to tentatively suggest that all groups within the study experienced changes in the development of their classroom climate in ways that could be described by Tuckman's (1965) theory. The evidence to support this conclusion is based on: the large number of statistically significant results due to time on nearly all indices of classroom climate; moderate agreement with quantitative estimates derived from Tuckman's (1965) theory (expressed in Table 4.6); the almost parallel development of all groups of classes, particularly the high-implementing group and the control group over the academic year; and specific examples where Tuckman's (1965) theory and the results from this study are congruent. Each of the above assertions will be consecutively substantiated in greater detail in the subsequent paragraphs.

The data presented in Chapter Four, Tables 4.2 and 4.3, reports statistically significant results due to time for nine of the 13 classroom climate indices. These changes which occurred from one measurement period to the next are in some cases quite small and the results do not reflect statistically significant changes between each and every measurement time. However, the accompanying figures 4.1 to 4.9 do illustrate changes upon classroom climate dimensions which can be interpreted using Tuckman's (1965) theory of group development if it can be assumed that measurement times correspond to the appropriate stage within the theory. When Tuckman's (1965) descriptive criteria are utilized to interpret these observed changes then it can be argued that each group of classes and their classroom climate do change and significant similarities can be determined. For example: all groups except the high-implementing group experienced an increase in friction from time one to time two; all groups experienced a decrease in cohesion from time one to time two and then an increase until time three; all groups except the high-implementing group experienced a decrease in Empathy from time one to time two, and students' best-friend choices increased from time one to time two. These changes were predicted by Tuckman's (1965) theory and specifically apply to his description of changes from the Forming to the Storming stage.

Further support for the conclusion that all groups of classes tend to show a sequential development in classroom climate is shown in Table 4-6. This table indicates that the classes tended to show stage-like changes in their climate throughout time. Unfortunately there appears to be a greater degree of correspondence between the High-Implementing Group (E_1) and the Control Group (C) on their developments, then between

either E_1 or C groups and the developmental stages predicted from Tuckman's theory. The two groups' similarity of changes on the scales of attraction, regard, difficulty, cohesion, and friction yielded an overall statistic of agreement of 0.64. This suggests that the high-implementing and control group of classes had a high degree of similarity on most of their indices of classroom climate and offers general support to the notion that the changes in classroom climate for all groups of classes can be usefully interpreted using some theory of stage-like development.

Some indices, however, tended to show a closer correspondence with predicted changes. In particular, the sociometric measurements tend to illustrate this point. In relation to Tuckman's (1965) theory the "peaking" of attraction among peers at time three can be interpreted as being coincidental with stage three: Norming. Within this stage the interpersonal conflicts of stage two have given way to greater cohesion and closer friendships.

Another characteristic of the results which can be described by Tuckman's theory is the gradual decrease in student friendship choices from time three to time four. During stage four, Performing, Tuckman (1965) describes the interpersonal relations between members as being of secondary importance to their task performance. Roles become more flexible and the group energy is channeled into the task. This behaviour could also be associated with a decrease in the number of BF choices received.

While there are points of agreement and disagreement with Tuckman's (1965) theory and the results of this study, there would appear to be some evidence to suggest that Tuckman's (1965) theory can usefully

explain the development of upper-elementary classroom climates for the groups of classes in this study. Observable changes were small, however, and were compared to the quantified estimates suggested by Tuckman's (1965) theory. Further, while there were some similarities with Tuckman's (1965) theory, there were also important areas of variance.

The second aspect of this discussion focusses on an examination of the data which suggests that the high-implementing group may experience the second stage differently than the other groups. Upon the friction dimension the control group of students perceived the level of friction increasing from time one to time two, and remaining at this level until the end of the year.

In Table 4.6 this change was represented as a +2 movement in the control group, while the high-implementing group remained the same. This could be indicative that the control group of classes more drastically experienced stage two: Storming, of Tuckman's (1965) theory. By contrast, the high-implementing group remained at the same level of friction until it increased slightly at time four. Tuckman's (1965) theory predicts that during stage two: Storming, there will be a higher level of conflict and friction while the groups' cohesiveness will decline. The development observed within the high-implementing group suggests that this group did not experience classroom climate development indicative of stage two as described by Tuckman (1965). This result suggests that the intervention of Project GROW activities may be associated with the maintenance of a low level of friction and an avoidance of the projected problems associated with stage two of

Tuckman's theory. However, there were no statistically significant differences between the groups to support this claim.

Evidence of the different experience of the Storming stage by the high-implementing group is also found upon the TRI scales of empathy and regard. These scales measured the students' perceptions of their teacher's empathy and regard, and the changes during stage two are seen as more positive than those changes upon the control group's development.

When these changes upon the empathy and regard subscales are interpreted within Tuckman's (1965) model it must be remembered that his model was evolved from a majority of small group studies where the leader was usually non-directive. Within this study the teachers displayed traditional teacher-leadership and did not assume a non-directive role to force students to assume responsibility for the class or their school work. Thus, in stage two, Storming, it would be expected that students' perception of their teachers' empathy and regard would decrease along with the increased conflicts they experience with others in their class. The control group showed a very slight indication of such a decrease. By contrast the high-implementing group showed a dramatic increase which was maintained until time three, then declined. This change is again supportive of the high-implementing group's reduced experience of the Storming stage. Again, these results suggest that the implementation of Project GROW activities may be associated with experiences of less class friction, and more positive perceptions of teachers at times two and three within the high-implementing group.

The third finding observed in the previous figures and on Table 4.6 in Chapter Four suggests that the high-implementing group may have experienced stage four (Performing) differently from the other groups.

Upon the MCI cohesion subscale, the changes over time indicate that the high-implementing and control groups reacted as described by Tuckman's theory until time three. The high-implementing group continued to maintain this level of cohesiveness while the control group regressed to a level previously experienced at time two.

Further evidence of the high-implementing group experiencing the Performing stage differently was provided by the sociometric dimensions of the mean number of BF choices and the six or more BF choice data. Upon both of these measures of attraction and peer group friendship patterns, the high-implementing group experienced less of a "fall-off" in choices than the control group. This tends to suggest that the high-implementation of Project GROW may be associated with a higher maintenance of friendships between class members.

While the preceding data suggests that Tuckman's (1965) theory can describe some changes in classroom climate in upper-elementary classes, the conclusions are tentative for several reasons: the changes and differences between groups over time were quite small; the trends suggested here were not demonstrated upon all dimensions of the classroom climate subscales; and the data has been interpreted on the assumption that each measurement time coincided with a particular stage within Tuckman's (1965) theory.

Theoretical Implications of Results

The preceding discussion argued that Tuckman's (1965) theory of group development can be a reasonably useful model to facilitate the understanding of changes in classroom climate in upper-elementary classrooms. The high-implementing group's development suggested the possibility of the reduction of the severity of the Storming stage and a slight tendency to experience less of a decline in the socio-emotional dimensions at the fourth stage of Performing. Each of these points will be discussed in relation to their implications for existing theory and research.

The data from this study suggests that Tuckman's (1965) theory can be useful in describing classroom climate changes in upper-elementary classes. This conclusion supports the findings of Wilson, et al. (1979) who adapted Tuckman's (1965) theory and also found it a useful descriptive theory. Moreover, as discussed earlier, Tuckman's (1965) theory is a general descriptive model which has little detail on specific dimensions and the way they are expected to change over the life-time of the group. As a result, any quantification of changes must be seen as crude estimations and, because of this, any critical comparison with the theory is very difficult. Thus, the degree of usefulness of Tuckman's (1965) theory may be related to its lack of specificity and its general descriptive nature. As such this characteristic also limits any rigorous application of the theory or comparison between theory and empirical results. With this limitation in mind, these exploratory study results should be regarded as offering only tentative support for Tuckman's (1965) theory. Future research in this area could be directed toward: greater specification of the theory, an increase in the number

of classes investigated, and an increase in the diversity of measurements of classroom climate utilized.

In relation to Stiltner's (1973) findings from her high school population, the results of this present study tend to lend some support to her conclusions. She reported data which suggested that the experimental group did not experience the Storming stage of Tuckman's model. Her conclusion was based primarily upon the development of the cohesion scale which reported a statistically significant time x treatment interaction at time two. Support for Stiltner's conclusion from this present study can also be found upon the friction subscale of the MCI. While the high-implementing group experienced considerably less friction at times two and three, the control group experienced a rapid increase in the level of perceived friction from time one to time two, a level which was maintained until the end of the year. Further support for Stiltner's conclusion can also be found in the results from the students' perception of the teachers' empathy and regard. The high-implementing groups did not display a decrease, but rather an increase, in these two dimensions at time two and time three. However, the results from this present study were mainly trends which were not supported by statistically significant time x treatment interactions or differences between groups.

Since Stiltner's (1973) findings were interpreted by Stanford (1977) and formed the basis of his theoretical model of group development, the findings of this present study also provide tentative support for Stanford's theory. Stanford (1977) proposed that high-school classes which were taught by a traditional teacher who intervened with interaction activities over the period of a semester would progress

through his five stages of Orientation, Norm Establishment, Conflict, Productivity, and Termination.

The results from this study suggest that traditional upper-elementary classroom teachers who implement a large number of sequentially organized interaction activities may have classes which have less conflict during their development and less severe decline upon social dimensions during their later life than do control classes. While the support for Stanford's (1977) theory is tentative the data from the high-implementing group by comparison with the control group does suggest that a different and more positive development may be experienced.

While this conclusion is the major supportive finding of this study which is relevant to Stiltner's conclusions, there is also one major difference between the two studies. Stiltner's (1973) findings suggest that all groups did not experience Tuckman's stages of development. Stiltner found that during a semester her secondary classes did not pass through these stages unless intervention of interaction activities occurred. Within the elementary school and over the period of an academic year it would appear that the groups of classes in this sample may have all experienced Tuckman's stage-like characteristics. This finding is congruent with Tuckman's theory that all groups experience these developmental changes over time. It appears that circumstances of the elementary school, such as the one class together as a group for a year, may help to facilitate the development of classroom climate through the projected stages.

Stiltner (1973), Stanford (1977) and Wilson et al. (1979) have cited empirical evidence to suggest that the development of classroom

climate can be arrested, usually at stage two. Further they assert that it will take interventions of the interaction activity type to facilitate the class through to the level of development at stage four. The data tentatively interpreted from this study indicate that upon the cohesion, attraction and empathy dimensions, all groups of classes may experience a similar developmental trend and do not necessarily have their development arrested at stage two.

However, the data from this study only compared groups of classes and not individual classes. Thus, it would appear that the earlier studies' findings for individual classes experiencing retarded growth at stage two also may be found within this study. What is interesting is the suggestion that groups of classes may be described as experiencing all stages upon cohesion, friction and attraction dimensions.

These tentative findings suggest that in spite of the possibility of the teacher limiting the development of the class as a group, upper-elementary classes may experience classroom climate development which could be described as progressing through Tuckman's (1965) stages of group development upon socio-emotional dimensions.

Thus, if findings from this present study are able to be replicated so that they can be generalized, teachers may be able to predict changes in their classroom climate. As a consequence, the introduction of interaction activities may also facilitate the development of the class through the stages or help to optimize the positive aspect of the stages. Data in this study also suggested that this may be a probability.

Another noticable difference between the results from each study is the lack of change upon Stiltner's dimensions at times three and four.

This present study had a greater degree of variability of results at both of these time periods. This may have been due to the end of the academic year and the anxieties attached to the unknowns of the following year, especially for grade seven students. At time four there was a slight trend for the high-implementing group not to experience a reduction in the socio-emotional dimension of cohesion.

This finding, although small, tends to provide some weak empirical support for Stanford's (1977) fifth stage.

Conclusion of Discussion on Aspect Two

The preceding discussion has examined the results from the analyses associated with Hypotheses One and Two in order to answer the question, "Can changes in the climate of upper-elementary classroom climates be described by Tuckman's (1965) theory of group development?" The data from the previous hypotheses did indicate that upper-elementary classroom climates do change over time. Examination of these changes revealed that they could be usefully interpreted within the theoretical framework of Tuckman's (1965) theory of group development.

Data was discussed which suggested that the groups of classes within the study progressed through stages. The high-implementing group did however experience time two with less friction, more cohesion, greater student attraction and their teachers were perceived as more empathic and highly regarding than the other groups. This evidence was interpreted as suggesting that in this study the teachers who implemented a high number of Project GROW activities had classes who only mildly experienced the Storming stage of group development. Further, the high-implementing group of classes also experienced the last stage of

group development with less decline upon several dimensions. Together the differences suggest tentative support for Stanford's (1977) model of group development, or at least the possiblity that when a traditional teacher implements interaction activities in the class, the class's group development is no longer accurately and adequately described by Tuckman's (1965) theory.

Evidence to suggest that the control group and the low-implementing group also experienced the stages of group development as described in Tuckman's model was provided by the parallel development of each group upon the dimension of cohesion, the mean number of BF choices, and six or more BF choices received. However, these interpretations are extremely tentative because of the small differences between groups of classes used to generalize each group's development and subsequent incorporation within Tuckman's theory.

Further, these conclusions should be regarded as tentative since the ability of Tuckman's (1965) theory to describe differences between the control group and the high-implementing group upon the indices of classroom climate was limited by three factors: first, the limitations of this present study and its problems associated with internal validity; second the differences between the high-implementing and control groups were not statistically significant; third, the rather crude attempts to interpret Tuckman's theory quantitatively could only provide a rough comparative standard.

The third aspect of this study was oriented toward a measure of the teachers' attitudes toward controlling students and their effect upon the development of the classroom climate and students' self-concepts. Specifically the question posed was:

Aspect Three: Can humanistically oriented teachers facilitate the development of positive classroom climates and students' positive self-concepts to a greater degree than the more custodially oriented teachers?

Discussion of Results

Within this section the results and the lack of statistically significant findings will be discussed with recognition that either they could reflect an instrumentation problem, or that there is no relationship between the variables investigated. However, it will be generally assumed that the first possibility has been minimized and the data does in fact reflect relationships between accurately measured concepts.

The correlations of teachers' PCI scores with students' perceptions of the classroom climate upon the MCI, TRI, sociometric measures and students self-concepts were not statistically significant and the percentage of variance in each case was minute. Evidence that the MCI and TRI subscale scores were not correlated with the teachers' PCI scores indicates that the teachers may not be as influential upon dimensions of classroom climate as initially believed. An alternative explanation could be that the PCI humanistic-custodial continuum is not a sufficiently adequate measure of the teachers' classroom behaviour to allow statistically significant correlations to be made upon these dimensions.

The one major and statistically significant correlation achieved in relation to this hypothesis was the teachers' PCI scores and their relationship with students' perception of the classroom climate upon the Classroom Life (CL) instrument. The teachers' PCI scores accounted for 41 percent of the variance upon the CL instrument and achieved a

statistically significant correlation of ($p<.025$) and a correlation of ($r=-0.64$).

Because the CL instrument is highly negatively correlated with some of the MCI dimensions the above statements can be more explicitly expressed as: the more custodial the classroom teacher, the more likely students are to perceive the class as having a high degree of satisfaction, competition, friction and teacher empathy; by contrast, the more humanistic the teacher the more likely students are to perceive the classroom as low in satisfaction, friction, competition and teacher empathy. This result was contrary to the conceptual and theoretical framework evolved in Chapter Three and may be explained by several possibilities. First, the CL instrument may not be as valid a measure of classroom climate as its face validity indicates. Because this instrument has not been widely used in previous research and this researcher could find no published data upon it, the results should be interpreted tentatively until further analyses upon the instrument can be performed. As a consequence, data collected from this instrument need to be cautiously interpreted.

A second reason to explain this relationship between the teachers' PCI scores and students' perception of the classroom climate could be found in the relationship between the variables with which the CL is highly correlated and which, presumably, it is measuring. Assuming that the measurements are valid and reliable and that the relationship between the variables has been accurately measured, then the question becomes, "Why would students experience a custodial teacher's class as being highly satisfying, more competitive, and high upon friction, while the teacher was viewed as more empathic?" The answer may lie in the

degree of satisfaction achieved from a competitive and friction oriented classroom. Both elements when found in moderation could stimulate and motivate the students. They may see their class as more challenging, lively and an exciting place to be. However, if the level of competition and friction rises above an optimal level the classroom climate may become less satisfying.

The correlation between the CL and the TRI empathy subscale was r=-0.66 which indicates that when the teacher is more custodial, the lower the CL score and the higher the students' perception of the teacher's empathy. As the previous discussion of the TRI has established that there was no direct correlation between the teachers' PCI scores and their perceived level of empathy and regard, this result should be excluded from serious consideration as it is not a direct measure of the teachers' empathy.

Possible Reasons for Non-Significant Results Related to Aspect Three

Besides the limitations of the internal validity of this study, which have been discussed earlier, there remain some specific reasons why the results relating to this hypothesis did not reach statistical significance.

1. Despite the range of teacher PCI scores from the most custodial (55), to the most humanistic (40), it would appear that this sample of teachers did not contain extremely humanistic or extremely custodial teachers. The PCI scores for teachers in this study yielded a mean of 46.4 while Willower et al (1967) reported a mean PCI score of 55.3 for 464 elementary teachers. From these means it can be seen that the present sample of teachers is less custodial and more humanistic than

Willower's initial sample. Further, since there were no extreme examples upon the continuum, the correlations had to be found within a moderate range of PCI teacher scores in order to be statistically significant. This may have limited the possiblity of any statistically significant correlations.

2. The unpredicted results obtained from the low-implementing group may also have affected the probability of achieving statistically significant correlations between the teachers' PCI scores and the dependent variables. Again these negative results would have served to moderate any positive relationships that may have occurred between the teachers' PCI scores and the dependent variables.

3. It may be that the type of instruments employed to measure the dependent variables were too specifically orientated to finite dimensions such as friction. The CL instrument which was correlated with the teachers' PCI scores is by contrast a general instrument which incorporates a number of different aspects of the classroom climate.

4. The possibility exists that the instrument chosen to measure the independent variable was not as appropriate as initially thought. The PCI has general predictive validity but does not have an accompanying detailed description of expected teacher behaviours. Its general nature does however allow inferences to be made, but these inferences may have been beyond the level of predictability of the instrument. For example predicting that humanistic teachers will be related to the level of classroom friction is a generalization from the description of a humanistic teacher. It may require a larger study with more finite observation to support the prediction. In short, this exploration may have selected too general a measure of teacher style.

These factors added to those already mentioned in earlier sections may have operated to restrict the attainment of statistically significant correlations between teachers' PCI scores and the dependent variables.

Theoretical Implications of Results

Because of the limitations associated with the internal validity of this exploratory study and the lack of statistically significant findings, the results should have little impact upon the existing theory. The results of this study would need to be verified within a replication study before any conclusions could have an impact upon existing theoretical frameworks. However, while there was a general lack of statistically significant results, the interpretation of the two statistically significant correlations can be attempted in the light of existing theory.

PCI and CL Relationship. Assuming that the results from the correlation between the teachers' PCI score and students' perception of the classroom climate are valid and reliable, the association of dimensions measured by the CL instrument leads to some interesting conjecture. Classroom climates which were competitive and high on friction were perceived as being more satisfying. This result is probably a matter of degree and there may be a threshold point where the relationship is reversed. This relationship may be explained by Estep, Willower, Licata (1980) conception of classroom "robustness". These researchers found evidence to suggest that the dynamic, dramatic and empathic nature of a robust class was associated with higher student interest and satisfaction. However their more robust class was found to

be conducted by a more humanistic teacher and not a more custodial teacher. The results of this study suggest the opposite.

However, these results need not necessarily conflict with the Willower et al. (1980) findings since the critical word in the previous paragraph is more. Within this present study the range of scores upon the PCI may not have been similar to the earlier study and there was no attempt to find correlations with only the extreme teachers in this sample. If the results are interpreted as contradictory to the Willower et al. (1980) findings then the disparity may also be accounted for by the lack of specification of the levels of competition, friction and satisfaction. Because this line of research is relatively new, developments within the area hopefully will remedy the lack of specific data and tight conceptualization of key terms.

PCI Relationship with FAIR Categories. The general lack of variance accounted for by the teachers' PCI scores upon the classroom discussion leading behaviour of the teachers in this study creates doubt about the ability of the PCI to predict specific teacher behaviour or styles. Further, doubt is also associated with the reliability of the FAIR categories and whether two sampled discussions can be representative of the teachers' discussion leading ability as well as their teaching styles.

In relation to the reliability of the observations and their generalizability, Rowley (1978) presents evidence to suggest that two observation periods of 20 minutes each would only allow reliability of measurement to be 0.402. This statistic would only allow the predictability of the sample of discussion leading behaviours to be generalized to the year-long sample of teacher discussion leading ability and not

general teaching style. Thus, it could be argued that the lack of correlation between the teachers' PCI scores and their discussion leading behaviour is due to a low reliability of the observation measurement and the possibility that the teachers' style is not adequately represented by their discussion leading ability.

However, the PCI and the FAIR instruments were included in this study to allow validity checks upon each other. The results indicate that for this sample the lack of statistically significant correlations suggests that interpretation of results upon both instruments is of limited and doubtful validity.

Overview and Conclusions Upon Aspect Three

The preceding discussion has suggested that the lack of statistically significant findings could be accounted for by instrumentation problems and problems with the internal validity of the study. As a consequence the interpretation of findings was made more difficult. However, in general the findings suggested that the teachers' humanistic-custodial orientation was not related to: students' perceptions of their clasroom climate upon the MCI and TRI instruments; the distribution of students' sociometric choices; the frequency of classroom behaviours observed using the FAIR observation categories and the development of students' self-concepts.

There was one statistically significant relationship between teacher orientation and the Classroom Life responses given by students. In general students perceived the classrooms of the more humanistic teachers as being less satisfying, less competitive, and having less friction than the custodial teachers. While this relationship was

strong it was contrary to the theoretical rationale evolved in Chapter Three. This result suggested that further research upon these concepts and the instruments would need to be conducted before the theoretical framework was altered.

In conclusion, data from this study did not support the facilitative relationship between the humanistically oriented teacher and the development of classroom climate and students' self-concepts. Instead data supported the opposite relationship. Students in this study perceived the more custodial teachers having classroom climates which were more satisfying, competitive and higher on friction than the more humanistic teachers' classrooms. Since the key word in this last statement is more, a replication study with more extreme humanistic and custodial teachers may serve to clarify this conceptual incongruity.

CHAPTER SIX

SUMMARY AND CONCLUSIONS

Summary of the Study

This study was designed as an exploration of the development of classroom climate in upper-elementary grades. Specifically three questions were investigated:

1. Can teachers' implementation of a series of interaction activities facilitate the development of positive upper-elementary classroom climates and students' positive self-concepts?
2. Can changes in the climate of upper-elementary classrooms be described by Tuckman's theory of group development?
3. Can humanistically oriented teachers facilitate the development of positive classroom climates and students' positive self-concepts to a greater degree than more custodially oriented teachers?

These three questions were investigated by studying 12 volunteer teachers and their upper-elementary classes. The grades 6, 7 and 6/7 were pretested then randomly assigned to treatment and control groups. Six teachers in the experimental group were given a one-day orientation workshop and each implemented Project GROW interaction activities throughout the academic year. The control group of teachers did not implement a program of interaction activities. All classes and students were tested on four occasions, each at least seven school weeks apart. Data gathered include the teacher's ratings on a humanistic-custodial scale, teacher-student interaction, and students' perceptions of themselves, their classroom, their teachers, and fellow students.

Summary of Findings

The results were analysed by dividing the experimental group into two: the high-implementing group; and the low-implementing group. Three classes from each of these groups and the control group had their data analysed using analysis of variance procedures and a multiple regression. Because of the small number of classes in each group it was not surprising that only a few analyses produced results which indicated statistically significant differences between treatment groups.

In relation to aspect one of this study:

> "Can teachers' implementation of a series of interaction activities facilitate the development of positive upper-elementary classroom climates and students' positive self-concepts?"

each null hypothesis was accepted as there was a lack of statistically significant evidence which could distinguish the experimental groups from the control groups. However, small differences between groups were seen as indicative of possible trends which suggested that the high-implementing group of teachers had students who experienced their classes as having less friction and difficulty, and greater attraction and cohesion than either the control or low-implementing group of classes. The high-implementing teachers were also experienced as more empathic and more highly regarding than the other teachers. Upon the self-concept scales, trends were more difficult to isolate, but the high-implementing group had greater development of their sense of interpersonal adequacy than the other groups.

The second aspect of this study investigated the question:

> "Can changes in the climate of upper-elementary classrooms be described by Tuckman's theory of group development?"

Data was interpreted by examining statistically significant changes on dimensions over time and also comparing these changes with quantitative estimates based on Tuckman's (1965) theory. These analyses suggested that all groups of classes could be interpreted as having evolved through stages of group development which could be usefully described by Tuckman's (1965) theory. Changes not inconsistent with Tuckman's (1965) model were found on the cohesion, attraction, and empathy scales. Changes occurring within the high-implementing group on the friction and teacher empathy scales suggested that this group of classes may have experienced a reduction in conflict associated with Tuckman's (1965) stage two (Storming). Further, data from the cohesion and sociometric scales suggested that the high-implementing group experienced the last stage of development differently from that predicted by Tuckman's stage four (Performing). These conclusions were tentative however since: changes on dimensions over time were generally small, comparison with Tuckman's (1965) theory was based on estimates, and each group of classes only comprised three classes.

In relation to aspect three of this study, "Can humanistically oriented teachers facilitate the development of positive classroom climates and students' positive self-concepts to a greater degree than more custodially oriented teachers?," the teacher attitude measures were regressed upon 33 dependent variables. The teachers' humanistic-custodial orientation was generally found not to correlate with the dependent variables at any statistically significant level, although there was one exception to this generalization. Students' perception of "Classroom Life" was found to be strongly and negatively correlated with their teacher's PCI score. This suggested that the more custodial the

teacher, the more students perceived their classes as being competitive, having high levels of friction, but also being more satisfying. Again, because of the small sample size and other internal validity problems this relationship would need to be further explored in a replication study to confirm its validity.

Practical Implications of Results

Because of the small sample size and other problems associated with the internal validity of this exploratory study, its external validity and practical value is also limited. Thus, no attempt should be made to generalize from the results of this study to other populations or situations. However, as an exploratory study this investigation has examined the development of upper-elementary classroom climates and has revealed some findings which suggest that this area of research deserves further investigation.

The few practical implications that can be drawn from this study are listed below.

1. Classroom climate development can be investigated by the variables and instrumentation utilized within this study.

2. The results of this exploratory study suggest further research with a larger population will be necessary to determine if the previously suggested interpretations are indicative of statistically significant differences associated with the Project GROW interventions.

3. Classroom climate development interpreted by Tuckman's (1965) theory of group development can provide a useful aid to facilitate understanding of changes in classroom climate.

4. Further investigation of teachers' humanistic-custodial orientation and its relationship to classroom climate development may be worthwhile. In this study results suggested that the teachers' orientation was related to classroom climate, particularly when the climate was measured generally. Future studies should insure that a larger teacher population also contains teachers with a more extreme humanistic and custodial orientation toward teaching.

5. Results suggest that the Classroom Life (CL) inventory has high reliability, high correlations with other classroom climate dimensions and may be a useful research instrument in future studies.

Subjective Findings

Being involved with teachers, principals, classes, and students over the period of an academic year has led this researcher to derive the following intuitive and subjective findings.

1. The Project GROW activities were enthusiastically received by both teachers and students. The teachers were particularly grateful for the year-long curriculum and suggested facilitative teacher behaviour.

2. Teachers' ownership of the Project GROW resource and the mutual adaptation-implementation strategy was beneficial. Feedback from teachers and students at the conclusion of the study revealed that the "Classroom Meeting" was a useful, constructive, and valuable activity. Two other activities were received with less enthusiasm and the feedback from teachers and students would suggest that they need revision. The activities were "Do as I say", and "Communication Breakdown" (Barling 1980b, p. 45 and 61 respectively).

3. The high-implementing teachers had consciously decided to implement as many activities as they could. They saw the integration of the class' social development as proceeding hand-in-hand with their cognitive development. By contrast the low-implementing group of teachers generally held the same views but did not have the degree of commitment to the implementation of Project GROW activities. They appeared to be under more pressure, and found it difficult to organize their classes to implement more activities.

4. The four meetings with teachers were most beneficial and helped to maintain interest and commitment to the implementation of the activities. The meetings could have been improved by scheduling them more often and developing the teachers as a group themselves. Further, training sessions to improve teachers' skills in conducting activities would have been advantageous.

By way of combination of these subjective findings and the empirical results of this study, the following ideas for further research were generated.

Suggestions for Further Research

Because of the exploratory nature of this research its purpose was to identify trends which may warrant more comprehensive and thorough investigation. The preceding chapters have elaborated on the trends which were identified. It now remains the task of future research to establish if these trends can be replicated to enable them to be generalized. The following suggestions should assist this endeavour.

1. This study needs to be replicated with: a larger sample size; a restriction of classes to one grade level (not the most senior

elementary grade); utilization of different observation categories throughout the term of the study; and more regular meetings with implementing teachers.

2. Classroom climate research to date has not tapped the rich potential of the key influence upon classroom climate development: the teacher. Questionnaires which survey the teachers' experience of their classes over the period of the year could be an invaluable source of information upon the group development in classrooms.

3. The dimension of power, both from a teacher's perspective and students' perspectives, could be a useful variable which warrants more research of its relationship to the development of classroom climate.

4. The variation of activities, both their order and type, in a well-controlled study could provide valuable information to either support or negate the theoretical and practical rationale upon which Project GROW-type interventions are based.

APPENDICES

APPENDIX A

Glossary of Terms

In this study the following definitions have been applied:

A Social System. This is a conceptual term used to describe a collection of people who interact with each other to achieve a common goal. A social system is characterized by three man social-psychological aspects of the patterns of relationships, namely: roles, norms, and values (Katz & Kahn, 1978).

Classroom Climate. Refers to students' perceptions of class norms, beliefs, attitudes, and patterns of relationship that are reflected in instructional patterns, class behaviour practices and interactional patterns (Lezotte, Hathaway, Miller, Passalacqua and Brookover, 1980). In this study, classroom climates were measured upon the My Classroom Inventory (MCI, Anderson, 1973) and its subscales of cohesion, satisfaction, difficulty, friction, and competition. A sociogram measured the degree of interpersonal attraction between students.

Group Development. Describes the stage-like changes in groups upon dimensions of group structure elements and task activity.

Group Structure. Refers to the interaction of group cohesion, norms, communication, leadership, individual and group expectation, and attraction. Each of these elements is defined below:

(a) leadership: an interpersonal influence process comprised of behaviours, some desirable and some undesirable, which help the group toward particular objectives (Schmuck & Schmuck, 1979).

(b) norms: shared expectations or attitudes about appropriate school related procedures, behaviours, thoughts, and feelings (Schmuck & Schmuck, 1979).

(c) communication: occurs whenever persons attribute significance to message-related behaviour. Communication is dynamic, pro-active, interactive, and contextual (Mortensen, 1972).

(d) attraction: friendship between students which was demonstrated by the liking patterns which existed within the classroom (Schmuck & Schmuck, 1979).

(e) expectations: are evaluations--whether conscious or unconscious--that a person forms of another. This evaluation leads the evaluator to treat the person being evaluated as though the assessment were valid. The person doing the evaluation typically anticipated or predicts that the other person will act in a manner consistent with the assessment (Schmuck & Schmuck, 1979).

(f) cohesion: the sum of the preceding group processes that converge to influence students' feelings of inclusion and involvement (Schmuck & Schmuck, 1979).

Sociometric choice. Refers to students' selection of their best friends, friends, students they know and others who they do not know.

1. Diffuseness of sociometric choice describes that distribution of student friendship choices which reflected a relatively equal distribution of friendship choices. A diffusely structured classroom has an absence of distinct sub-groups whose members receive a large proportion of choices.

2. Centrality of sociometric choice describes that distribution of friendship choices with a class, whereby a few students receive many friendship choices and most children receive few sociometric choices.

Task Functions.

1. Task-maintenance group functions are interactions that are direted toward the task-oriented goal of the group. For example, students' interactions and attitudes toward their group's solution of a social studies problem.

2. Socio-emotional group functions are interactions within a group which are oriented toward the interpersonal and feeling concerns of group members. For example, reducing a new class member's anxiety and making him feeling welcome and part of the class.

Project G.R.O.W. The Project for Group Resourcefulness and Optimal Well-being (G.R.O.W.) in the classroom through improving the social climate, was designed by Barling (1980b) for use by upper elementay classroom teachers. Project G.R.O.W. (Barling, 1980b) represents the initial phase of development of a useful resource for upper elementary school teachers.

APPENDIX B-1

PROJECT G.R.O.W. ACTIVITIES

The following activities throughout Project G.R.O.W. have been selected from Vacha, E., et al. Improving Classroom Social Climate: Teacher's Handbook. N.Y.: Holt, Rinehart and Winston, 1979, the Project for Securing Every Learner's Future (S.E.L.F.).

Project G.R.O.W. Page	Project G.R.O.W. Activity	Project S.E.L.F. Reference Page
34	Many Sides to Me	32
36	The Microphone	78
38	Columbo	34
43	Revolving Circles	86
60	Back to Back	89
61	Comiunication Breakdown	94
67	Don't Push Our Button	186
69	Does It Bug You?	184
82	Most Correct Answer to Task and People Job Worksheet	130
83	Play Your Cards	141
85	What Should We/Bring?	155
86	What/Should We Bring?	156
87	What Should We Bring?	157
88	Group Roles	142
90	I Think...My Teacher Thinks...	212
96	Poster Design	188-191
99	Survival Kit	214
103	Opinion Box	144
104	Who Influences Us?	202
106	I Am...? Cause They Think I Am?	216
123	Putting It Together	235
126	Play a Role	147
128	Things That Make A Friend	193
131	Knotted Compliments	242
132	Who's Who in Our Room?	243
142	Finding Similarities	46
143	Word Picture	233
154	Fixed Words Story	239
156	Silent Movies	106
157	Candyland	237
159	Compliment Time	48

APPENDIX B-2

Project GROW Activities and Their Relationship to Dewey's Philosophy of Education

First, Dewey argued that educational experiences are optimal when they are organized developmentally and they have some degree of continuity. He said,

> ...every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after (Dewey, in Knowles, 1973, p. 69)

This principle was practically applied within Project GROW by: the sequencing of activities weekly and twice-weekly during the course of the academic year; the sequencing of activities in a developmental way as proposed from the implications of Tuckman's (1965) group development theory; the sequencing of activities which built upon trust, communication skills, cohesion-developing activities and cooperation activities.

Second, Dewey asserted that all education comes about through experience--"doing, rather than talking about doing". This aspect of Dewey's philosophy is central to all Project GROW activities where the emphasis is upon experience and learning through experiencing. One example from each phase of Project GROW will serve to illustrate the experimental nature of the activites. The "Experience Walk", "Communication Breakdown", "Fish Bowl", "Time Capsule" and "Symbol" (Barling 1980b, p. 47, 61, 124 and 125, respectively), are all examples of activities within the Project GROW curriculum which are experiential in nature. Each activity is described in detail in Project GROW.

Third, Dewey argued that in essence the teaching-learning process is a social process. As most learning takes place within classrooms, the social context of the class also contributes to and influences the learning process. Because the development of a cooperative atmosphere

and relationship will facilitate the teaching-learning process, Dewey argued that the teacher should ideally become a leader of group activities to promote social learning, cooperation and a conducive environment for teaching and learning. This aspect of Dewey's educational philosophy is the "raison d'etre" for Project GROW. All activities have been specifically selected to promote skills which foster better communication and a more cohesive, satisfying and friendly classroom climate.

Fourth, Dewey also argued that education in a democracy should model democratic principles. He maintained that:

> ...democratic social arrangements promote a better quality of human experience, one which is more widely accessible and enjoyed, than do non-democratic and anti-democratic forms of social life (Dewey, in Knowles 1973, p. 69).

Within the Project GROW curriculum of interaction activities "Classroom Meeting" (Barling 1980b, p. 64) provides the best example of an activity which allows for the practise of a democratic class structure and principles. This activity is of central importance to Phase two: Shared Influence, and it is suggested that it be conducted each week during this phase, if not for the continuation of the academic year.

Thus far, it has been argued that in the initial stages of development, the Project GROW curriculum resource has to some extent addressed the criteria evolved by Dewey in his philosophy of education. If this is the case then empirical support for Dewey's arguments would suggest that classes which implement the Project GROW activities should expect to produce more satisfying classroom climates, more conducive social learning, greater student learning, and greater development of student self-concepts, than non-democratic classes which did not implement Project GROW activities.

APPENDIX B-3

Some Implications from Stanford's (1977) Theory of Group Development, and a Discussion of How Project GROW Addresses Each Implication.

1. "The teacher needs to understand the process of group development and its stage characteristics." This implication is derived from Stanford's model which presents descriptions of the characteristic of each stage of group development and provides a logically developed sequence of behaviour and concerns of group members. The teacher's lack of knowledge of these processes could lead to inappropriate interventions at inappropriate times.

(a) teachers were given a one day orientation to the Project GROW resource, its structure and Stanford's theory of group development;

(b) each phase in Project GROW and the written introduction to the resource provides a detailed elaboration upon stage characteristics and group development;

(c) Project GROW also provides a bibliography of selected texts upon group development. While these resources were available to teachers no measure of their understanding of group development was undertaken. It was assumed that as the implementing teachers proceeded through the activities they would read the accompanying theoretical elaboration. This expectation was generally seen to be accurate when implementing teachers met to discuss their progress.

2. "The teacher needs to sequentially organize interventions so that they promote development and build upon previous learnings". This implication is drawn from the developmental notion of both models. Both models could be seen as analogous processes to Erikson's (1950) successive stages of social development. Just as each person at each stage of

development must learn to cope with new problems and must develop new skills and attitudes, so also is the group's development from one stage to another dependent upon the development of new skills and resolution of conflicts. The sequential and developmental nature of interventions will help to facilitate group development.

This implication from Stanford's model was addressed within the Project GROW resource by the ordering of activities into Phases of group development and arranging them upon a weekly schedule. The activities were considered to be developmentally sequenced as demonstrated by the leadership activity, "Task and People Jobs" (Barling 1980b, p. 70), preceding the group activities of "Survival in the Rockies" and "Mysteries" (Barling 1980b, pp. 120 and 134).

3. "The teacher needs to continue to utilize interventions to facilitate the class's development." This implication from Stanford's (1977) model can be seen to be drawn from the whole developmental conceptualization of the change in group processes. It can be seen that an intervention at Stage one will unlikely affect the group's development at Stage four. Thus, throughout the life of the class the teacher should continue her interventions in order to have an optimal effect upon each stage of development.

This implication from Stanford's theory was stressed to the implementing teachers at the one-day orientation workshop. The design of the Project GROW resource reflects this need for continuity through its week-by-week "Suggested Weekly Schedule" (Barling 1980b, p. 23-24).

4. "The teacher needs to recycle her interventions during the class's development". This is to say that an intervention presented when the class is at Stage one can be re-introduced and constructively

dealt with in later stages. This implication can be justified by an examination of Stanford's (1977) stages, to discover that issues in one stage are often recycled and dealt with in a different way in a later stage. For example, within the Orientation stage students are orienting themselves to each other and try to answer the question, "Who are the pupils in this class?" Later in the Productivity stage when members are trying out new roles in the group the previous question takes on a slightly different form, "What is my place in the class?" Thus, interventions introduced to help students answer the first question in Stage one, can be recycled to help students answer the second question in Stage four.

This implication from Stanford's theory was demonstrated to have been addressed by the inclusion of: "Many Sides to Me" during Phase one; "I am a Person Who" and "Who's Who in our Room" in Phase four (Barling 1980b, p. 34, 130 and 132 respectively).

5. "The teacher needs to implement activities which relate to all elements of group processes". This implication is drawn from Stanford's mention of the group process of "cohesion" being of central importance to changes and stages of group development. Cohesion has been defined as the sum of group processes that converge to influence students' feelings of inclusion and involvement (Schmuck and Schmuck 1979). Thus, if the development of and change in cohesion are important elements of group development, then interventions which cater to other group process elements and combine to form the group's cohesion will also be important. This implies that interventions should seek to cover the range of group process elements.

This implication from Stanford's theory can be seen to be addressed when the group dynamics characteristics of each activity are examined in the "Suggested Weekly Schedule." Each group process element of attraction, cohesion, communication, norms, leadership and expectations has a number of activities which are specifically related to the development of each aspect of group processes.

6. "Within the Orientation stage of class development the teacher needs to implement interventions with the following focuses:

(a) orientation to one another, and to the teacher;

(b) orientation to the tasks, requirements and expectations;

(c) orientation to standards of behaviour."

Interventions designed to focus upon these concerns are directly implied from Stanford's model. Stanford identifies group members' initial concerns of orientation, testing and dependence as constituting the group processes most active in the Orientation stage. If these are the key group processes, then interventions designed to satisfy these process needs will be most relevant at this stage. Interventions designed with the above focuses will reduce students' needs to engage in disruptive and counter-productive testing and dependent behaviour in order to satisfy these needs.

Activities which attempt to orientate students to each other and the teacher are: "Many Sides to Me," "Columbo," "A Personal Coat of Arms," "Happy Days and Revolving Circles" (Barling 1980b, p. 34, 38, 41, 42, and 43 respectively). Both the orientation to tasks and orientation to standards of behaviour were elaborated upon in the resource in a section titled, "Facilitative Teacher Behaviour to Help Achieve the Goals of Phase 1: Orientation" (Barling 1980b, p. 31-33).

7. "During the second stage of class development the teacher needs to implement interventions with the following focuses:

(a) confronting problems;

(b) tolerance and acceptance;

(c) listening and responding skills;

(d) development of cooperation;

(e) development of personal and class responsibility."

During the Establishing Norms stage the class members experience conflict as they struggle with issues of power and try to evolve interpersonal harmony. Stanford argues that the establishment of positive norms during this stage is of critical importance to later group development. This implies that teacher interventions which address: the resolution of conflict, the development of tolerance, the development of listening and responding communication skills, the development of cooperation, and the development of responsibility, will facilitate the class through this stage. Facilitation will be accomplished as the students become equipped with skills to constructively deal with their conflicts and as they are shown a more acceptable way of dealing with interpersonal differences.

The many activities which are designed to meet these criteria are listed in Appendix B-3.1.

8. "Within the third stage of class development the teacher needs to implement interventions with the following focuses:

(a) development of cohesion;

(b) examining norms;

(c) developing relationships;

(d) development of cooperation;

(e) resolution of conflict."

Stanford describes the "coping with conflict" stage as evolving when conflicts are confronted and dealt with in a supportive way. These conflicts arise when during the previous stage students have developed norms to actively confront and respond to problems. Again, interventions which provide a vehicle for the class to engage in satisfying these needs will be facilitative. Further, interventions which specifically encourage the development of group cohesion will be particularly relevant during this stage.

Again, these implications were addressed by a number of different activities. Each implication and its contributing activities were mainly located in Phase 3 and Phase 2 of the Project GROW resource. The activities and their relevance to each implication are listed in Appendix B-3.2.

9. "Within the Productivity stage of class development the teacher needs to implement interventions with the following focuses:

(a) maintenance of class cohesion;

(b) avenues for resolution of interpersonal problems;

(c) development of interdependence and flexibility;

(d) development of problem solving skills."

Stanford describes this stage as one where the interpersonal conflicts have been dealt with and students can now accept each other and work more cooperatively upon their tasks. However, while task concerns are paramount within this stage, Stanford argues that a group will oscillate between task and interpersonal concerns. As a result, interventions in this stage should continue to allow avenues for

interpersonal relations development, as well as to improve productivity, cohesion and problem solving skills.

These implications and the Project GROW activities which seek to provide experiences for students to achieve these needs are listed in Appendix B-3.3.

10. "Within the fifth stage of group development: Termination, the teacher needs to help students express their genuine feelings about the class, complete unfinished tasks and help them to resolve to reinvest their emotional energies into future group experiences."

Stanford identifies several characteristics of the termination stage which suggests that the class will experience increased conflict, lethargy, a breakdown in group skills and anger at the teacher. In order to avoid a concentration on the negative aspects of the group's experiences, interaction activities should concentrate on reviewing the positive aspects of the group's life, help students express their feelings about the end of the class, and to look positively to new group experiences.

These implications and the Project GROW activities which seek to provide experiences for students to achieve these needs are listed as the last eight activities in Project GROW. They include "Time Capsule and Symbol," "Silent Movies," "Candyland," and "Remember When" (see Barling, 1980b, pp. 154-161).

11. "The teacher, as the principal influence upon class development, will need to conduct herself in a congruent manner to her interventions, in order to reinforce and optimize the effects of her interventions." This implication is not drawn directly from Stanford's (1977) theory but is a teaching-learning principle espoused by Bandura

(1969) and other social learning theorists. If students experience a teacher who demonstrates good "listening skills," then social learning theory would assert that these skills are more likely to be developed by the students.

This social learning principle is reinforced throughout the Project GROW resource with a direct reference within each section to the "Facilitative Teacher Behaviour to Help Achieve the Goals of each Phase", of class social climate development. This section lists suggestions for "general facilitative" behaviour and "specific facilitative" teacher behaviour.

The preceding categorization of Project GROW activities has served to demonstrate that, as an initial teacher resource, Project GROW addresses many of the implications of Stanford's (1977) model. Further, if a teacher is able to implement the activities, combined with the suggested facilitative behaviour, then the class is more likely to evolve into an effective group than a class which did not experience the interaction activities.

APPENDIX B-3.1

PROJECT GROW ACTIVITIES: STANFORD'S STAGE TWO

Activities from Project G.R.O.W. which Meet the Implications from Stanford's (1977) Model During

Stage Two: Establishing Norms

Implication	Project G.R.O.W. Activity	Page
a) Confronting Problems	Class Meeting	64
	Don't Push Our Button	67
	Does It Bug You	69
	Don't Tear Me Apart	95
	Problem Solving Group Progress	118
b) Tolerance & Acceptance	Class Meeting	64
	Don't Push Our Button	67
	Does It Bug You	69
	Don't Tear Me Apart	95
	Problem Solving Group Progress	118
	Opinion Box	103
	Fishbowl	124
	Things That Make a Friend	128
c) Listening & Responding Skills	Back to Back	60
	Communication Breakdown	61
	The Microphone	36
	Do As I Say	45
	Classroom Meeting	64
	Reducing Communication Gaps	101
	Fishbowl	124
d) Development of Cooperation	Class Meeting	64
	Task & People Jobs	70
	Problem Solving Group Progress	118
	Play Your Cards	83
	Group Roles	88
	Survival Kit	99
	Fishbowl	124
e) Development of Personal & Class Responsibility	Class Meeting	64
	Task & People Jobs	70
	Survival Kit	99
	Problem Solving Group Progress	118

APPENDIX B-3.2

PROJECT GROW ACTIVITIES: STANFORD'S STAGE THREE

Activities from Project G.R.O.W. Which Meet
The Implications from Stanford's (1977) Model
of Group Development during Stage Three:
Coping with Conflict

Implication	Project G.R.O.W. Activity	Page
a) Development of Cohesion	Class Meeting	64
	Problem Solving Group Progress	118
	Survival in the Rockies	120
	Putting it Together	123
	Knotted Compliments	131
	Who's Who in Our Room	132
	Mysteries	134
	Broken Squares	139
	Word Picture	143
	Fixed Words Story	154
	Time Capsule & Symbol	155
	Candyland	157
	Remember When	158
b) Examining Norms	Don't Tear Me Apart	95
	Opinion Box	103
	Who Influences Us	104
	Things That Make a Friend	128
c) Developing Relationships	Putting it Together	123
	Fishbowl	124
	Things That Make a Friend	128
	I Am a Person Who . . .	130
	Who's Who in Our Room	132
	Word Picture	143
d) Development of Cooperation	Problem Solving Group Progress	118
	Mysteries	134
	Broken Squares	139
e) Resolution of Conflict	Class Meeting	64
	Problem Solving Group Progress	118

APPENDIX B-3.3

PROJECT GROW ACTIVITIES: STANFORD'S STAGE FOUR

Activities from Project G.R.O.W. Which Meet the Implications from Stanford's (1977) Model of Group Development During Stage Four: Productivity

Implication	Project G.R.O.W. Activity	Page
a) Maintenance of Class Cohesion	Problem Solving Group Progress	118
	Putting it Together	123
	Knotted Compliments	131
	Who's Who in Our Room	132
	Mysteries	134
	Broken Squares	139
	Fixed Words Story	154
	Time Capsule & Symbol	155
	Remember When	158
b) Avenues for Resolution of Interpersonal Problems	Class Meeting	64
	Problem Solving Group Progress	118
c) Development of Interdependence & Flexibility	Problem Solving Group Progress	118
d) Development of Problem Solving Skills	Problem Solving Group Progress	118

APPENDIX B-4

PROJECT GROW ACTIVITIES AND THEIR RELATIONSHIP TO SELF-CONCEPT THEORY.

1. Some Project GROW activities have been designed to increase the probability of students finding at least one best-friend in the class. The following activities offer students the opportunity to get to know different aspects of others in the class: "Many Sides to Me," "Columbo," "A Personal Coat of Arms," "Happy Days," and "Revolving Circles", (Barling, 1980b, p. 34, 38, 41, 42, and 43 respectively). Each activity provides students with the opportunity to discover new information about students in the class. It also gives students an opportunity to explore new friendships, and increase the possibility of receiving positive reinforcement from peers.

2. Some Project GROW activities have been designed to allow students to share their perceptions of reality. Activities of this kind are: "Happy Days," "Revolving Circles," "Trust Walk" and the "Classroom Meeting" (Barling, 1980b, p. 42, 43, and 64 respectively). These activities allow students to express their ideas and receive feedback upon them from others in the class.

3. Some Project GROW activities have been designed to sensitize students to the effects of "put downs" and negative interactions. Activities of this type are: "Don't Push our Buttons," "Does it Bug You," "Don't Tear Me Apart", and "Survival Kit" (Barling, 1980b, p. 67, 69, 95, and 99 respectively). Within these activities students have the opportunity to share with others how it feels to be "put down" and to recognize when they may be putting someone else down.

4. Some Project GROW activities have been designed to increase students' sensitivity to others' feelings and their acceptance of differences among people. Activities which help students to achieve these abilities are: "Don't Tear Me Apart," "The Experience Walk," "Does it Bug You;" and "Opinion Box," "Classroom Meeting," and Fishbowl" (Barling 1980b, p. 95, 47, 69, 103, 64 and 124 respectively). This range of activities will help students to develop empathy for others, as well as increase their acceptance and tolerance of others with different ideas to their own.

In general, most of the Project GROW activities have been oriented toward increasing the opportunity for students to interact with each other in the classroom in a positive and cooperative manner so as to help them feel better about themselves. As a result, it is expected that students who have experienced the Project GROW activities will have developed more positive self-concepts than those who have not experienced the activities.

APPENDIX C
PERMISSION LETTER FOR STUDENT INVOLVEMENT IN THIS STUDY

SFU

September 25, 1980

Dear Parent:

I am an educationalist presently engaged in study at Simon Fraser University. As a requirement for my Doctoral Dissertation I have proposed a study of an important influence upon your child's effective learning -- the classroom climate. In order to improve our knowledge of effective teaching and learning environments I would like to observe and administer some questionnaires to both teacher and students.

Your child's anonymity will be protected on all data collected. Most information will be collected and expressed in the form of grade averages. Your child's teacher has volunteered to involve him/herself in this study, the School District Office has approved my implementation of the research, the University Research & Ethics Committee has also approved my proposal -- finally, to enable data to be collected, I request your permission to allow your child to participate in the study.

I can be contacted to answer any questions about the study by phoning: Office - 291-4344; Home - 939-0980. Copies of my procedure and a description of each questionnaire can be obtained from your Principal or myself upon request. Results of the study will be available from your School Board and District office or by writing to me at the above address.

While you may withdraw your child from participation in the study at any time, I request their inclusion in this study of the important area of "classroom climate." If you do consent to your child's participation in this study, please sign the form and have your child return the letter to his/her teacher tomorrow.

Thank you.

Respectfully,

Norman Barling

Norman Barling
Graduate Student

NB:em

I consent to have _____ be part of this research.
Name of Child

_____ _____
Signature Date

APPENDIX D

The Pupil Control Ideology (P.C.I.) by
Willower, Eidell and Hoy (1973).

(Directions are included on the P.C.I. form.)

FORM PCI.

INFORMATION.

On the following pages a number of statements about teaching are presented. Our purpose is to gather information regarding the actual attitudes of educators concerning these statements.

You will recognize that the statements are of such a nature that there are no correct or incorrect answers. We are interested only in your frank opinion of them.

Your responses will remain confidential, and no individual or school will be named in the report of this study. Your co-operation is greatly appreciated.

Instructions:

Following are twenty statements about schools, teachers, and pupils. Please indicate your personal opinion about each statement by circling the appropriate response at the right of the statement.

		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1.	It is desirable to require pupils to sit in assigned seats during assemblies.	SA	A	U	D	SD
2.	Pupils are usually not capable of solving their problems through logical reasoning.	SA	A	U	D	SD
3.	Directing sarcastic remarks toward a defiant pupil is a good disciplinary technique.	SA	A	U	D	SD
4.	Beginning teachers are not likely to maintain strict enough control over their pupils.	SA	A	U	D	SD
5.	Teachers should consider revision of their teaching methods if these are criticized by their pupils.	SA	A	U	D	SD
6.	The best principals give unquestioning support to teachers in disciplining pupils.	SA	A	U	D	SD
7.	Pupils should not be permitted to contradict the statements of a teacher in class.	SA	A	U	D	SD
8.	It is justifiable to have pupils learn many facts about a subject even if they have no immediate application.	SA	A	U	D	SD
9.	Too much pupil time is spent on guidance and activities and too little on academic preparation.	SA	A	U	D	SD
10.	Being friendly with pupils often leads them to become too familiar.	SA	A	U	D	SD
11.	It is more important for pupils to learn to obey rules than that they make their own decisions.	SA	A	U	D	SD
12.	Student governments are a good "safety valve" but should not have much influence on school policy.	SA	A	U	D	SD
13.	Pupils can be trusted to work together without supervision.	SA	A	U	D	SD

/2.

		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
14.	If a pupil uses obscene or profane language in school, it must be considered a moral offense.	SA	A	U	D	SD
15.	If pupils are allowed to use the lavatory without getting permission, this privilege will be abused.	SA	A	U	D	SD
16.	A few pupils are just young hoodlums and should be treated accordingly.	SA	A	U	D	SD
17.	It is often necessary to remind pupils that their status in school differs from that of teachers.	SA	A	U	D	SD
18.	A pupil who destroys school material or property should be severely punished.	SA	A	U	D	SD
19.	Pupils cannot perceive the difference between democracy and anarchy in the classroom.	SA	A	U	D	SD
20.	Pupils often misbehave in order to make the teacher look bad.	SA	A	U	D	SD

NOTE: Before going on check to make sure you have circled one response for each statement.

INFORMATION SHEET.

Instructions:

Please complete this form by checking the appropriate boxes and filling in blanks where indicated.

1. Name: _____

2. Sex:
   ( ) Male ( ) Female

3. Years Teaching experience _____

4. Years Teaching grade 6 _____

APPENDIX E-1

TEACHER INTERACTION ACTIVITY SCHEDULE (TIAS)

Directions: Observe the teacher conducting the "Don't Tear Me Apart" activity and circle an appropriate number corresponding to your rating of the teacher's behaviour.

Teacher Interaction Activity Schedule

This observation schedule is designed for you to observe a teacher conducting a particular 15-20 minute interaction activity, a copy of which is attached.

Please rate each of the following teacher behaviours according to your observations and place a number to correspond with your choice in the appropriate box

1. The teacher's introduction of the interaction activity was ...

lifeless boring								enthusiastic dynamic
1	2	3	4	5	6	7	8	9	10

2. The purpose of the activity was stated ...

not at all							sensitively clearly	
1	2	3	4	5	6	7	8	9	10

3. The teacher's directions for the activity were ...

very confusing						clearly understood		
1	2	3	4	5	6	7	8	9	10

4. The percentage of students involved and attending to the teacher during the first half of the lesson (5-10 minutes) was ...

10%				50%					100%
1	2	3	4	5	6	7	8	9	10

5. The students' enjoyment of the activity during the first half of the lesson was ...

low				medium					high
1	2	3	4	5	6	7	8	9	10

6. The teacher's management of the activity was ...

disjointed									smooth
1	2	3	4	5	6	7	8	9	10

7. The students' enjoyment of the second half of the lesson (last 5-10 minutes) was ...

low				medium					high
1	2	3	4	5	6	7	8	9	10

8. The percentage of students involved and attending to the teacher and each other during the second half of the lesson was ...

10%				50%					100%
1	2	3	4	5	6	7	8	9	10

9. The percentage of students who actively contributed to the discussion was ...

10%				50%					100%
1	2	3	4	5	6	7	8	9	10

10. The teacher related the students' responses to the lesson objective ...

poorly				moderately well					effectively
1	2	3	4	5	6	7	8	9	10

11. The teacher's achievement of the objective of the lesson was ...

minimal									optimal
1	2	3	4	5	6	7	8	9	10

12. Your overall rating of the effectiveness of the teacher's conducting of the lesson was ...

poor									excellent
1	2	3	4	5	6	7	8	9	10

Definition of Terms

Q5. Students' enjoyment will be behaviourally demonstrated as they actively participate in the activity and as they identify with the characters in the story and respond to the teacher's questions.

Q6. The teacher's management of the activity will be defined as the general conducting of the learning experience, organization of the students, the setting of procedures, and the movement from one part of the activity to another.

Q12. The overall effectiveness rating should be a combination of the teacher's skill in conducting the lesson and the students' enjoyment and achievement of the objective of the lesson.

APPENDIX E-2

NUMBER OF PROJECT G.R.O.W. ACTIVITIES CONDUCTED AND QUALITY OF IMPLEMENTATION FOR EXPERIMENTAL GROUP TEACHERS

Teacher	Number of Activities Conducted	Quality Measure	E_1 High-Implementers	E_2 Low-Implementers
1	18	8.5	E_1	
4	24	8.5	E_1	
6	17	8.25	E_1	
8	6	7.5		E_2
9	11	7.5		E_2
10	6	8.0		E_2

APPENDIX E-3

PROJECT GROW ACTIVITIES IMPLEMENTED -- II

Teacher Number/ Sex (M/F) & Grade level	Implementation Group	Activities Implemented Between T_1 & T_2	Activities Implemented Between T_2 & T_3	Activities Implemented Between T_3 & T_4	Total Number of Activites Conducted
4/F	E_1	1,2,4,5 7,9,10	12,13,15 18,20,21 25	27,29,31 33,35,39 45	24
6/M	E_1	1,2,3,5 6,7,8,9 10	12,13,15 16,17,20 21	31	17
1/F	E_1	1,2,3,4 5,7	11,13,14 16,17,20 22	28,31,35 36,39	18
9/F	E_2	1,2,4,5 6,8	13,14,20 23	30	11
8/M	E_2	1,3,7	13,14,20		6
10/F	E_2	1,5,10 Phase I Activities	13,14 Phase 2 Activities	31 Phase 3 & 4 Activities	6

APPENDIX F-1

FULLER'S (1969) AFFECTIVE INTERACTION RECORD (F.A.I.R.)

Directions: Classify each teacher and student behaviour each 5 seconds. Repeat the coding if the behaviour continues for another 5 second period.

Teacher Categories

V. Values
Values feelings; identifies; shares. Listens attentively. Unqualified acceptance. Includes laughing or being sad with someone, "I feel that way too." (Person oriented.)

N. Nurtures
Teacher gives focused encouragement. Guides. Hints. "Come on, Johnny, you know this one." Gives praise, approval to previous behaviour. Smiles. Includes recognition of student volunteer, and "Thank you for helping me." (Affect)

C. O.K.
"That's the right answer." Acknowledgement that the student is right.

D. Delves
Probes the meaning of a student response. Asks for more information about a student response. Asks for feedback on teacher (own) interpretation, reflection or incorporation of student idea. "Do I understand?" "What do you think of what Bill said?" Correctness of student response is not an issue. (Task oriented)

F. Confirms
Incorporates student ideas and uses them in lecture. Responsively gives information or opinion; attentive to student feedback and questions. Includes repeating; also, interrupting self to call on a student. Shifts action on basis of previous student response, suggestion.

P. Ponders
"I'm not sure." "Well...maybe, but...." Ponders a student response or expresses doubt. Includes "Don't you understand?"

K. Corrects
"That's the wrong answer." "Do this." "Quit that." Behaviour change requested is specified. Corrects or questions what preceded; opportunity for right response offered. May be serious or humorous.

C. Criticizes
Student behaviour condemned. Change of behaviour requested. Includes cold, hostile, sarcastic remarks, scolding, teasing and belittling.

Y. Yea
Teacher praises self; expresses self-approval. "This time I was right." Includes denial of mistake. "I didn't add it wrong." "Right on time."

T. Tangential
Tangential talk or action to self. Teacher "out to lunch." Sighs; looks out window. Fusses with objects, shuffles papers, stands by indecisively.

O. Owns up
Scolds self; expresses self-disapproval; admits error. "I don't know what's the matter with me today." "Here's my mistake."

I. Initiates
initiates a probe or asks broad question. (Open-ended question: "What if....")

M. Manages
Teacher gives procedural directions. Teacher asks narrow question (questions with specific, predictable answer). May be either substantive or procedural. Includes teacher "drill."

L. Lectures
Gives information or opinion; not in response to feedback. Students are passively receptive (listening). Includes ignoring student attempts to participate.

Solitary Work
Grading papers, writing on board without reference to students, arranging material, bulletin board, operating projector.

Student Categories

J. Rejoices
Student praises self; expresses self-approval. "I got it right." "Now I understand." "Me first."

W. Woolgathering
Extraneous behaviour with only self involved. Not work oriented. Bored, yawning, sleeping. Includes rest periods in primary.

A. Admits
Student owns up or admits error. "I don't understand." "I got that one wrong." Expresses self-disapproval. Includes self-punitive actions: banging fist on desk, if directed against self.

G. Generates
Student initiates, asks for new information on own or offers own ideas.

H. How
Student asks for "the" answer; asks for directions on how to do something without reference to preceding teacher behaviour. Asks if preceding answer is right; also, if it is O.K. to do something.

B. Brings Out
Student gives information or opinion. Reads report; recites.

So. Solitary Work
Activity which is not under immediate supervision (individual or group); such as: doing assignments, art work, sharpening pencils, computer assisted instruction.

M. Student Manager
Student takes over the role of group leader and gives directions and instructions to the class.

Z. Zeal
Student is responsive, participating. Listens attentively. Values or recognizes another's feelings. Waves hand, shows pleasure, appreciation, good mood, laughing with someone. "Oh, boy." (Affect)

E. Encourages
Encourages teacher or another student to go on. Includes "Thank you for helping me." Gives approval; praises. "You got it right." Includes choosing in a game, election panel.

O.K.
Any acknowledgement that the teacher is right (acquiescence), that is not included in another category. Include "Yes, sir." "Yes, Ma'am."

X. Explores
Student asks for information; may be incorporating teacher idea in response. Student gets teacher or another student to give idea, talk. "But why?" "Is it like what we did yesterday?" (Task oriented)

U. Usual
Routine feedback in response to teacher direction, questions whether response is correct or not.

Q. Questions
Questions or ponders a preceding response by doubting, arguing, or bringing up new information. "But yesterday...." "I don't get it."

S. Suggests
Student requests change of behaviour. Makes correcting suggestion. "Why don't we...." May be serious or humorous.

R. Resists
Student resists. Openly ignores teacher, e.g., rudeness, hostility, aggressive antipathy, obvious foot-dragging, "Aw, nuts."

APPENDIX F-2

FAIR OBSERVATION DATA

Mean Frequencies and Ranges of Teacher and Student Talk Categories Upon the FAIR Observation

Instrument at Time One and Time Four

Teacher Talk Categories

	Mean Freq. T.1	Mean Freq. T.1	Range Time 1	Range Time 4
Lectures	7.1	8.2	15	22
Manages	3.5	4.5	11	19
Initiates	11.0	9.2	19	19
Delves	20.3	18.2	23	15
O.K.	6.4	3.4	16	10
Confirms	10.8	7.8	16	23
Total	63.0	56.8	40	33

Student Talk Categories

	Mean Freq. T.1	Mean Freq. T.1	Range Time 1	Range Time 4
Generates	1.6	4.7	11	21
Brings Out	52.8	55.2	43	53
Questions	0.8	2.9	4	12
Usual	3.8	2.4	13	18
Total	65.1	72.1	43	37

APPENDIX G-1

MY CLASS INVENTORY (MCI) BY ANDERSON (1973)

Directions:

This is not a test. The questions inside are to find out what your class is like. Please answer all the questions.

Each sentence is meant to describe your class. If you agree with the sentence place a <u>one</u> in the box to stand for yes. 1

If you disagree with the statement, place a <u>two</u> in the box to stand for no. 2

<u>Example</u>

Place 1 or 2 in the box
1 = yes
2 = no

1. Most children in the class are good friends

If you think that most children in the class are good friends, place 1, to stand for YES, in the box like this:

1. Most children in tne class are good friends. 1

If you do not think that most children in the class are good friends, place 2, to stand for NO, in the box like this:

1. Most children in the class are good friends. 2

Definition of MCI Subscales

The five subscales of the MCI are cohesiveness, friction, difficulty, satisfaction and competitiveness. Each subscale was briefly described within the manual:

Cohesiveness: When several individuals interact for a period of time a feeling of intimacy or cohesiveness may develop. This property separates members of the group from nonmembers.

Friction: The friction scale measures, from the pupil's viewpoint, essentially the three observational categories 'shows disagreement,' 'shows tension,' and 'shows antagonism' of Bales (1959) interaction process categories.

Difficulty: This scale was incorporated specifically for course evaluation and to measure perceived difficulty levels associated with class work.

Satisfaction: Whether or not pupils like their class can be expected to affect their learning. If students dislike the subject, the teacher, or their classmates their frustration may result in less than optimal performance.

Competitiveness: Competitiveness is a central concept in group dynamics and was defined as the desire between students to compete by finishing first and getting higher grades (Anderson, 1973, pp. 11-13).

APPENDIX G-2

MCI SUBSCALE ANALYSIS I

Fraser (1980, p. 148) Descriptive Statistics of MCI Alpha Reliability and Sample Scale Items

	Descriptive Information		Scale Validation Statistics[a]	
Scale	Sample Item	No. of Items	Alpha Rel.	Mean Correl. with Other Scales
Cohesiveness	Some people in my class are not my friends (-).	6	0.94	0.27
Friction	Many of the children in our class like to fight (+).	8	0.94	0.30
Difficulty	In our class the work is hard to do (+).	8	0.90	0.20
Satisfaction	Some pupils are not happy in the class (-).	9	0.96	0.28
Competitiveness	Most children want their work to be better than their friends' work (+).	7	0.91	0.13

Items designated (+) are scored 3 and 1, respectively, for responses Yes and No. Items designated (-) are scored in the reverse manner. Omitted or invalid responses are scored 2.

[a]Scale statistics were calculated using the class mean as the unit of analysis.

APPENDIX G-3

MCI SUBSCALE ANALYSIS II

MCI Subscale Means, Standard Deviations, and Alpha Reliabilities for N = 275 Students at Time One

Sub-scale	Mean	Standard Deviation	Reliability (Alpha)
Satisfaction	19.33	5.15	0.789
Friction	16.92	3.53	0.672
Competition	16.22	3.43	0.653
Difficulty	12.11	3.12	0.542
Cohesion	10.83	3.12	0.648

APPENDIX G-4

MCI SUBSCALE ANALYSIS III

Pearson Correlation Coefficient Between MCI Subscales

Subscales	Sat.	Fri.	Compet.	Dif.	Coh.
Satisfaction	1.00				
Friction	0.99	1.00			
Competition	0.57	0.59	1.00		
Difficulty	-0.05	-0.11	-0.57	1.00	
Cohesion	0.11	0.11	0.14	0.05	1.00

°APPENDIX H-1

THE TEACHER RELATIONSHIP INVENTORY (TRI)

The Teacher Relationship Inventory (TRI)
by Wittmer and Myrick (1974)

Directions: Think of your relationship with your teacher and try to decide how you feel about your teacher in the following examples. Look at the first statement.

My teacher respects me as a person.

If you feel that your teacher respects you as a person, and you strongly agree, then place a 5 in the box opposite. If you agree, you are uncertain, you disagree or you strongly disagree with this statement put a 4, 3, 2 or 1 in the box opposite.

Card 2

Col 8

TEACHER RELATIONSHIP INVENTORY

Directions

Consider each statement below with regards to your present relationship with your teacher. Read each statement and place the number in the box corresponding to how strongly you feel the statement is true or not true of your present relationship with your teacher. Please place a number in each box.

My teacher,	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	
1. Respects me as a person	5	4	3	2	1	
2. Wants to understand how I see things	5	4	3	2	1	
3. Interest in me depends upon the things I say or do	5	4	3	2	1	Col 10
4. Feels a true liking for me	5	4	3	2	1	
5. Understands my words, but does not see the way I feel	5	4	3	2	1	
6. Is impatient with me	5	4	3	2	1	
7. Almost always knows exactly what I mean	5	4	3	2	1	
8. Depending on my behavior, she/he has a better opinion of me sometimes than at others	5	4	3	2	1	Col 15
9. Seems to realize or sense what I am feeling	5	4	3	2	1	
10. Wants me to be a particular kind of person	5	4	3	2	1	
11. Cares for me	5	4	3	2	1	
12. Sometimes she/he thinks I feel a certain way because that is the way she/he feels	5	4	3	2	1	
13. Likes certain things about me and there are other things she/he does not like	5	4	3	2	1	Col 20
14. I feel she/he disapproves of me	5	4	3	2	1	
15. Realizes what I mean even when I have difficulty saying it	5	4	3	2	1	
16. Usually understands what I mean	5	4	3	2	1	
17. Is friendly and warm with me	5	4	3	2	1	
18. Does not take any notice of some things I think and feel	5	4	3	2	1	Col 25
19. Appreciates exactly how the things I experience feel to me	5	4	3	2	1	
20. Approves of some things I do and plainly disapproves of others	5	4	3	2	1	
21. Understands me	5	4	3	2	1	
22. Is truly interested in me	5	4	3	2	1	
23. I feel like I can talk about little things	5	4	3	2	1	
24. She/he will like me better if I say the right things	5	4	3	2	1	Col 32

APPENDIX H-2

TRI SUBSCALE ANALYSIS I

Sample Items & Number of Items from Teacher Relationship Inventory by Wittner & Myrick (1974) also Scales, Sample items, number of items and Split-half Reliabilities for the Barrett-Lennard Relationship Inventory (1962)

Scale	Sample Item	Wittner & Myrick (1974)		Stiltner (1973)
	TRI	TRI		BLRI
		No. of items	No. of items	Reliability Coefficient
Empathy	My teacher...seems to realize or sense what I am feeling	10	16	.852
Regard	Is impatient with me	7	16	.855
Unconditionality of regard	Interest in me depends on the things I say or do	7	16	.750
Congruence	--	0	16	.845

[a]reliability coefficient was Cronbach's alpha.

APPENDIX H-3

TRI SUBSCALE ANALYSIS II

TRI Subscale and Total Means, Standard Deviations, and Alpha Reliabilities for N = 272 Students at Time One

Subscale	Mean	Standard Deviation	Reliability (Alpha)
Empathy	33.82	4.95	0.735
Regard	23.99	4.45	0.776
Unconditionality of Regard	20.30	3.00	0.1879
Total	78.11	10.01	0.8153

APPENDIX H-4

TRI SUBSCALE ANALYSIS III

Pearson Correlation Coefficients Between TRI Subscales

Subscales	Emp.	Reg.	Un-reg.	Total
Empathy	1.00			
Regard	0.85	1.00		
Unconditionality of Regard	0.39	0.40	1.00	
Total	0.96	0.89	0.57	1.00

APPENDIX I-1

CLASSROOM LIFE (CL) BY FOX, LUSZKI AND SCHMUCK (1966)

Directions: As indicated upon the questionnaire.

CLASSROOM LIFE

Card [3]

Col 8

Directions

Here is a list of some statements that describe life in your classroom. Select the best alternative to describe how you feel about this class and place the corresponding letter in the appropriate square. There are no right or wrong answers. Please place a letter in each box.

1. Life in this class with your regular teacher has

   a. all good things.
   b. mostly good things.
   c. more good things than bad.
   d. about as many good things as bad.
   e. more bad things than good
   f. mostly bad things.

   [ ]

2. How hard are you working these days on learning what is being taught at school?

   a. Very hard.
   b. Quite hard.
   c. Not very hard.
   d. Not hard at all.

   [ ]

3. When I'm in this class, I

   Col 10

   a. usually feel wide awake and very interested.
   b. am pretty interested, kind of bored part of the time.
   c. am not very interested, bored quite a lot of the time.
   d. don't like it, feel bored and not with it.

   [ ]

4. How hard are you working on schoolwork compared with the others in the class?

   a. Harder than most.
   b. A little harder than most.
   c. About the same as most.
   d. A little less than most.
   e. Quite a bit less than most.

   [ ]

5. How many of the pupils in this class do what the teacher suggests?

   a. Most of them do.
   b. More than half do.
   c. Less than half do.
   d. Hardly anybody does.

   [ ]

6. If we help each other with our work in this class, the teacher

   a. likes it a lot.
   b. likes it some.
   c. likes it a little.
   d. doesn't like it at all.

   [ ]

7. How good is your schoolwork compared with the work of others in the class?

   a. Much better than most.
   b. A little better than most.
   c. About the same as most.
   d. Not quite as good as most.
   e. Much worse than most.

   [ ]

8. How often do the pupils in this class help one another with their schoolwork?

   a. Most of the time.
   b. Sometimes.
   c. Hardly ever.
   d. Never.

   [ ]

9. How often do the pupils in this class act friendly toward one another?

   a. Always.
   b. Most of the time.
   c. Sometimes.
   d. Hardly ever.

   [ ]

Col 17

APPENDIX I-2

C.L. TEST ANALYSIS I

Classroom Life (C.L.) Means, Standard Deviations, and Alpha Reliabilities for Students at Time One

Scale		N	Mean	Standard Deviation	Reliability (Alpha)
Total		275	29.33	4.58	0.767
	Exp.	132	28.97	4.81	0.788
	Control	143	29.67	4.35	0.746
(-item 7)	Exp.	132	25.67	4.20	0.755
	Control	143	25.98	3.83	0.707

APPENDIX I-3

C.L. TEST ANALYSIS II

Correlation Matric for Classroom Life (CL) Questions at Time One, N = 274

Question	1	2	3	4	5	6	7	8	9
1	1.00								
2	0.28	1.00							
3	0.42	0.38	1.00						
4	0.28	0.43	0.34	1.00					
5	0.28	0.26	0.18	0.21	1.00				
6	0.16	0.13	0.28	0.17	0.14	1.00			
7	0.30	0.33	0.36	0.66	0.19	0.21	1.00		
8	0.25	0.16	0.35	0.28	0.17	0.31	0.24	1.00	
9	0.26	0.22	0.37	0.25	0.25	0.24	0.29	1.00	

APPENDIX I-4

C.L. TEST ANALYSIS III

C.L. Scale, Pearson Correlation Coefficients with Other Dependent Variable Subscales

Subscales	PCI	MCI Sat	MCI Frict	MCI Comp	MCI Diff	MCI Coh	TRI Emp	TRI Reg	CL	CL (-7)
CL Total	-0.64	-0.89	-0.85	-0.54	-0.10	-0.09	-0.66	-0.47	1.00	-0.12
CL (-7)	0.08	0.11	0.14	0.55	-0.65	0.18	0.14	0.18	-0.12	1.00

APPENDIX J

HOW I SEE MYSELF (HISM)

by Gordon (1968)

Directions:

I would like to explain this scale to you and tell you why you are being asked to answer these questions. This is part of a study. We are trying to get information that we hope will eventually help to improve the kind of school and education for you and other pupiles.

Let me emphasize that this is not a test to see how much you know or do not know about something. These questions are all about you. They are to learn how you see yourself most of the time. There are no right or wrong answers. We are only interested in what you think about yourself.

I am going to ask you to think about yourself for a little while before you write anything. I want you to think of how you are most of the time...not how you think you ought to be - not how the teacher thinks you ought to be...not how you want to be or your parents or friends want you to be. No - this is to be how you yourself fee you are most of the time.

Let me first promise you that these papers will not be seen by anyone other than the people making this study. Your teacher will not see them nor your parents or friends. No one will know your answers but you and the ones who are doing this study. We are asking you to put your names on the paper so that we can check then on any other scales we might give you in the future.

Now - let's look at the papers.

Look at No. 1. On the side it has "Nothing gets me mad" and on the other side "I get mad easily and explode". If you feel that nothing gets you too mad most of the time, you would circle the 1. If you feel that most of the time you get mad easily and explode, you would circle the 5. If you feel you are somewhere in between, you would circle the 2, 3, or 4.

Look at No. 2. It is different. On one side it has "I don't stay with something till I finish". If you feel that most of the time you don't stay with things and finish them, you would circle a 1. If you feel that most of the time you do stay with things and finish, you would circle a 5. If you feel you fit somewhere in between, you would circle the 2, 3, or 4. It is important to see that some of these mean one thing on the left side, some of them mean another. So it is very important to think about each statement as I read it. I will answer any questions you need answered, so feel free to ask them.

Remember, we how you yourself feel. We want you to be honest with us in your answer. Remember, it is how you feel most of the time.

HOW I SEE MYSELF

T.T. ☐

Name _____ ☐☐

Class ☐☐

Col 4 - 5

Sex M/F ☐

Age ☐☐

Card 0 4

Col 9 - 10

Directions

Circle the appropriate number to indicate your position and also write the number in the appropriate box on the right hand side of the page.

11.	Nothing gets me too mad	1	2	3	4	5	I get mad easily and explode	
12.	I don't stay with things and finish them	1	2	3	4	5	I stay with something till I finish	
13.	I'm very good at drawing	1	2	3	4	5	I'm not much good in drawing	
14.	I don't like to work on committees, projects	1	2	3	4	5	I like to work with others	
15.	I wish I were smaller (taller)	1	2	3	4	5	I'm just the right height	
16.	I worry a lot	1	2	3	4	5	I don't worry much	
17.	I wish I could do something with my hair	1	2	3	4	5	My hair is nice-looking	
18.	Teachers like me	1	2	3	4	5	Teachers don't like me	
19.	I've lots of energy	1	2	3	4	5	I haven't much energy	
20.	I don't play games very well	1	2	3	4	5	I play games very well Col 20	
21.	I'm just the right weight	1	2	3	4	5	I wish I were heavier (lighter)	
22.	The girls don't like me, leave me out	1	2	3	4	5	The girls like me a lot, choose me	
23.	I'm very good at speaking before a group	1	2	3	4	5	I'm not much good at speaking before a group	
24.	My face is pretty (good looking)	1	2	3	4	5	I wish I were prettier (good looking)	
25.	I'm very good in music	1	2	3	4	5	I'm not much good in music	
26.	I get along well with teachers	1	2	3	4	5	I don't get along with teachers	
27.	I don't like teachers	1	2	3	4	5	I like teachers very much	
28.	I don't feel at ease, comfortable inside	1	2	3	4	5	I feel very at ease, comfortable inside	
29.	I don't like to try new things	1	2	3	4	5	I like to try new things	
30.	I have trouble controlling my feelings	1	2	3	4	5	I can handle my feelings Col 30	
31.	I do well in school work	1	2	3	4	5	I don't do well in school	
32.	I want the boys to like me	1	2	3	4	5	I don't want the boys to like me	
33.	I don't like the way I look	1	2	3	4	5	I like the way I look	
34.	I don't want the girls to like me	1	2	3	4	5	I want the girls to like me	
35.	I'm very healthy	1	2	3	4	5	I get sick a lot	
36.	I don't dance well	1	2	3	4	5	I'm a very good dancer	
37.	I write well	1	2	3	4	5	I don't write well	
38.	I like to work alone	1	2	3	4	5	I don't like to work alone	
39.	I use my time well	1	2	3	4	5	I don't know how to plan my time	
40.	I'm not much good at making things with my hands	1	2	3	4	5	I'm very good at making things with my hands Col 40	
41.	I wish I could do something about my skin	1	2	3	4	5	My skin is nice-looking	
42.	School isn't interesting to me	1	2	3	4	5	School is very interesting	
43.	I don't do arithmetic well	1	2	3	4	5	I'm real good in arithmetic	
44.	I'm not as smart as the others	1	2	3	4	5	I'm smarter than most of the others	
45.	The boys like me a lot, choose me	1	2	3	4	5	The boys don't like me, leave me out	
46.	My clothes are not as I'd like	1	2	3	4	5	My clothes are nice	
47.	I like school	1	2	3	4	5	I don't like school	
48.	I wish I were built like the others	1	2	3	4	5	I'm happy with the way I am	
49.	I don't read well	1	2	3	4	5	I read very well	
50.	I don't learn new things easily	1	2	3	4	5	I learn new things easily Col 50	

APPENDIX K

SELF-CONCEPT OF ACHIEVEMENT (SCA) SCALE

by Brookover, Erickson, and Joiner (1967)

Directions:

Think of yourself and your ability and then answer each question by selecting the best answer for you and writing its corresponding number in the appropriate box.

QUESTIONNAIRE

SCA

TT

NAME _____

Class

Col 4 - 5

Directions

Place the corresponding number 1, 2, 3, 4, or 5 in the square on the right-hand side of each statement which best answers each question for you. There are no right or wrong answers. Place a 1, 2, 3, 4, or 5 in each square.

Sex M/F

Age

Card 0 5

1. Think of your friends. Do you think you can do school work better, the same or poorer than your friends?

Better than all of them 1
Better than most of them 2
About the same 3
Poorer than most of them 4
Poorer than all of them 5

Col 11

2. Think of the students in your class. Do you think you can do school work better, the same or poorer than the students in your class?

Better than all of them 1
Better than most of them 2
About the same 3
Poorer than most of them 4
Poorer than all of them 5

3. When you finish high school, do you think you will be one of the best students, about the same as most or below most of the students?

One of the best 1
Better than most of the students 2
Same as most of the students 3
Below most of the students 4
One of the worst 5

4. Do you think you could finish college?

Yes, for sure 1
Yes, probably 2
Maybe 3
No, probably not 4
No, for sure 5

5. If you went to college, do you think you would be one of the best students, same as most or below most of the students?

One of the best 1
Better than most of the students 2
Same as most of the students 3
Below most of the students 4
One of the worst 5

Col 15

6. If you want to be a doctor or a teacher, you need more than four years of college. Do you think you could do that?

Yes, for sure 1
Yes, probably 2
Maybe 3
No, probably not 4
No, for sure 5

7. Forget how your teachers mark your work. How good do you think your own work is?

Excellent 1
Good 2
Same as most of the students 3
Below most of the students 4
Poor 5

8. How good of a student do you think you can be in this school?

One of the best 1
Better than most of the students 2
Same as most of the students 3
Below most of the students 4
One of the worst 5

Col 18

APPENDIX L

SOCIOGRAM, ADOPTED FROM HALLINAN (1976)

Directions:

In front of you is a list of all students in your class. I'd like you to decide whether each student in your class is either your best friend, your friend, you know them, or you do not know them.

Your best friends are people who you like very much.

Your friends are people who you like, but they are not really your best friends.

Known refers to people who you would not call friends but you know them.

Not know refers to people who you would not know anything about.

QUESTIONNAIRE F1

T.T. [ ] 233

Directions

Name _____ Class [ ][ ]

Below is a list of all students in your class. Please place a number 1, 2, 3, or 4 in the square opposite each name to indicate whether the person is

Best Friend 1
Friend 2
Known 3
Not Known 4 as a member of your class.
Place a 9 in the square opposite your own name.

Sex [ ]
Age [ ][ ]
Card [0][6]
Col 9 - 10

Student's name	Student's No.	Best Friend	Friend	Known	Not Known	Selection	
	11	1	2	3	4		
	12	1	2	3	4		
	13	1	2	3	4		
	14	1	2	3	4		
	15	1	2	3	4		
	16	1	2	3	4		
	17	1	2	3	4		
	18	1	2	3	4		
	19	1	2	3	4		
	20	1	2	3	4		Col 20
	21	1	2	3	4		
	22	1	2	3	4		
	23	1	2	3	4		
	24	1	2	3	4		
	25	1	2	3	4		
	26	1	2	3	4		
	27	1	2	3	4		
	28	1	2	3	4		
	29	1	2	3	4		
	30	1	2	3	4		Col 30
	31	1	2	3	4		
	32	1	2	3	4		
	33	1	2	3	4		
	34	1	2	3	4		
	35	1	2	3	4		
	36	1	2	3	4		
	37	1	2	3	4		
	38	1	2	3	4		
	39	1	2	3	4		
	40	1	2	3	4		Col 40
	41	1	2	3	4		
	42	1	2	3	4		
	43	1	2	3	4		
	44	1	2	3	4		

APPENDIX M

DISCUSSION TOPICS LIST

1. Why do students misbehave for substitute teachers?
2. If you were a teacher, how would you keep order in the classroom?
3. Why do some students steal?
4. How would you like for this class to be different?
5. Is Canadian justice equally available for all?
6. What does one do when a law seems immoral by one's standards?
7. When the law fails to protect a person's rights, what should he do?
8. What are the alternatives to war as a way of solving international problems?
9. Does the government have a right to tell a person what he can and cannot drink, smoke, inject, etc.?
10. What should schools teach that they do not presently emphasize?
11. In what ways should a person be different when he finishes grade 9 than he was when he started grade 7.
12. Is religion important in the life of the average 6-7th grader?
13. What can students do to get along better with teachers? Teachers with students?
14. Why do some people enjoy hurting others?
15. On what should one base his decisions about right and wrong?
16. What are the best things and the worst things that have taken place in this class so far this year?
17. Does a woman need to marry to be truly happy?
18. What is the best way to react when someone criticizes you?
19. Does the most qualified person usually win in school elections?
20. Is going steady important in order to achieve social success?
21. Should children have to work for their allowances?
22. Should the United States have spent the billions of dollars that were required to send a man to the moon?

23. Should Canadian police follow the example of the British "Bobbies" and not carry guns?

24. Do most students feel free to talk with their teachers?

25. Should married women stay at home and be primarily wives and mothers?

26. Should people limit the size of their families to two children? Should the government make this a legal requirement?

27. Should school be optional (after grade 9 or some other limitation)?

28. What effects does TV watching have on the viewer?

29. Should one always tell the truth?

30. Should homework be eliminated?

31. What characteristics should a good school officer possess?

32. What decisions should a person your age be allowed to make for himself or herself? Which should he or she not be allowed to make?

33. How can a person cope with loneliness?

34. What is the greatest problem facing America today?

35. What is the greatest problem facing our school right now?

36. Should grades be eliminated?

APPENDIX N-1

PROJECT GROW ACTIVITIES AND TUCKMAN'S (1965) STAGES OF DEVELOPMENT

Tables of Activities from Project G.R.O.W. Which Meet the Implications from Tuckman's (1965) Model During Stages Two, Three, and Four.

APPENDIX N-1.1

PROJECT GROW ACTIVITIES: TUCKMAN'S STAGE TWO, STORMING

Activities from Project G.R.O.W. Which Meet the Implications from Tuckman's (1965) Model During Stage Two: Storming.

Implication	Project G.R.O.W. Activity	Page
a) Resolution of Interpersonal Conflict	Class Meeting	64
	Don't Push Our Buttons	67
	Does it Bug You	69
	Don't Tear Me Apart	95
	Problem Solving the Group Progress	118
b) Tolerance & Acceptance	Class Meeting	64
	Don't Push Our Buttons	67
	Does it Bug You	69
	Don't Tear Me Apart	95
	Problem Solving the Group Progress	118
	Opinion Box	103
	Fishbowl	124
	Things That Make a Friend	128
c) Listening & Responding Skills	Back to Back	60
	Communication Breakdown	61
	The Microphone	36
	Do As I Say	45
	Classroom Meeting	64
	Reducing Communication Gaps	101
	Fishbowl	124
d) Development of Cooperation	Class Meeting	64
	Task & People Jobs	70
	Problem Solving the Group Progress	118
	Play Your Cards	83
	Group Roles	88
	Survival Kit	99
	Fishbowl	124
e) Development of Personal and Responsibility	Class Meeting	64
	Task & People Jobs	70
	Survival Kit	99
	Problem Solving the Group Progress	118

APPENDIX N-1.2

PROJECT GROW ACTIVITIES & TUCKMAN'S STAGE THREE, NORMING

Activities from Project G.R.O.W. Which Meet the Implications from Tuckman's (1965) Model of Group Development During Stage Three: Norming.

Implication	Project G.R.O.W. Activity	Page
a) Development of Cohesion	Class Meeting	64
	Problem Solving the Group Progress	118
	Survival in the Rockies	120
	Putting it Together	123
	Knotted Compliments	131
	Who's Who in Our Room	132
	Mysteries	134
	Broken Squares	139
	Word Picture	143
	Fixed Word Story	154
	Time Capsule & Symbol	155
	Candyland	157
	Remember When	158
b) Examining Norms	Don't Tear Me Apart	95
	Opinion Box	103
	Who Influences Us	104
	Things That Make a Friend	128
c) Developing Relationships	Putting it Together	123
	Fishbowl	124
	Things That Make a Friend	128
	I Am A Person Who...	130
	Who's Who in Our Room	132
	Word Picture	143
d) Development of Cooperation	Problem Solving the Group Progress	118
	Mysteries	134
	Broken Squares	139

APPENDIX N-1.3

PROJECT GROW ACTIVITIES: TUCKMAN'S STAGE FOUR, PERFORMING

Activities from Project G.R.O.W. Which Meet the Implications from Tuckman's (1965) Model of Group Development During Stage Four: Performing.

Implication	Project G.R.O.W. Activity	Page
a) Maintenance of Class Cohesion	Problem Solving the Group Progress	118
	Putting it Together	123
	Knotted Compliments	131
	Who's Who in Our Room	132
	Mysteries	134
	Broken Squares	139
	Fixed Word Story	154
	Time Capsule & Symbol	155
	Remember When	158
b) Avenues for Resolution of Interpersonal Problems	Class Meeting	64
	Problem Solving the Group Progress	118
c) Development of Interdependence & Flexibility	Problem Solving the Group Progress	118
d) Development of Problem Solving Skills	Problem Solving the Group Progress	118

APPENDIX O-1

SCHOOLS, TEACHERS, AND CLASSES PARTICIPATING IN THE STUDY

School	Teacher	Experimental / Control	Grade	T_1 Response	Actual Class Size
1	1	E_1	7	26	28
2	2	C	6	25	26
2	3	C_3	7_c	16	18
3	4	E_1	7	23	28
3	5	C_3	6	21	23
4	6	E_1	6/7	26	27
4	7	C_3	7	24	28
5	8	E_2	$6/7_a$	23	27
5	9	E_2	6_b	21	26
6	10	E_2	6	24	25
6	11	C	7	27	29
6	12	C	6	19	24

E_1 were high-implementers of Project G.R.O.W. activities.

E_2 were low-implementers of Project G.R.O.W. activities.

C_3 were the randomly chosen control groups used in the major analyses.

a seven grade six students.

b five academically and socially advanced grade five students were in this class.

c four students in this class received special remedial assistance.

APPENDIX O-2

STATISTICAL MODEL USED IN THE ANALYSES

$$Y = U + A + B + AB + C(B) + AC(B) + E$$

Within this equation, the subject's score (Y) is equal to: the grand mean (U); plus the time effect (A); plus the treatment effect (B); plus the interaction of the time and treatment effects (AB); plus the teacher effect which is nested within the treatment (C(B)); plus interaction of time and teacher effect nested within the teacher (AC(B)); plus the error term.

APPENDIX P-1

ANALYSES OF MCI, TRI, AND CL DATA - I

School Means for MCI Satisfaction and Friction Subscales at Time One

Satisfaction		Friction	
School	Mean	School	Mean
5	16.59	4	15.64
1	18.50	3	15.73
6	19.57	2	16.95
3	19.68	6	17.03
4	19.72	1	18.07
2	21.51 *	5	18.68 *

* Indicates School Effect ($p<.05$) using Scheffe (1959) Range Test.

APPENDIX P-2

ANALYSES OF MCI, TRI, AND CL DATA - II

One-way Analysis of Variance Between Control and Experimental Groups Upon Class Means of Dependent Variables at Time One.

Variable	df	Mean Squares	F Ratio	Probability
MCI				
Satisfaction	1	11.23	0.42	0.51
Friction	1	27.46	2.22	0.14
Competition	1	4.09	0.35	0.56
Difficulty	1	9.94	1.02	0.31
Cohesion	1	6.16	0.63	0.43
TRI				
Empathy	1	0.86	0.03	0.85
Regard	1	0.46	0.02	0.88
Un-regard	1	2.29	0.26	0.61
Total	1	77.19	0.77	0.38
CL				
CL(-7)	1	6.83	0.42	0.51
CL	1	32.87	1.57	0.21

Appendix P-3

Analysis of MCI, TRI, and CL Data - III

Variable	df	Mean Squares	F Ratio	Probability
MCI				
Satisfaction	5	112.07	4.51	0.0006
Friction	5	63.35	5.51	0.0001
Competition	5	21.76	1.88	0.0980
Cohesion	5	23.37	2.47	0.0330
TRI				
Empathy	5	29.62	1.67	0.3260
Regard	5	26.51	1.31	0.2599
Un-Regard	5	11.69	1.35	0.2441
Total	5	164.79	1.67	0.1435
C.L.				
C.L. (-7)	5	3.87	0.24	0.9457
C.L.	5	6.93	0.33	0.8970

APPENDIX Q-1

ANALYSIS OF VARIANCE FOR MCI SUBSCALES

Scale	Source	df	Mean Square	F-Value	Probability
Satisfaction					
	A (Time)	3	1.5439	0.7244	0.5534
	B (Treatment)	2	41.3028	1.6291	0.2723
	AB	6	1.8584	0.8719	0.5352
	C (Teacher)	6	25.3531		
	AC	18	2.1315		
Friction					
	A	3	2.2121	7.2056	0.0023
	B	2	16.1341	3.2237	0.1116
	AB	6	3.2341	1.0534	0.4254
	C	6	5.0048		
	AC	18	3.0070		
Competition					
	A	3	7.8404	1.7697	0.1880
	B	2	8.4565	0.3569	0.7161
	AB	6	4.0958	0.9245	0.5015
	C	6	2.3694		
	AC	18	4.4306		
Difficulty					
	A	3	1.9783	8.1192	0.0013
	B	2	5.3825	4.1229	0.0746
	AB	6	3.9936	1.6390	0.1934
	C	6	1.3055		
	AC	18	2.4366		
Cohesion					
	A	3	1.2430	3.8192	0.0278
	B	2	8.9028	7.3308	0.0250
	AB	6	7.9043	0.2429	0.9550
	C	6	1.2144		
	AC	18	3.2547		

APPENDIX Q-2

ANALYSIS OF VARIANCE FOR TRI AND CLI SCALES

Scale	Source	df	Mean Square	F-Value	Probability
Empathy					
	A (Time)	3	4.4457	6.5694	0.0035
	B (Treatment)	2	12.0951	0.9019	0.4567
	AB	6	2.5282	3.7359	0.0138
	C (Teacher)	10	14.4555		
	AC	30	1.0158		
Regard					
	A	3	10.5369	5.0801	0.0101
	B	2	13.7900	0.7841	0.5010
	AB	6	6.0731	1.4640	0.2455
	C	10	9.3620		
	AC	30	7.6486		
CL Total					
	A	3	4.5395	1.2669	0.3157
	B	2	12.3167	1.2996	0.3405
	AB	6	2.9397	0.8204	0.5696
	C	6	9.4772		
	AC	18	3.5832		
CL (-7)					
	A	3	2.0116	4.4361	0.0167
	B	2	10.0825	1.1780	0.3714
	AB	6	5.3343	1.1763	0.3619
	C	6	8.5593		
	AC	18	4.5347		

APPENDIX Q-3

ANALYSIS OF VARIANCE FOR SOCIOMETRIC DATA - I

Analysis of Variance upon Mean Number of BF Choices Received and Mean Deviation of BF Choices

Scale	Source	df	Mean Square	F-Value	Probability
Mean Choice					
	A (Time)	3	1.35601	11.9239	0.0002
	B (Treatment)	2	9.9227	0.5551	0.6042
	AB	6	1.5556	1.3680	0.2792
	C (Teacher)	6	1.7879		
	AC	18	1.1372		
Mean Deviation					
	A	3	8.8459	4.6375	0.0143
	B	2	7.8115	0.5676	0.5979
	AB	6	2.6488	1.3887	0.2720
	C	6	1.3761		
	AC	18	1.9075		

APPENDIX Q-4

ANALYSIS OF VARIANCE FOR SOCIOMETRIC DATA - II

Analysis of Variance UPon Mean Number of 3 or more BF Choices Received

Scale	Source	df	Mean Square	F-Value	Probability
3+ Choices BF %					
	A (Time)	3	200.9166	4.0551	0.0228
	B (Treatment)	2	743.0832	1.0449	0.4096
	AB	6	136.5277	2.7556	0.0443
	C (Teacher)	6	711.1386		
	AC	18	49.5463		
3+ Choice BF Logits					
	A	3	1.4605	1.6981	0.2022
	B	2	8.5751	1.0041	0.4224
	AB	6	1.7013	1.9780	0.1221
	C	6	8.5399		
	AC	18	8.6012		

APPENDIX Q-5

ANALYSIS OF VARIANCE FOR SOCIOMETRIC DATA - III

Analysis of Variance upon Number of 6 or More B.F. Choices Received

Scale	Source	df	Mean Square	F-Value	Probability
6+ BF Choices %					
	A (Time)	3	346.2497	4.7246	0.0133
	B (Treatment)	2	194.1110	0.4827	0.6424
	AB	6	20.2222	0.2759	0.9402
	C (Teacher)	6	402.1386		
	AC	18	73.2870		
6+ BF Choices Logits					
	A	3	5.3873	4.3718	0.0176
	B	2	2.4342	0.1817	0.8363
	AB	6	5.9235	0.0481	0.9989
	C	6	1.3394		
	AC	18	1.2329		

APPENDIX Q-6

ANALYSIS OF VARIANCE FOR SOCIOMETRIC DATA - IV

Analysis of Variance upon Number of Zero B.F. Choices

Scale	Source	df	Mean Square	F-Value	Probability
0 BF Choices %					
	A (Time)	3	194.8425	12.7921	0.0001
	B (Treatment)	2	118.0277	5.8769	0.0389
	AB	6	52.1759	3.4255	0.0196
	C (Teacher)	6	20.0833		
	AC	18	15.2315		
0 BF Choices Logits					
	A	3	2.0954	9.2366	0.0007
	B	2	1.7537	4.1978	0.0723
	AB	6	5.4216	2.3898	0.0707
	C	6	4.1777		
	AC	18	2.2687		

APPENDIX Q-7

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - I

Analysis of Variance for FAIR Category Student "Brings Out"

Scale	Source	df	Mean Square	F-Value	Probability
Brings Out					
	B (Treatment)	1	0.0578	0.77	0.4004
	A (Time)	1	0.0058	0.20	0.6606
	C(B)	10	0.0749		
	AB	1	0.0104	0.36	0.5594
	AC(B)	10	0.0285		
	C (Teacher)				

APPENDIX Q-8

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - II

Analysis of Variance for FAIR Category Student "Questions"

Scale	Source	df	Mean Square	F-Value	Probability
Questions					
	B (Treatment)	2	0.4832	0.92	0.0814
	A (Time)	1	0.8613	5.70	0.0542
	C(B)	6	0.1231		
	AB	2	0.6559	4.34	0.0682
	AC(B)	6	0.1510		
	C (Teacher)				

APPENDIX Q-9

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - III

Analysis of Variance for FAIR Category Student "Usual"

Scale	Source	df	Mean Square	F-Value	Probability
Usual					
	B (Treatment)	2	0.8341	3.58	0.0948
	A (Time)	1	0.1579	0.70	0.4349
	C(B)	6	0.2355		
	AB	2	0.3847	1.71	0.2592
	AC(B)	6	0.2256		
	C (Teacher)				

APPENDIX Q-10

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - IV

Analysis of Variance for FAIR Category Student "Generates"

Scale	Source	df	Mean Square	F-Value	Probability
Generates					
	B (Treatment)	2	0.5297	2.36	0.1757
	A (Time)	1	0.4941	3.02	0.1331
	C(B)	6	0.2248		
	AB	2	0.2123	1.3	0.3405
	AC(B)	6	0.1638		
	C (Teacher)				

APPENDIX Q-11

AYALYSIS OF VARIANCE FOR F.A.I.R. DATA - V

Analysis of Variance for FAIR Category Student "Total"

Scale	Source	df	Mean Square	F-Value	Probability
Total					
	B (Treatment)	2	0.0310	0.37	0.7047
	C (Time)	1	0.0236	4.60	0.0757
	C(B)	6	0.0836		
	AB	2	0.0001	0.03	0.9711
	AC(B)	6	0.0051		
	C (Teacher)				

APPENDIX Q-12

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - VI

Analysis of Variance for FAIR Category Teacher "Delves"

Scale	Source	df	Mean Square	F-Value	Probability
Delves					
	B (Treatment)	2	0.0385	1.88	0.2325
	A (Time)	1	0.0384	1.07	0.3408
	C(B)	6	0.0205		
	AB	2	0.0129	0.36	0.7109
	C (Teacher)				

APPENDIX Q-13

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - VII

Analysis of Variance for FAIR Category Teacher "OK"

Scale	Source	df	Mean Square	F-Value	Probability
OK					
	B (Treatment)	2	0.1920	1.14	0.3809
	A (Time)	1	0.2989	1.25	0.3063
	C(B)	6	0.1686		
	AB	2	0.1592	0.67	0.5481
	AC(B)	6	0.2391		
	C (Teacher)				

APPENDIX Q-14

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - VIII

Analysis of Variance for FAIR Category Teacher "Initiates"

Scale	Source	df	Mean Square	F-Value	Probability
Initiates					
	B (Treatment)	2	0.0185	0.25	0.7892
	A (Time)	1	0.0525	1.40	0.2818
	C(B)	6	0.0752		
	AB	2	0.0185	0.49	0.6334
	AC(B)	6	0.0375		
	C (Teacher)				

APPENDIX Q-15

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - IX

Analysis of Variance for FAIR Category Teacher "Confirms"

Scale	Source	df	Mean Square	F-Value	Probability
Confirms					
	B (Treatment)	2	0.0063	0.02	0.9756
	A (Time)	1	0.0043	0.05	0.8235
	C(B)	6	0.2550		
	AB	2	0.2200	2.77	0.1407
	AC(B)	6	0.0795		
	C (Teacher)				

APPENDIX Q-16

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - X

Analysis of Variance for FAIR Category Teacher "Lectures"

Scale	Source	df	Mean Square	F-Value	Probability
Lectures					
	B (Treatment)	2	0.1819	0.88	0.4623
	A (Time)	1	0.1300	0.35	0.5756
	C(B)	6	0.2068		
	AB	2	0.1292	0.35	0.7193
	AC(B)	6	0.3712		
	C (Teacher)				

APPENDIX Q-17

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - XI

Analysis of Variance for FAIR Category Teacher "Manages"

Scale	Source	df	Mean Square	F-Value	Probability
Manages					
	B (Treatment)	2	0.1614	0.45	0.6574
	A (Time)	1	0.1670	0.47	0.5170
	C(B)	6	0.3585		
	AB	2	0.0377	0.11	0.9001
	AC(B)	6	0.3526		
	C (Teacher)				

APPENDIX Q-18

ANALYSIS OF VARIANCE FOR F.A.I.R. DATA - XII

Analysis of Variance for FAIR Category
Teacher "Total"

Scale	Source	df	Mean Square	F-Value	Probability
Total					
	B (Treatment)	2	0.0242	0.26	0.7779
	A (Time)	1	0.0333	9.21	0.0229
	C(B)	6	0.0924		
	AB	2	0.0046	1.30	0.3407
	AC(B)	6	0.0036		
	C (Teacher)				

APPENDIX Q-19

ANALYSIS OF VARIANCE FOR SCA DATA

Source	df	Mean Square	F-Value	Probability
A	1	11.9993	2.6958	0.1498
B	2	30.0953	1.9087	0.2280
AB	2	4.2727	0.0960	0.9031
C	6	15.7675	1.0840	0.3716
AC	6	4.4511	0.3060	0.9330
Error	341	14.5459		

APPENDIX R-1

MULTIPLE REGRESSION OF TEACHERS' PCI AND NUMBER OF PROJECT G.R.O.W. ACTIVITIES CONDUCTED FOR MCI SUBSCALES

Dependent Variable	Independent Variable	B Coef.	F	Prob. (F)	df.	R^2	Adj R^2
MCI Satisfaction	PCI	0.5129	0.3053	0.5927	(2,9)	0.0474	-0.1642
	No GROW	0.1961	0.2240	0.8036			
	Constant	-3.5676					
MCI Friction	PCI	0.2810	0.3653	0.7038	(2,9)	0.0750	-0.1304
	No GROW	0.3201	0.618	0.4500			
	Constant	-2.4777					
MCI Competition	PCI	0.3176	1.1808	0.3027	(2,9)	0.2626	0.0987
	No GROW	0.1766	1.6023	0.2539			
	Constant	-17.8979					
MCI Difficulty	PCI	0.2813	0.3507	0.5668	(2,9)	0.0486	-0.1628
	No GROW	-0.1241	0.2299	0.7991			
	Constant	-0.2399					
MCI Cohesion	PCI	-0.4413	0.6195	0.5597	(2,9)	0.1210	-0.0743
	No GROW	-0.3804	0.8494	0.3784			
	Constant	1.7215					

APPENDIX R-2

MULTIPLE REGRESSION OF TEACHER PCI AND NUMBER OF PROJECT G.R.O.W. ACTIVITIES CONDUCTED FOR TRI SUBSCALES

Dependent Variable	Independent Variable	B Coef.	F	Prob. (F)	df.	R^2	Adj R^2
Empathy	PCI	0.1171	0.6821	0.4281	(2,9)	0.0969	-0.1037
	No GROW	0.4201	0.4830	0.6320			
	Constant	-7.2790					
Regard	PCI	0.3767	0.1952	0.6680	(2,9)	0.0262	-0.1901
	No GROW	0.1168	0.1213	0.8872			
	Constant	-2.5353					

APPENDIX R-3

MULTIPLE REGRESSION OF TEACHERS' PCI AND NUMBER OF PROJECT G.R.O.W. ACTIVITIES CONDUCTED FOR F.A.I.R. STUDENT CATEGORIES

Dependent Variable	Independent Variable	B Coef.	F	Prob. (F)	df.	R^2	Adj R^2
Brings Out	PCI	0.1591	0.6212	0.5588	(2,9)	0.1213	-0.0739
	No GROW	-0.1394					
	Constant	-0.6978					
Generates	PCI	-0.5485	0.0199	0.3988	(2,9)	0.1848	0.0036
	No GROW	-0.6534					
	Constant	3.1018					
Questions	PCI	0.4805	1.2574	0.3299	(2,9)	0.2184	0.0447
	No GROW	0.3688					
	Constant	-2.2166					
Usual	PCI	-0.4845	4.2156	0.0511	(2,9)	0.4836	0.3689
	No GROW	1.6935					
	Constant	1.6935					
Total	PCI	-0.9737	0.0126	0.9875	(2,9)	0.0028	-0.2188
	No GROW	0.3923					
	Constant	-0.4518					

APPENDIX R-4

MULTIPLE REGRESSION OF TEACHERS' PCI AND NUMBER OF PROJECT G.R.O.W. ACTIVITIES CONDUCTED FOR F.A.I.R. TEACHER CATEGORIES

Dependent Variable	Independent Variable	B Coef.	F	Prob. (F)	df.	R^2	Adj R^2
"OK"	PCI	-0.5574	0.7679	0.4921	(2,9)	0.1458	-0.0440
	No GROW	-0.2911					
	Constant	0.1737					
Delves	PCI	-0.1549	0.0128	0.9873	(2,9)	0.0028	-0.2187
	No GROW	0.8676					
	Constant	0.7215					
Confirms	PCI	0.7087	2.5194	0.1352	(2,9)	0.3582	0.2164
	No GROW	0.3288					
	Constant	-0.6634					
Initiates	PCI	0.2534	0.0004	0.9995	(2,9)	0.0001	-0.2221
	No GROW	0.3072					
	Constant	-0.9328					
Lectures	PCI	-0.7769	0.0146	0.9855	(2,9)	0.0032	-0.2183
	No GROW	0.7053					
	Constant	0.4374					
Manages	PCI	0.4814	0.1124	0.8949	(2,9)	0.0244	-0.1924
	No GROW	-0.1221					
	Constant	0.5659					
Total	PCI	0.8231	0.5664	0.5865	(2,9)	0.1118	-0.0855
	No GROW	0.5161					
	Constant	-2.264					

APPENDIX R-5

MULTIPLE REGRESSION OF TEACHERS' PCI AND NUMBER OF PROJECT G.R.O.W. ACTIVITIES CONDUCTED FOR SOCIOMETRIC DATA

Dependent Variable	Independent Variable	B Coef.	F	Prob. (F)	df.	R^2	Adj R^2
Logit Zero BF Choices	PCI	0.2041	0.8990	0.4406	(2,9)	0.1665	-0.0187
	No GROW	0.2349					
	Constant	-0.7296					
Logit Three or more BF Choices	PCI	0.1125	0.6653	0.5377	(2,9)	0.1288	-0.0648
	No GROW	0.6657					
	Constant	-0.5204					
Logit Six or more BF Choices	PCI	0.4313	2.4513	0.1413	(2,9)	0.3526	0.2087
	No GROW	-0.1787					
	Constant	-0.4110					
Mean BF Choices	PCI	0.9614	1.0458	0.3905	(2,9)	0.1885	0.0083
	No GROW	0.3419					
	Constant	-1.4134					
Mean Deviation of BF Choices	PCI	0.3045	1.6359	0.2478	(2,9)	0.2665	0.1036
	No GROW	0.5037					
	Constant	-2.3129					

APPENDIX R-6

MULTIPLE REGRESSION OF TEACHERS' PCI AND NUMBER OF PROJECT G.R.O.W. ACTIVITIES CONDUCTED FOR SCA SCALE AND ITEMS

Dependent Variable	Independent Variable	B Coef.	F	Prob. (F)	df.	R^2	Adj R^2
Question 1	PCI	-0.1536	3.1713	0.0438	(2,229)	0.0269	0.0184
	No GROW	-0.1230					
	Constant	0.2304					
Question 6	PCI	-0.1626	3.5639	0.0299	(2,229)	0.0301	0.0217
	No GROW	0.1800					
	Constant	0.6245					
SCA Total	PCI	-0.2636	0.1700	0.8437	(2,229)	0.0014	-0.0072
	No GROW	-0.5459					
	Constant	1.7630					

APPENDIX R-7

MULTIPLE REGRESSION OF TEACHERS' PCI AND NUMBER OF PROJECT G.R.O.W. ACTIVITIES CONDUCTED FOR H.I.S.M. FACTORS

Dependent Variable	Independent Variable	B Coef.	F	Prob. (F)	df.	R^2	Adj R^2
Teacher/ School	PCI	0.4252	0.3871	0.6898	(2,9)	0.0792	-0.1254
	No GROW	0.3945					
	Constant	-3.2606					
Physical	PCI	0.6328	1.4089	0.2935	(2,9)	0.2384	0.0692
	No GROW	0.7683					
	Constant	1.8422					
Inter- personal Adequacy	PCI	0.9543	2.4503	0.1414	(2,9)	0.3525	0.2086
	No GROW	0.1021					
	Constant	-5.2508					
Social	PCI	0.3428	0.8868	0.4451	(2,9)	0.1646	-0.0210
	No GROW	0.4028					
	Constant	-2.2042					

APPENDIX S

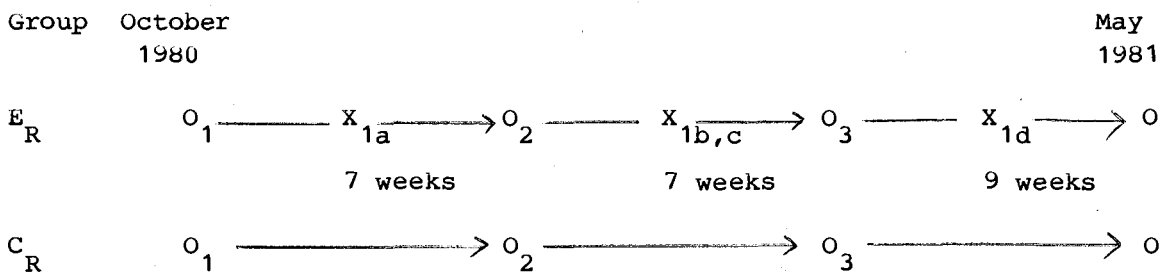
VARIMAX ROTATED FACTORS FOR H.I.S.M. FACTORIAL ANALYSIS

Varimax Rotated Factors for HISM Factor Analysis.
Factor Names, Eigen Values, Percentage of Variance
Accounted For, Questions and Factor Loadings.

Factor	1		2		3		4	
Factor Name	Teacher/ School		Physical		Interpersonal Adequacy		Social	
Eigen Value	6.31		2.79		1.91		1.79	
% of Variance	15.8		7.0		4.8		4.5	
	Questions and Factor Loadings							
	2	.329	5	.349	1	.320	4	.416
	8	.578	7	.532	10	.455	9	.308
	15	.401	11	.473	13	.424	12	.643
	16	.649	12	.309	18	.329	22	.337
	17	.742	14	.683	20	.374	24	.407
	21	.515	20	.350	21	.543	26	.533
	27	.382	23	.720	29	-.303	28	.505
	29	-.429	25	.382	33	.432	35	-.335
	32	.671	31	.546	34	.663		
	37	-.756	35	-.442	35	-.358		
			34	.344	39	.546		
			38	.574	40	.663		
Total No. of Questions	10		12		12		8	

APPENDIX T-1

STUDY DESIGN AND TIME-LINE OF INTERVENTIONS
AND DATA COLLECTION



Key:

E_R randomly assigned experimental group

C_R randomly assigned control group

O_1 data collection time -- 1-14 October, 1980

O_2 3- 9 December, 1980

O_3 23-27 February, 1981

O_4 13-22 May, 1981

X_1 implementation of Project GROW

X_{1a} the 1-day workshop, 12 November, 1980

X_{1b} the second meeting of the experimental group, 3 December, 1980

X_{1c} the third meeting of the experimental group, 4 February, 1981

X_{1d} the fourth meeting of the experimental group, 22 April, 1981

APPENDIX T-2

ADMINISTRATION ORDER OF INSTRUMENTS AND THEIR APPROXIMATE TIME OF INVOLVEMENT DURING DATA COLLECTION TIME O_1 AND O_4

Subject	Instrument	Approximate Time
Teacher	PCI	15 minutes
Students	SCA	10 minutes
	(MCI)	20 minutes
	(TRI)	15 minutes
	(CL)	5 minutes
Teacher and Students	FAIR	20 minutes discussion session*
Students	HISM	20 minutes
	Sociometric Questionnaire	10 minutes

() indicate that these three instruments were stapled together.

* discussion topics chosen from a list in Appendix M.

APPENDIX U

COMPARATIVE STATISTICS BETWEEN CLASS 4 AND CLASS 8 UPON SOCIOMETRIC MEASUREMENTS AT FOUR TIME PERIODS

Statistics

	$\bar{x}$ BF		S.D. BF		Zero BF		+3 BF		+6 BF	
Class	4	8	4	8	4	8	4	8	4	8
Time 1	2.3	1.4	1.9	1.4	8	4	14	10	0	0
Time 2	3.4	1.5	2.2	1.2	4	3	19	4	4	0
Time 3	4.1	1.6	2.9	1.3	3	5	18	5	11	0
Time 4	3.8	1.5	2,8	1.1	2	3	18	7	10	0

BIBLIOGRAPHY

Anderson, G.J. Effects of classroom social climate on individual learning. American Educational Research Journal, 1970, 7, 135-152.

Anderson, G.J. Effects of course content and 'teacher sex on the social climate of learning. American Educational Research Journal, 1971, 8, 649-663.

Anderson, G.J. The Assessment of Learning Environments: A Manual for the Learning Environment Inventory and The My class Inventory. Halifax: Atlantic Institute of Education, 1973.

Anderson, G.J. & Walberg, H.J. Classroom climate and group learning. International Journal of Educational Sciences, 1968, 2, 175-180.

Anderson, G.J. & Walberg, H.J. Learning environments. In H.J. Walberg (Ed.), Evaluating Educational Performance: A Sourcebook of Methods, Instruments, and Examples. Berkeley: McCutchan, 1974.

Anderson, H.H. The measurement of domination and of socially integrative behaviour in teachers' contracts with children. Child Development, 1939, 10, 73-89.

Anderson, H.H. & Brewer, H.M. Studies of teachers' classroom personalities 1. Applied Psychological Monographs No. 6, 1945.

Anderson, H.H. & Brewer, H.M. Studies of teachers' classroom personalities II. Applied Psychological Monography No. 8, 1946.

Anderson, R.C. Learning in discussions: a resume of the authoritarian-democratic studies. Harvard Educational Review, 1959, 29, 201-215.

Appleberry, J.B., & Hoy, W.K. The pupil control ideology of professional personnel in "open" and "closed" elementary schools. Educational Administration Quarterly, 1969, 5.

Bandura, A. Principles of Behaviour Modification. New York: Holt, Rinehart and Winston, 1969.

Bany, M.A. & Johnson, L.V. Classroom Group Behaviour: Group Dynamics in Education. New York: Macmillan, 1964.

Barling, N.R. A critical examination of some assertions associated with Carkhuff's model of effective helping in the psychotherapeutic context. Unpublished Masters Thesis, La Trobe University, Melbourne, Australia, 1980a.

Barling, N.R. Improving Classroom Social Climate: Project GROW. Mimeograph, Simon Fraser University, 1980b.

Barrett-Lennard, G.T. Dimensions of therapist response as causal factors in therapeutic change. Psychologic Monography, 1962, 76, No. 43.

Benne, K. & Sheets, P. Functional roles of group members. Journal of Social Issues, 1948, 4, 41-49.

Berman, P. & McLaughlin, M. Implementation of Educational Innovation, Educational Forum, 1976, 3, 347-370.

Berzon, B. The self-directed therapeutic group: an evaluative study. Western Behavioural Sciences Institute Reports. No. 1 in a series on "The Intensive Group Experience", 1964.

Bonney, M.E. Sociometric study of agreement between teacher judgements and student choice. Sociometry, 1947, 10, 133-146.

Bradford, L. (Ed.) Group Development, 2nd Edition. La Jolla, California: University Associates, 1978.

Brofenbrenner, U. Adults and peers as sources of conformity and autonomy. Unpublished study. Ithaca, New York: Cornell University, Dept. of Child Development & Family Relations, 1965.

Brookover, W.B., Erickson, E.L., & Joiner, L.M. Self-Concept of Ability & School Achievement III. U.S.O.E. Co-operative Research Report, Project No. 2831, East Lansing: Michigan State University, 1967.

Brookover, W.B., LePere, J.M., Hamachek, T.S., & Erickson, E. Self-Concept of Ability & School Achievement II. Final Report No. 1636. East Lansing: Michigan State University, 1965.

Brookover, W.B., Paterson, A., & Thomas, F. Self-Concept of Ability & School Achievement, I. East Lansing: Michigan State University, 1962.

Buswell, M.M. The relationship between the social structure of the classroom and the academic success of the pupils. Journal of Experimental Education, 1953, 22, 37-52.

Cayne, R.E. Relationships of teacher personality to classroom social climate. AERA Abstracts, 1970, 40.

Campbell, D.T. & Stanley, J.C. Experimental and quasi-experimental designs for research on teaching. In N.L. Gage (Ed.) Handbook of Research on Teaching. Chicago: Rand McNally, 1963, 171-246.

Carkhuff, R.R. Helping & Human Relations V I & II. New York: Holt, Rinehart & Winston, 1969.

Charters, W.W. & Jones, J.E. On The Risk of Appraising Non-Events in Program Evaluation, in Educational Researcher, 5-7, 1973.

Cheong, G.S. & Wadden, E.P. The relationship between teachers' experimental & dogmatic attitudes, & their pupils' self-concept. The Alberta Journal of Educational Research, 1978, 24, 121-125.

Cogan, M.L. The behaviour of teachers and the productive behaviour of their pupils: a perception and analysis. Journal of Experimental Education, 1958, 27, 89-105.

Combs, A.W., Avila, D.L. and Purkey, W.W. Helping Relationships. Basic Concepts for the helping professions. Boston: Allyn and Bacon, 1971.

Combs, A.W. & Gordon, I.J. Attitudes and behaviour of B.S.C.S. special materials classes in two Florida counties, 1965-66. Report to B.S.C.S., March 1967.

Combs, A.W., Richards, A.C., & Richards, F. Perceptual Psychology: A Humanistic Approach to the Study of Persons. New York: Harper and Row, 1976

Combs, A.W. & Syngg, D. Individual Behaviour. A perceptual approach to behaviour. (Rev. ed.). New York: Harper, 1959.

Dewey, J. Democracy & Education. New York: Macmillan, Inc., 1916.

Dinham, S. Exploring Statistics. Monterey, California: Brooks/Cole, 1976.

Dixon, W.J. & Brown, M.B. (Eds.). Biomedical Computer Programs, (BMDP) P-Series. Los Angeles: University of California Press, 1977.

Dunkin, M.J. & Biddle, B.J. The Study of Teaching. New York: Holt, Rinehart & Winston, 1974.

Ellett, C.D., Capie, W., Okey, J.R., & Johnson, C.E. Validating the teacher performance assessment instruments against student perceptions of school climate/learning environment characteristics. Unpublished paper. Teacher assessment project, University of Georgia, 1978.

Ellett, C.D. & Masters, J.E. Learning environment perception. Paper presented at the annual APA convention, Toronto, 1978.

Ellett, C.D., Masters, J.E., & Pool, F. The incremental validity of teacher and student perceptions of school characteristics. Paper presented at the Annual Meeting of the Georgia Educational Research Association, 1978.

Ellett, C.D. & Walberg, H.J. Principals, competency, environment and outcomes. In H.J. Walberg (Ed.) Educational Environments & Effects. Berkeley: McCutchan, 1979.

Erikson, E.H. Childhood & Society. New York: W.W. Norton & Co., 1950.

Estep, L.F., Willower, D.W., & Licata, J.W. Teacher pupil control ideology & behaviour as predictors of classroom robustness. High School Journal, 1980, 62, 155-159.

Finn, J. Expectations and the educational environment. Review of Educational Research, 1972, 42, 387-410.

Fisher, B.A. Decision emergence phases in group decision making. Speech Monographs, 1970, 37, 53-66.

Fox, R., Luszki, M.B., & Schmuck, R. Diagnosing Classroom Learning Environments. Chicago: S.R.A., 1966.

Flanders, N.A. Personal-social anxiety as a factor in experimental learning situations. Journal of Educational Research, 1951, 45, 100-110.

Flanders, N.A. Teacher influence in the classroom. In E.J. Amidon & J.B. Hough (Eds.) Interaction Analysis. Reading, Mass.: Addison-Wesley, 1967.

Flanders, N.A. Analyzing Teacher Behaviour. Reading, Mass.: Addison-Wesley, 1970.

Fraser, B.J. The impact of ASEP on pupil learning and classroom climate. In A.M. Lucas & C.N. Power (Eds.) Research in Science Education. Brisbane: Australian Science Foundation Research Association, 1975.

Fraser, B.J. Evaluation of a science-based curriculum in H.J. Walberg (Ed.) Educational Environments & Effects. Berkeley: McCutchan, 1979.

Fraser, B.J. & Fisher, D.L. Predictive validity of My Class Inventory. In I.D. Smith (Editor) Annual Conference Report Australian Association for Research in education Youth Schooling & Employment. Sydney, 1980.

Fraser, B.J. Validity and use of individualized classroom environment questionnaire. Paper presented at the Annual Meeting AERA, Los Angeles, 1981.

Fullan, M. Conceptualizing Problems of Curriculum Implementation, in W. Werner Curriculum Canada. Vancouver: University of British Columbia, 1979.

Fuller, F.F. Fuller Affective Interaction Record (FAIR). Austin, Texas Research & Development Center for Teacher Education. University of Texas, 1969.

Getzels, J.W. A social psychology of education. In G. Lindrey & E. Aranson (Eds.) The Handbook of Social Psychology. Second Edition, V5, London: Addison-Wesley, 1969.

Getzels, J.W. & Guba, E.G., Social behaviour and the administrative process. School Review, 1957, 65, 423-441.

Getzels, J.W. & Thelen, H. The classroom as a unique social system. National Society of the Study of Education Year Book. 1960, 59, 53-81.

Gibb, J. Climate for trust foundation. In T-Group Theory & Laboratory Methods. Edited by L. Bradford, J. Gibb, & K. Benne. New York: John Wiley & Sons, 1964.

Glidewell, J.C., Kantor, M.B., Smith, L.M., & Stringer, L.A. Socialization and social structure in the classroom. In M. Hoffman & L. Hoffman (Eds.) Review of Child Development Research, 1966, 2, 221-257.

Goldenberg, R.E. Pupil control ideology and teacher influence in the classroom. Paper presented at the annual meeting of the American Educational Research Association Annual Meeting, New York: 1971.

Good, T.L., Cooper. H.M., & Blakey, S.L. Classroom interaction as a function of teacher expectations, student sex and time of year. Journal of Educational Psychology. 1980, 72, 378-385.

Gordon, I.J. Test Manual: How I See Myself. Gainesville, Florida: University of Florida, 1968.

Greig, M. & Osterlin, D. UBC ANOVAR, Analysis of Variance and Covariance. Vancouver: University of British Columbia, 1978.

Gronlund, N.E. Sociometry in the Classroom. New York: Harper, 1959.

Gronlund, N.E. & Anderson, L. Personality characteristics of socially accepted, socially rejected junior high school pupils. Educational Administration & Supervision, 1957, 43, 329-338.

Guilford, J.P. & Fruchter, B. Fundamental Statistics in Psychology and Education. Edition Six. New York: McGraw-Hill, 1978.

Hallinan, M.T. Friendship patterns in open and traditional classrooms. Sociology of Education, 1976, 49, 254-265

Hallinan, M.T. Structural effects on children's friendships and cliques. Social Psychology Quarterly, 1979, 42, 43-54.

Hallinan, M.T. & Tuma, N.B. Classroom effects on change in children's friendships. Sociology of Education, 1978, 51, 270-282.

Harvey, O.J., Hunt, D.E., & Schroder, H.M. Conceptual Systems and Personality Organizations. New York: John Wiley and Sons, 1961.

Heath, R.W. & Nielson, M.A. The research basis for performance-based teacher education. Review of Education Research, 1974, 44, 463-484.

Helsel, R.A. & Willower, D.J. Toward definition and measurement of pupil control behaviour. The Journal of Educational Administration, 1974, 12, 114-123.

Horstein, H. Influence and satisfaction in organizations. Sociology of Education, 1968, 41, 380-389.

Hoy, W.K. Dimensions of student alienation and characteristics of public high schools. Interchange, 1973, 3.

Hoy, W.K. & Miskel, C.G. Educational Administration: Theory, Research & Practice. New York: Random House, 1978.

Hoyt, C. Test reliability estimated by analysis of variance. Psychometrika, 1941, 6, 153-161.

Hull, H.C. & Nie, N.H. SPSS Update. New York: McGraw-Hill, 1979.

Jennings, H.H. Leadership and sociometric choice. Sociometry, 1947, 10, 32-39.

Jennings, H.H. Using children's social relations for learning. Journal of Educational Sociology, 1948, 21, 543-552.

Katz, D. & Kahn, R.L. The Social Psychology of Organizations. (2nd Ed.) New York: Wiley, 1978.

Knowles, M. The Adult Learner: A Neglected Species. Houston, Texas: Gulf Publishing, 1973.

Lewin, K. Principles of Topological Psychology. New York: McGraw-Hill, 1936.

Lewin, K., Lippit, R., & White, R.K. Patterns of aggressive behaviour in experimentally created social climates. Journal of Social Psychology, 1939, 10, 277-299.

Levitt, E.E. Effects of a "causal" teacher training program on authoritarianism and responsibility in grade school children. Psychological Representative, 1955, 1, 449-458.

Lezotte, L., Hathaway, D., Miller, S., Passalacqua, J., & Brookover, W. School Learning Climate & Student Achievement: A Social Systems Approach to Increased Student Learning. Tallahasse, Florida: Florida State University Foundation, 1980.

Licata, J.W. & Wildes, J.P. Environmental robustness and classroom structure: some field operations. High School Journal, 1980, 63, 146-154.

Lippitt, R. & Gold, M. Classroom social structure as a mental health problem. Journal of Social Issues, 1959, 15, 40-58.

Mann, R.D. Interpersonal Styles & Group Development: An Analysis of Member-Leader Relationship. New York: Wiley, 1967.

Martin, E.A. & Hill, W.F. Toward a theory of group development: six phases of therapy group development. International Journal of Group Psychotherapy, 1957, 7, 20-30.

Mason, J. & Blumberg, A. Perceived educational value of the classroom and teacher-pupil interpersonal relationship. Journal of Secondary Education, 1969, 44, 135-139.

McLelland, F.M. & Ratliff, J.A. The use of sociometry as an aid in promoting social adjustment in the ninth grade home room. Sociometry, 1947, 10, 147-153.

Medley, D.M. Teacher Competence & Teacher Effectiveness. Washington: American Association of Colleges for Teacher Education, 1977.

Medley, D.M. The effectiveness of teachers in P.L. Peterson & H.J. Walberg, (Eds.) Research on Teaching: Concepts, Findings and Implications. Berkeley: McCutchan, 1979.

Medley, D.M. & Mitzel, H.E. Some behavioural correlates of teacher effectiveness. Journal of Educational Psychology, 1959, 50, 239-246.

Mills, D.H. & Zytowski, D.G. Helping relationship: a structural analysis. Journal of Counselling Psychology, 1967, 14, 193-197.

Mills, T.M. Group Transformations: An Analysis of a Learning Group. Englewood Cliffs, N.J.: Prentice-Hall, 1964.

Moreno, J.L. Who Shall Survive? Washington, D.C.: Nervous & Mental Disease Publishing Co., 1934.

Mortensen, D.D. Communication. New York: McGraw-Hill, 1972.

Moos, R.H. A typology of junior high school classrooms. American Educational Research Journal, 1978, 15, 53-66.

Moos, R.H. Evaluating Educational Environments. San Francisco: Jossey-Bass, 1979a.

Moos, R.H. Educational climates: in H.J. Walberg (Ed.) Educational Environments & Effects. Berkeley, California: McCutchan, 1979b.

Moos, R.H. & Moos, B.S. Classroom social climate and student absences and grades. Journal of Educational Psychology. 1978, 70, 263-269.

Moos, R.H. & Trickett, E.J. Classroom Environment Scale Manual. Palo Alto: Consulting Psychologist Press, 1974.

Morrison, T.L. Classroom structure, work involvement, and social climate in elementary school classrooms. Journal of Educational Psychology, 1979, 71, 471-477.

Multhauf, A.P., Willower, D.J., & Licata, J.W. Teacher pupil-control ideology and behaviour and classroom environmental robustness. The Elementary School Journal, 1978, 79, 1.

Nie, H.N., Hull, C.M., Jenkins, J.G., Steinbrenner, R., & Bent, D.H. Statistical Packages For the Social Sciences (SPSS) Second Edition. New York: McGraw-Hill, 1975.

Nunnally, J.C. The Place of statistics in psychology. Educational and Psychological Measurement, 1960, 20, 641-650.

Ornstein, A.C. & Levine, D.U. Teacher behaviour research: overview and outlook. Phi Delta Kappan, April 1981, 62, 592-596.

Parsons, T. & Bales, R. Family Socialization & Interaction Processes. New York: Free Press, 1955.

Paterson, A. An evaluation of an instrument designed to measure the construct, self-concept of academic ability. Unpublished Doctoral Dissertation, Michigan State University, 1966.

Paterson, A. An evaluation of the self-concept of academic achievement. In Brookover, W.B., Erickson, E.L., & Joiner, L.M. Self-Concept of Ability & School Achievement, III. East Lansing: Michigan State University, 1962.

Perkins, H.V. A study of selected factors influencing perceptions of and changes in children's self-concepts. Dissertation Abstracts, 1957, 17, 567.

Peterson, P. & Walberg, H. (Eds.) Research on Teaching. Berkeley: McCutchan, 1979.

Prawat, R.S. & Solomon, D.J. Validation of a classroom climate inventory used at the elementary level. Educational and Psychological Measurement, 1981a, 41.

Prawat, R.S. & Solomon, D.J. Objective Measures of Classroom Affect as They Relate to Teacher Thinking About the Affective Domain. Paper presented at the Annual A.E.R.A. Conference, Los Angeles (1981b).

Pritchett, W. The relationship between teacher pupil control behaviour and students' attitudes toward school. Doctoral Dissertation. Pennsylvania State University, 1973.

Purkey, W.W. Self-concept and School Achievement. Englewood Cliffs, N.J.: Prentice-Hall, 1970.

Randhawa, B. & Michayluk, J. Learning environments in rural and urban classrooms. American Educational Research Journal, 1975, 12, 265-285.

Rehage, M.J. A comparison of pupil-teacher planning and teacher directed procedures in eighth grade social studies classes. Journal of Educational Research, 1951, 45, 111-115.

Rexford, G.E., Willower, D.F., & Lynch, P.D. Teacher's Pupil Control Ideology and Classroom verbal behaviour. Journal of Experimental Education. 1972, 40, 78-82.

Richards, H.H. Psychological factors associated with the sociometric status of children attending a comprehensive school in Breconshire. British Journal of Educational Psychology. 1967, 37, 261-262.

Rokeach, M. Political and religious dogmatism: an altenative to the authoritarian personality. Psychological Monograph, 1956, 70, No. 425.

Rokeach, M. The Open and Closed Mind. New York: Basic Books, 1960.

Rosenshine, B. & Furst, N.F. The use of direct observation to study teaching. Second Handbook of Research on Teaching. R.M. Travers, (Ed.) Chicago: Rand McNally, 1973.

Rowley, G. The relationship of reliability in classroom research to the amount of observation: An extension of the Spearman-Brown formula. Journal of Educational Measurement, 1978, 15, p. 165-180.

Runkel, P.J., Lawrence, M., Oldfield, S., Rider, M., & Clark, C. Stages of group development: an empirical test of Tuckman's hypothesis. Journal of Applied Behavioral Science, 1971, 7, 180-193.

Scheffe, H. The Analysis of Variance. New York: Wiley, 1959.

Scheirer, M.A. & Kraut, R.E. Increasing educational achievement via self-concept change. Review of Educational Research, 1979, 49, 131-150.

Schmuck, R.A. Sociometric status and utilization of academic ability. Merrill-Palmer Quarterly, 1962, 8, 165-172.

Schmuck, R.A. Some relationships of peer liking patterns in the classroom to pupil attitudes and achievement. School Review, 1963, 71, 337-359.

Schmuck, R. Some aspects of classroom social climate. Psychology in the Schools, 1966, 8, 59-65.

Schmuck, R.A. & Schmuck, P.A. Group Processes in the Classroom. Iowa: W.C. Brown, 1971, (2nd Edition 1975) (3rd Edition 1979).

Schmuck, R.A., Runkel, P.J., Arends, J.H., & Arends, R.I. Second Handbook of Organizational Development in Schools. Palo Alto: Mayfield Press, 1977.

Schmuck, R. & Van Egmond, F. Sex differences in the relationship of interpersonal perceptions to academic performance. Psychology in the Schools, 1965, 7, 32-40.

Schutz, W.C. F.I.R.O. A Three Dimensional Theory of Interpersonal Behaviour. New York: Holt, Rinehart & Winston, 1958.

Schutz, W.C. Joy, Expanding Human Awareness. New York: Grove Press, 1967.

Schutz, W.C. The Interpersonal Underworld. Palo Alto, California: Science & Behaviour Books, 1966.

Shavelson, R.J., Bolus, R., & Keesling, J.W. Self concept: recent developments in theory and methods. In D. Payne (Ed.) Measurement in the Affective Domain. San Francisco: Josey-Bass, in press.

Shavelson, R.J., Burstein, L., & Keesling, L. Methodological considerations in interpreting research on self-concept. Journal of Youth & Adolescence, 1977, 14, 83-97.

Shavelson, R.J., Hubner, J.J., & Stanford, G. Developing Effective Classroom Groups. New York: Hart, 1977.

Stanton, G.C. Self-concept: validation of construct interpretations. Review of Educational Research, 1976, 46, 407-441.

Shavelson, R.J. & Stuart, K.R. In Lynch et al. (Eds.) Self-Concept. Boston: Balinger, 1980.

Simon, A. & Boyer, G. Mirrors for Behaviour, Vol. IX. Philadelphia: Research for Better Schools, 1970.

Soar, R.S. & Soar, R.M. Emotional climate and management. In P.L. Peterson & H.J. Walberg (Eds.) Research on Teaching. Berkeley, California: McCutchan, 1979.

Stanford, G. Developing Effective Classroom Groups. New York: Hart, 1977.

Stanford, G. & Roark, A.E. Human Interaction in Education. Boston: Allyn & Bacon, 1974.

Stern, G.G. People in Context. New York: Wiley, 1970.

Stiltner, B. The effects of interaction activities on group development in junior high school classrooms. Unpublished doctoral dissertation, University of Colorado, 1973.

Talmage, H. & Eash, M.J. A paradigm for designing evaluation studies of three determinants of the classroom learning environments. Paper presented at A.E.R.A., Toronto, 1978.

Talmage, H. & Walberg, H.J. Naturalistic decision-orientated evaluation of a district reading program. Journal of Reading Behaviour, 1978, 10, 185-195.

Talmage, H. & Eash, M.J. Curriculum, instruction and materials. In P.L. Peterson & H.J. Walberg (Eds.) Research on Teaching. Berkeley: McCutchan, 1979.

Thelen, H.A. & Withall, J. Three frames of reference: the description of climate. Human Relations, 1949, 2, 159-176.

Thelen, H.A. Educational dynamics: theory and research. Journal of Social Issues, 1950, 6, 5-95.

Thelen, H.A. (Ed.) Experimental research toward a theory of instruction. Journal of Educational Research, 1951, 45, 89-136.

Thelen, H. Dynamics of Groups at Work. Chicago: University of Chicago Press, 1954.

Tikunoff, W.J., Berliner, D.C., & Rist, R.C. An Ethnographic Study of Forty Classrooms of the Beginning Teacher Evaluation Study Known Sample. Technical Report No. 75-10-5. San Francisco: Far West Laboratory for Educational Research & Development, 1975.

Trow, C.W., Zander, A.E., Morse, C.W., & Jenkins, D.H. Psychology of group behaviour: the class as a group. Journal of Educational Psychology, 1950, 41, 322-338.

Tuckman, B.W. Developmental sequences in small groups. Psychological Bulletin, 1965, 63, 384-399.

Vacha, E.F., McDonald, W.A., Coburn, J.M., & Black, H.E. Improving Classroom Social Climate. Teachers' Handbook (Project S.E.L.F.). New York: Holt, Rinehart & Winston, 1979.

Walberg, H.J. The evaluation of a Title I project using the My Class Inventory. Unpublished paper, Harvard University, 1966.

Walberg, H.J. Predicting class learning: an approach to the class as a social system. American Educational Research Journal, 1969, 6, 529-542.

Walberg, H.J. Physical and psychological distance in the classroom. Social Review, 1969, 77, 64-71.

Walberg, H.J. A model for research on instruction. School Review, 1970, 78, 185-200.

Walberg, H.J. Psychology of learning environments: behavioural, structural, or perceptual? Review of Research in Education. Edited by L. Schulman. Illinois: Peacock, 1976.

Walberg, H.J. (Ed.) Educational Environments & Effects: Evaluation, Policy & Productivity. Berkeley: McCutchan, 1979.

Walberg, H.J. & Anderson, G.J. The achievement-creativity dimension and classroom climate. Journal of Creative Behaviour, 1968a, 2, 281-291.

Walberg, H.J. & Anderson, G.J. Classroom climate and individual learning. Journal of Educational Psychology, 1968b, 59, 414-419.

Walberg, H.J. & Ahlgren, A. Predictors of social environment of learning. American Educational Research Journal, 1970, 7, 153-167.

Walberg, H.J., House, E.R., & Steel, J.M. Grade level, cognition and effect: a cross section of classroom perceptions. Journal of Educational Psychology, 1973, 64, 142-146.

Walberg, H.J., House, E.R., & Steel, J.M. Subject areas and cognitive press. Journal of Educational Psychology, 1974, 66, 367-372.

Walberg, H.J., Sorenson, J., & Fishback, T. Ecological correlates of ambience in the learning environment. American Educational Research Journal, 1972, 9, 139-148.

Willower, D.J., Eidell, T.L., & Hoy, W.K. The School & Pupil Control Ideology. Monograph, Pennsylvania State University Studies No. 24, 1967. (2nd Ed. 1973).

Wilson, N., LaFleur, C., Brodie, R., Carey, M., Dale, A., Johnston, B., & Young T. Developing the Classroom Group: Research Report. Adelaide, South Australia: Education Department of South Australia, Government Printer, 1979.

Withall, J. The development of a technique for the measurement of social-emotional climate in classrooms. Journal of Experimental Education, 1949, 17, 347-361.

Withall, J. & Lewis, W.W. Social interaction in the classroom. In N.L. Gage (Ed.) Handbook of Research on Teaching. Chicago: Rand, McNally, 1963.

Wittmer, J. & Myrick, R.D. Facilitative Teaching: Theory & Practice. Santa Monica, California: Goodyear, 1974.

Wylie, R.C. The Self-Concept: A Critical Survey of Pertinent Research Literature. Lincoln: University of Nebraska Press, 1961.

Wylie, R.C. The Self-Concept (Volume 2): Theory & Research on Selected Topics. Lincoln: University of Nebraska Press, 1979.

Yalom, I. The Theory & Practice of Group Psychology. New York: Basic Books, 1970.

Yeats, J. Factor Analysis of HISM (1967), in I.J. Gordon A Test Manual For The How I See Myself (HISM) Scale. Gainesville, Florida Educational Research Council, 1968.

Young, L.L. Sociometric and related techniques for appraising social status in an elementary school. Sociometry, 1947, 10, 168-177.

Zeichner, K.M. Group membership in the elementary school. Journal of Educational Psychology, 1978, 70, 554-564.

Zeichner, K.M. The development of an instrument to measure group membership in elementary school classrooms. Journal of Experimental Education, 1980, 48, 237-244.