TEACHER COLLABORATION: A STUDY OF THE

TEACHING-LEARNING RELATIONSHIP

by

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ABSTRACT

This study served two purposes. First, it provided a synthesis of the literature relating teacher collaboration to teaching-learning outcomes. Second, it investigated empirically the existence of links posited in the literature reviewed.

From the literature a conceptual framework was synthesized regarding the postulated relationships, with respect to teacher collaboration, between and among: (1) teacher trust for the teaching partner, (2) the teaching partner's supervisory beliefs, (3) teacher efficacy, (4) teacher reflection, (5) teacher classroom behaviour, (6) pupil achievement, (7) pupil attitudes, and (8) pupil behaviour. The general question under investigation was: "What is the relationship between teacher participation in a teacher collaboration programme and teaching-learning outcomes?

To test the aptness of the model, data for each of the eight variables listed above were collected at the beginning and at the end of the 1991/92 school year from four collaboration groups and one non-collaboration group. The five groups represented the following teacher collaboration strategies: (1) collaborative consultation, (2) collaborative consultation in a team teaching environment, (3) collaborative consultation without direct classroom observation by the teaching partner, (4) collegial consultation without direct classroom observation by the teaching partner, and (5) teachers who did not work with a teaching partner. The groups self-selected from two School Districts in

the Lower Mainland of British Columbia. A total of 30 teachers and 476 pupils formed the sample for the study.

The data were analyzed using two multivariate techniques, namely: (1) Multivariate Analysis of Variance (MANOVA), and (2) Canonical Analysis (CA). Analysis of the evidence collected using MANOVA suggests that teacher participation in various collaboration programs is associated with differing teaching-learning outcomes. Analysis of the ungrouped data using CA suggests the existence of positive relationships between general teacher efficacy, teacher behaviours, and pupil attitudes and behaviours.

It was concluded that the results are potentially useful in two ways. First, the results may further the development of theory in the area of collaborative consultation in particular and teacher collaboration in general. Second, if used cautiously, the results are practically useful for teachers and administrators who may want to put a programme of collaborative consultation into place.

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ACKNOWLEDGEMENTS

Although a dissertation is typically authored by only one person, it represents an amalgamation of work performed by a large number of people--this study is no exception. In particular, four groups of people deserve credit for their help in realizing this study.

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CHAPTER I

Introduction

In a review of "school effects" literature, Bossert (1988) states:

> . . . one key "effect" always is associated with the charter of our public schools: to provide children with the opportunities to learn reading, writing, and arithmetic. . . . Comparisons of effective and ineffective schools have begun to identify specific school-level factors that promote higher student achievements, particularly in the basic skills (pp. 341, 345).

With this concern for pupil learning and methods of improving pupil learning, it is not surprising to find that teachers have been identified as a school level factor promoting higher pupil achievement. Over the past two decades, educational researchers have conducted many studies investigating the effects, on teachers and pupils, of various teacher development approaches whose emphasis was teacher growth (e.g., Donovan, Sousa, and Walberg, 1987; Showers, 1985; Smith, 1989; Stallings, 1985).

Many of these once promising teacher development approaches have fallen into disfavour with both the research community and the teachers themselves (e.g., Slavin, 1986; Stallings and Krasavage, 1986; Smith and Acheson, 1991). The failure of these teacher development approaches has been attributed to various factors, one of which is lack of teacher commitment traced to

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conflicts between teachers' own norms and values and those imposed externally by the model. Grimmett *et al.* (1992) write:

> Externally mandated change typically has a cataclysmic effect on teachers' morale, resulting in a strong sense of dependency. Teachers often feel overwhelmed by the new expectations when their actions are continually shaped by the directives of others. There is an accompanying sense of helplessness and powerlessness when heightened expectations appear to be beyond reach (pp. 185-186).

Of interest in this study are consultation approaches promoting collegial interactions of teachers on a professional level emphasizing self-examination and development of classroom behaviours from the individual teacher's value and belief perspectives. The goal of these consultation approaches is to permit teachers to make sense, through their own values and norms, of their classroom behaviours. Of particular interest is how teachers and pupils are affected when teachers interact professionally in different ways.

Background

Teacher isolation in the work-place has been observed and noted in many studies focusing on the educational work environment (e.g., Anastos and Ancowitz, 1987; Ashton and Webb, 1986; Ashton *et al.*, 1983; Barnett, 1982; Johnson, 1976; Lesnik, 1987; Little, 1987; Lortie, 1975). Teachers typically spend the majority of their day in a classroom with "their pupils"; they rarely interact with peers. DeSanctis and Blumberg (1979) found that professional interactions typically averaged less than two

minutes per day. Teacher meetings, such as committee, department, and faculty meetings were found to be primarily for purposes of disseminating information, not for discussion of professional concerns (Glickman, 1990, p. 35).

Because there seems to be a lack of collegial interaction focusing on classroom practice, it is not surprising that, as individuals, teachers feel inadequate when confronted with an acute pedagogical problem. Glickman (1990) states that "In high-status professions . . . success depends on professionals working together to combine, review, and share their knowledge, skills, and practices" (p. 30). One method of providing teacher professional contact is through the use of collaborative consultation[1]--a technique of supervision in the helping mode. The essential purpose of the interaction between the teachers involved is to expand their repertoire of teaching strategies. In addition to providing professional contact for teachers, Garman (1986) contends that "Ultimately the reason teachers and clinical supervisors work together is in order to enhance practice (both the teacher's and the teaching-partner's) and to make education better for students" (p. 19). It is suggested that collaborative consultation will lead to reduced teacher isolation and feelings of inadequacy while simultaneously promoting reflective thought and increased feelings of efficacy in teachers. Collaborative consultation should also enable pupils to experience positive

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[1] The term "collaborative consultation" was adopted by the author as a result of working as a research assistant with Grimmett and Crehan at the University of British Columbia during 1990-91.

change in terms of achievement, attitude, and behaviour. However, these links are currently only conjectures; empirical evidence is lacking (Acheson and Gall, 1992; Greene, 1987; Robinson, 1984; Wildman and Niles, 1987).

Statement of Purpose

Previous research, mostly qualitative in nature, has investigated teacher consultation approaches and, as noted above, suggested that positive outcomes for both teachers and pupils result when teachers engage in the use of collaborative consultation. In the literature there does not, presently, exist a synthesis relating collaborative consultation to teaching-learning outcomes. At a theoretical level, the purpose of this study was to provide such a synthesis while simultaneously providing empirical evidence for or against the existence of the links posited in the literature. The analytic approach used in this study was also different from what has been previously reported in the literature. This study, primarily quantitative in nature, relied heavily on multivariate data analyses to begin to take into account some of the complex interactions between and among the various constructs of interest. At a practical level, the purpose of this study was to begin to provide direction for educators in developing collaborative consultation programmes which benefit teachers as well as their pupils.

Description of Terms Used

The descriptions that follow are provided to inform the reader how "key" terms are used in the context of this study. These descriptions are based on the literature reviewed in chapter two.

Clinical supervision. This refers to the partnership described by Cogan (1973) and Goldhammer *et al.* (1980) between supervisor and teacher which uses classroom data as the basis for subsequent analyses whose purpose is to improve the teacher's classroom practices, for formative purposes only, in ways that make sense to the teacher. The supervisor's job is not to identify what is "right" or "wrong" with the teacher's teaching, but to help the teacher identify appropriate goals for improvement. The teacher's role is to decide the focus of the clinical supervision process and the direction in which it will proceed.

Collegial consultation. This refers to a process intended to facilitate teacher development using the principles of Cogan's (1973) "clinical supervision." This is a professional relationship between a teacher and another individual (e.g., vice-principal, principal) within the school or school district. The relationship is not a reciprocal one, the two people forming the dyad do not

exchange roles. Collegial consultation is seen as a special case of the more general case of clinical supervision.

Collaborative consultation. This also refers to a process intended to facilitate teacher development using the principles of Cogan's (1973) "clinical supervision." Underpinning this process, however, exists a non-hierarchical relationship between a teacher and a teaching-partner characterized by mutual trust and respect which is presumed to provide a supportive environment in which the teacher can evaluate previous teaching strategies, as well as implement and evaluate new strategies. It is a reciprocal (the teacher and teaching-partner exchange roles) relationship of equals in which both partners wish to engage (Nolan, 1989). Collaborative consultation is seen as a special case of the more general case collegial consultation.[2]

Collaborative consultation without direct observation. This is similar to collaborative consultation as defined above

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[2] A different way of conceptualizing the hierarchy of teacher collaboration methods is on the basis of the nature of data used by teachers and their teaching partners for conferencing. Observational data collected by the teaching partner and used for the basis for conferencing in clinical supervision, collegial consultation, and collaborative consultation form one category. Data recollected by the teacher and used as the basis for conferencing in collegial consultation without observation, and collaborative consultation without observation form a second category.

except that the classroom observation phase, as described by Cogan (1973), used to collect "objective" data is not implemented; instead, data for conferencing are obtained from the teacher's recollection of past events.

Teacher collaboration. This is used here as a generic term for the varying terminologies used by different authors when referring to teachers working with other individuals for formative purposes. (e.g., Little's (1987) collegial consultation, Glickman's (1990) developmental supervision, Sergiovanni and Starratt's (1993) human resources supervision, Grimmett and Crehan's (in progress) collaborative consultation).

Directive mode of interaction. This refers to a conferencing approach used by a teaching partner based on the belief that teaching consists of technical skills with known standards and competencies for all teachers to be effective. The teaching partner's role is to inform, direct, model, and assess those competencies. Conferences between teachers and teaching-partners conducted in this mode exhibit high teaching-partner control and low teacher control (Glickman, 1990, p. 92).

Pre- and post-measures. It is recognized that this pair of terms typically refers to the measures obtained during the

periods immediately before and following researcher intervention--e.g., pretest-posttest experimental and quasi-experimental studies. Although there was no researcher intervention in this study, these terms are used here in reference to the measures obtained at the beginning and the end, respectively, of the 1991-1992 school year.

Reflection. This is an activity which draws on experiencing, remembering, believing, reasoning, knowing, perceiving, and feeling, as needed, to bear on a ". . . directly experienced situation which [is] puzzl[ing] or surpris[ing] (Grimmett and Erickson, 1988, p. 6) to construct a reality. From this construction of a "reality," hypotheses can be derived and tested logically; afterwards the "best" hypotheses can be tested by overt action. Reflection is distinct from thoughtfulness in that the latter does not require one to draw on past experience and internal history, nor does it require the formation or logical testing of hypotheses; thoughtfulness involves thinking about what just happened and deciding what should be done.

Pupil academic achievement. This refers to ". . . the reaching of a specific quantity or quality level by an individual" (Dejnoska and Kapel, 1982, p.8). Pupil academic achievement is referred to more simply in this study as "achievement." Overall achievement for each pupil was

obtained by averaging teacher assigned grades in language arts, math, science and social studies.

Pupil attitude. This refers to an affective, evaluative disposition manifested by a person towards a psychological object. Six attitudinal objects of interest are identified in the literature, namely: (1) self, (2) peers, (3) the classroom teacher, (4) the school, (5) various school subjects, and (6) learning in general.

Pupil behaviour. Pupil behaviour refers to the manner in which pupils interact with each other and with adults while in the charge of the classroom teacher or an assignee of the classroom teacher (e.g., a pupil is sent to the library to work with the librarian on an individual research project). Also included is behaviour exhibited by pupils who are supposed to be in the charge of the classroom teacher, but have manipulated the "system" allowing them to be elsewhere under false pretences (e.g., a pupil is released from school on the basis of a forged "note from home").

Supervision. This refers to a formative process in which a teacher, working with a teaching-partner, decreases the discrepancy between perceived teaching behaviour and desired teaching behaviour.

Teacher efficacy. This refers to a construct with two components: (1) teaching efficacy, and (2) personal teaching efficacy. Efficacy is defined in the Gage Canadian Dictionary as "the power to produce a desired effect or result" (1973, p. 371). Applied to teaching, Gibson and Dembo (1984) identify two facets of teaching efficacy: (1) teaching efficacy is the belief that any teacher's ability to bring about change is limited by factors external to the teacher--this is referred to here as general teaching efficacy, and (2) personal teaching efficacy is described as the belief that the individual teacher has the skills and abilities to bring about pupil learning.

Teaching-partner. This refers to a trusted and respected colleague who shares classroom data with the teacher in a nonjudgemental and noncritical way so that the teacher can engage in pedagogic reflection and self-evaluation. This individual *does not* occupy a hierarchically superior position whose role is to collect data for the purpose of teacher evaluation.

Trust. This refers to a person's general expectation that in a risk-taking situation the words, spoken or written, or actions of another individual will be in the best interest of the former (Wheeless and Grotz, 1977).

General Problem Statement

Since the links described above are conjectures, the present investigation sought empirical evidence to corroborate or refute the existence of the speculated links derived from the literature. Based on the brief overview of the literature the general problem investigated in this study can be stated as follows: What is the relationship between teacher participation in a collaboration programme and teaching-learning outcomes?

Specific Research Questions and Substantive Hypotheses

This study sought to illuminate further the relationships among four teacher-related variables and three pupil related variables. The teacher-related variables were: (1) type of consultation with a teaching-partner, (2) teacher trust for the teaching-partner, (3) teacher efficacy--general and personal dimensions, and (4) teacher classroom behaviour. The pupil related variables were: (1) pupil achievement, (2) pupil attitudes, and (3) pupil behaviour.

From the framework synthesised in Chapter 2 (see pages 56-66), and related to the general question of interest presented above, emerge five specific questions of interest. The first two include:

    (1)   Can the teaching-learning variables, taken together, distinguish among the CC, CCTT, CCNO, and CoNO groups (see pp. 71-73 for descriptions of the five groups)?

    (2)   Can the teaching-learning variables of teacher efficacy and behaviour, and pupil achievement, attitude and behaviour--taken together--distinguish among the CC, CCTT, CCNO, CoNO, and NC groups?

The three remaining specific questions are derived from the links hypothesized between and within each of the framework's four cells. The third question is related to the links existing between and within the framework's first and second cells:

    (3)   After accounting for the covariation of the variables within the first cell and within the second cell of the framework, are trust for the teaching partner and the teaching partner's preferred mode of interaction related to teacher efficacy and teacher reflection?

The fourth question is related to the links existing between and within the framework's second and third cells:

    (4)   After accounting for the covariation of the variables within the second cell and within the third cell of the framework, how strong is the relationship and what are the underlying links among teacher reflection and teacher efficacy, and teacher classroom behaviours?

The fifth question is related to the links existing between and within the framework's third and fourth cells:

(5) After accounting for the covariation of the variables within the third cell and fourth cell of the framework, how strong is the relationship and what are the underlying links among teacher classroom behaviours, and pupil outcomes?

Paralleling the specific questions are five substantive research hypotheses. The hypotheses to be tested are:

(1) of the four collaboration groups, the CC group differs most from the other groups when all the teaching-learning variables are taken at one time;

(2) of the five groups, the CC group differs most from the other groups when teacher efficacy and behaviour, and pupil achievement, attitude and behaviour are taken simultaneously;

(3) strong links exist, after taking into account the covariation among the variables in each set, between the first set of variables--trust for the teaching partner and the teaching partner's preferred mode of interaction--and the second set of variables--teacher reflection, general teaching efficacy and personal teaching efficacy;

(4) strong links exist among general teaching efficacy, personal teaching efficacy and teacher reflection, taken together to account for the covariation between the first set of variables, and teacher classroom

behaviours, taken together to account for the
covariation between the second set of variables;

(5)   strong links exist among teacher classroom behaviours,
taken together to account for the covariation between
the first set of variables, and behavioural,
attitudinal, and academic pupil outcomes, taken
together to account for the covariation among the
second set of variables.

Method of Study

The study employed a pre- post-measurement non-experimental
design--no researcher intervention was introduced to the
participants. The sample consisted of 30 intact classes (30
teachers and 476 pupil volunteers), at the elementary level, from
two British Columbia Lower Mainland School Districts.

Teacher volunteers represent five consultation strategies.
These strategies were: (1) collaborative consultation between
teacher dyads teaching in separate classrooms, (2) collaborative
consultation between team-teacher dyads teaching in one double
sized classroom, (3) collaborative consultation without direct
observation with dyads teaching in separate classrooms, (4)
collegial consultation without direct observation with dyads
teaching in separate classrooms, and (5) individual teachers
working independently of other teachers.

Data were collected from the intact classes at two points during the school year. The first phase of data collection occurred during late October and early November of 1991. The second phase of data collection occurred during May and early June of 1992.

Limitations

The limitations of this study will be briefly discussed in terms of Cook and Campbell's (1979) four types of validity. These are, namely: internal, external, statistical conclusion, and construct.

In the design of this non-experiment, threats to internal validity, or control of the study, were kept to a minimum by making use of a comparison group not participating in any form of collaborative consultation. However, since the sample consisted entirely of volunteers, both teachers and pupils, it is possible that the subjects self-selected in a systematic way for participation in the study. Five teachers and the pupil volunteers in their classes withdrew from the study between the two phases of data collection and this fact may also have unknown effects on the internal validity.

With respect to external validity, or generalizability of the results, the study utilized a sufficiently large sample that, had it been randomly selected, this would not have been a problematic issue. Since the sample consisted entirely of

volunteers, the results are not truly generalizable beyond the population of teachers and pupils who would volunteer for a study investigating the effects of collaborative consultation. However, in practical terms, it will be argued that the results may be generalizable to comparable teachers, and their classes.

Statistical conclusion validity addresses the sensitivity or power of a study to assess covariation of variables. This combined with the substantive theory guiding the study are key in making valid inferences. Given the size of the sample and the utilization of measures with high reliabilities, the largest threat to statistical conclusion validity may be the relatively short period of time between the pre- and post-measures.

With the exception of "true experiments," it can be argued that construct validity is problematic in all research. What one researcher identifies as a link between two constructs, another researcher may attribute to a number of other factors (Cook and Campbell, 1979); this study is no exception to the problem of confounding constructs. To alleviate the construct validity problem, this study relies heavily on the findings of previous research for the formulation of possible links between and among constructs. Furthermore, whenever possible, constructs were measured using two sources of data, one quantitative and the other qualitative, to provide a more complete "picture" of what was found in the research setting. Using this technique reduces what Cook and Campbell (1979) refer to as the problem of mono-operational bias.

Significance

The results of this study could have a potentially far-reaching impact on district- and provincial-level policies regarding education for inservice teachers. The practice of collaborative consultation can be more easily justified to "skeptical teachers" and a "skeptical public" if it is shown to be associated with positive pupil change in areas such as achievement, attitudes, and behaviour. Many teachers seek to improve classroom practice, usually through infrequent "professional development days." Collaborative consultation offers an alternative to sporadic "shot-in-the-arm" approaches potentially to enable continuous teacher development. In response to the question "What difference do colleagues make?" Little (1987) answers:

> The reason to pursue the study and practice of collegiality is that, presumably, something is gained when teachers work together and something is lost when they do not. The teachers who put aside other activities in order to work with colleagues, the principals who promote and organize such work, the superintendents who endorse it, and the school boards that pay for it must all be convinced that the benefits are substantial. . .(p. 492).

Delimitations

In this study, as with most, practical considerations require that limits be established for various facets of the

research. The delimitations in this study and the reasons for
imposing them will be listed below.

First, the length of time for data collection for the study
was limited to one school year. This length of time was selected
since a shorter period would have compromised the power of the
analyses and a longer period would not have added considerably
since the pupils involved would have moved onto the classrooms of
other teachers not involved in the study. Second, because of
other commitments, the researcher chose to work only in school
districts within a one-hour commute of the University of British
Columbia. Third, financial considerations resulted in limiting
the maximum number of teachers involved in the study to 35.
Fourth, the study was limited to two school districts because of
financial considerations and potentially more difficult
interpretation of results. Fifth, since none of the pupil-related
scales had been field-tested with learning disabled pupils, only
mainstream classes were included in the target population.
Classes and schools specifically directed at addressing the needs
of learning disabled children were not included in the target
population. Sixth, since all the pupil-related scales
administered had been previously field-tested with pupils at not
lower than the grade three level, this was chosen as the lower
limit for selecting the pupil sample. Seventh, to reduce
contamination of pupil change by different teachers, only self-
contained classes at the elementary level (up to and including
grade seven) were used (e.g., one teacher instructs his or her

class in most curricular areas). Eighth, to increase the likelihood that pupil change was due to what the classroom teacher was doing, only teachers who had contact with their class no less than 50 percent of the time were invited to participate. Ninth, to prevent the design of the study from becoming even more complex, the feedback loops described by the literature and incorporated in the conceptual framework were not investigated.

Overview of the Dissertation

The balance of this dissertation is offered in four chapters. Chapter two serves two purposes. It provides a review of the literature in four inter-related topic areas: (1) collaborative consultation, (2) teacher reflection, (3) teacher efficacy, and (4) pupil change factors. The literature review does not attempt to encompass these four topics in their entirety; instead, the approach is to focus on the topics as they relate to this study. Chapter two also provides a synthesis of the literature to form the conceptual framework which guided this study.

In chapter three, the method used is elaborated. Three main aspects of the study will be dealt with in detail, namely: (1) the measures used, (2) the population and the sample, (3) procedures used in the study for gaining access, collecting the data, preparing the data, and analyzing the data.

Chapter four reports the findings of the study. The results provided will be primarily from multivariate quantitative data analyses. These quantitative data analyses will be followed by qualitative data either to support or refute the principal data analyses technique. Both expected and unexpected findings, as suggested by the literature reviewed, will be reported in this chapter.

Chapter five provides a discussion of the findings for each of the research questions. This chapter also provides conclusions, recommendations, and suggestions for further research based on the findings of this study.

CHAPTER II: REVIEW OF THE LITERATURE

Introduction

The purpose of this chapter is to consolidate research findings regarding the effects of collaborative consultation on teachers and on pupils in order to synthesize the conceptual framework for the present investigation. An exhaustive review of the literature did not reveal any studies which attempted to deal with the complexities of collaborative consultation, nor the more general cases under which it falls, as it related to teacher growth and to pupil growth. The literature reviewed in this chapter is presented in clusters corresponding to the areas of previous investigations, namely: collaborative consultation, teacher reflection, teacher efficacy, and potential areas of pupil change. Although links between and among the four areas of research are posited by some authors (e.g., Acheson and Gall, 1992; Ashton *et al.*, 1983; Cavers, 1988; Grimmett and Erickson, 1988; Little, 1987; Oberg, 1989), empirical evidence for such links is lacking. The present study is one which provides: a synthesis of the four areas of the literature, and explores empirical evidence for the links posited in the literature.

The literature review is divided into the four main sections identified above. These are followed by a fifth section synthesizing the literature reviewed into a conceptual framework.

Collaborative Consultation

Traditionally, supervision has been conducted by school administrators in positions hierarchically above the teachers being supervised. This traditional approach viewed teachers as technicians and consisted essentially of

> . . . monitoring teacher's application of theory and research to practice and finding ways to help them use research and theory to make their behaviour in the classroom more effective and efficient (Nolan and Huber, 1989., p. 127).

Wise *et al.* (1984) report that in 25 of 32 school districts surveyed, "the building principal" fulfilled the role of supervisor. However, during the past 15 years there has been an increasing number of researchers (e.g., Berman and McLaughlin, 1978; Bussis *et al.*, 1976; Darling-Hammond, 1986; Garman, 1986; Gersten, Carnine, and Greene, 1982; Grimmett, 1987; Lieberman and Miller, 1979, 1981, 1984; Little, 1982; Nemser, 1983; Oja, 1980; Sparks, 1983; Zumwalt, 1986) who suggest that teachers are more apt to develop professionally through collegial, teacher-teacher interactions than through hierarchical, administrator-teacher interactions. From this perspective, teachers are viewed, not as technicians, but as professionals; consequently, "[t]he critical task of the supervisor . . . is to help teachers engage in

reflective behaviour more successfully" (Nolan and Huber, 1989,
p. 128). Grimmett and Crehan (1990) posit that teachers derive
the meaningful perceptions they use to organize the world around
them and their experiences through "experiential metaphors,"
consequently:

> . . . if one thinks of teachers as responsible
> professionals, one would presume that there are reasons
> for a teacher's classroom behaviour that (even if the
> behaviour per se were dysfunctional) must first be
> explicated, respected, and considered before that
> teacher can seriously be expected to undertake
> behavioral changes. According to this metaphor, the
> imitation of new behaviors that are inconsistent with
> the teacher's fundamental values and beliefs about
> teaching is, at best, short-lived and, at worst,
> illusory (p. 12).

Showers (1983) found that administrators functioning as
"peer coaches" effectively helped teachers improve instructional
skills. However, considerable research contradicting Showers'
finding, (e.g., Anderson, Evertson, and Brophy, 1979; Crawford et
al.,1978; Evertson et al., 1984; Good and Grouws, 1979; Griffin,
1987; Holly, 1982; Tikunoff et al., 1979) demonstrates that, if
teachers are to develop pedagogic skills, they need to interact
in small groups with other teachers.

Two main difficulties regarding administrator-teacher
collaborative relationships are highlighted in the literature.
The first of these difficulties relates to the "generalist"
administrator's lack of expertise when supervising a "specialist"
teacher. This often leads the teacher to question the credibility
of the administrator's views. Blumberg and Jonas (1987) point out
that, if the supervisory experience is to be beneficial,

supervisor credibility is a necessary aspect of the relationship in order for the supervisor to gain psychological, if not physical, access to the teacher. The second difficulty relates to the problem of role conflict. The case has been made in the literature (e.g., Darling-Hammond, 1986; Russell and Spafford, 1986) for the involvement of peers in supervision. Administrators, traditionally cast in the role of "rater," find the development of trust needed for the role of "helper" is compromised by role conflict. This role conflict, real or imagined, can result in the teacher denying the supervisor physical and psychological access to his or her classroom.

To better understand collaborative consultation as it is envisioned in this study, three topics will be addressed in more detail. The three topics that will be addressed are: (1) a discussion of the modes of interaction possible within supervision, (2) a review of the phases encompassing collaborative consultation (to eliminate confusion regarding the stages involved in the collaborative consultation cycle as understood by the author), and (3) a discussion of the effects of collaborative consultation on various facets of education--a look at what can be anticipated from collaborative consultation.

Supervisory Cycle Interaction Modes

Glickman (1990) describes three philosophical platforms-- essentialism, experimentalism, and existentialism--to which

teachers and supervisors, or teaching-partners, may subscribe.
These correspond to preferred modes of interaction, respectively:
directive (this is further broken down into directive
informational and directive control behaviours), collaborative,
and non-directive. These modes of interaction are similarly
described by Acheson and Gall (1992) as falling on a continuum
with direct (corresponding to Glickman's directive behaviours)
and indirect (corresponding to Glickman's non-directive
behaviours) styles of supervision at the extremes. Glickman
(1990) asserts that no platform is either right or wrong if the
goal of the supervisor, or teaching-partner, is eventually to
return control to the teacher, thus empowering the teacher to
govern his or her own teaching (pp. 92-93). Consequently, a
teaching-partner who remains fixated in a directive interaction
mode is not: (1) engaging in a relationship of equals, (2)
surrendering control of the developmental experience to the
teacher, nor (3) encouraging reflective thought in the teacher.
Thus, according to the definition of collaborative consultation
provided earlier, a directive teaching partner cannot engage in
collaborative consultation with a teacher.

Stages of Collaborative Consultation

Although various authors (e.g., Acheson and Gall, 1992;
Cogan, 1973; Goldhammer *et al.*, 1980; Lovell and Wiles 1983;
Sergiovanni and Starratt, 1993) recommend a different number of

phases for the supervisory process, it can be collapsed into three main components. Collaborative consultation is viewed here as a special case of the more general case of Cogan's (1973) Clinical Supervision, furthermore, the phases described as encompassing the latter are seen as directly applicable to the former. It should be kept in mind that teacher reflection throughout the collaborative consultation cycle, and especially during the post-observation phase, is seen as an essential element of collaborative consultation--it is reflection that allows the teacher to make sense of and give meaning to the classroom experience (Garman, 1986). In this section, the pre-observation conference, classroom observation, and post-observation conference stages of the collaborative consultation process are described.

Pre-conference Observation Activity

The pre-conference observation activity has three purposes. These purposes are to: (1) provide an opportunity for the teaching-partner and the teacher to develop trust and mutual respect for each other as professionals, (2) translate teacher concerns into goals and establish what specific observable behaviours reflect those goals, and (3) select suitable observation instruments (Acheson and Gall, 1992; Lovell and Wiles, 1983; Sergiovanni and Starratt, 1993).

The development of mutual trust and professional respect between the teaching-partner and teacher are probably the most critical aspects of the collaborative consultation process (e.g., Acheson and Gall, 1992; Cogan, 1973; Lovell and Wiles, 1983; Sergiovanni and Starratt, 1993). Lovell and Wiles (1983) state that "Trust means that the supervisor and teacher see each other as individuals who care about the other's well being" (p. 172).[3] Respect between teachers and teaching-partners is exhibited by viewing ". . . each other as competent professionals who are not only eager to improve their professional behaviour but are also eager and able to help and be helped by each other" (Lovell and Wiles, 1983, p. 172). Mutual trust and professional respect between the teaching-partner and the teacher forming a dyad are enhanced when the two view each other as competent professionals who are accountable for their classroom performance (Acheson and Gall, 1992; Lovell and Wiles, 1983).

Additionally, the pre-observation conference establishes the framework for an observation that is to follow. The teacher and teaching-partner should address: (1) the purpose and format of the lesson to be observed; (2) teacher needs, concerns, and goals regarding any aspect of the lesson, class, or collaborative consultation; (3) identifying a mutually convenient time for the observation; (4) the type and amount of data that will be collected during the observation; (5) the technique for data

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[3]In the case of collaborative consultation, the term teaching-partner could be substituted for supervisor.

collection--instrument selection and modification; and (6) how the data are to be used (Acheson and Gall, 1992; Cogan, 1973; Goldhammer *et al.*, 1980; Lovell and Wiles, 1983; Sergiovanni and Starratt, 1993). The process involves negotiation between the teacher and the teaching-partner regarding the direction the collaborative consultation cycle is to take (Lovell and Wiles, 1983; Sergiovanni and Starratt, 1993).

Classroom Observation

The classroom observation is the source of the data used as the basis for future discussion and reflection. Consequently, the use of accurate, objective data collection procedures by the teaching-partner is critical. The emphasis during the observation is on objectively recording behaviour and the physical surroundings as agreed to during the pre-observation conference. Garman (1986) refers to this as "stable data." Acheson and Gall (1992) and Simon and Boyer (1974) identify a number of techniques appropriate for the collection of objective data. These include: (1) selective verbatim techniques, (2) observational records based on seating charts, (3) wide-lens techniques, and (4) checklists and time-line coding techniques.

Objective data collection utilizing the techniques agreed to during the pre-conference will produce a data-base that is clear, undistorted, and relevant to teacher concerns (Acheson and Gall, 1992; Lovell and Wiles, 1983). Having data which are considered

valid by the teacher is essential if the teacher is to interpret and reflect further on his or her practice (Acheson and Gall, 1992; Lovell and Wiles, 1983).

Post-observation Activity

The post-observation activity can be divided into four distinct segments: (1) conference objectives, (2) data analysis, (3) data interpretation, and (4) teacher generalization to future practice. These are elaborated further below.

Regarding the strategy of the post-observation conference, Cogan (1973) indicates that teaching-partners should prepare, prior to the post-observation conference, tentative objectives for the meeting. The tentative objectives should be in alignment with the goals and objectives agreed to during the pre-conference between the teacher and the teaching-partner. These tentative objectives should not force the meeting into an un-natural or unproductive mold nor preclude the introduction of content not agreed upon in the pre-observation conference.

Data analysis is an attempt on the part of both the teacher and the teaching-partner to make sense of and understand the data collected during the observation. Stated differently, the purpose of the data analysis is to describe what the data indicate is happening in the class without making value judgements (Acheson and Gall, 1992; Cogan, 1973; Lovell and Wiles, 1983). Cogan (1973) states that, initially, the teacher and the teaching-

partner may work individually or together analyzing the data; eventually, the two share the experience of data analysis.

Effects of Teachers Collaborating

The effects of teachers collaborating with other teachers or other adults are tentatively linked to four aspects of education: (1) pupil performance, (2) experienced and inexperienced teachers, (3) the school, and (4) the teaching "profession" (adapted from Little, 1987). Each of these points will be elaborated further below.

Effects on Pupils

Several authors suggest the existence of a link between clinical supervision and various positive pupil changes. In this regard, Lovell and Wiles (1983) state that:

> . . . clinical supervision is based on the assumption that the teaching-learning situation is at least partly composed of behaviour that can be observed and analyzed. At least part of this behaviour occurs on a more or less regular basis and can be associated with learning outcomes. Therefore, the identification of certain patterns of behaviour can result in improvement of instruction and learning outcomes for students (p. 170).

Also suggesting the existence of linkage between clinical supervision and positive pupil effects are Acheson and Gall (1992), who state:

> Ultimately, clinical supervision should improve student learning. If clinical supervision is effective, we

should be able to observe its effects in the supervised
teacher's students. . . . Improvements in student
attitude, classroom behaviour, and scholastic
achievement represent the range of possible student
effects (p. 19).

Little (1987) also found some evidence suggesting that collegial

consultation led to pupil gains in achievement, behaviour, and

attitude. However, she also states that many factors contribute

to the environment of a classroom and to pupil success in the

classroom; little is known about the specific linkages between

teacher collegial relations and pupil gains. Echoing Little's

assertion, Acheson and Gall (1992) contend that:

. . . the links between clinical supervision . . . and
student performance have not been convincingly
demonstrated. Although indirect evidence suggests that
these linkages exist, research directly focused on the
process should be encouraged (p. 20).

However, not everyone is as certain of the benefits of

clinical supervision, and consequently of collaborative

consultation. Little (1987) lists some dysfunctional effects of

collegial consultation, noting that:

Some protest that extensive out-of-classroom time is
suspect. Others maintain that the press for cooperation
may lead individual teachers to succumb to peer
pressure, leading to compliant implementation of ideas
with little merit or to robotlike activity that stifles
variety (p. 493).

Effects on Teachers

Little (1987) identifies the main advantage of teachers

interacting collaboratively as: "breaking the isolation of the

classroom" (p. 494)--a problem identified by Lortie (1975) and

more recently by Ashton and Webb (1986) as significant and
endemic to the teaching profession. The reduction of teacher
isolation is associated with other benefits for experienced
teachers. The first of these benefits is that collegial
consultation is significantly correlated to teachers' capacities
to assimilate new curriculum (Cohen, 1981 cited in Little, 1987).
Lesnik (1987) notes "curricular innovation" as a positive side
effect of collegial consultation. Ashton *et al.* (1983) identify
reduced isolation as one of five factors contributing to an
increased sense of teacher efficacy. According to Little (1987),
other case-study evidence suggests that consultation is a factor,
but it alone does not account for advances in instructional
practice.

A second benefit attributed to reduced teacher isolation is
an increased teacher feeling of influence on the direction of the
school as an organization (Barnet, 1982; Johnson, 1976). Anastos
and Ancowitz (1987) and Lesnik (1987) identify peer recognition
and respect as a third benefit of reduced teacher isolation.

For beginning teachers, collaborative consultation offers an
alternative to the "sink or swim" mentality to which they are
often subjected. Copeland and Jamgochian (1985) suggest that by
reducing teacher isolation, neophytes would be more self-
confident and adept in the classroom. However, the effects of
consultation on beginning teachers are not always viewed as
positive. Little (1987) indicates that teachers beginning their

careers in "collegial schools" may find the situation demanding
because:

> Established collegial teams have a standard of
> productivity, a fast pace, a shared language, and an
> accumulated knowledge base that may prove hard for
> beginning teachers to assimilate (p. 500).

Effects on the School

Little (1987) cites three ways in which schools benefit
from having teachers work collegially: (1) teachers work to
develop programs with common goals--classrooms are not simply
independent islands of learning; (2) teachers are more adaptable
and self-reliant with respect to school and classroom innovations
(see also Lesnik, 1987); and (3) the strain of staff turn-over is
eased by socializing newcomers to existing norms, values and
resources. Because of the larger pool of energy, skill, and
resources, school improvement is more easily accomplished through
the communal effort of teachers than through individual efforts
(Little, 1987).

Effects on the Teaching Profession

A profession was defined by Cogan (1953, cited in Garman,
1986) as satisfying the following criteria:

> (1) full-time occupation, (2) [having] a specialized
> body of knowledge in which practitioners participate as
> a part of the community of scholars responsible for
> contributions to that knowledge, (3) a service
> orientation toward clients, (4) educational preparation

and standards, and (5) a professional association which sets entry criteria and monitors the quality of service rendered (p. 4).

Of these, the criterion being most seriously violated is the second in the list; teachers have traditionally been consumers of educational knowledge rather than contributors to that body of knowledge (Little, 1986). Collaborative consultation is a method by which teachers can work together to bring their experience to bear on issues previously reserved for university researchers (Elliot, 1988; Hunt, 1980; Kohl, 1983; Lieberman, 1986; Smyth, 1983, 1984). As Garman (1986) states ". . . the function of the clinical supervisor, is to provide the teacher with collaborative help that encourages the teacher to become the primary knowledge generator" (p. 18). Since collaborative consultation is a special case of clinical supervision, it stands to reason that the teaching-partner's role would also include enabling the teacher to become "the primary knowledge generator." Collaborative consultation has the potential to enhance professional status by having teachers contribute to their specialized body of knowledge.

Teacher Reflection

Reflection is identified as an important component of collaborative consultation if teaching is ever to attain professional stature (Cogan, 1973). Garman (1986) maintains that reflection ". . . is posited as a primary process of inquiry

within the teacher's practice . . . Reflection is regarded here

as being at the heart of clinical supervision" (p. 2). However,

not all teachers utilizing collaborative techniques reflect to

the same degree. This portion of the literature review is divided

into three sub-sections. The first examines the literature for

conceptions of reflection. The second sub-section describes

techniques for enhancing the degree of teacher reflection. The

last sub-section examines the effects of increased teacher

reflection.

What is Reflection?

In 1933, with regard to obtaining knowledge, Dewey wrote

that:

> There is nothing in the mere fact of thought as
> identical with belief that reveals whether the belief
> is well founded or not. Two different men [sic] say, "I
> believe the world is spherical." One man if challenged,
> could produce little or no evidence for thinking as he
> does. It is an idea that he has picked up from others
> and that he accepts because the idea is generally
> current, not because he has examined into the matter
> and not because his own mind has taken any active part
> in reaching and framing the belief. Such thoughts are
> prejudices; that is, prejudgments, not conclusions
> reached as the result of personal mental activity, such
> as observing, collecting, and examining evidence. Even
> when they happen to be correct, their correctness is a
> matter of accident as far as the person who entertains
> them is concerned (p. 6-7).

In this excerpt Dewey provides examples of two "ways of knowing."

The first approach is what Dewey refers to as the blind

acceptance of commonly accepted beliefs. This is what Zeichner

and Liston (1987) call *routine action* and Garman (1986) calls the

application approach. Ziechner and Liston (1987) state that
routine action is guided predominantly by tradition, external
mandate, and circumstance. Garman (1986) states that the
application approach bids the teacher to: (1) "plan"--describe
what one intends to do, (2) "implement"--act out the plan, and
(3) "evaluate"--determine if the intended goals were achieved.
Although this may require thoughtfulness on the part of the
teacher it does not draw on his or her past experience. Warning
of the pitfalls of this approach, Dewey (1933) states "Direct
immediate discharge or expression of an impulsive tendency is
fatal to thinking" (p. 87). In other words, blind acceptance,
routine action, and the application approach describe what it
means to be not reflective.

The second approach refers to the acceptance (or rejection)
of beliefs through analysis and synthesis of related facts in
which the beliefs are grounded--referred to by Zeichner and
Liston (1987) as *reflective action* and by Garman (1986) as the
reflection approach. Zeichner and Liston (1987) describe
reflective action as a process in which teachers repeatedly
appraise the origins, aims, and outcomes of their work. Garman
(1986) states that the reflection approach guides the teacher to
"reflect" after implementation of the plan and before evaluating
the outcomes of the act. Reflection is "A search for the
underlying rationale inherent in the experience as well as for
the meaning, motives, and consequences of the action . . ."
(Garman, 1986, p. 14); it involves building theory from practice.

Following a similar vein of thought, Grimmett and Erickson (1988)

assert that:

> To be reflective, . . . immediate direct action is
> with-held; the perplexity is conceptualized as a
> problem to be solved and suggested actions are
> entertained as hypotheses to be tested first by mental
> elaboration or reasoning and second by overt action
> (1988, p. 7).

Garman's reflective approach and Zeichner and Liston's

(1985) reflective action are very similar to Schön's "reflection-

on-action." He states:

> In real world practice, problems do not present
> themselves to the practitioner as givens. They must be
> constructed from the materials or problematic
> situations that are puzzling, troubling and uncertain
> (p. 40).

Schön argues that in the "real world" problems do not occur in

pure forms ready to be solved by the simple application of a

single theory. Schön (1983) states that:

> Because each practitioner treats his [sic] case as
> unique, he cannot deal with it by applying standard
> theories or techniques. He must construct an
> understanding of the situation as he finds it. And
> because he finds the situation problematic, he must
> reframe it (p. 129).

In the same vein, but written fifty years earlier, Dewey (1933)

stated:

> Phases of reflective thinking . . . in distinction from
> other operations to which we apply the names of
> thought, involve (1) a state of doubt, hesitation,
> perplexity, mental difficulty, in which thinking
> originates, and (2) an act of searching, hunting,
> inquiring, to find material that will resolve the
> doubt, settle and dispose of the perplexity. . . .
> Thinking begins in what may fairly enough be called a
> *forked-road* situation, a situation that is ambiguous,
> that presents a dilemma, that proposes alternatives. As
> long as our activity glides smoothly along from one
> thing to another, or as long as we permit our

> imagination to entertain fancies at pleasure, there is
> no call for reflection. Difficulty or obstruction in
> the way of reaching a belief brings us, however, to a
> pause. In the suspense of uncertainty, we
> metaphorically climb a tree; we try to find some
> standpoint from which we may survey additional facts
> and, getting a more commanding view of the situation,
> decide how the facts stand related to one another (pp.
> 12, and 14, italics in original).

The point being made by these authors is that to be reflective,

pedagogic problems need to be approached from a thoughtful,

curious perspective and contextualized using past experience.

Stated differently, actions need to constitute mindful selections

from alternative solutions to consciously identified problems or

alternative answers to consciously framed questions.

Reflection then is an activity composed of several elements.

First, the selection of object or subject of the reflective

thought is not one of mindlessness or convenience. Rather, it is

the result of a discrepancy between what one perceives to be the

case and what one thinks would be "desirable" to be the case.

Second, reflection draws on experience, memory, belief, reason,

knowledge, perception, and feelings, as needed, to bear on the

selected puzzling or surprising situation to construct a reality

(or realities if the perplexing situation or problem is framed

and reframed using a variety of different frameworks or

theories). Third, from this construction of "reality" or

"realities," hypotheses can be derived and tested logically and

evaluated. Fourth, after mentally testing and then evaluating the

hypotheses, the "best" choice or choices can be tested through

overt action.

Factors Affecting Teacher Reflection

This sub-section examines two aspects of teacher reflection which have bearing on the degree of reflective behaviour exhibited. The first summarizes literature suggesting techniques for the enhancement of teacher reflection; the second summarizes what the literature has to say regarding impediments to reflective teaching practice.

Stimulating Reflection

According to Garman (1984), Elliot (1976), and Zimpher and Howey (1987), it is possible to amplify the degree of teacher reflection through the use of suitable self-monitoring techniques and teacher consultation practices. Garman (1986) presents two notions of reflection, reflection on action and reflection through recollection. The use of either should result in the possibility of increased teacher self-understanding, and augmented professional competence.

Regarding reflection on action, a model essentially cast in Cogan's (1973) Clinical Supervision mold, Garman (1986) states that initially the teacher and the teaching-partner determine the focus of the observation. During the observation, data must be collected that are "stable" (e.g., verbatim transcript, audio or video recordings). The next step involves contextualizing, in

light of educational theory, the data through interpretation,

explanation, and evaluation. This is followed by putting

> . . . the events and meanings. . .in an abbreviated,
> manageable (often conceptual) form for future use: an
> insight, concept, principle, significant incident,
> portrait, or conceptual framework are examples of a
> construal. The essence of reality is "construed" from
> one form to another (Garman, 1986, p. 15).

As a final step, the "construal's" universality of meaning for

other teachers and researchers in general is determined.

Reflection through recollection is similar to the model just

described (Garman, 1986). However, teachers must rely on their

memories--knowing that emotions may distort the recollections--to

provide accounts of past events. Most often the recollections are

recorded using media similar to those utilized for the collection

of "stable data" so that meaning can be assigned to the

"construals" through interpretation, explanation, and evaluation.

Finally, the "construal's" universality is determined, just as

with the final step in "reflection on action." Both procedures,

Garman (1986) maintains, enhance teacher reflection.

More specifically, teacher reflection can be enhanced through

certain supervisory behaviours as well as through particular

teacher activities. Based on the work of Turner-Muecke *et al.*

(1986), Kilbourn (1984), and Robinson (1984), Nolan and Huber

(1989) summarize five supervisory behaviours to stimulate

reflective behaviour in supervisees:

> 1.   reflecting in action by the supervisor;
> 2.   encouraging teacher autonomy;

3. using data as evidence for salient teaching patterns;
4. observing and conferring over time;
5. helping teachers develop the skills to interpret the data collected on their teaching and allowing them to play a major role in interpreting the data (p. 141).

Furthermore, Elliot (1976) suggests six activities which facilitate reflection through teacher self-monitoring. These are:

1. Listening to or viewing recordings of their teaching situation;
2. Listening to or viewing recordings and then systematically noting salient patterns in their classroom behaviour;
3. 2, plus dialogue with participant observer;
4. 3, plus dialogue with students about pedagogic values;
5. Triangulation controlled by participant observer;
6. Triangulation controlled by the teacher (Elliot, 1976, p. 2).

Difficulties to Overcome

The above review has centred on describing ways of enhancing teacher reflection. But in order to accomplish this task, it is just as important to be aware of the teachers' needs with respect to becoming more reflective, and the hindrances toward teacher reflection.

Seven needs identified by Wildman and Niles (1987) should be met if teachers are to become more reflective about their practice. These needs include having:

1. observational description of classroom events to reflect on;
2. the skills to obtain and express classroom descriptions;
3. control of the reflexive process;
4. administrative support;

5.   a "safe" environment for disclosing one's beliefs;
6.   time for reflection;
7.   collegial support and respect for teachers'
     knowledge (Wildman and Niles, 1987, pp. 25-31).

In addition to the needs described above, Sykes specifies

four obstacles standing in the way of increased teacher

reflectiveness. These obstacles are characterized as:

1.   Facing complex tasks and making decisions under
     uncertainty, the press to act in the classroom
     setting typically precludes the opportunity to
     reflect. . . . Teachers, like most people,
     frequently resort to action rather than analysis
     to solve problems.
2.   Teachers regularly confront the unique and
     idiosyncratic in their students, exercise
     imperfect control over the contingencies of
     learning and sense the ambiguities surrounding
     competence. . . Teachers do not regard their
     interactions with students as exhibiting stable
     patterns which warrant systematic inquiry.
3.   Teaching is one of the few professions which
     people have already experienced in their life
     time. Teachers have already spent more than a
     dozen years of their lives "in" education.
     Teachers tend to teach as they were taught, and
     little in their experience suggests what might be
     problematic in their approach.
4.   Teachers work in isolation; trial and error and
     learning by doing are the most prevalent forms of
     learning on the job, with the imperative for
     control of behaviour dominating instruction
     (Sykes, 1986, pp. 236-238).

The Effects of Increasing Reflection

What can be anticipated as a result of increasing teacher

reflection? Some of the answers described in the literature to

this question will be explored in this sub-section. Of particular

concern is how increased reflection affects both teachers and

pupils.

Effects on Teachers

Nolan and Huber (1989) summarize the findings of McCoombe (1984) and Potash (1987) that increased teacher reflectivity positively affects beliefs about teaching. Robinson (1984, cited in Nolan and Huber, 1989) found that increased teacher reflection positively influenced teacher self-esteem. Cruickshank and Applegate (1981) not only support these findings, but also conclude that, as a result of the positively affected teaching beliefs and increased self-esteem, ". . . teachers become more reflective about teaching and more interested in self-improvement" (p. 554). Robinson (1984, cited in Nolan and Huber, 1989) and Cruickshank and Applegate's (1981) findings suggest the possibility of a positive relationship existing between level of teacher reflectiveness and level of teacher efficacy.

Effects on Pupils

Wildman and Niles (1987) state that "Teachers may be more able or willing to lead their students in systematic reflection" (p. 28) when they themselves become more reflective. Along a slightly different vein, Greene (1986) contends that much of what is learned by pupils is passively absorbed and both non-reflective and non-critical. Greene's argument is that pupils, like their teachers, learn more when knowledge is actively pursued through self-reflective and critical avenues. Logically,

the synthesis of Wildman and Niles (1987) work and that of Greene (1986) lends credibility to the existence of a link between the degree of teacher reflectiveness and pupil achievement and possibly other measures of pupil effects such as attitude and behaviour.

Teacher Efficacy

The literature provides evidence regarding the relationships between collaborative consultation, teacher reflection, and teacher efficacy. Regardless of the exact nature of the relationship among these constructs, one fact remains important: a positive relationship does exist. Consequently, teacher efficacy is an important intervening variable to consider in the relationship between collaborative consultation and pupil growth. This section will provide an overview of the teacher efficacy construct.

Research regarding teacher beliefs and their relationship to teacher effectiveness has been taking place for some time. Two Rand Corporation studies (Armor et al., 1976; Berman et al., 1977) found a significant relationship between teacher efficacy and pupil achievement on a two item instrument yielding a single measure of efficacy. This single measure of efficacy mirrored ". . . the extent to which the teacher believed he or she had the capacity to affect student performance" (Cavers, 1988, p. 16). At approximately the same time, Bandura (1978) proposed the theory

of "Reciprocal Determinism." He hypothesized that ". . . expectations of personal efficacy determine whether coping behaviour will be initiated, how much effort will be expended, and how long it will be sustained in the face of aversive experiences" (1986, p. 191). Bandura's conception of efficacy differed from the Rand studies in that two components were delineated:

> (1) a person's behaviour is determined by general outcome expectancy (belief that behaviour will lead to desirable outcomes);
> (2) a person's behaviour is also determined by a sense of self efficacy (belief that one has the requisite skills to bring about the outcome) (Dembo and Gibson, 1985, p. 174).

Subsequently, Bandura's work was accepted and applied to educational research (Ashton *et al.*, 1983; Denham and Michael, 1981; Gibson and Dembo, 1984). From the work of Bandura, Gibson and Dembo (1984) propose that:

> . . . teachers who believe that student learning can be influenced by effective teaching, and who also have confidence in their own teaching abilities would persist longer, provide a greater academic focus in the classroom, and exhibit different types of feedback than teachers who have lower expectations concerning their ability to influence student learning (p. 570).

Like Bandura, Gibson and Dembo (1984) propose that the efficacy construct is composed of two components:

> (1) Teaching Efficacy - a belief that any teacher's ability to bring about change is limited by factors external to the teacher such as home environment, family background, and parental influence;
> (2) Personal Teaching Efficacy - a belief that the individual teacher has the skills and abilities to bring about student learning (p. 175).

Ashton *et al.* (1983), also borrowing from Bandura (1977),
differentiate between general teaching efficacy and personal
teaching efficacy. Ashton and her colleagues emphasize the
importance of keeping ". . . these dimensions separate
conceptually because it is likely that the most appropriate
teacher change strategy will depend on the origin of the sense of
inefficacy" (1983, p. 2). Similarly, Cavers (1988) and Housego
(1992) retain the two dimensions as distinct in their studies.
Cavers (1988) goes so far as to use personal teaching efficacy
dimension scores for defining teacher efficacy because ". . .
this efficacy dimension is most predictive of teaching behaviour"
(p. 61).

Interestingly, although several studies suggest a reciprocal
relationship between teacher efficacy and pupil achievement
(e.g., Armor *et al.*, 1976; Ashton, 1985; Berman *et al.*, 1977),
Cavers (1988) did not find such a relationship to exist between
either of the two efficacy dimensions, teaching efficacy and
personal teaching efficacy, and pupil achievement. However,
Cavers (1988) states that this finding is odd and attributes his
finding to ". . . a problem of interpretation since the high
efficacy teachers may or may not have directly contributed to the
outcome measured by the CAT scores (p. 189). Anderson *et al.*
(1987) indicate that although the relationships are ambiguous,
their analyses ". . . suggest that at least for Grade three
students, teachers' personal efficacy beliefs do have some effect
on student achievement" (p. 23).

Areas of Potential Pupil Change

The literature reviewed has drawn tentative connections between collaborative consultation and various pupil effects factors which require further explication. These factors, which can be traced back to Plato's trilogy of human condition-- knowing, feeling, and acting, are: (1) pupil achievement, (2) pupil attitude, and (3) pupil behaviour. In this section of the literature review, each of the three constructs will be described.

Pupil Achievement

No one would question that learning is one of the major goals of education. The Report of the British Columbia Royal Commission on Education (Sullivan, 1988) states that:

> The school's first educational purpose is the cultivation of mind. What this means is that youngsters should learn how to think at advanced levels . . . The development of expertise in anything requires both knowledge about a subject and the capability to think deeply about that knowledge (p. 69).

Assessment of the amount and quality of learning attained by pupils is used to quantify and report pupil progress. In addition, educational research often makes use of measures of the amount learned (Borg and Gall, 1989).

Measures of the amount learned are termed pupil achievement measures. Pupil performance levels can be evaluated by two basic means: (1) traditional tests, and (2) other techniques. The

latter may include the use of teacher evaluations; for example, the current British Columbia public school pupil progress reporting system (Sullivan, 1988). Each of the methods of pupil assessment will be discussed further below.

Academic Achievement Tests

Two types of achievement tests are available to researchers for determining pupil performance: norm referenced measures and domain or criterion referenced measures. Each type of test serves a very specific function. Borg and Gall (1989) identify norm referenced measures as those appropriate for providing ". . . information about student achievement *relative to other students*. . ." (p. 265, italics in original). They also state that "When we want to diagnose difficulties or find out what students have achieved *in absolute terms*, we should select domain-referenced measures" (Borg and Gall, 1983, p. 265, italics in original).

Common (1987) addresses an important limitation of standardized achievement testing. She suggests that because standardized tests place heavy emphasis on a multiple choice item format, ". . . students who think creatively and imaginatively often have enormous difficulty deciding upon the correct answer" (p. 13). Many researchers have criticized standardized tests for obtaining measures that are closely correlated to test takers' intelligence quotients (Hosford, 1973; Serow and Jackson, 1983;

Van Horn, 1977). Marston *et al.* (1986) assert that when measuring changes in pupil achievement differences, the emphasis on specific, but different, content areas on standardized tests means that measurements may be more indicative of the specific test being used than of actual change in pupil performance.

Teacher Assessment of Pupil Achievement

Because of the achievement test limitations discussed above, a case is made for augmenting standardized achievement test data with teacher evaluations of pupil progress. Airasian (1980) and Dusek and O'Connell (1973) found that teachers could accurately predict pupil ability and achievement test scores. Because investigators can ask similar questions and obtain different answers, some researchers suggest that teacher evaluation of pupils is unstable (e.g., Elmore and Beggs, 1972; Pedulla *et al.*, 1977; Sorotzkin *et al.*, 1974); however, it is recognized that standardized tests alone do not provide the entire "picture" of how a pupil is performing (e.g., Sullivan, 1988). Indeed, the literature on teacher assessment of pupils demonstrates that teacher evaluations are a reasonable source of information regarding pupil achievement. Moreover, these evaluations are often in agreement with standardized tests of various sorts. The two together provide a more complete "picture" of pupil achievement than either can independently.

<u>Pupil Attitude</u>

Schools are known to do more than just influence pupil achievement as assessed by standardized tests and other measures. Serow and Jackson (1983), who argue for measurement that recognizes diversity in schools, point out that an important dimension is pupil attitude.

Attitude is a bidirectional (on a like-dislike continuum) evaluative quality, an affective reaction not necessarily bound to fact, towards a psychological object (Edwards, 1957; Osgood *et al.*, 1957; Anderson and Fishbein, 1965; Shaw and Wright, 1967; Fishbein and Ajzen, 1975; Berkowitz, 1980; Mueller, 1986; Germann, 1988). In the context of the present study, attitude will refer to a favourable or unfavourable outlook possessed by pupils toward objects, topics, concepts, or human beings (Wrightsman, 1977).

Many authors agree that peoples' attitudes are shaped by predisposition, social influence and experience (Allport, 1954; Shaw and Wright, 1967; Baron *et al.*, 1975). Baron *et al.* (1975) write that:

> Heros may be born, but bigots are clearly made. No one
> would seriously suggest . . . that children spring from
> the womb with all the complex attitudes they will later
> show as adults firmly in place. Rather, there is
> virtually universal agreement that they acquire their
> reactions in precisely the same manner that they
> acquire other forms of behaviour--largely through a
> prolonged period of learning (p. 105).

Miller and Coleman (1981) carry the argument further stating that attitudes are temporary but stable. In other words, attitudes are

persistent enough to be stable but transient enough to be altered. Wrightsman (1977) writes that the transient nature of attitudes depends on the nature of the object to which they are directed; attitude towards more specific objects is more easily altered than attitude toward broad objects. For example, a pupil's attitude toward learning will be much more stable than the same person's attitude toward an individual classroom teacher. Germann (1988) and Talton and Simpson (1987) concluded that attitude toward science appeared to be positively related to science achievement. However, Canon and Simpson (1985) concluded that science attitude and science achievement were poorly correlated to each other. Similarly, Randhawa and Van Hesteren (1983) found that general attitude toward school-related psychological objects and pupil achievement shared only 7% of the variance.

Wrightsman (1977) states that: "The number of attitudes is almost infinite; an attitude exists within a person in regard to every object, topic, concept, or human being the person encounters" (p. 316). With this and the need to limit the number of attitude measures in mind, it is necessary to recognize which psychological objects of pupils' attitudes should be included in data collection.

Serow and Jackson (1983) contend that:

Students who feel good not only about themselves and their potential, but also about the school and others in it, are more likely to demonstrate the characteristics that lead to success in school and beyond (p. 23).

The preceding quotation identifies three attitudinal variables of interest for Serow and Jackson: (1) pupil self concept, (2) attitude toward their school, and (3) attitudes toward other people in the school. In a study examining the effects of different teaching models on pupil self concept and attitude toward the teacher, Van Horn (1976) considers two attitudinal variables: (1) pupil self concept in specific subjects such as math or English, and (2) attitudes toward the specific classroom teacher. In a study commissioned by the Alberta Ministry of Education, Nyberg and Clarke (1979) chose to obtain measures of pupils' attitudes toward 14 school subjects. In a similar vein, Germann (1988) identified pupil attitude toward science as the psychological object of investigation. Walberg, Donovan and Sousa (1987) utilized a measure of pupil attitude towards school in general in their study. It is obvious that the objects of the attitudinal measures are varied according to the needs and desires of the researchers utilizing them.

Classification of the psychological objects identified above reveals five salient categories of pupils' attitudes toward: (1) self, (2) peers, (3) the classroom teacher, (4) the school, and (5) school subjects. The need for a sixth category--attitude toward learning in general--is identified by Eisner (1991). He states that:

> People acquire minds during the course of their lifetimes; the task is not completed when students finish the 12th grade. . . . The reason it is so important for youngsters to enjoy what they study in school is because without such satisfactions, the

likelihood that they will pursue their studies outside
our institutions is small (p. 11).

Pupil Behaviour

Teachers typically have expectations, either implicit or
explicit, regarding pupil behaviour in the classroom and the
school. Broadly defined, behaviour refers to any act of an
individual or group that is observable and measurable. Within the
framework of this study, Evertson's (1987) definition--pupil
behaviour refers to how pupils interact with one another and with
adults while in the charge of the classroom teacher--is broadened
slightly to include behaviour exhibited by pupils who are
supposed to be in the charge of the classroom teacher.

The most noticeable form of pupil behaviour, the behaviour
that the classroom management literature is aimed at preventing
or reducing, is that which is disruptive because ". . . it
seriously interferes with the activities of the teacher or of
several students for more than a brief time" (Emmer *et al.*, 1984,
p. 151). If the classroom is thought of in terms of social
interaction, it becomes evident that ". . . individual freedoms
must necessarily be regulated to accomplish the goals of the
group. . ." (Evertson, 1987, p. 60). Regarding the
appropriateness of pupil classroom behaviour, Emmer *et al.*,
(1984) state that:

> Students should not, after the first several weeks of
> classes, need constant reminders to follow rules and
> procedures, and they should follow the teachers'

> directions without excessive delay or complaints. . . .
> A problem in this area is indicated when many students
> continue to test limits, disregard class rules and
> major procedures, and display rudeness and intolerance
> toward each other or toward the teacher (p. 151).

This is not to say that negative pupil behaviours are the only

ones of interest to classroom teachers. In fact, undesirable

pupil behaviour may be purposely ignored by a teacher in an

extinguishing strategy (Emmer et al., 1984; Evertson et al.,

1984; Evertson, 1987). In the context of the present study, pupil

behaviour is either appropriate or inappropriate relative to the

teacher's perspective of classroom management.

Direct Assessment of Behaviour

Many specific techniques for collecting data regarding

classroom behaviour of pupils are provided in a number of

different texts (e.g., Simon and Boyer, 1974; Acheson and Gall,

1992; Miles and Huberman, 1988; and Joyce, 1989). Acheson and

Gall (1992) provide a comprehensive description of the various

techniques included in other texts. They classify these specific

data collection techniques within four main categories. The

categories are: (1) selective verbatim transcripts--involving

teacher questions, feedback, directions and structuring

statements; (2) observational records based on seating charts

measuring "at task," verbal flow, movement pattern behaviour; (3)

wide lens techniques such as anecdotal records, video and audio

recording, and global screen; and (4) checklists and timeline

coding using pupil administered and observer administered
checklists, as well as the Flanders interaction analysis (Acheson
and Gall, 1992). All these techniques are suitable for collecting
data directly from classrooms.

Indirect Assessment of Behaviour

Elmore and Beggs (1972) report that unlike test scores,
teachers' judgments of pupil classroom behaviour are neither
stable nor accurate; however, in a study completed just two years
later, Beggs found evidence contradicting the lack of stability
and accuracy of teachers' judgments. In fact, several studies
have provided evidence that teachers' perceptions of pupil
behaviour in the classroom are stable (e.g., Sorotzkin *et al.*,
1974; and Pedulla *et al.*, 1977). This points to the viability of
utilizing teacher comments recorded in "report cards" regarding
pupil behaviour as a source of data.

Camp (1980) compiled a comprehensive list of 101 pupil
misbehaviours commonly identified in the literature. This list
could form the basis for categorizing undesirable behaviours
described by teachers in pupils' report cards. A similar list of
desirable pupil behaviours was not found in the literature.

Conceptual Framework

This section will centre on the synthesis of the conceptual framework for the present study. Many authors (e.g., Sergiovanni and Starratt, 1993; Acheson and Gall, 1992; Little, 1987; Lovell and Wiles, 1983) agree that if teachers can be encouraged to think critically about what they do in the classroom and then act upon those thoughts, there should be an accompanying change in pupils' achievement, attitudes, and behaviour. However, these linkages are conceived of logically and have not, as yet, been identified empirically. This framework synthesizes the salient aspects described in the literature regarding the postulated linkages that exist between teacher collaboration and pupil effects in terms of: achievement, attitudes, or behaviour. Below, the four main "cells" of the framework will be discussed individually; this is followed by a discussion of the hypothesized interactions among the "cells."

The Framework's First Cell

Some authors suggest that teacher consultation can lead to teacher growth through teacher reflection on classroom practice (e.g., Grimmett and Erickson, 1988; Nolan and Huber, 1989; Oberg, 1989; Grimmett and Crehan, 1990). The literature also suggests that teacher consultation can positively affect teacher efficacy, thereby, facilitating teacher growth (Ashton et al., 1983;

Cavers, 1988; Denham and Michael, 1981). The key modifier in each of the two preceding sentences is the word "can." This suggests that simply providing opportunities for teachers to observe and conference with each other does not necessarily produce positive changes for teachers and pupils. An important question to ask at this point is: what does the literature have to say regarding the effects of teacher collaboration on teacher growth?

In response to the question posed above, the literature identifies two important hurdles to overcome in order for teacher consultation to have the desired effects: (1) the development and maintenance of teacher trust and professional respect for the teaching-partner (Cogan, 1973; Goldhammer *et al.*, 1980; Lovell and Wiles, 1983; Acheson and Gall, 1992; Grimmett and Erickson, 1988; Sergiovanni and Starratt, 1993); and also related to the development and maintenance of trust, (2) the teaching partner's preferred mode of supervisory interaction should not be a directive one. The call for teachers to be treated as competent professionals who are accountable for their professional performance and in control of their professional development is expressed by many authors (e.g., Acheson and Gall, 1992; Cogan, 1973; Goldhammer *et al.*, 1989; Grimmett and Erickson, 1988; Lovell and Wiles, 1983; Sergiovanni and Starratt, 1993). This suggests that in order for teacher collaboration to have positive effects on teaching, two conditions should be met: (1) teacher trust for the teaching-partner should exist, and (2) the teaching-partner's preferred mode of conferencing interaction

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┌─────────────────────────────────────────────────────┐
│                                                       │
│     Teacher                                           │
│     Collaboration                                     │
│                                                       │
│                                                       │
│                                                       │
│                                                       │
│   Cell "1"                                            │
│   ┌─────────────────┐                                 │
│   │ ·················· │                               │
│   │ Teacher trust    │                                │
│   │ for the          │                                │
│   │ teaching-         │                                │
│   │ partner          │                                │
│   │ ·················· │                               │
│   │ ·················· │                               │
│   │ Teaching-         │                                │
│   │ partner's         │                                │
│   │ supervisory      │                                │
│   │ beliefs          │                                │
│   │ ·················· │                               │
│   └─────────────────┘                                 │
│                                                       │
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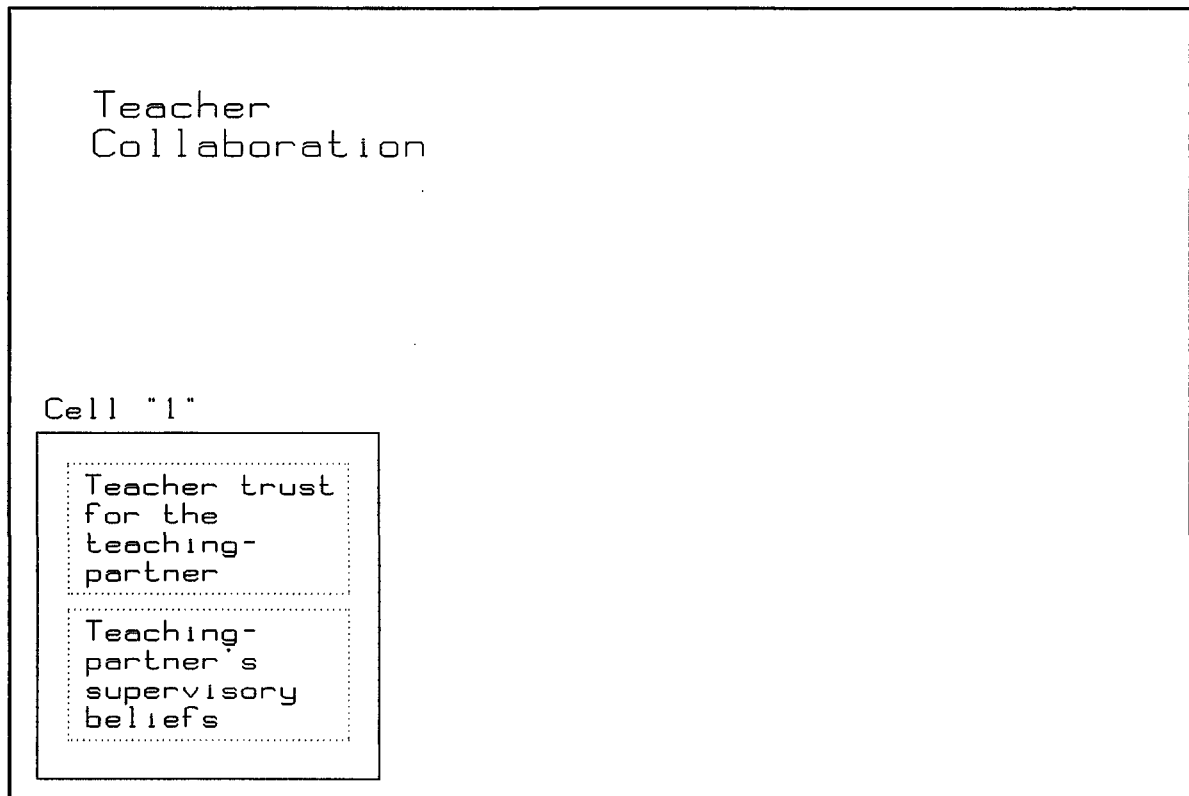
Figure 1: Two factors important for teacher collaboration.

should be either, using Glickman's (1990) terms, collaborative or non-directive (see Figure 1). It is expected that collaboration between individuals who fulfil these requirements is prone to lead to increased levels of teacher reflection regarding practice and increased levels of teacher efficacy.

The Framework's Second Cell

At this point, the literature seems to branch regarding what can be expected from teacher consultation if the two conditions presented above are satisfied. Many authors indicate that increased teacher reflection can be anticipated as a result

(e.g., Grimmett and Erickson, 1988; Nolan and Huber, 1989; Oberg, 1989; Grimmett and Crehan, 1990). Others suggest that gains in teacher efficacy can be expected (e.g., Ashton *et al.*, 1983; Cavers, 1988; Denham and Michael, 1981). McCoombe (1984) and Robinson (1984) posit that increased teacher reflectivity positively affects teachers' self-esteem, as well as their beliefs regarding teaching. Cruickshank and Applegate (1981) suggest that increased levels of teacher self-esteem and a positive outlook on teaching led teachers to become more concerned with self-improvement. Robinson's (1984) and Cruickshank and Applegate's (1981) conclusions suggest the existence of a positive relationship between the degree of teacher reflectiveness and the teacher's efficacy level. However, the literature is unclear regarding which affects the other. What is clear is that increased levels of either teacher reflectiveness or teacher efficacy are believed to affect pupils positively (see Figure 2). This ambiguity is likely the result of these previous studies not considering teacher reflectiveness, teacher efficacy, and pupil change simultaneously, choosing instead to consider interactions between only two of the three constructs at a time.

A logical question to ask at this point is: by what mechanisms are teacher efficacy and teacher reflection related to the effects on pupils? An answer to this question is addressed in the next section. The discussion of a possible answer also sheds

light on the literature's ambiguity regarding the relationship

between teacher reflectiveness and teacher efficacy.
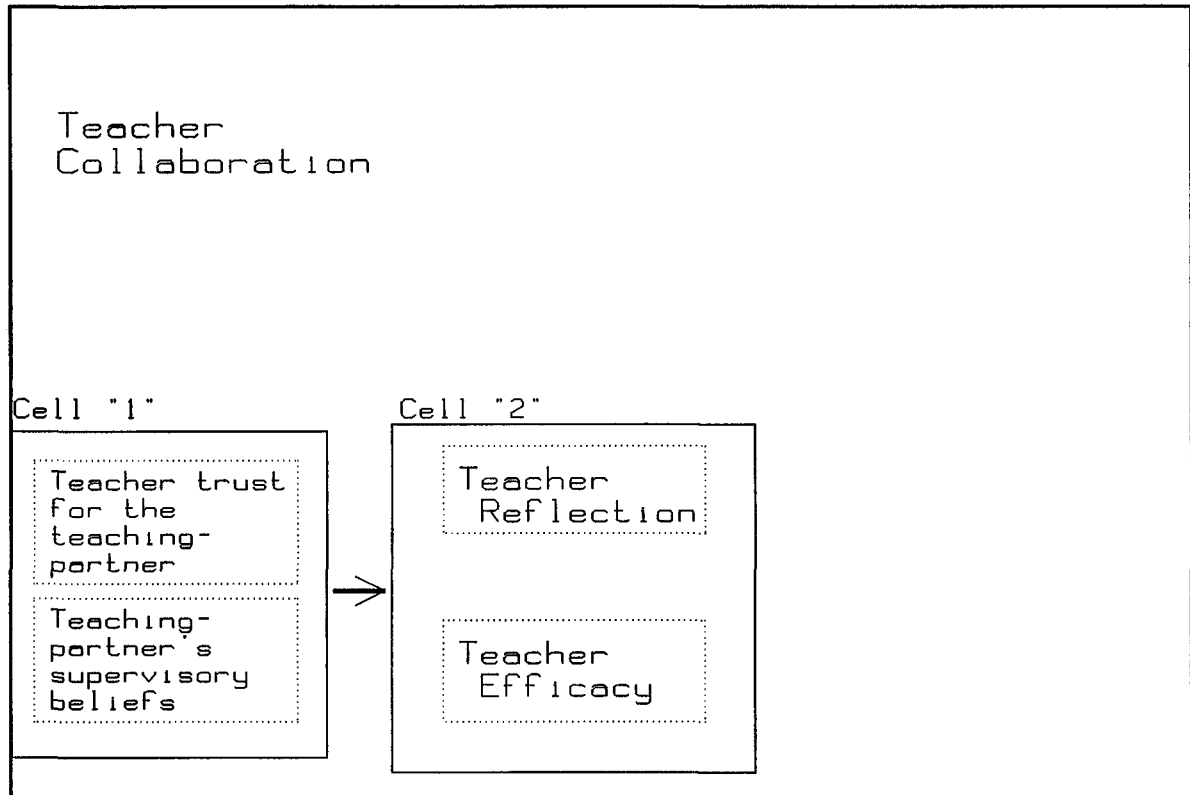
Figure 2: Posited link between cell 1 and cell 2.

The Framework's Third Cell

To answer the question posed in the previous sub-section

regarding the nature of the relationship between teacher

reflection and positive pupil change, and between teacher

efficacy and positive pupil change, it is necessary to consider

two other questions. First, what do teachers change as a result

of being reflective? and second, how do teachers function as their sense of efficacy changes?

Grimmett and Erickson (1988) provide an indication of the linkage between teacher reflection and pupil change. They state that ". . . suggested actions are entertained as hypotheses to be tested first by mental elaboration or reasoning and second by overt action" (p. 7). Stated differently, after reflecting on a situation and testing the potential outcomes of various solutions in the mind (presumably, the number of alternatives from which to make mindful selections increases) the teacher can implement overtly what he or she considers to be the "best" solution. Similarly, Sykes (1986) states that one of the criteria for identifying teacher reflection lies in:

> ... [t]he use of knowledge sources internal to practice
> to explore and modify one's actions with student and
> students' learning being the primary source (p. 233).

Relating both of these excerpts to the first question posed above, one can conclude that the teacher behaves differently with respect to pupils after reflecting on problems of teaching (see Figure 3).

The linkage between teacher efficacy and positive pupil change is similar, if not identical, to that linking teacher reflection with positive pupil change. Re-visiting the premise on which Bandura's (1978) theory of "Reciprocal Determinism" is based provides the insight required to propose the nature of the link between teacher efficacy and positive pupil change. The premise is that teacher's efficacy attitudes influence behaviour,

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Teacher
Collaboration


        Cell "1"                  Cell "2"                        Cell "3"

     ┌─────────────┐       ┌───────────────────┐       ┌──────────────────┐
     │ Teacher trust│      │ Teacher           │  ───> │ Teacher          │
     │ for the      │      │   Reflection      │       │   Classroom      │
     │ teaching-    │      │                   │       │   Behaviour      │
     │ partner      │      └───────────────────┘       └──────────────────┘
     ├─────────────┤
     │ Teaching-    │      ┌───────────────────┐
     │ partner's    │      │ Teacher           │
     │ supervisory  │      │   Efficacy        │
     │ beliefs      │      └───────────────────┘
     └─────────────┘
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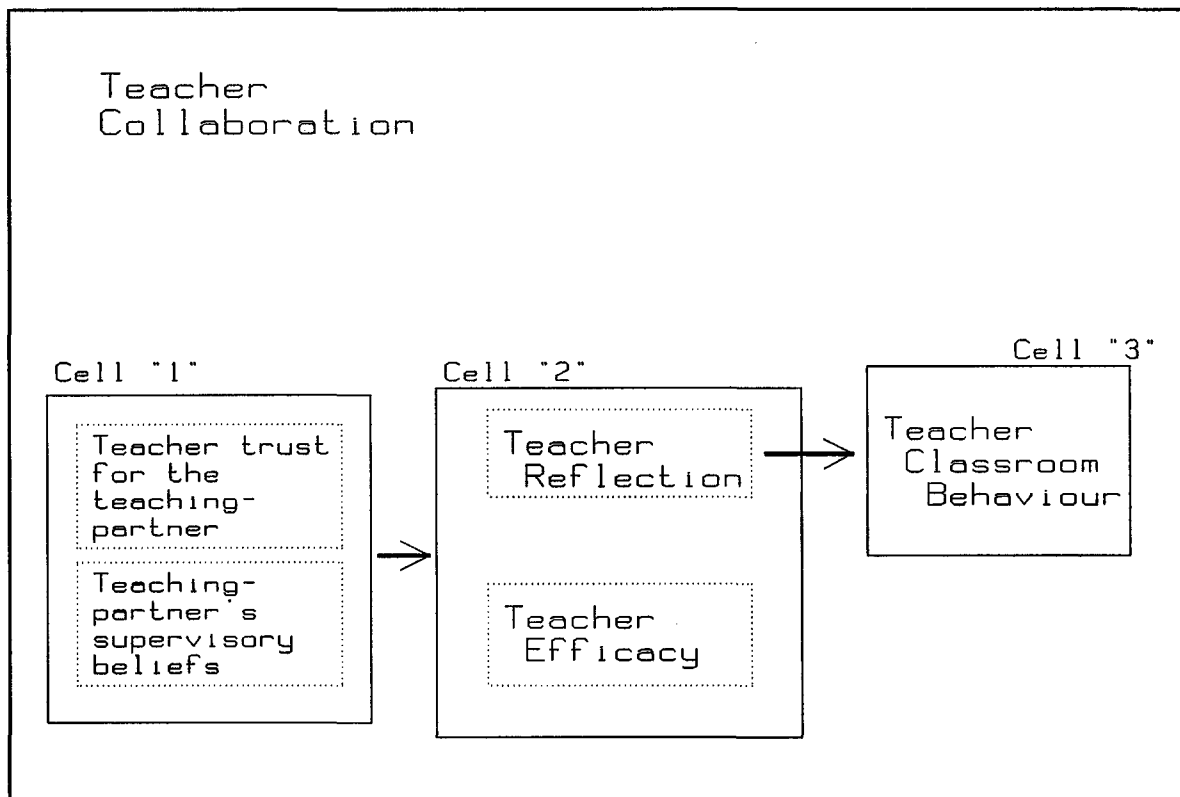
Figure 3: Posited link between cell 2 and cell 3.

resulting in altered expectations which, in turn, affect

efficacy. To put this another way, efficacy can be imagined to

give the teacher confidence that there is the possibility of

improving things by considering alternative approaches; if one

believes that matters are beyond one's control, there is little

point in deliberating about alternative approaches. In response

to the second question posed above, it is the teacher's

behaviour, as a result of considering a wider variety of

alternatives thus increasing the possibility of identifying an

effective one, which acts as the link between how efficacious a

teacher feels and how pupils change.

Thus, at least logically, the ambiguity found in the literature and identified in the previous section is clarified: teacher efficacy likely affects teacher reflection which in turn affects teacher behaviour (see Figure 4). It also appears that the answer provided by the literature to the question regarding the mechanisms through which teacher efficacy and reflection are related to effects on pupils is that: (1) teacher behaviour is the link between teacher reflection and positive pupil change, and (2) teacher behaviour through teacher reflection is the link between teacher efficacy and pupil change. In the next sub-section the nature of the pupil gains that can be anticipated will be discussed.

The Framework's Fourth Cell

It is suggested in the literature that the effects of teacher behaviour will be evident in pupils along three possible dimensions--corresponding to Plato's trilogy of human condition: (1) achievement, (2) attitude, and (3) behaviour (Acheson and Gall, 1992, Little, 1987). The four cells of the framework have been presented in a linear fashion. Essentially, it is expected that teacher collaboration will, if teacher trust for the peer-observer is present and the peer-observer's preferred supervisory interaction mode is not directive, positively affect teacher reflection, which is also affected by teacher efficacy. Teacher reflection then positively affects teacher behaviour toward

Teacher
Collaboration

Cell "1"

Teacher trust
for the
teaching-
partner

Teaching-
partner's
supervisory
beliefs

Cell "2"

Teacher
Reflection

Teacher
Efficacy

Cell "3"

Teacher
Classroom
Behaviour
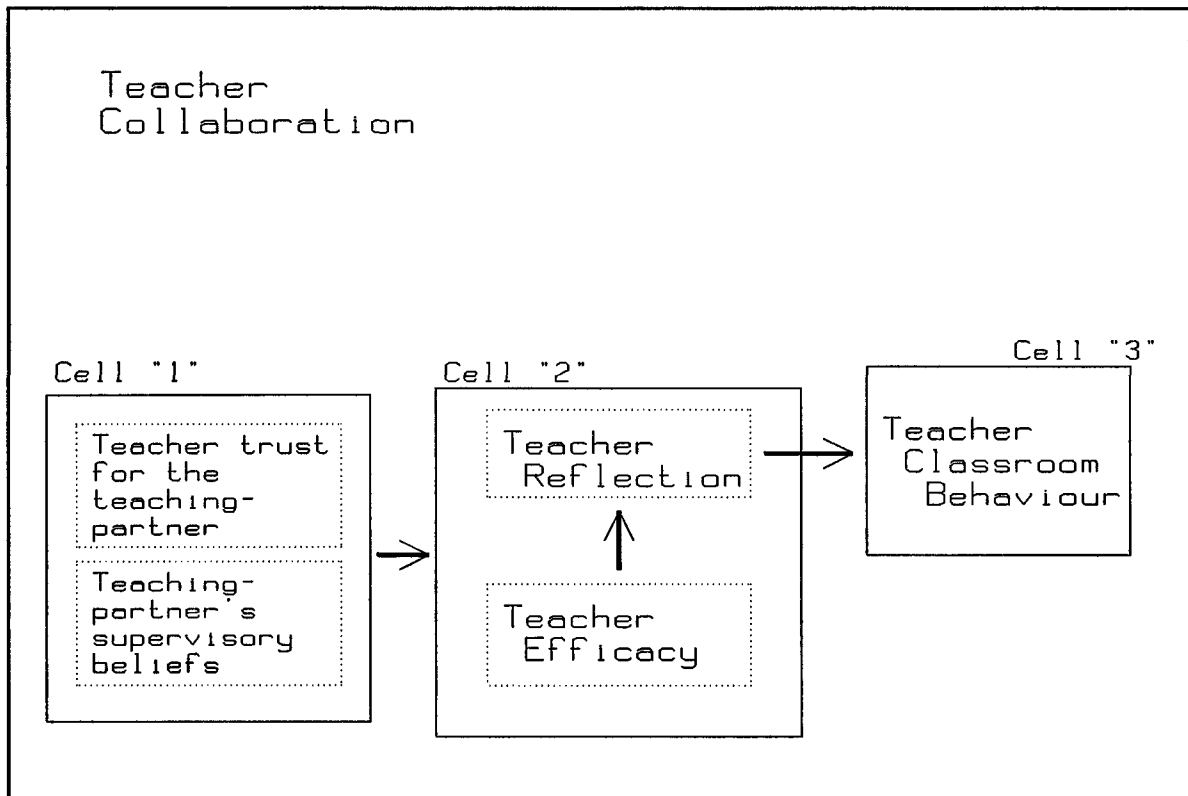
Figure 4: The logical link between teacher efficacy and teacher
reflection.

pupils, and pupils then show the manifestations of the teacher's

positive behaviour in terms of positive change in their

achievement, attitude, and behaviour. This unidirectional linear

relationship is displayed graphically in Figure 5.

Feedback Among the Cells of the Framework.

Feedback among various cells of the framework is to be

expected and even depended upon for teacher collaboration

strategies, particularly collaborative consultation, to be

successful. However, the study of the feedback among the cells of

the framework was not considered crucial for the purposes of this
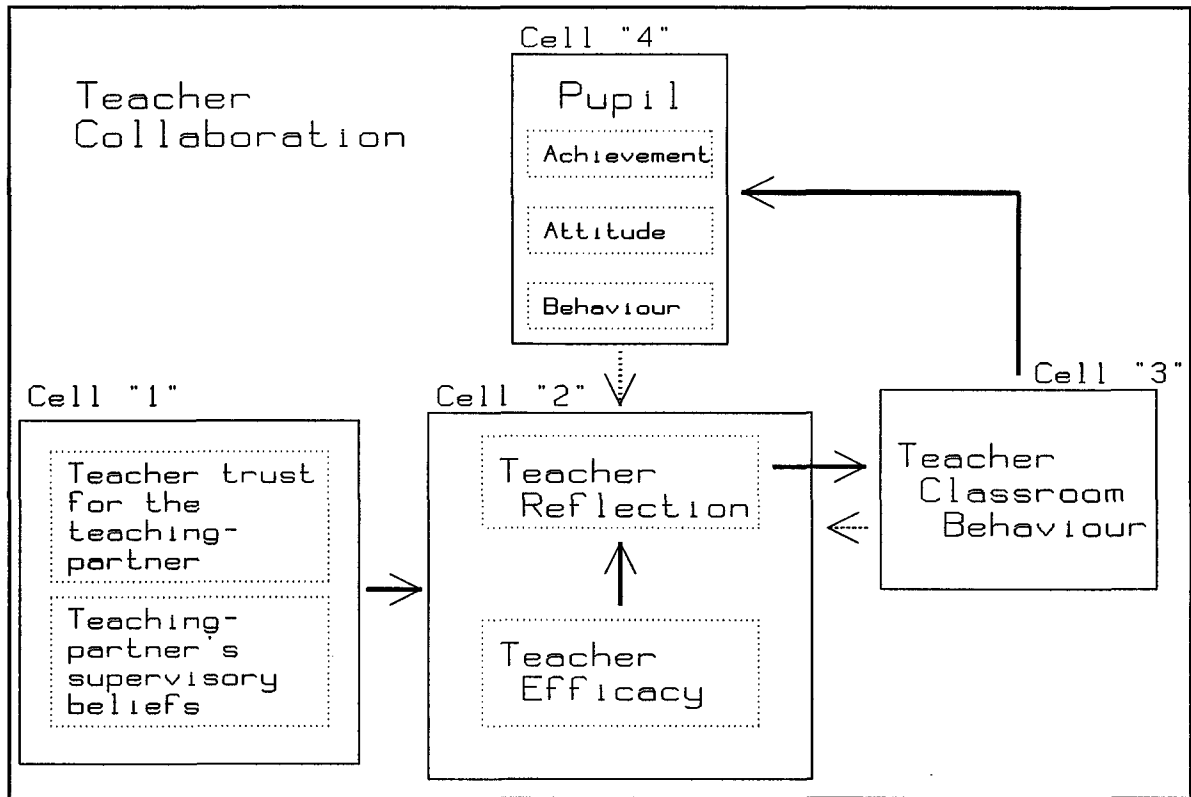
Figure 5: The unidirectional linear relationship among the four cells of the framework (shown with solid lines), and the anticipated feedback relationship among the cells (shown with dotted lines).

study. The feedback among the cells of the framework is discussed here for conceptual purposes only and is beyond the scope of this study.

One of the purposes of teacher collaboration is to translate teacher concerns into goals, establish what specific observable behaviours reflect those goals, then interpret and modify instructional techniques to mitigate undesirable interaction patterns, or intensify desirable patterns (Cogan, 1973, Goldhammer *et al.*, 1980; Lovell and Wiles, 1983; Acheson and Gall, 1992; Sergiovanni and Starratt, 1993). The data sources for this activity include the teacher and the pupils with whom the

teacher interacts. In the framework that has been developed, a provision needs to be made which allows information or data regarding aspects of the teacher and the pupils to feed back into the teacher collaboration process. Also, teacher reflection is predicated on the fact that the teacher will have something to reflect about (Dewey, 1933; Schön, 1983; Garman, 1986; Sykes, 1986; Grimmett and Erickson, 1988). Since teacher reflection is central to the collaboration process and since teacher reflection is based on the critical analysis of information originating from the teacher and the pupils, the framework developed here needs to show a path for information or data to feed from the teacher and the pupils to be reflected upon by the teacher. The literature also indicates that feedback from the teacher, and the pupils with whom the teacher interacts, to teacher efficacy is required in this model (Bandura, 1978; Denham and Michael, 1981; Ashton *et al.*, 1983; Gibson and Dembo, 1984). The addition of these feedback loops is demonstrated graphically in Figure 5 through the use of the dotted lines between cells 3 and 2, and between cells 4 and 2.

<center>Chapter Summary</center>

This review has endeavoured to delineate the background literature and thought forming the foundation for this study. Four parts were elaborated upon: (1) teacher collaboration, (2) teacher reflection, (3) teacher efficacy, and (4) pupil effects

factors. These were followed by a synthesizing section theorizing the relationships between and among the four areas of the literature.

Teacher growth through the use of teacher collaboration techniques is predicated on the establishment of teacher trust for the teaching-partner. It is expected that teacher trust for the teaching-partner is influenced by the "supervisory mode" preferred by the teaching-partner--these supervisory interaction modes are directive, collaborative, and non-directive (Glickman, 1990). The literature describes two potentially positive outcomes of teacher collaboration. These include increases in: (1) reflectiveness regarding teaching , and (2) general teaching efficacy and personal teaching efficacy. A relationship between reflectiveness and teaching efficacy is presumed to exist; although its exact nature is unclear, it was argued that teaching efficacy affects reflectiveness directly. Presumably, as a result of increased levels of teacher reflection and teacher efficacy, teachers' classroom behaviour will be positively affected. This in turn, will positively affect pupils in terms of achievement, attitude, and behaviour. Two feedback loops are then established, pupil outcomes provide a source of data: (1) for teacher reflection, and (2) influencing teacher efficacy. Furthermore, teacher behaviour also provides a data source for further analysis and reflection by the teacher.

It is the synthesizing nature of the present study which makes it different from previous studies of: teacher

collaboration, teacher reflection, teacher efficacy, and pupil change. Through the collection of empirical evidence and the use of multivariate analyses approaches, a study of this nature potentially will provide further insights into the nature of the complex relations between and among the four areas of the literature.

CHAPTER III: METHOD

This chapter provides the "blueprint" of how the study was
conducted. It is divided into three parts, namely: (1) the
population and sample, (2) the measures used, and (3) the
procedures used to gain access, collect, prepare and analyze the
data.

The general research question and the five specific research
questions are restated below to help the reader to see the
relationship between the research questions and the procedures
for addressing them. The general question of interest is:

What is the relationship between teacher participation in a
collaborative consultation programme and teaching-learning
outcomes.

The specific research questions addressed are:

(1) Can the teaching-learning variables, taken together,
     distinguish among the CC, CCTT, CCNO, and CoNO groups?

(2) Can the teaching-learning variables of teacher efficacy
     and behaviour, and pupil achievement, attitude and
     behaviour--taken together--distinguish among the CC,
     CCTT, CCNO, CoNO, and NC groups?

(3) After accounting for the covariation of the variables
     within the first cell and within the second cell of the
     framework, are trust for the teaching partner and the

69

teaching partner's preferred mode of interaction related to teacher efficacy and teacher reflection?

(4) After accounting for the covariation of the variables within the second cell and within the third cell of the framework, how strong is the relationship and what are the underlying links between teacher reflection and teacher efficacy, and teacher classroom behaviours?

(5) After accounting for the covariation of the variables within the third cell and fourth cell of the framework, how strong is the relationship and what are the underlying links between teacher classroom behaviours, and pupil outcomes?

Population and Sample

Target Population

The target teacher population in this study included all credentialed teachers in British Columbia teaching a minimum of half-time grade three to grade seven, or split level classes within this range. The target pupil population included all the pupils of the teachers in the target population. The accessible population was the population of teachers teaching a minimum of half-time grades grade three to grade seven, or split level grades within that range, and their pupils enrolled in public

school in the Lower Mainland of British Columbia during the 1991-1992 school year.

Sample

The sample of 30 grade three to grade seven classrooms (or split level grades within that range) was drawn, through a self-selection process, from two suburban public School Districts in the Lower Mainland of British Columbia during the 1991-1992 school year. A total of 15 classrooms from District "A" representing 6 elementary schools and 15 classrooms from District "B" representing 7 elementary schools made up the sample. Within these 30 classes, a total of 476 pupils volunteered to participate in the study and were present during both days of pupil data collection. Of the 30 teachers volunteering, 26 teachers fell into one of the four collaboration groups investigated in this study; put another way, 26 teachers had teaching partners with whom they had a professional working relationship (the other four teachers did not work with a teaching partner). All of the teachers had previously participated in the British Columbia Teacher's Federation Program for Quality Teaching (PQT); thus, they were experienced in the use of Cogan (1973) and Goldhammer's et al. (1980) clinical supervision. For the purposes of this project, all teachers engaged in one of the collaboration groups agreed to participate

in a minimum of five clinical supervision cycles during the
school year.

The constitution of the five groups was arrived at
inductively. After the individuals had volunteered for
participation in the study, each teacher was asked by the
researcher: (a) "Will you collaborate with a teaching partner?"
(b) "In what capacity is your teaching partner employed in the
school district (i.e., classroom teacher, librarian, district
resource teacher, school administrator, etc.)?" (c) "Will your
teaching partner be observing your classroom teaching to collect
data for conferencing purposes?" (d) "Do you share one open
classroom with your teaching partner?"

On the basis of the responses provided by the teachers to
the questions listed above, the composition of the groups was
determined. Teachers who stated that they would not work with a
teaching partner were assigned to the "no collaboration" (NC)
group. Any teacher who stated that he or she would be working
with a teaching partner:

1. with whom he or she shared an open classroom and that
    the teaching partner would conduct classroom
    observation of the teacher's teaching was assigned to
    the "collaborative consultation team teaching" (CCTT)
    group.

2. who was another teacher with his or her own classroom
    and that the teaching partner would conduct classroom

observation of the teacher's teaching was assigned to the "collaborative consultation" (CC) group.

3. who was another teacher with his or her own classroom and that the teaching partner would <u>not</u> conduct classroom observation of the teacher's teaching was assigned to the "collaborative consultation no observation" (CCNO) group.

4. who was not considered to be a classroom teacher (i.e., a librarian, an administrator, a district resource teacher) and that the teaching partner would <u>not</u> conduct classroom observation of the teacher's teaching was assigned to the "collegial consultation no observation" (CoNO) group.[4]

All volunteers--teachers, teaching partners, and pupils-- gave informed consent to participate in the study. It was not possible to use simple random sampling or any variation of probability sampling to choose classrooms within each district. As such, how well the sample represented the target population was not known. However, as described in the next chapter, the sample seemed rather typical of teachers and pupils, at least on some factors, found in suburban elementary schools.

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[4] Note that no teacher whose teaching partner was not a teacher stated that his or her teaching partner would observe the teacher's classroom instruction as a data source for conferencing. Hence, because of the nature of the relationships identified by the teachers who volunteered for the present study, a "collegial consultation" group--one that did conduct classroom observation-- was <u>not</u> formed.

The Measures

Scales were selected to measure the components of the theoretical framework synthesized in the previous chapter. All measures were administered twice during the school year, the pre-measures in October and early November of 1991, and the post-measures in May and early June of 1992. There was a minimum of 7 months between the pre- and post-measures. Identical scales were used for both sets of measurement.

Data for the following constructs were obtained from teachers, teaching partners, and pupils as appropriate: (1) teacher trust for the teaching partner, (2) teaching partner's supervisory beliefs, (3) degree of teacher reflection, (4) teacher efficacy, (5) teacher classroom behaviour, (6) pupil achievement, (7) pupil attitudes, and (8) pupil behaviour. Data were not collected for items 1, 2, and 3 from teachers stating they worked independently of other teachers. In addition, demographic data were also collected regarding teaching experience. This section describes how the data were collected and the instruments used to code them.

Teacher Trust for the Teaching Partner

To measure teacher trust for the teaching partner, Wheeless and Grotz's (1977) Individualized Trust Scale (ITS) was administered. This is a unidimensional scale measuring one's

trust for another specific individual. The scale consists of 15

semantic differential-type, 7 interval items with the positive-

negative polarities randomly ordered to avoid response bias.[5]

Wheeless and Grotz (1977) report a split-half reliability

coefficient of 0.92 when the scale was administered to 100

teachers and their spouses or oldest child (n = 261) (p. 254).

Wheeless and Grotz (1977) report that "the instrument had

predictive validity . . . for general use as an alternate means

of measuring trust" (p. 256).

Teaching Partner's Supervisory Beliefs

Determination of the teaching partner's supervisory beliefs

was done using Glickman and Tamashiro's (1981) Supervisory

Beliefs Inventory (SBI) (cited in Glickman, 1990, pp. 88-91). The

purpose of Glickman and Tamashiro's (1981) SBI is to estimate the

combination of philosophical beliefs held by a teaching partner

when working with a teacher. Related to the three philosophical

platforms described by Glickman and Tamashiro (1980), and

elaborated upon in the previous chapter, are three preferred

---

[5]The 15 item pairs are: (1) trustworthy/untrustworthy, (2) distrustful of this person/trustful of this person, (3) confidential/divulging, (4) exploitive/benevolent, (5) dangerous/ safe, (6) candid/deceptive, (7) deceitful/not deceitful, (8) straightforward/tricky, (9) disrespectful/ respectful, (10) considerate/inconsiderate, (11) dishonest/honest, (12) reliable/ unreliable, (13) faithful/unfaithful, (14) insincere/sincere, (15) careful/careless).

modes of interaction between a teacher and a teaching partner,

namely:

> *Directive* . . . is an approach based on the belief that
> teaching consists of technical skills with known
> standards and competencies for all teachers to be
> effective. The supervisor's role is to inform, direct,
> model, and assess those competencies.
>
> *Collaborative* . . . is based on the belief that
> teaching is primarily problem solving, whereby two or
> more persons jointly pose hypotheses to a problem,
> experiment, and implement those teaching strategies
> that appear to be most relevant in their own
> surroundings. The supervisor's role is to guide the
> problem-solving process, be an active member of the
> interaction, and keep the teacher(s) focused on their
> common problems.
>
> *Non-directive* . . . has as its premise that learning is
> primarily a private experience in which individuals
> must come up with their own solutions to improving the
> classroom experience for students. The supervisor's
> role is to listen, be non-judgemental, and provide
> self-awareness and clarification experiences for
> teachers (p. 76, italics in original).

Glickman (1990) asserts that individuals do not subscribe to

purely any one mode of interaction. He states:

> . . . we rarely find a pure ideological position. . . .
> Perhaps our beliefs are mainly essentialist and
> directive, yet contain parts of experimentalism and
> collaboration. . . (p. 92).

The SBI consists of 15 items, each with two choices,

labelled "A" and "B," from which to select. The inventory taker

is instructed to select the choice that most closely reflects how

he or she feels, even though he or she may not agree completely

with either choice. Scoring is done using a key which assigns a

tally for each item to one of three columns; the total in each

column is then multiplied by a constant of 6.7. The result is the

approximate proportion of preference, expressed as a percentage,

for each of the interaction approaches. In reviewing the

literature, reliability measures were not found for the SBI. With

respect to validity, the author does state that

> . . . the instrument has been field-tested six times
> with ninety supervisors and supervisor trainees.
> Response between the options indicated "good" item
> discrimination (Glickman, 1990, p. 91).

Teacher Reflection

MacKinnon (1985, 1986) has developed a framework for

identifying the reflective statements made by pre-service

teachers during supervisor-teacher conferences. MacKinnon merged

problem setting, developed by Schön, and the developmental

conception of teacher concerns advanced by Fuller and Brown (1975

cited in MacKinnon, 1985), to construct a cycle consisting of

three phases: (1) initial problem setting, (2) problem reframing,

and (3) problem resolution. MacKinnon (1985, 1986) is emphatic

that the three phases are analytic devices; therefore, they may:

(1) occur in groups of other than three, and (2) occur more than

once per cycle. From his work with pre-service teachers MacKinnon

concluded that: (1) preservice teachers are capable of reflection

in a clinically supervised situation nurturing reflection, and

(2) his framework is effective in detecting teacher statements

made as a result of "reflection in action." Nolan and Huber

(1989) recommend that further research be conducted to determine

the applicability of MacKinnon's techniques for identifying

reflective behaviour in inservice teachers' conferences.

For the purpose of this study, the reflective cycle is seen as transpiring within a segment of discussion dedicated to a specific topic between the teacher and the teaching partner. Audio-taped conferences between teachers and their respective teaching-partners were coded to identify instances of reflection. Combining MacKinnon's reflective phases with the definition of reflection used in this study, three points were developed to code each segment of discussion, namely:

(1)   identification of a perplexing or surprising event or condition--a problem,

(2)   relating past experience to the current problem to reformulate the problem, and

(3)   deriving hypotheses and testing them logically.

Using these points as the basis for a coding system, all conferences were coded with respect to teacher reflection. The procedure is described in more detail below.

Teacher Efficacy

Gibson and Dembo (1984) developed a 30-item, six interval Likert-type, teacher efficacy scale which, through a factor analysis, yielded two factors: teaching efficacy, and personal teaching efficacy. These were in line with Bandura's (1977) dual faceted model of teacher efficacy and with Ashton *et al's*. (1983) teacher efficacy model. Through statistical analysis, Gibson and Dembo (1984) found that only 16 of the 30 items in their scale

exhibited acceptable reliability coefficients. Gibson and Dembo (1984) report the following Cronbach's alpha coefficients for the 16 item teacher efficacy scale: (1) 0.78 for the personal teaching dimension, 0.75 for the general teaching dimension. These findings are supported by Anderson *et al.* (1987), who reported similar findings to those of Gibson and Dembo (1984). In their own study, analysis was done only on the items yielding acceptable reliability coefficients (Gibson and Dembo, 1984).

For this study, the differentiation between general teaching efficacy and personal teaching efficacy was maintained. Gibson and Dembo's (1984) 16 item Teacher Efficacy Scale was administered to all teachers.

Teacher Classroom Behaviour

The technique used in this study to collect data for establishing teacher classroom behaviour, described in detail by Acheson and Gall (1992), was the pupil administered check-list. Eash *et al.* (1980a, 1980b, 1989) and Eash and Waxman (1983a) have developed and refined an instrument specifically for ". . . gathering student perceptions of teachers' classroom behaviour . . ." (Eash *et al.* 1989, p. 6). The instrument, referred to as "Our Class and Its Work" (OCIW) consists of forty items describing teaching behaviours which form eight Likert-type sub-scales, namely: didactic instruction, enthusiasm, feedback,

instructional time, opportunity to learn, pacing, structuring comments, and task orientation.

High reliabilities for the eight scales are reported; Cronbach alphas range from 0.84 to 0.92 (Eash *et al.*, 1989). The OCIW scale has been successfully administered to pupils from grades three to 12. The reliability coefficients stated above were obtained after administering the scale to 762 pupils in 36 grade 4 and 6 classes in a large American city school district (Eash and Waxman, 1983b, pp. 4-5). To assess construct validity, an examination of the relationships among OCIW scores, student achievement, and principal ratings of the teachers obtained from the sample described showed that teachers who obtained higher scores on the OCIW scale also ". . . were rated higher by the principal in his yearly evaluations" (Eash and Waxman, 1983, p. 4).

For the present study, it was decided that the didactic instruction subscale of the OCIW scale was not appropriate given the current emphasis on cooperative learning in British Columbia's elementary schools. Eash and Waxman (1983b) define didactic instruction as a situation in which:

> . . . the teacher controls and directs the instruction
> for all students in the class. Students are not allowed
> to do things on their own nor work with other students
> in such teacher-directed classes (p. 1).

Although teachers may at times choose to use this form of instruction in their classrooms, clearly, it is not seen as the only way to facilitate learning in the classroom. The Year 2000 Curriculum (Sullivan, 1988) initiative places strong emphasis on

individualized instruction. Pupils are encouraged to work with other pupils as well as to select activities in which they are interested. For these reasons, although all eight of the OCIW subscales were administered to pupils, only subscales two through eight were actually used in the data analyses.

Pupil Achievement

A case is made in the literature for utilizing both standardized achievement tests and teacher assessment for establishing reliable and valid measures of pupil achievement. However, in the interest of making this study possible, compromises had to be made--especially regarding the use of standardized testing. All of the teachers in the first three schools approached in District "A" refused to participate in the study. In a letter from one school explaining why this was the case, the principal stated that:

> Their [the teachers'] decision of non-participation
> . . . is based upon . . . a strong philosophical
> opposition to any form of standardized testing.

Informal conversations with the principals of the other two schools echoed this as the primary reason for refusal to participate in the study. Consequently, it was decided not to use standardized achievement testing as one of the measures of pupil achievement in this study. Instead, this study relied entirely on the teachers' anecdotal, and for 18 of the 30 classes--anecdotal and letter graded, report cards of pupil progress.

Two report cards of pupil progress were used in this study. The first report issued in both districts approximately the middle of November, 1991 was used as the pre-measure. The final report card, issued at the end of June 1992, was used as the post-measure.

<div align="center">

Pupil Attitudes
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Pupil attitude data were collected using Randhawa and Van Hesteren's (1982, 1983) School Attitude Scales for Children (SASC). Randhawa and Van Hesteren (1982) describe the SASC as a series of:

> . . . semantic differential scales which tap the following school-related dimensions: School, Teachers, Arithmetic, Science, Social Studies, Language Arts, Music, Drama, French, Art, Dance, Religion, Health, and Physical Education (p. 6).

The scales are constructed such that the top of each scale has the phrase "Please indicate the degree to which you feel each pair of adjectives applies to . . ." followed by the school related dimension of interest (e.g., school, arithmetic, language arts.) This phrase is followed by ten evaluative bi-polar adjectives pairs with five intervals from which to select.[6] The intervals, from left to right, are labeled: very much, a bit, neither, a bit, and very much.

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[6]The ten bi-polar adjective pairs are: kind/cruel, clean/dirty, bad/good, sad/happy, beautiful/ugly, dishonest/honest, strong/weak, unfair/fair, interesting/boring, awful/nice.

The original SASC were administered to 99 (55 male and 44 female) pupils in grades three to six from two schools in a mid-western Canadian city (Randhawa and Van Hesteren, 1982, p. 5). The authors report that reliability coefficients for all the scales, except religion, were over 0.80 (Randhawa and Van Hesteren, 1982, p. 8). In a 1983 report utilizing the same sample, Randhawa and Van Hesteren state that reliability for SASC scales dealing with School, Language Arts, Teachers, and Arithmetic were in the 0.89 to 0.92 range for the pre-test measures and in the 0.95 to 0.97 range for the post-measures (p. 7). Furthermore, Randhawa and Vanhesteren (1982) report that the SASC scales exhibit a high degree of construct validity when analyzed using a ". . . multitrait-multimethod convergent and discriminant validation methodology . . ." (p. 11).

For the present study, four of Randhawa and Van Hesteren's SASC scale school related dimensions were used: school, social studies, language arts, and arithmetic. These satisfied two of the six categories revealed by the pupil attitude literature as being important. In addition to these, four other SASC scales were created for this study to obtain measures of what the literature suggests are important objects of attitudinal measure, namely: yourself, your classmates, your regular teacher, and learning in general.

Pupil Behaviour

Pupil behaviour data were collected using report card data. Behaviour data from teachers' anecdotal notes on report cards of pupil progress were used. For 18 of the 30 classes, in addition to the teachers' anecdotal notes, report cards also indicated a behaviour grade. For those schools which do not issue a behaviour grade, pupil report cards were read by three elementary level teachers; each teacher assigned a behaviour grade for each pupil report card.[7] These behaviour grades were then averaged to obtain an overall behaviour grade.

Once again, the November 1991 and the June 1992 report cards were used as pre- and post-measures respectively. This is probably the best source of behaviour data since the teacher has the greatest amount of contact with the pupil.

Procedures Used

Gaining Access

To gain access to teachers involved in the types of professional relationships of interest for this study, a series

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[7]The teachers were told to assign behaviour grades using the following three point scale: "good or excellent" behaviour was assigned a "2," "satisfactory" behaviour was assigned a "1," and "poor" behaviour or behaviour "needing improvement" was assigned a "0." Interrater reliability (split-half reliability coefficient) for the pre and post-measures were 0.91 and 0.88 respectively.

of steps were taken before any teachers were solicited for participation in the study. These are elaborated below.

The British Columbia Teachers' Federation (BCTF) was contacted. This was considered prudent since some of the teachers and teaching partners potentially participating in this study would also be involved in the Program for Quality Teaching (PQT), a program in which the focus is teacher collaboration-- collaborative consultation. The BCTF representative in charge of the PQT program suggested contacting two Lower Mainland School Districts which potentially had greater numbers of teachers practicing collaborative consultation than other districts. These two districts were contacted to make arrangements to present the research proposal. After gaining approval at the central office level in each district, all of the principals of the schools within the districts having classes in the grade three to the grade seven range were contacted (24 schools in district "A" and 26 schools in district "B"). This often led to a presentation to the teachers of the school by either the researcher or the principal. Teachers then made contact with the researcher if they wished to participate in the study. These teachers were provided with further information and classroom visits for classroom observation and pupil questionnaire administration were

scheduled.[8] All questionnaire administration times for the pre-measures were scheduled within four weeks of this meeting (late September and October, 1991).

Data Collection

Data were collected in two phases corresponding to the pre-measures and the post-measures; the questionnaires and procedures used were the same for both phases. Except as noted below for the teacher-teaching partner conference audio recordings, no difficulties were experienced in collecting any data. Data collection is elaborated upon below in three parts: teacher questionnaires and audio recordings, classroom observation, pupil questionnaires and report cards.

Teacher Questionnaires and Audio Recordings

Instructions for completing the consent forms and questionnaires were presented to the teachers by the researcher.

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[8]Each teacher was provided with a package containing: (1) a teacher consent form, (2) a teacher demographic information form, (3) a Teacher Efficacy scale, (4) an Individualized Trust Scale, (5) a teaching partner consent form, (6) a teaching partner demographic information form, (7) a Supervisory Beliefs Inventory, (8) a labeled audio tape, (9) 35 parental consent forms, and (10) 35 pupil consent forms. Each package contained four bundles of materials: one for the teacher (items 1 to 4), one for the teaching partner (items 5 to 7), one for the teacher and the teaching partner (item 8), and one for the pupils and their parents (items 9 and 10). For those teachers who did not work with a teaching partner, items 4, 5, 6, 7, and 8 were removed from the packages.

Directions for completing the teaching partner forms and questionnaire were explained to most teachers whose role would also include that of teaching partner. In those instances in which the researcher did not have direct contact with the teaching partner, the teacher was asked to pass the information onto his or her respective teaching partner. Questionnaires and demographic data forms were completed by teachers and teaching partners at their convenience. All teacher and teaching partner pre-measure questionnaires were picked up by the researcher on the day on which pupil questionnaires and observations were done.

All teacher and teaching partner pre-measures, with the exception of recorded conference audio tapes, were collected by the researcher the last week of November 1991. A total of 17 out of a possible 26 teachers working with teaching partners returned recorded conference audio tapes by this time. Two more teachers returned pre-measurement conference audio tapes by February 12, 1992. The seven remaining teachers stated that they had conferenced, in one case twice by the last week of November 1991, but that he or she had forgotten to record the conference.

To obtain post-measurement data, teachers were contacted by telephone during the last week of March 1992 to remind them that the researcher would be visiting them at their schools to drop off the last set of questionnaires and to schedule classroom observation and pupil questionnaire administration times during May 1992. During the first week of April 1992, teacher and teaching partner questionnaires, an audio tape for recording a

conference, and a return envelope with sufficient postage for mailing the questionnaires and the audio tape, were distributed to all teachers working with a teaching partner. Teachers not working with a teaching partner were given only a teacher efficacy scale and a return envelop with sufficient postage for mailing the questionnaire.

Teachers who had not returned the questionnaires or the audio tape by the time the researcher was collecting classroom observation and pupil questionnaire data in May 1992 were reminded, by telephone, to complete and return both. Teachers who had not returned either the questionnaires or the post-measure conference audio tape by the end of June 1992, were once again reminded to do so by telephone. Completed questionnaires were obtained from all teachers and teaching partners. Conference audio tapes were obtained from 17 of the 26 teachers working with a teaching partner. The reason for not having a conference audio tape given by seven of the teachers (the same seven who had not provided a conference pre-measure audio recording) was that they had forgotten to record the conference when it occurred. Two teachers stated that due to a lack of time to conference, they-- along with their respective teaching partners--had not completed their last planned collaborative consultation cycle for the year which they had originally planned to record for the study. Descriptions of the protocols used for obtaining teacher and teaching partner data are detailed below.

Administering the Individualized Trust Scale. The protocol
for administering the ITS in this study consisted of giving a
copy of the scale to the teacher and then telling him or her to
consider his or her relationship with the teaching partner when
considering each pair of terms on the scale. Each teacher was
asked to place an "X" between the two terms in the space best
describing the professional relationship between the teacher and
the teaching partner. Having listened to the instructions and
looked at the scale, teachers were given the opportunity to ask
questions to remove any ambiguity about what was expected of
them. The scales were completed in private at the convenience of
the teacher, and returned directly to the researcher in an
envelope.

Administering the Teacher Efficacy Scale. The protocol for
administering the Teacher Efficacy scale consisted of giving a
copy of the scale to the teacher and telling him or her to
consider each of the 16 statements then circle a number from one
(corresponding to strongly agree with the statement) to six
(corresponding to strongly disagreeing with the statement).
Having listened to the instructions and looked at the scale,
teachers were given the opportunity to ask questions to remove
any ambiguity about what was expected. The scales were completed
in private at the convenience of the teacher, and returned
directly to the researcher in an envelope.

Administering the Supervisory Beliefs Inventory. Since the researcher anticipated not making direct contact with all teaching partners the following description of the SBI was given to teachers to communicate to their teaching partners: "The SBI is a scale designed to get at a person's preferred mode of interaction when working with another teacher." The instructions printed at the top of the SBI read:

> *Please circle either "A" or "B" for each item. You may not completely agree with either choice, but choose the one that is closest to how you feel* (italics in original).

Because this inventory was originally designed for measuring the beliefs of "supervisors" in hierarchically superior positions to those of teachers, some items assume that the inventory taker is in a position of authority. For this reason, teachers were instructed to tell their teaching partners to imagine that they possessed the necessary district authority for making choices when working with another teacher (e.g., determining the need for an inservice workshop, deciding who should participate in a workshop). Of the 26 SBI's distributed for the pre-measure phase and the post-measure phase, all were completed and returned to the researcher. However, four teaching partners did write on their SBI's comments similar to the following: "The scale assumes I am a supervisor, I do not have authority to make these kinds of decisions."

Audio-taping teacher-teaching partner conferences. Teachers were also instructed on the use of the audio tape. They were

asked to record a conference with their teaching partner in which the focus was pedagogically related to their classroom practice. The conference could be as short or as long as the teacher and teaching partner wished it to be. Furthermore, the conference should be one that would normally be held: it should not be contrived for the benefit of the study. Teachers were also instructed to record the time and date of the conference on the label attached to the audio tape.

Pupil Questionnaires and Report Cards

The protocols for administering the SASC and the OCIW scales will be elaborated below. The protocols are followed by a description of how pupil report cards were obtained.

Administering the SASC scales. The protocol used for administering the SASC scales involved a total of nine steps. First, the researcher passed the scales out to the pupils participating in the study. The teacher either left the room or sat at his or her desk doing something unrelated to the pupils' tasks. Pupils who chose not to participate in the study or who did not have parental permission to participate were given an assignment unrelated to the study. Second, the researcher had the pupils complete a coded identification slip which was removed from the questionnaire and placed face-down on a corner of each pupil's desk for subsequent collection by the researcher. The

concept of anonymity was explained and stressed. The researcher read through the directions on the first page of the questionnaire with the pupils pausing at the end to answer any pupil questions. Third, the researcher worked through an example on the first page with all the pupil participants. It was stressed that their opinions were important in this questionnaire; an answer was correct if they individually thought it to be right. Fourth, pupils were told that if they did not understand any words to raise their hands and the researcher would explain the words to them. Fifth, pupils were told to complete each scale only when they had been told to do so; they were not to go on without being instructed. Sixth, after answering any questions or clarifying any ambiguities, pupils were told to turn the page to the first scale. Seventh, the researcher read the phrase indicating the attitudinal object of interest that pupils were to consider as they completed the scale; the meaning of the attitudinal object was explained by the researcher. If any questions or ambiguities arose, they were answered by the researcher. When all pupils had completed the scale, everyone was instructed to turn to the next scale. Eighth, step seven was repeated for the remainder of the scales; the researcher circulated throughout the classroom collecting the coded identification slips. Ninth, the researcher collected all SASC scale booklets. As the booklets were collected, the researcher checked the responses to ensure that no items had been missed or otherwise improperly marked; any errors or omissions

were identified to the questionnaire taker and corrections were made.

Descriptions of the five attitudinal objects of interest which were expected to pose interpretive difficulties were generated and used with all pupils. The following is a list of those attitudinal objects and how they were described to pupils:

> *classmates in general:* this refers to how you feel about all of the other pupils in your class overall, do not just think about one or two people in particular; think about how you feel about everyone;

> *school:* this refers to the building and all of the people in it, including all of the pupils, all of the teachers, teacher's aides, the secretaries, principal, vice-principal, even the janitors and the people who take care of the fields;

> *learning in general:* this refers to any time you are learning something new, it doesn't have to even be in school although it can be; it could be a new sport or game--think about any time you are learning about anything you did not know about before;

> *social studies:* this refers to the subject in which you learn about other people--what they do and how they live, other places--where other places are, these people and places could be from the past or the present.

> *language arts:* this refers to any time you are reading, writing, spelling, or speaking.

Administering the OCIW scale. The protocol used for administering the OCIW scale involved the five steps elaborated below. First, the researcher passed the questionnaires out to the pupils participating in the study. The teacher either left the room or sat at his or her desk doing something unrelated to the pupils' task. Pupils who chose not to participate in the study or

who did not have parental permission to participate were given an assignment unrelated to the study. Second, the researcher had the pupils complete a coded identification slip which was removed from the questionnaire and placed face-down on a corner of each pupil's desk for subsequent collection by the researcher. The concept of anonymity was repeated and re-stressed. The researcher read through the directions on the first page of the questionnaire with the pupils pausing at the end to answer any pupil questions. Third, the researcher then worked through an example on the first page with all the pupil participants. It was stressed that their opinions were important in this questionnaire; an answer was correct if they individually thought it to be right. Fourth, pupils were told that if they did not understand any words to raise their hands and the researcher would explain the words to them. Fifth, pupils were told to think about what their present class was like with their present teacher running it as they completed the scale. Pupils were then told to open their booklets and begin the questionnaire. As the pupils were completing the questionnaire, the researcher circulated throughout the classroom collecting the coded identification slips, answering any questions as they arose (e.g., "What does immediately mean?" "What does interruptions mean?"), and collecting the completed questionnaires. As the booklets were collected, the researcher checked the responses to ensure that no items had been missed or otherwise improperly

marked; any errors or omissions were identified to the
questionnaire taker and corrections were made.

Obtaining pupil report cards. Copies of report cards of
pupils who were participating in the study for both pre-measures
and post-measures were obtained in several different ways. Many
report cards came directly from the classroom teachers to the
researcher. Some were obtained through various intermediary steps
from the school office. No difficulties were experienced in
obtaining pupil report cards for use in the study.

Data Preparation

The focus of this section is on how the data were prepared
for analysis. This section is broken into two sub-sections, the
first dealing with questionnaire data; the second, with anecdotal
and conference data. Raw data from all questionnaires were
entered into a computer spreadsheet (Borland International's
Quattro-Pro 3) and transformed into item scores for each
questionnaire administered.

Questionnaire data. Following the collection of
questionnaire data, each survey was assigned an arbitrary subject
number; all post-measure surveys were assigned the same arbitrary
subject number as the pre-measure surveys. To help describe the
makeup of the sample, data for a number of demographic

characteristics were collected. The demographic variables of
gender and teaching partner position within the district were
assigned arbitrary identification codes (e.g., males were coded
"1," females were coded "2"). To maintain maximum precision for
the teaching partner position variable, every different position
listed by the 26 teaching partners was assigned a different code
(e.g., classroom teachers were coded "1," school level resource
teachers "2," school librarian "3," and vice-principals/teachers
were coded "4"). Other demographic variables (e.g., total
teaching experience, teaching experience in the district,
teaching experience in the present school) were coded according
to the numbers provided by the teachers regarding their teaching
experience.

Pupil report card data. Pupil report card data (letter
grades) regarding achievement (e.g., language arts (reading and
writing grades were averaged), math, science, and social studies;
these four components were then equally weighted to determine an
overall achievement score) were coded using a four point grade
point average (GPA) type scale.[9] For those schools not issuing
achievement grades, pupil report cards--with the names removed--
were read by three elementary level teachers; each teacher

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[9]The scale was as follows: "A+, A, A-" were assigned a "3,"
"B+, B, B-" were assigned a "2," "C+, C, C-" were assigned a "1,"
"D+, D, D-, F" were assigned a "0") Similarly, pupil report card
data regarding behaviour were coded using a three point scale
(e.g., "good" was assigned a "2," "satisfactory" was assigned a
"1," and "needs improvement" was assigned a "0."

assigned a grade for the subject areas of language arts, math, science, and social studies for each pupil report card.[10] The subject matter grades, assigned by all of the teachers, were then averaged to obtain an overall achievement grade.[11]

Conference Data. This subsection deals with the qualitative conference data collected in the study. Audio taped conference data were collected for analysis for the purpose of determining a teacher's conference reflective index. The reflective index then became a quantitative measure of teacher reflection used in the statistical analyses.

Segments of discussion with common themes were identified within each conference. Each of these segments was then searched for evidence of the existence of the following points:

(1) mindful identification of a perplexing or surprising event or condition--a problem,

(2) relating past experience to the current problem to reformulate the problem, and

(3) deriving hypotheses and testing them logically.

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[10]The three teachers had 4, 8, and 9 years, respectively, of teaching experience at the elementary and intermediate level.

[11]The teachers were told to assign numerical grades according to the following schema: students achieving "very good" or "excellent" were assigned a "3," students "doing well" or "good" were assigned a "2," students performing "adequately" or "average" were assigned a "1," pupils performing "below average," "poorly," or needing improvement" were assigned a score of "0." Inter-rater reliabilities for the pre- and post-measures were .86 and .87 respectively.

The segments of discussion within a conference were coded as follows: (1) "reflective," if all of the above points were evident; (2) "thoughtful," if the discussion lacked either points two or three; and (3) "information exchange," if the discussion did not contain item one.[12]

A conference reflective index was then obtained by assigning the following numerical values to a conference: (1) a "0" if all of the segments were deemed to be of the information exchange type, (2) a "1" if at least one of the segments was deemed thoughtful but no segments were deemed reflective, or (3) a "2" if at least one segment of the conference was deemed to be reflective. The RI ranges from a minimum of 0 to a maximum of 2.

Data Analyses

The analyses of the data were carried out in four phases. In order to prevent inflation of statistical power, all analyses used the class as the unit of analysis (i.e., pupil data from each class were averaged and then used in the data analyses). This conservative approach was chosen to reduce the possibility of making a type I error (i.e., rejecting the null hypothesis when it should not be rejected) in the statistical analyses.

First, descriptive statistics for each variable were calculated to screen the data and gain a preliminary

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[12]Information exchange is possible when a teaching partner simply provides the teacher with a series of observations or raw data—there is no discussion in the true sense of the word.

understanding of the data set. Second, group differences on the pre-measures were sought. A MANOVA was conducted on all of the pre-measure variables simultaneously to determine if the four collaboration groups differed near the beginning of the school year. To determine if any of the five groups in the study differed at the beginning of the school year, a MANOVA was also conducted on all of the pre-measures, simultaneously, common to the five groups. Third, group differences on the post-measures were sought.[13] A MANOVA was conducted on all post-measures simultaneously to determine if the four collaboration groups differed near the end of the school year. To determine if any of the five groups in the study differed at the end of the school year, another MANOVA was conducted on all of the post-measures, simultaneously, common to the five groups. Both of these MANOVAs were followed by post-hoc Discriminant Analysis to determine which groups differed and on what theoretical dimensions they differed. Fourth, to determine the nature of the links among the conceptual framework's adjacent cells, three Canonical Analyses (CA) were performed using the variables within each pair of adjacent cells as the "first set" and the "second set" of variables. All analyses were conducted using SPSS/PC+ 4.01 (1990) "Base, Statistics, or Advanced Statistics" software.

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[13] The results of the MANOVAs suggest that no differences existed among the five groups at the beginning of the school year. Since this was the case, any differences found in the post-measures could be attributed to the type of collaboration in which each group of teachers engaged. Consequently, it was decided that differences among the groups would only need to be sought on the basis of the post-measures data.

CHAPTER IV: FINDINGS

The purpose of this chapter is two-fold. First, the chapter reports the findings of this study with respect to: (1) the sample, (2) each of the variables, and (3) data screening. Second, the chapter reports the findings regarding the five substantive research hypotheses and their associated specific research questions.

Sample

The sample obtained for the study consisted of 30 grade three to grade seven teachers, 15 from each of two suburban public School Districts in the Lower Mainland of British Columbia during the 1991-1992 school year. The sample obtained from District "A" self-selected from an estimated 196 teachers teaching grade three to grade seven (Source: District "A" Assistant-Superintendent's Office). The sample obtained from District "B" self-selected from an estimated 570 teachers teaching grade three to grade seven (Source: District "B" Superintendent's Office). All subjects were volunteers; it was not possible to use any variation of probability sampling to choose classrooms within each district. As such, how well the sample represented the target population is not known precisely.

However, as described below, the sample seemed reasonably typical, and on that basis the study was carried forward.

Table 1. Distribution of the sample among the five groups.

	CC	CCTT	CCNO	CoNO	NC
DISTRICT "A"					
Teachers					
Male	2	1	0	2	2
Female	0	1	6	1	0
Pupils					
Male	14	15	47	19	20
Female	18	16	42	23	13
DISTRICT "B"					
Teachers					
Male	1	2	0	0	0
Female	2	2	3	3	2
Pupils					
Male	26	25	17	28	21
Female	28	31	24	28	21
TOTAL					
Teachers	5*	6	9*	6	4
Pupils	86	87	130	98	75

* Note that an odd number of teachers are identified as forming the dyads because two teacher's teaching partners chose to participate in this study only as teaching partners; in practice, these dyads were reciprocal in nature, but data could not be collected from the classrooms of those individuals participating only as teaching partners.

A summary of descriptive statistics regarding the sample is found in Table 1. It should be noted that the number of female teachers in the sample is double that of the male teachers. This is not surprising given the fact that elementary level female

teachers greatly outnumber elementary level male teachers. From a provincial standpoint, the ratio of female ($\underline{n}$ = 17475) to male ($\underline{n}$ = 4095) elementary teachers was 4.27:1 at the time the data for this study were collected (Statistics Canada, 1991). A Chi-square goodness of fit test indicates that the female to male ratio found in the sample does not differ significantly (χ^2(1, $\underline{N}$ = 30) = 1.68, p>.05) from the provincial ratio.

Experientially, the subjects in the sample ranged widely. District "A" teachers who volunteered for the study had just slightly more teaching experience than the district average for elementary teachers. At first glance, District "B" teachers appear to have considerably more experience than other elementary teachers in the district; however, an independent t-test ($\underline{t}$ (14) = 1.16, p > .05) reveals that, in terms of experience, the District "B" teacher-volunteers are representative of other teachers in the district. A breakdown of teacher participation by district membership is provided in Table 2.

It should be noted that when data collection started in September of 1991, 35 teachers were involved in the study. The five teachers who withdrew from the study did so under the following circumstances: one teacher left her teaching position at the end of the first term (28 pupils were also dropped from the study as a result), a second teacher did not provide the necessary teacher and teaching partner consent forms for participation in the study (16 pupils from this teacher's class were also dropped from the study), two teachers from one school

Table 2. Descriptive statistics of the sample and sub-samples.

	District "A"	District "B"	Total
Number in sample			
male	7	3	10
female	8	12	20
total	15	15	30
Teaching experience for sample (years)			
range	2 - 20	2 - 28	2 - 28
mean	9.93	17.47	13.70
std. dev.	6.23	6.45	7.31
Average Elementary teacher experience within district (years)	$\approx 8^a$	$\approx 10^b$	
Total number of pupils in participating teacher's classes	364	402	766
Student sample			
male	115	117	232
female	112	132	244
total	227	249	476
Proportion of possible pupils volunteering	62.4%	61.9%	62.1%

[a]Data supplied by District "A" Assistant Superintendent's Office. [b]Data supplied by District "B" Superintendent's Office.

indicated that their involvement with another study was "just too much to handle" (32 pupils were dropped from this study as a result), and one teacher did not meet the criterion of teaching her class at least half time (15 pupils were also dropped from the study as a result).

The 26 teaching partners, 13 from each district, included 19 females (73.1%) and 7 males (26.9%). The total teaching experience of the teaching partners in district "A" ranged from 2 to 17 years, with a mean just under 7 years; the total teaching experience of the teaching partners in district "B": ranged from 13 to 22 years, with a mean just over 17.5 years. All pupils from the 30 classes who were present during both days of questionnaire administration, and who provided consent forms signed by both themselves and a parent or guardian formed the pupil component of the sample. Table 1 also provides an ungrouped break-down of the pupils participating in the study. Table 2 provides a grouped break-down of pupil participation in the study by group membership

Descriptions of the Variables

Data were collected for each variable identified in the conceptual framework using the protocols described in the previous chapter, namely: (1) teacher trust for the teaching partner, (2) teaching partner's supervisory beliefs, (3) teacher reflection, (4) teacher efficacy--general and personal, (5) teacher classroom behaviour, (6) pupil achievement, (7) pupil attitudes, and (8) pupil behaviour. Statistical descriptions of these variables, for both the pre- and post-measures, are given below (see table 4). Reliability coefficients are provided for all scales which were modified or created for use in the present

Table 3. Abbreviations of variables used in this study.

	Pre-measure	Post-measure
CELL 1:		
Trust for teaching partner (ITS)	ITS1	ITS2
Supervisory beliefs (SBI)	SBI1	SBI2
Transformed ITS (reflected and inverted ITS)	ITS1T	ITS2T
CELL 2:		
Teacher reflection	RI1	RI2
Personal teaching efficacy	EF1P	EF2P
General teaching efficacy	EF1G	EF2G
CELL 3:		
OCIW (teacher behaviour)	OCIW1	OCIW2
OCIW sub-scales		
Enthusiasm	ENTH1	ENTH2
Feedback	FDB1	FDB2
Instructional time	INST1	INST2
Opportunity to learn	OPP1	OPP2
Pacing	PACE1	PACE2
Structuring comments	STRC1	STRC2
Task orientation	TASK1	TASK2
CELL 4:		
Pupil achievement	ACH1	ACH2
Pupil attitude	ATT1	ATT2
Pupil behaviour	BEH1	BEH2

study. In preparation for analyses, variables from the pre- and post-measures were assigned abbreviations. These are found in Table 3 and are used in the remainder of this dissertation.

Teacher Trust for the Teaching Partner

Measures of teachers' trust for their teaching partners as measured by Wheeless and Grotz's (1977) ITS were obtained from all teachers in the four collaboration groups (n = 26). As seen

Table 4:   Grouped and ungrouped means, standard deviations and possible ranges for the pre- and post-measures.

Measures	CC mean	sd	n	CCTT mean	sd	n	CCNO mean	sd	n	CoNO mean	sd	n	NC mean	sd	n	Ungrouped mean	sd	n	Possible Range Min	Max
PRE-																				
ITS1	6.84	0.22	5	6.38	0.40	6	6.81	0.20	9	6.63	0.35	6				6.68	0.33	26	1	7
SBI1	8.80	6.26	5	8.50	9.83	6	6.33	4.79	9	10.83	5.81	6				8.35	6.54	26	0	67
EF1G	3.46	0.67	5	3.55	0.67	6	3.86	0.71	9	4.05	0.40	6	3.72	0.39	4	3.75	0.61		1	6
EF1P	4.51	0.27	5	4.54	0.47	6	4.56	0.35	9	4.58	0.62	6	4.61	0.20	4	4.56	0.39	30	1	6
RI1	0.67	0.94	3	1.00	0.00	4	1.00	0.00	7	1.00	0.00	5				0.95	0.39	19	0	2
OCIW1	2.75	0.06	5	2.71	0.09	6	2.82	0.09	9	2.74	0.14	6	2.74	0.04	4	2.76	0.10	30	1	4
ACH1	1.83	0.14	5	1.79	0.25	6	1.71	0.26	9	1.75	0.24	6	1.57	0.29	4	1.74	0.24	30	0	3
BEH1	1.72	0.14	5	1.62	0.23	6	1.62	0.24	9	1.69	0.22	6	1.49	0.37	4	1.63	0.23	30	0	2
ATT1	2.64	0.16	5	2.60	0.26	6	2.75	0.29	9	2.74	0.29	6	2.55	0.22	4	2.67	0.25	30	1	5
POST-																				
ITS2	6.86	0.17	5	6.38	0.81	6	6.82	0.19	9	6.71	0.31	6				6.70	0.45	26	1	7
SBI2	6.40	8.10	5	7.50	6.41	6	4.78	4.24	9	9.67	5.99	6				6.85	5.95	26	0	67
EF2G	3.20	1.05	5	3.57	0.85	6	3.78	0.72	9	3.74	0.72	6	3.65	0.54	4	3.62	0.76	30	1	6
EF2P	4.75	0.46	5	4.68	0.37	6	4.35	0.35	9	4.67	0.63	6	4.25	0.77	4	4.53	0.51	30	1	6
RI2	0.00	0.00	2	1.00	0.00	4	1.00	0.00	7	1.00	0.00	4				0.88	0.32	17	0	2
OCIW2	2.67	0.04	5	2.61	0.14	6	2.77	0.16	9	2.68	0.23	6	2.71	0.08	4	2.70	0.15	30	1	4
ENTH2																2.83	0.36	30	1	4
FDB2																2.94	0.26	30	1	4
INST2																2.63	0.13	30	1	4
OPP2																2.40	0.24	30	1	4
PACE2																2.76	0.26	30	1	4
STRC2																2.60	0.23	30	1	4
TASK2																2.72	0.22	30	1	4
ACH2	2.06	0.15	5	1.83	0.27	6	1.69	0.25	9	1.76	0.24	6	1.48	0.29	4	1.77	0.29	30	0	3
BEH2	1.59	0.16	5	1.64	0.23	6	1.59	0.24	9	1.72	0.20	6	1.44	0.35	4	1.61	0.23	30	0	2
ATT2	2.56	0.18	5	2.59	0.27	6	2.87	0.13	9	2.76	0.28	6	2.53	0.21	4	2.69	0.24	30	1	5

Note that the class is the unit of analysis

from Table 4, teacher trust for the teaching partner group means were very high on both the pre- (ITS1) and post-measures (ITS2).

Teaching Partner's Supervisory Beliefs

Scores obtained from Glickman and Tamashiro's (1981) SBI, the scale used to measure the teaching partner's supervisory beliefs, reflect the preference of the teaching partners for a *non-directive* or *collaborative* conferencing approach. Stated differently, low scores on the SBI indicate a preference for collaborative or non-directive modes of interacting with the teacher during conferencing; conversely, high scores indicate a preference for a directive conferencing style. As noted in Table 4, group means on the SBI, for both pre- (SBI1) and post-measures (SBI2), were very low indicating a very strong preference by teaching partners for collaborative or non-directive conference interaction modes.

Teacher Efficacy

Two dimensions of teacher efficacy were measured using Gibson and Dembo's (1984) TES, namely: personal teaching efficacy, and general teaching efficacy. Each of these dimensions was used as a variable in the data analyses. A trend evident in both the pre- and the post-measure teacher efficacy scores was that teachers asserted stronger beliefs in their personal

teaching efficacy (mean EF1P = 4.56 and mean EF2P = 4.53) than in the general ability of teachers to effect change--general teaching efficacy (mean EF1G = 3.75 and mean EF2G = 3.62).[14]

Teacher Reflection During Conferences

Two problems became evident in the measurement of teacher reflection through coding of conferences held between teachers and their respective teaching partners. From Table 5, it can be seen that: (1) given the relatively small size of the sample the rate of return of usable audio-taped conferences was not very good (61.5% and 57.7% respectively for pre- and post-measures); and (2) although, according to the definition used in this study, teachers were thoughtful, they were not (with the exception of one instance in the pre-measures) being reflective during the conferences with their respective teaching partners. Table 4 indicates that of the four collaboration groups involved in conferencing, the members of three of these groups were thoughtful during pre- and post-conferences but not reflective.[15] Consequently, it was decided that RI (RI1 for the pre-measures and RI2 for the post-measures) would not be entered

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[14]$t(29)$ = 4.44, p<.001 for the ungrouped data for the pre-measures; $t(29)$ = 4.42, p<.001 for the post-measures.

[15]Three examples of coded conference transcripts appear in Appendix A; these transcripts were selected because they provide samples of conferences in which teachers were: reflective, thoughtful, or simply exchanged information. A complete set of conference transcripts is available from the author upon request.

as a variable in any data reduction procedures. As a result, there is no usable empirical evidence to support the hypothesized links among teacher reflection and the variables around it in the conceptual framework.

Table 5. Teacher Reflective Index for pre- and post-measures.

	Pre-measure RI[a]	Post-measure RI[b]
Reflective	1	0
Thoughtful	13	13
Information sharing	2	2

[a]Of a total of 26 teachers working with a teaching partner, 19 returned pre-measure conference audio tapes to the researcher--of these 3 were inaudible because of excessive background noise. [b]Of the same 26 teachers working with a teaching partner, 17 returned post-measure conference audio tapes to the researcher--of these 2 were inaudible because of excessive background noise.

Pupil Perceptions of Teacher Behaviour

Although pupils completed the eight sub-scales of Eash and Waxman's (1983) OCIW, only seven scales were actually used for the OCIW1 and OCIW2 variables.[16] Reliability of the entire OCIW (40 items, n = 476) was .58 (Cronbach's alpha) for the pre-measures and .62 (Cronbach's alpha) for the post-measures. By

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[16]In the previous chapter, it was indicated that the didactic instruction subscale may be problematic with respect to the current emphasis on cooperative learning and would not be used.

eliminating the items dealing with didactic instruction (items 8, 10, 13, 25, and 39), Cronbach's alpha, increased to .63 and .68 for the pre- and post-measures respectively. The elimination of the didactic instruction subscale from the OCIW improved its reliability given the context in which it was used.

For purposes of testing the relationships between the framework's cells 2 and 3, and cells 3 and 4 using CA[17], post-measure teacher classroom behaviour was broken down into seven individual variables as measured by the OCIW sub-scales. The sub-scales used as variables included: (1) enthusiasm, (2) feedback, (3) instructional time, (4) opportunity to learn, (5) pacing, (6) structuring comments, and (7) task orientation.

Pupil Achievement

Pupils' achievement scores as obtained from pupil report cards, both letter graded and anecdotal, appear to be within reasonable limits. The average overall grade for all of the pupils (n = 476) was found to be 1.74 and 1.77 for the pre- and post-measures respectively (see Table 4). Recalling that a 4-point scale ranging from 0 to 3 was used to code achievement, the two achievement means obtained from the sample represent grades slightly above, what would normally be considered, average (higher than "C+" but lower than "B"). The inter-rater

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[17]Since CA is concerned with maximizing the correlations between the variables, only ungrouped data for each of these variables were obtained.

reliabilities for the anecdotal report card data coded into numerical format by three elementary teachers were .86 and .87 (split-half reliability coefficient) for the pre- and post-measures respectively. Achievement scores obtained by coding the letter graded report cards (n = 301) were not significantly different (α = .05) from achievement scores obtained by coding the anecdotal report cards (n = 175).[18]

Pupil Behaviour

Pupils' behaviour scores were obtained from pupil report cards in a manner similar to achievement scores. Overall behaviour scores from all pupils in the study (N = 476) appear to be quite high for both the pre- and the post-measures; the ungrouped means were 1.63 and 1.61 respectively (see table 4).[19] Inter-rater reliabilities for the behaviour scores obtained from the anecdotal report cards were .91 and .88 (split-half reliability coefficient) for the pre- and post-measures respectively. Behaviour scores obtained by coding the letter graded report cards (n = 301) were not significantly different (α = .05) from behaviour scores obtained by coding the anecdotal report cards (n = 175).[20]

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[18]t(474) = 1.05, p = .296 for the pre-measures; t(474) = 1.37, p = .170 for the post-measures.

[19]The highest possible behaviour score was 2.00.

[20]t(474) = 1.01, p = .311 for the pre-measures; t(474) = 1.93, p = .054 for the post-measures.

Pupil Attitude

Cronbach alpha reliabilities for the four SASC scales created for the present study were generally comparable to those

Table 6. Reliability coefficients for the original SASC and for the SASC created for the present study.

Object of interest	Original scale	n	Cronbach α (pre-measure)	Cronbach α (post-measure)
Yourself	No	476	.75	.75
Classmates	No	476	.79	.84
Teacher	No	476	.90	.92
Learning	No	476	.87	.88
School	Yes	476	.89	.91
Social Studies	Yes	476	.89	.92
Language Arts	Yes	476	.92	.92
Math	Yes	476	.92	.93
All Objects of interest taken at once.		476	.94	.95

found for Randhawa and Van Hesteren's (1982) original SASC scales (see Table 6). Special note should be taken of the very high reliabilities of the eight SASC scales, for both the pre- and the post-measures, when they are taken at once--as was the case in the present study.

Pupil attitude scores obtained by averaging the 8 SASC scales appear to be slightly below what would have been expected. Given that the SASC uses a 5-point scale ranging from 1 to 5, from a mathematical point of view an overall mean equal to 3

would have been expected ($\underline{N}$ = 476). The ungrouped mean attitude scores for both the pre- and the post-measures are significantly less (α = .05) than 3 ($\underline{t}$(475) = 28.8, p < .001 for the pre-measures; $\underline{t}$(475) = 28.2, p < .001 for the post-measures). This suggests that pupil attitudes, in general, were slightly negative toward the eight attitudinal objects considered by the pupils when completing the SASC.

Data Screening

Prior to analysis, the data collected for each variable, with the exception of RI, were screened for normality (i.e., kurtosis and skewness), outliers (univariate and multivariate), linearity, multicollinearity and singularity using various SPSS-PC+ 4.01 (1990) computer software programs. Each of these issues is addressed below.

Normality

Using SPSS-PC+ 4.01 (1990) "Frequencies" software, all data were screened for normality using two techniques by determining skew and kurtosis values for each variable, and by visual inspection of histogram plots. All variables, except ITS2, are normally distributed with kurtosis values falling between -1.1 and 1.4, and skewness values falling between -1.2 and 1.1. Kurtosis and skewness values for ITS2 were found to be 5.804

and -2.361; these are significantly different from 0

(α = .01).[21] Given the shape of the ITS2 distribution,

Tabachnick and Fidell (1989) recommend that the variable be

transformed through reflection and inversion to "substantially

improve" the results of the analysis (p. 84). Skewness and

kurtosis of the new transformed variable (ITS2T) were found to be

normal. To maintain a "one-to-one" correspondence between the

measures obtained during the pre-measures and the post-measures,

it was decided that ITS1 would be similarly transformed. Skewness

and kurtosis of the transformed ITS1 variable (ITS1T) were found

to remain normal. Although ITS1T, SBI1, ITS2T, and SBI2 are, from

a statistical perspective, reasonably normally distributed, an

examination of the frequency distribution histograms reveals that

a ceiling effect may have been reached (see Table 7 and Appendix

C).

Outliers

All data were screened for univariate and multivariate

outliers. Univariate outliers--scores greater than 3 standard

deviations above or below a given variable mean--were identified

by transforming all of the scores to z-scores (mean = 0, standard

deviation = 1.0) through the SPSS-PC+ 4.01 (1990) "Frequencies"

software. Only one case in the collaborative consultation team

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[21]Refer to appendix B for an explanation and an example of how
significant kurtosis and skewness values were determined.

Table 7. Obtained values compared to the minimum and maximum
values possible for the Individualized Trust Scale and
the Supervisory Beliefs Inventory.

	ITS1T	SBI1	ITS2T	SBI2
Possible range				
minimum	0.13	0	0.13	0
maximum	1.00	67	1.00	67
Mean	0.82[a]	8.3[b]	0.83[c]	7.2[d]
N	26	26	26	26

[a]15 scores were >0.80. [b]25 scores were <25.0. [c]16 scores were
>0.80. [d]26 scores were <25.0.

teaching group was a univariate outlier because of a low ITS
post-measure score. The score of 5.27 is 3.353 standard
deviations below the mean of ITS2. This outlying case ceased
being an outlier after ITS2 was transformed to make ITS2T as
described above.

To screen for multivariate outliers, Mahalanobis distance
($\alpha = 0.001$ as recommended by Tabachnick and Fidell, 1989) in
three regressions was determined using SPSS/PC+ 4.01 (1990)
"Regression." First, a regression was performed on the pre-
measure variables, using the ITS1T variable, and Mahalanobis
distances for each case were determined; no cases were identified
as multivariate outliers ($\alpha = 0.001$). Second, Mahalanobis
distances were determined, using the ITS2T variable, for each
case on the post-measure variables. No instances of multivariate
outliers were found. Third, to check for multivariate outliers on
the OCIW2 subscales, used to test hypotheses 4 and 5, a

regression was performed and Mahalanobis distances were determined for each case; again, no multivariate outliers were found (α = 0.001).

Linearity

Tabachnick and Fidell (1989) state "Linearity is fundamental to multivariate statistics because the solutions are based on the general linear model" (p. 79) which assumes ". . . that relationships between pairs of variables are adequately represented by a straight line" (p. 678). Regarding how to assess linearity, Tabachnick and Fidell state:

> In plots where residuals are plotted against predicted values, nonlinearity is indicated when most of the residuals are above the zero line on the plot at some predicted values and below the zero line at other predicted values (p. 79).

Linearity is assessed here by examination of residuals plots derived from regressions of: (1) pre-measure variables--including ITS1T; (2) post-measure variables, including ITS2T; and (3) subscales of OCIW2. Examination of the three residuals plots derived from these three regressions reveals that the variables are linearly related within each group.[22]

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[22]Refer to Appendix C for the computer printout of the residuals plots.

Homogeneity of the MANOVA Variance-Covariance Matrices

Multivariate analysis of variance requires that individual group variances and covariances be pooled together to form a single estimate of error. Tabachnick and Fidell (1989) state that "If the within-cell error matrices are heterogeneous, the pooled matrix is misleading as an estimate of error variance" (p. 379). They go on to recommend examination of the group sizes and the sizes of the variances and covariances associated with the respective groups so that they may be assessed as follows:

> If cells with larger samples produce larger variances
> and covariances, the α level is conservative so that
> null hypotheses can be rejected with confidence
> (Tabachnick and Fidell, 1989, p. 379).

In fact, this situation is exactly what occurred in the data sets used in this study. Comparison of the group variance-covariance matrices from both the overall pre- and post-measures MANOVAs reveals that in all six analyses the larger variances and covariances are generally associated with the groups having more members (i.e., larger n).[23] The null hypotheses were rejected in the MANOVAs performed on the post-measurement data--this can be done with confidence because the effect of heterogeneity of the variance-covariance matrices in these instances resulted in a more conservative alpha level than actually specified. However, the null hypotheses were not rejected in the three MANOVAs

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[23] An element in a group's variance-covariance matrix was considered very large if it was more than four times greater than a corresponding element in another group's variance-covariance matrix.

performed on the pre-measurement data. In these three cases, it is not expected that the null hypotheses were found tenable simply because of an overly conservative alpha level. The probability that there was no difference among the groups in the three MANOVAs is much greater than 50% (these are summarized in Table 8).

Table 8.   MANOVA summaries of statistics of groups on pre-measures.

Variables used in MANOVA	Groups evaluated	Wilks lambda	Approx. F.	p =
ITS1T, SBI1, EF1G, EF1P, OCIW1, ACH1, BEH1, ATT1.	All groups with teaching-partners	0.346	.811	0.705
ITS1, SBI1, EF1G, EF1P, OCIW1, ACH1, BEH1, ATT1.	All groups with teaching-partners	0.331	.853	0.656
EF1G, EF1P, OCIW1, ACH1, BEH1, ATT1.	All groups	0.590	.483	0.976

Although the assumption of homogeneity of the variance-covariance matrices for each MANOVA has not been met, it is expected--as discussed above--that the effect is to make the alpha level more conservative so that rejection of the null hypothesis, when warranted, can be done with confidence. Furthermore, since normality was not violated, estimates of the population parameters--although not as good as when the homogeneity of variance-covariance assumption is not violated--

can still be used from this dataset. Inferences drawn from this sample should be treated with caution.

Multicollinearity and Singularity

Authors do not agree on exact definitions of multicollinearity and singularity, nor do they agree to which variables--independent or dependent--the terms apply; however, they do agree on the negative impact caused by multicollinearity and singularity (i.e., Norusis, 1990; Pedhazur, 1982; Tabachnick and Fidell, 1989). In the present study, Tabachnick and Fidell's (1989) interpretations of multicollinearity and singularity were adopted. Multicollinearity refers to the condition that exists when variables within a set, or a variable and a linear combination of other variables--all within a set, are highly correlated (.90 to .99). Singularity is taken to refer to the condition that exists when variables within a set, or a variable and a linear combination of other variables--all within a set, are perfectly correlated.

Multicollinearity and singularity are problematic in several ways. Substantively, redundant variables do not provide any unique information to a solution making it difficult to judge the effects of individual variables. Statistically, the power of an analysis is weakened by reducing degrees of freedom for error. Mathematically, singularity prohibits matrix inversion while multicollinearity results in extremely large and unstable values

in inverted matrices. Tabachnick and Fidell (1989) caution against including two variables, unless factor analysis is the purpose, with a ". . . bivariate correlation of .70 or more in the same analysis" (p. 87). Tabachnick and Fidell (1989) later make explicit that this also applies to correlations between a variable and a linear combination of variables within the same set of variables (pp. 380-381).

In the present study, instances of multicollinearity and singularity were sought using two techniques. First, for each MANOVA, the determinant of the within-cell correlation matrix was examined to determine if it was near 0.[24] Second, for each MANOVA, the within-cell correlation matrix was input to SPSS/PC+ 4.01 (1990) "Factor" which then calculated the squared multiple correlation (R^2 or SMC) between each variable and a linear combination of all other variables.

Examination of the determinants of the within-cell correlation matrices for each MANOVA performed did not reveal any that were smaller than .046, well above the .0001 cutoff. These results were confirmed by the SMC's calculated between each variable and the linear combination of all other variables within its set by SPSS/PC+ 4.01 (1990) "Factor." In this analysis, the largest SMC was calculated to be .652; again, this is well below the .90 level used to define multicollinearity; this value is even below the .70 suggested by Tabachnick and Fidell (1989) as

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[24] Tabachnick and Fidell (1989) suggest that a singularity or multicollinearity problem may exist if the determinant of the within-cell correlation matrix is less than .0001 (p. 380).

being potentially problematic. Multicollinearity and singularity were judged to not be a problem for the MANOVA analyses conducted in this study.

Analyses

It will be recalled that five specific research questions and associated substantive hypotheses were listed in Chapter 1. For convenience, the hypotheses and the specific research questions are repeated below. The five substantive hypotheses to be tested are:

(1) of the four collaboration groups, the CC group differs most from the other groups when all the teaching-learning variables are taken at one time;

(2) of the five groups, the CC group differs most from the other groups when teacher efficacy and behaviour, and pupil achievement, attitude and behaviour are taken simultaneously;

(3) strong links exist, after taking into account the covariation among the variables in each set, between the first set of variables--trust for the teaching partner and the teaching partner's preferred mode of interaction--and the second set of variables--teacher reflection, general teaching efficacy and personal teaching efficacy;

(4)   strong links exist among general teaching efficacy, personal teaching efficacy and teacher reflection, taken together to account for the covariation among the first set of variables, and teacher classroom behaviours, taken together to account for the covariation among the second set of variables; and

(5)   strong links exist between teacher classroom behaviours, taken together to account for the covariation among the first set of variables, and behavioural, attitudinal, and academic pupil outcomes, take together to account for the covariation among the second set of variables.

The five specific research questions are:

(1)   Can the teaching-learning variables, taken together, distinguish between the CC, CCTT, CCNO, and CoNO groups?

(2)   Can the teaching-learning variables of teacher efficacy and behaviour, and pupil achievement, attitude and behaviour--taken together--distinguish between the CC, CCTT, CCNO, CoNO, and NC groups?

(3)   After accounting for the covariation of the variables within the first cell and within the second cell of the framework, are trust for the teaching partner and the teaching partner's preferred mode of interaction related to teacher efficacy and teacher reflection?

(4) After accounting for the covariation of the variables within the second cell and within the third cell of the framework, how strong is the relationship and what are the underlying links among teacher reflection and teacher efficacy, and teacher classroom behaviours?

(5) After accounting for the covariation of the variables within the third cell and fourth cell of the framework, how strong is the relationship and what are the underlying links among teacher classroom behaviours, and pupil outcomes?

This subsection is arranged such that, after determining whether group differences exist on the basis of the pre-measures, each of the substantive hypotheses and its parallel specific research question are addressed. For the analyses that follow, it was decided that, since this is an exploratory study there is a concern that the power of the analyses may be insufficient to detect subtle effects due to the differing collaboration strategies used by teachers. Consequently, the alpha level for statistical significance should be relaxed to the .10 level.

Pre-measure Analyses

Two MANOVAs were conducted to determine if any differences existed among the groups at the beginning of the study. The first MANOVA compared the four collaboration groups (CC, CCTT, CCNO,

and CoNO), the second MANOVA compared the five groups involved in the study (CC, CCTT, CCNO, CoNO, and NC).[25]

The first MANOVA, after taking all of the pre-measure variables together to account for the covariation among the variables, revealed no significant differences among the four collaboration groups on the pre-measures at the .10 level (Wilks lambda = .346, F = .811, df = 24/44, p = .705). The second MANOVA, after taking EF1G, EF1P, OCIW1, ATT1, BEH1, and ACH1 simultaneously to account for the covariation among the variables, revealed no significant differences among the five groups on the pre-measures at the .10 level (Wilks lambda = .590, F = .483, df = 24/71, p = .976). Having established that the groups were probably similar at the beginning of the school year, it was decided that post-measure group data did *not* need to be adjusted (i.e., through MANCOVA) to compensate for any initial differences among the groups.

<u>Post-measure Analyses</u>

<u>Research Hypothesis 1</u>

The first research question was designed to get at the differences among the four collaboration groups on the basis of

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[25]A third MANOVA was conducted to evaluate the effect of using ITS1 instead of ITS1T variable (Wilks lambda = .331, F = .853, df = 24/44, p = .656). No difference was found between the two analyses.

the post-measure data. The hypothesis tested was: of the four

collaboration groups, the CC group differs most from the other

groups when all the teaching-learning variables are taken at one

time. The results of a MANOVA suggest that differences do exist

at the .10 level among collaboration groups after taking ITS2T,

SBI2, EF2G, EF2P, OCIW2, ACH2, BEH2, ATT2 simultaneously to

account for covariation among the variables (Wilks lambda = .147,

$F = 1.72$, df = 24/44, p = .058).[26] To find the nature of these

differences it was necessary to conduct a post-hoc discriminant

analysis.

Using ITS2T, SBI2, EF2G, EF2P, OCIW2, ACH2, BEH2, ATT2 as

potential predictors, discriminant analysis was carried out. At

the .10 level, only the first discriminant function was retained

$(\chi^2(24) = 36.48$, p = .049). This single function accounted for

65.67% of the variance in the data set and resulted in 80.77%

correct reclassification into the collaboration groupings. Using

structure coefficients, a dimension with pupil attitude (-.44) at

one end and personal teaching efficacy (.27) and pupil

achievement (.39) at the other end is described.[27] As can be

seen in Figure 6, plotting the discriminant means (CC mean =

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[26]A second MANOVA using ITS2 instead of ITS2T produced results almost identical to those reported in the text. For this MANOVA the following statistics were calculated: Wilks lambda = .139, $F = 1.79$, df = 24/44, p = .046. Furthermore, in the post-hoc discriminant analysis only the first discriminant function was retained and the factors of EF2P, and ACH2 formed one end of the discriminant dimension, while ATT2 formed the opposite end of the dimension.

[27]Loadings of |.25| or greater were retained for describing the salient characteristics of the dimension.

2.02, CCTT mean = 0.68, CCNO mean = -1.56, and CoNO mean = -0.03) one finds that the: (1) CC group differs most from the other three groups, (2) CCTT group and the CoNO groups are similar to each other but differ from both the CC and the CCNO groups, and (3) CCNO differs from all other groups.
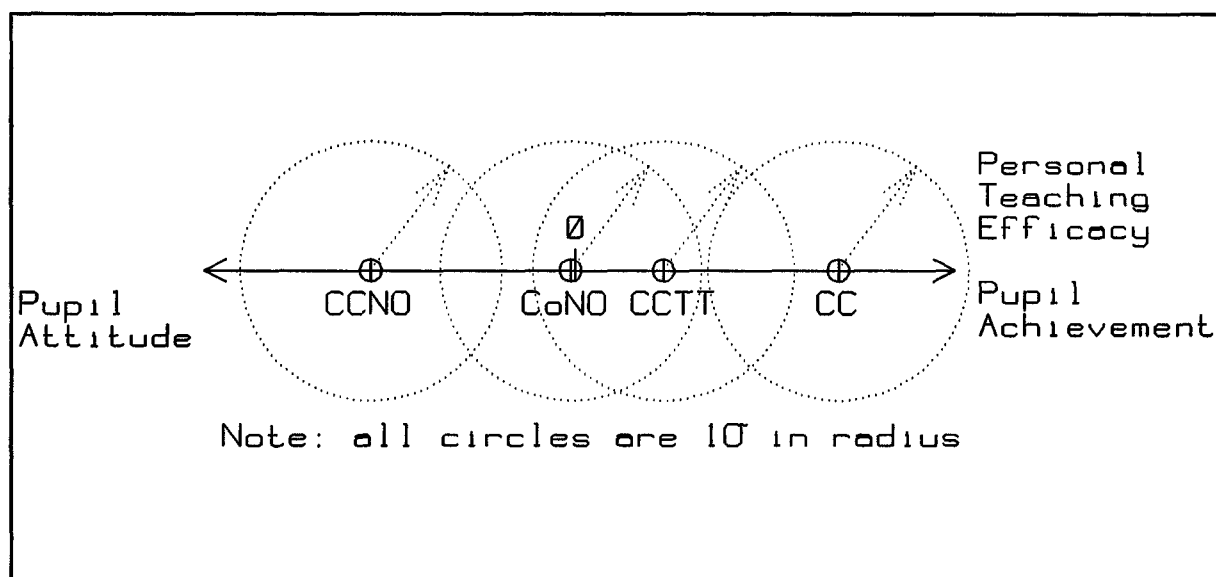
Figure 6: Discriminating the four collaboration groups on a single bipolar dimension.

The CC group seems to stand out when compared to other collaboration groups in the present study. Teachers in the CC group exhibited more personal teaching efficacy and pupils in the this group had higher achievement than the teachers and pupils, respectively, in the other collaboration groups. However, pupils in the CC group also tended to have more negative attitudes toward the 8 attitudinal objects measured, namely: themselves, peers, teacher, school, learning in general, language arts, social studies, and math. Also distinctive in comparison to the other collaboration groups, is the CCNO group. Teachers in the

CCNO group tended to have lower personal teaching efficacy and
lower pupil achievement; however, pupils generally had more
positive attitudes toward the eight attitudinal objects for which
measures were obtained.

Research Hypothesis 2

The second research question was designed to get at the
differences among the five groups in the study on the basis of
the post-measure data. The hypothesis tested was: of the five
groups, the CC group differs most from the other groups when
teacher efficacy and behaviour, and pupil achievement, attitude
and behaviour are taken simultaneously. The results of the MANOVA
suggest that differences do exist at the .10 level between at
least two of the four collaboration groups after taking EF2G,
EF2P, OCIW2, ACH2, BEH2, ATT2 simultaneously to account for
covariation among the variables (Wilks lambda = .165, F = 2.00,
df = 24/71, p = .013). To find the nature of these differences,
it was necessary to conduct a post-hoc discriminant analysis.

Using EF2G, EF2P, OCIW2, ACH2, BEH2, ATT2 as potential
predictors, a discriminant analysis was computed. At the .10
level only the first discriminant function was retained
$(\chi^2(24) = 42.29, p = .012)$. This single function accounted for
61.86% of the variance in the data set and resulted in 73.33%
correct reclassification into the collaboration groupings. Using
structure coefficients, a dimension with pupil attitude (-.35)

and teacher behaviour (-.28) at one pole and personal teaching

efficacy (.31) and pupil achievement (.47) at the other pole is

described. As can be seen in Figure 7, plotting the discriminant

means (CC mean = 1.59, CCTT mean = 1.11, CCNO mean = -1.37, CoNO

mean = 0.28, NC mean = -0.98) one finds that the: (1) CC group is

similar to the CCTT group but differs from the other three

groups, (2) CCTT group is similar to the CC and CoNO groups but

different from the other two groups, (3) the CoNO group is

similar to the CCTT group but differs from all other groups, and

(4) CCNO group and the NC group are similar to each other but

differ from all other groups.
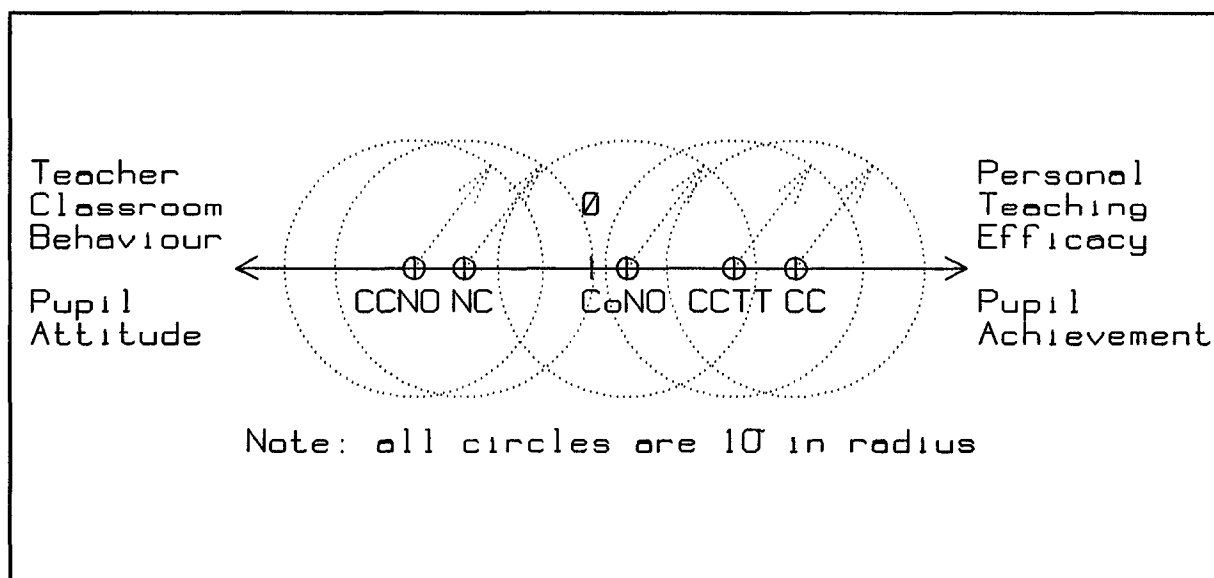
Figure 7: Discriminating all groups on a single bipolar dimension.

The CC group and the CCTT group seem to stand out when

compared to other groups in the study. Teachers in the CC and

CCTT groups exhibited more personal teaching efficacy and pupils

in the this group had higher achievement than the teachers and

pupils, respectively, in the other groups. However, because of the nature of this discriminant function, pupils in the CC and CCTT groups were less likely to perceive their teacher's classroom behaviour positively and they were also more likely to have more negative attitudes toward: themselves, peers, teacher, school, learning in general, language arts, social studies, and math.

Research Hypothesis 3

The third research question addresses the nature of the links between the first and the second cells of the conceptual framework. The research hypothesis to be tested is: strong links exist, after taking into account the covariation between the variables in each set, between the first set of variables--trust for the teaching partner (ITS2T) and the teaching partner's preferred mode of interaction (SBI2)--and the second set of variables--general teaching efficacy (EF2G) and personal teaching efficacy (EF2P).

The results of a CA suggest that after accounting for the covariation of the variables within each set of variables, no significant (α = .10) relationship was found to exist between the variables contained within cell 1 and cell 2 (Wilks lambda = .900, F = .60, df = 4/44, p = .667). The canonical correlation between the $\hat{X}^{(1)}$ and the $\hat{Y}^{(1)}$ was only 0.25; put another way, variate $\hat{X}^{(1)}$ explains only 6.3% of the variance in

variate $\hat{Y}^{(1)}$ and vice-versa (R^2_{c1} = .063).[28] It does not appear, after accounting for the covariation of the variables within the first cell and within the second cell of the framework, that trust for the teaching partner and the teaching partner's preferred mode of interaction is related to teacher efficacy and teacher reflection.

Research Hypothesis 4

The fourth research question addresses the nature of the links between the second and the third cells of the conceptual framework. The research hypothesis to be tested is: strong links exist between general teaching efficacy (EF2G) and personal teaching efficacy (EF2P), taken together to account for the covariation between the first set of variables, and teacher classroom behaviours (ENTH2, FDB2, INST2, OPP2, PACE2, STRC2, TASK2), taken together to account for the covariation among the second set of variables.

The results of a CA suggest that, after accounting for the covariation of the variables within each set of variables, a significant (α = .10) relationship was found to exist between the variables contained within cell 2 and cell 3 (Wilks lambda = .403, F = 1.72, df = 14/42, p = .087). Dimension reduction analysis indicates that only the first pair of

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[28]Results of a CA using ITS2 instead of ITS2T produced results almost identical to those reported in the main text (Wilks lambda = .925, F = .44, df = 4/44, p = .779).

clear that the Cell 2 variable correlated with the first canonical variate is EF2G and that the Cell 3 variables correlated with the first canonical variate are ENTH2, FDB2, OPP2, PACE2, STRC2, TASK2. The first pair of canonical variates indicates that those teachers with high degrees of general teaching efficacy (EF2G, .99) also tended to: be more enthusiastic (ENTH2, .54), provide more feedback to pupils (FDB2, .78), ensure that all pupils have the opportunity to learn (OPP2, .77), set an appropriate level of difficulty for assignments (PACE2, .42), provide structuring comments (i.e., overviews) (STRC2, .71), and not be task oriented or "businesslike" (TASK2, -.51).

Research Hypothesis 5

The fifth research question addresses the nature of the links between the third and the fourth cells of the conceptual framework. The research hypothesis to be tested is: strong links exist among teacher classroom behaviours (ENTH2, FDB2, INST2, OPP2, PACE2, STRC2, TASK2), taken together to account for the covariation between the first set of variables, and pupil outcomes which are behavioural (BEH2), attitudinal (ATT2), and academic (ACH2), taken together to account for the covariation among the second set of variables.

The results of a CA suggest that, after accounting for the covariation of the variables within each set of variables, a

canonical variates was statistically significant at the .10 level (significance of λ_2 is p = .411). The canonical correlation between the $\hat{X}^{(1)}$ and the $\hat{Y}^{(1)}$ is 0.69; variate $\hat{X}^{(1)}$ explains 47.9% of the variance in variate $\hat{Y}^{(1)}$ (R^2_{c1} = .479). Data on the first pair of canonical variates appear in Table 9.

Table 9. Correlations, standardized canonical coefficients, canonical correlations, percents of variance, and redundancies between Cell 2 variables and Cell 3 variables and their corresponding canonical variates.

	First Canonical Variate[a]	
	Structure Coeff.	Std. Coeff.
Cell 2 set--$\hat{X}^{(1)}$		
EF2G	.99	1.01
EF2P	.03	.15
Variance	.48	
Redundancy	.23	
Cell 3 set--$\hat{Y}^{(1)}$		
ENTH2	.54	-.18
FDB2	.78	.50
INST2	.08	-.35
OPP2	.77	.56
PACE2	.41	-.15
STRC2	.71	.35
TASK2	-.51	-.23
Variance	.35	
Redundancy	.17	

[a]For this canonical variate pair R_{c1}=.692 and λ=.479.

The percent of variance and redundancy indicate that the first pair of canonical variates is moderately correlated. Examining the correlations (using a cutoff correlation of .30) between the variables and their respective canonical variate, it becomes more

significant (α = .10) relationship was found to exist between the variables contained within cell 3 and cell 4 (Wilks lambda = .201, F = 2.07, df = 21/58, p = .015). Dimension reduction analysis indicates that only the first pair of canonical variates is statistically significant at the .10 level (significance of λ_2 is p = .462). The canonical correlation between the $\hat{X}^{(1)}$ and the $\hat{Y}^{(1)}$ is 0.82; variate $\hat{X}^{(1)}$ explains 66.8% of the variance in variate $\hat{Y}^{(1)}$ (R^2_{c1} = .668). Data on the first pair of canonical variates appears in Table 10. The percent of

Table 10. Correlations, standardized canonical coefficients, canonical correlations, percents of variance, and redundancies between Cell 3 variables and Cell 4 variables and their corresponding canonical variates.

	First Canonical Variate[a]	
	Structure Coeff.	Std. Coeff.
Cell 3 set--$\hat{X}^{(1)}$		
ENTH2	.63	.18
FDB2	.73	-.50
INST2	.16	.35
OPP2	.83	-.56
PACE2	.67	.15
STRC2	.72	-.35
TASK2	-.56	.23
Variance	.42	
Redundancy	.28	
Cell 4 set--$\hat{Y}^{(1)}$		
ACH2	.25	.13
BEH2	.48	-.01
ATT2	.99	.98
Variance	.42	
Redundancy	.28	

[a]For this canonical variate pair R_{c1}=.817 and λ=.668.

variance and redundancy indicate that the first pair of canonical variates are moderately correlated. Examining the correlations

(using a cutoff correlation of .30) between the variables and their respective canonical variate, it becomes more clear that the Cell 3 variables correlated with the first canonical variate are ENTH2, FDB2, OPP2, PACE2, STRC2, and TASK2, and that the Cell 4 variables correlated with the first canonical variate are BEH2, and ATT2. The first pair of canonical variates indicates that those teachers who are enthusiastic (ENTH2, .63), provide more feedback to pupils (FDB2, .73), ensure that all pupils have the opportunity to learn (OPP2, .83), set an appropriate level of difficulty for assignments (PACE2, .67), provide structuring comments (STRC2, .72), are not task oriented (TASK2, -.56) tend to have pupils who are better behaved (BEH2, .48) and have more positive attitudes (ATT2, .99) toward: themselves, peers, teacher, school, learning in general, language arts, social studies, and math.

Summary of the Findings

This subsection briefly reviews the major findings reported in this chapter. Included are brief descriptions of: (1) the nature of the sample, (2) the nature of the variables with particular emphasis on the difficulties encountered in measuring reflection, and (3) how the research questions were answered.

The Sample

On the basis of teacher experience, female-to-male ratio, teacher efficacy scores (personal teaching efficacy and general teaching efficacy), and OCIW scores, the self selected sample consisting of 30 teachers and their respective pupils (n = 476) from two School Districts in the British Columbia Lower Mainland appears to be reasonably representative of teachers and pupils in British Columbia School Districts. The teaching experience of the sample teachers was found to not be significantly different from the teaching experience of the elementary teachers in the two districts from which the sample came. Similarly, the female-to-male sample teacher ratio of 2:1 does not differ significantly ($\alpha = .05$) from the British Columbia provincial female-to-male elementary teacher ratio; in the vast majority of School Districts, female elementary teachers outnumber male teachers by a large degree. Comparing the TES and OCIW mean scores obtained from the present sample with comparable mean scores from previous studies, it was concluded that this sample is similar to the samples used in the studies cited for comparison (see Table 11). It is expected that the sample is representative of the teachers within the two districts from which it was drawn. On this basis, the study was carried forward.

Table 11. Comparisons of TES and OCIW means between the present
study and previous studies.

Study	Teacher Efficacy			OCIW	
		Personal	General		Total
	n	mean	mean	n	mean
Anderson et al. (1987)	24	4.77	3.56	584	2.70
Cavers (1988)	339	4.64	3.44		
Tracz & Gibson (1986)	14	4.86	3.65		
Grimmett and Crehan (In progress) PRE	93	4.29	3.22		
POST	78	4.69	3.20		
Housego (1992) BASE	177	3.97	3.76		
T1	129	4.38	3.56		
T2	121	4.50	3.41		
T3	123	4.47	3.47		
da Costa (1992) PRE	30	4.56	3.75	476	2.68
POST	30	4.53	3.62	476	2.68

Measuring the Variables

With the exception of the teacher reflection variables (RI1
and RI2), all variables and the scales used to measure them
behaved as expected. The evidence collected in this study vis-a-
vis audio-taped conferences between teachers and their respective
teaching partners did not, with the exception of one instance
during a CC group dyad conference, result in any dialogue being
termed "reflective." Regardless of group membership, the vast

majority of conference discussions between teachers and their respective teaching partners were of a "thoughtful" nature.

Screening the Data

After transformation of ITS2 and ITS1 to maintain parallelism between the pre- and post-measures, all variables exhibited linearity and normality. Furthermore, no cases of univariate or multivariate outliers were found to exist. Multicollinearity and singularity were also found not to be a problem for the variables studied. One assumption made for the use of MANOVA which had to do with the heterogeneity of the variance-covariance matrices was violated. However, because the larger samples tended to be associated with the larger variances and covariances, the net result was a more conservative alpha level and greater confidence in rejection of the null hypotheses.

The Research Questions

Research Question 1

In response to question 1: the teaching-learning variables, taken together, do distinguish among the groups using different collaboration strategies along a bi-polar dimension defined by pupil attitudes at one pole and personal teaching efficacy and pupil achievement at the other pole. When compared to the other

collaboration groups, teachers in the CC group exhibited higher levels of personal teaching efficacy while pupils in this group had higher achievement; however, pupils in this CC group were also more likely to have poorer attitudes toward: themselves, peers, teacher, school, learning in general, language arts, social studies, and math. Interestingly, the CCNO group pupils exhibited the most positive attitudes while having the most negative achievement and the CCNO group teachers exhibited the lowest personal teaching efficacies of the four groups.[29]

Research Question 2

In response to question 2: the teaching-learning variables of teacher efficacy, teacher behaviour, pupil achievement, pupil attitude, and pupil behaviour do distinguish among the five groups in the study along a bi-polar dimension defined by pupil attitudes and teacher behaviour at one pole and personal teaching efficacy and pupil achievement at the other pole. Relative to the CCNO, CoNO, and the NC groups, the CC group and the CCTT group teachers were most likely to have higher personal teaching efficacy and pupils with higher achievement. However, the same teachers were also perceived by pupils as exhibiting less

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[29] An alternate interpretation of the discriminant space described by this single bipolar dimension, defined by pupil attitudes at one pole and personal teaching efficacy and pupil achievement at the other pole, is that the focus of the CC group was on enhancing pupil achievement while the focus of the CCNO group was on enhancing pupil attitudes.

desirable classroom behaviour; the pupils also had poorer attitudes generally. Relative to the CC, CCTT, and CoNO groups, the CCNO group and the NC group teachers were most likely to have lower personal teaching efficacy and pupils with lower achievement. However, the same teachers were also perceived by pupils as exhibiting more desirable classroom behaviour; the pupils also had better attitudes generally.[30]

Research Question 3

In response to question 3: after accounting for the covariation of the variables within the first cell and within the second cell of the framework, trust for the teaching partner and the teaching partner's preferred mode of interaction were not found to be related to teacher efficacy and teacher reflection.

Research Question 4

In response to question 4: after accounting for the covariation of the variables within the second cell and within the third cell of the framework, one moderately strong link exists between teacher reflection and teacher efficacy taken

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[30] An alternate interpretation of the discriminant space described by this single bipolar dimension, defined by pupil attitudes and teacher behaviour at one pole and personal teaching efficacy and pupil achievement at the other pole, is that the focus of the CC and the CCTT groups was on enhancing pupil achievement while the focus of the CCNO and the NC groups was on enhancing pupil attitudes.

together, and teacher classroom behaviours taken together. This link suggests that those teachers with high degrees of general teaching efficacy were associated with the following pupil perceived classroom behaviours: were more enthusiastic, provided more feedback to pupils, ensured that all pupils had the opportunity to learn, set an appropriate level of difficulty for assignments, provided structuring comments (i.e., overviews), and were less task oriented.

Research Question 5

In response to question 5: after accounting for the covariation of the variables within the third cell and fourth cell of the framework, one moderately strong link exists between teacher classroom behaviours, and pupil outcomes. This link suggests that those teachers who were more enthusiastic, provided more feedback to pupils, ensured that all pupils had the opportunity to learn, set an appropriate level of difficulty for assignments, provided structuring comments (i.e., overviews), and were not task oriented tended to be associated with pupils who had more positive attitudes toward themselves, their peers, their teacher, school, learning in general, language arts, social studies, and math and were better behaved.

In general then, the findings suggest that differences among the five collaboration groups do exist with respect to the teaching-learning variables measured. Furthermore, the analyses

of the ungrouped data suggest that some changes should be made to the conceptual framework so that it better reflects the relationships among the variables as measured in the thirty classrooms. Having reported the statistical and substantive findings of this study, the next chapter seeks to discuss these findings and delineate additional research.

CHAPTER V: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter is four-fold. First, this chapter provides a review of the present study by describing the: (1) general and specific research questions, (2) design of the study, and (3) the method used. Second, the major findings of this study are presented and discussed in light of the literature reviewed. Congruencies and incongruencies between the present study and the literature reviewed are emphasised. Third, conclusions are drawn on the basis of the present study's findings and the literature reviewed. Fourth, based on the conclusions reached, recommendations for future research and practice are made.

Nature of the Study

Purpose

Previous research, mostly qualitative in nature, has investigated teacher consultation approaches and suggested that positive outcomes for both teachers and pupils result when teachers interact collaboratively, particularly through the use of collaborative consultation. In the literature there does not, presently, exist a synthesis relating teacher collaboration to teaching-learning outcomes. At a theoretical level, the purpose

of this study was to create such a synthesis while simultaneously
providing empirical evidence for the existence of the links
posited in the literature and, subsequently, in the conceptual
framework. At a practical level, the purpose of this study was to
explore the types of outcomes that may be associated with various
collaboration strategies which permit teachers to make sense of
their classroom behaviours through their own values and norms
(e.g., collaborative consultation, collaborative consultation
with team teaching, collaborative consultation without
observation, collegial consultation without observation, and no
consultation).

Research Questions

The general problem under investigation was: "What is the
relationship between teacher participation in a teacher
collaboration programme and teaching-learning outcomes?" Five
specific research questions guided this study to address the
general problem. These were:

(1) Can the teaching-learning variables, taken together,
     distinguish among the collaborative consultation,
     collaborative consultation in a team teaching
     situation, collaborative consultation without direct
     classroom observation by the teaching partner, and
     collegial consultation without direct classroom
     observation by the teaching partner groups?

(2)   Can the teaching-learning variables of teacher efficacy
        and behaviour, and pupil achievement, attitude and
        behaviour--taken together--distinguish among the
        collaborative consultation, collaborative consultation
        in a team teaching situation, collaborative
        consultation without direct classroom observation by
        the teaching partner, and collegial consultation
        without direct classroom observation by the teaching
        partner, and no consultation groups?

(3)   After accounting for the covariation of the variables
        within the first cell (trust for the teaching partner,
        and the teaching partner's preferred mode of
        interaction) and within the second cell (teacher
        efficacy, and teacher reflection) of the framework, are
        trust for the teaching partner and the teaching
        partner's preferred mode of interaction related to
        teacher efficacy and teacher reflection?

(4)   After accounting for the covariation of the variables
        within the second cell (teacher efficacy, and teacher
        reflection) and within the third cell (teacher
        classroom behaviours) of the framework, how strong is
        the relationship and what are the underlying links
        among teacher reflection and teacher efficacy, and
        teacher classroom behaviours?

(5)   After accounting for the covariation of the variables
        within the third cell (teacher classroom behaviours)

and fourth cell (pupil outcomes) of the framework, how strong is the relationship and what are the underlying links between teacher classroom behaviours, and pupil outcomes?

Literature Review: the Framework of Relationships

The purpose of the conceptual framework was to consolidate the research findings regarding the effects of collaborative consultation on teachers and pupils so that a greater amount of the complexity surrounding the teacher and pupil constructs is taken into account. Hypothesized links among four areas of the literature--collaborative consultation, teacher reflection, teacher efficacy, and pupil effects were explored. From these hypothesized links, a conceptual framework for guiding this study was synthesized (see Figure 8).

In the conceptual framework, a series of hypothesized links were made. First, it was hypothesized that teacher growth through the use of teacher collaboration techniques was predicated on the establishment of teacher trust for the teaching-partner. Furthermore, it was expected that teacher trust for the teaching-partner would be influenced by the "supervisory mode" preferred by the teaching-partner. Second, it was hypothesized that teacher collaboration should result simultaneously in increases in teacher reflectiveness regarding teaching and increases in both general and personal teaching efficacy. Moreover, a positive
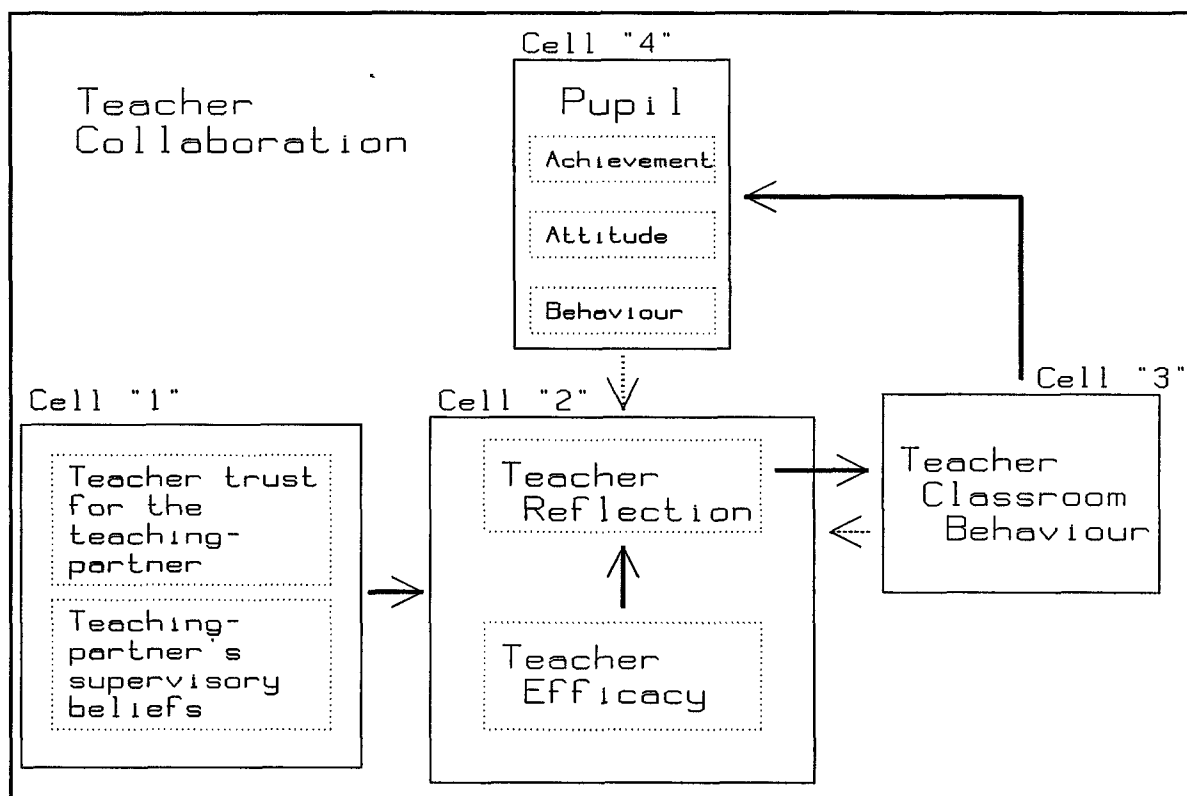
Figure 8: The unidirectional linear relationship among the four cells of the framework (shown with solid lines), and the anticipated feedback relationship among the cells (shown with dotted lines).

relationship between reflectiveness and teaching efficacy was presumed to exist. Although the exact nature of this relationship is unclear, it was argued that teaching efficacy affects reflectiveness directly. Third, it was hypothesized that as a result of increased levels of teacher reflection and teacher efficacy, teachers' classroom behaviour would be positively affected. Fourth, it was hypothesized that more positive teacher classroom behaviour would positively affect pupils in terms of achievement, attitude, and behaviour.

Study Procedures

The present study tested the conceptual framework by obtaining measures for each variable of interest from teachers, their teaching partners, and their pupils. The variables of interest included: (1) teacher trust for the teaching partner, (2) the teaching partner's supervisory beliefs, (3) teacher reflection, (4) general and personal teacher efficacy, (5) teacher behaviour, (6) pupil achievement, (7) pupil attitudes, and (8) pupil behaviour.

Data for the variables listed above were collected from a volunteer sample of 30 teachers, 26 teaching partners, and 476 pupils. This sample was obtained from 13 elementary schools in two suburban School Districts in British Columbia's Lower Mainland. The grade levels represented by the pupils included grade three through to grade seven. The sample was broken down into five teacher collaboration strategies, namely: (1) collaborative consultation, (2) collaborative consultation in a team teaching situation, (3) collaborative consultation without direct classroom observation by the teaching partner, (4) collegial consultation without direct classroom observation by the teaching partner, and (5) no collaboration.

The analytic approach used in this study differed from most teacher collaboration research previously reported in the literature. Using the teacher as the unit of analysis, the present study relied heavily on multivariate data analyses to

begin to take into account some of the complex interactions between and among the various constructs of interest. The main data analysis procedures used to test for relationships were Multivariate Analysis of Variance (MANOVA) and Canonical Analysis (CA).

Generalizability of the Findings

As noted above, this study was conducted using volunteers from two suburban School Districts. The issue of generalizability of the results for any study using a self-selected sample of volunteers is a contentious one because of the possibility of bias; this study is no exception. At issue are the sources of sampling bias which affect the representativeness of the sample used in this study with respect to the population to which the findings are to be generalized.

From an examination of teacher demographic variables of gender and teaching experience, of teaching partner demographic variables of gender and teaching experience,[31] and of pupil gender it was concluded that no known serious external factors had biased the sample; in other words, the sample was adequately representative for the purpose of a field study such as this. It is believed that the results obtained here can, as a first approximation, be cautiously generalized to the population of teachers and pupils involved in a context of teacher

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[31]See the report of the "Sample" in Chapter Four.

collaboration in sub-urban schools in British Columbia. This suggests that policy decisions should not be based on the results obtained in the present study. However, it should be recalled that, as suggested by Grimmett *et al.* (1992), participation in a teacher collaboration program should not be mandated by others; teachers should participate in teacher collaboration because of their own desire to change or improve what they do in the classroom to make education better for the pupils and to make educating pupils better for themselves. From this point of view, a sample consisting of volunteers, although not statistically representative, is probably most illustrative of what teacher collaboration is capable of.

Discussion of the Major Findings

The discussion of the findings is divided into two sections. First, the responses to the specific research questions are discussed. Second, the response to the general research question is addressed.

Specific Research Questions

This section is divided into five parts. First, a discussion of the difficulties encountered in obtaining measures of teacher reflection is provided. The sections following the first address the findings relevant to the specific research questions. For

convenience, the specific research question(s) being addressed are provided at the beginning of each section.

Difficulties in Measuring Teacher Reflection

The problem encountered in the measurement of reflection was not anticipated as a result of the review of the literature regarding reflective thought. Although empirical data are still lacking regarding the nature of the links between teacher reflection and the variables surrounding it in cells 1, 2, and 3 of the conceptual framework, on the basis of previous research (e.g., Cruickshank and Applegate, 1981; McCoombe, 1984; Robinson, 1984) it is still defensible to include reflection as part of the framework in cell 2.

Based on the work of Cruickshank and Applegate (1981), McCoombe (1984), and Robinson (1984) as well as an examination of the TES, it can be argued that teacher efficacy can act as a proxy variable for teacher reflection. Many items on the TES require the teacher to be reflective about his or her practice if a high score is assigned. For example, item 5 states "when a student is having difficulty with an assignment, I am usually able to adjust it to his/her level"; to strongly agree with this statement a teacher would have had to: (1) encounter the situation--*identified the problem*, (2) assessed the present situation in terms of past experience--*reframed the problem*, and (3) mentally test the outcomes of the adjustments to the

assignment before implementing the changes--*logically test the hypothesis before physically acting.*

However, it is unknown whether teacher reflection is more related to personal teaching efficacy or to general teaching efficacy. For the purposes of the present study, personal teaching efficacy and general teaching efficacy are simultaneously used as a proxy variable for the teacher reflection variable.[32]

The main difficulty in this study with the measurement of teacher reflection appears to lie in the "place" in which it was sought, namely the conference between the teacher and teaching partner. Although nothing precludes teacher reflection from occurring during a teacher/teaching partner conference, it does not appear that teacher reflection occurs with any great frequency during this time. It is unlikely that 26 teachers in the four collaboration groups could not, with one exception, be reflective regarding their teaching. A more likely explanation of this phenomenon is that teachers were reflective after conferencing with their respective teaching partners. As Garman (1984), Elliot (1976), and Zimpher and Howey (1987) suggest, it is possible to amplify the degree of teacher reflection through the use of suitable self-monitoring techniques and teacher consultation practices. These techniques and practices may serve

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[32] To reiterate, because of the relationship described by the literature regarding teacher efficacy--general and personal--and teacher reflection, it was decided that teacher efficacy would act as a proxy variable for teacher reflection.

to "plant the seed" which later initiates reflective thought.

That evidence of reflective thought was not found in conferences

between teachers and their teaching partners in no way diminishes

the usefulness of conferencing for, among other things,

stimulating reflection.

Specific Research questions 1 and 2: Testing for Differences
Among the Groups

(1) Can the teaching-learning variables, taken together,
distinguish among the collaborative consultation,
collaborative consultation in a team teaching situation,
collaborative consultation without direct classroom
observation by the teaching partner, and collegial
consultation without direct classroom observation by the
teaching partner groups?

(2) Can the teaching-learning variables of teacher efficacy and
behaviour, and pupil achievement, attitude and behaviour--
taken together--distinguish among the collaborative
consultation, collaborative consultation in a team teaching
situation, collaborative consultation without direct
classroom observation by the teaching partner, and collegial
consultation without direct classroom observation by the
teaching partner, and no consultation groups?

It is noteworthy that all post-hoc discriminant analyses

resulted in at least one discriminant function describing a bi-

polar underlying continuum composed of personal teaching efficacy

and pupil achievement at one end of the scale and pupil attitudes

at the opposite end[33] on which the groups were discriminated.

The expectation, as a result of the literature reviewed (e.g.,

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[33]Note that for research question 2, the end of the scale with
pupil attitude also contained teacher behaviour.

Acheson and Gall, 1992; Little, 1987), would have been to observe pupil attitudes and pupil achievement anchor at one end of the continuum rather than at opposite ends of the same continuum as found here. This suggests that high achieving pupils generally have more negative attitudes towards attitudinal objects associated with school.[34]

A second point regarding this continuum can be made involving the relationship between personal teaching efficacy and pupil achievement. Several studies suggest that a reciprocal relationship exists between teaching efficacy and pupil achievement (e.g., Armor *et al.*, 1976; Ashton, 1985; Berman *et al.*, 1977). Cavers (1988), however, found no evidence of such a relationship. Ashton and Webb (1986) concluded that their findings "strongly support the hypothesis that teachers' sense of efficacy is related to pupil achievement" (p. 139). This study suggests that: (1) a positive relationship does exist between personal teaching efficacy and pupil achievement--as suggested by Anderson *et al.* (1987), and (2) a negative relationship exists between personal teaching efficacy and pupil attitudes toward school-related attitudinal objects. Furthermore, Canon and Simpson's (1985) and Randhawa and Van Hesteren's (1983) conclusion that attitude and achievement are not significantly related is also supported by the present study.

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[34] Recall that an alternate interpretation of the bi-polar continua is that the focus of the CC and CCTT groups may have been on enhancing pupil achievement, while the CCNO and NC groups may have chosen to enhance pupil attitudes.

A possible explanation for the grouped data relationships among personal teaching efficacy, pupil achievement and pupil attitudes may be found by first recalling the definition of personal teaching efficacy and then examining the nine items related to this efficacy dimension on Gibson and Dembo's (1984) TES. Personal teaching efficacy is described by Gibson and Dembo (1984) as the belief that the individual teacher has the skills and abilities to bring about pupil learning. This definition is reflected in the personal teaching efficacy items of the TES by the inclusion of a phrase indicating how the teacher would react to various pupil difficulties.[35] Teachers with high personal teaching efficacy may be more apt than teachers with low personal teaching efficacy to try various techniques or strategies to increase individual pupil achievement. It is likely that these techniques or strategies are successful in increasing pupil achievement; however, pupils may no longer feel they possess ownership of the learning process since the teacher has control of it. It may be speculated that this loss of control of the learning process on the part of the pupil may result in more negative pupil attitudes toward school-related attitudinal objects (B.E.J. Housego, personal communication, March 18, 1993).

A puzzling finding was the general trend of the positioning of the various group means relative to one another in the

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[35]Examples of phrases indicating how the teacher would react to pupil problems: item 1, ". . . I exerted a little extra effort"; item 5, ". . . I am usually able . . ."; item 6, ". . . I found better ways . . ."; item 13, ". . . I know some techniques . . ."

discriminant space comprised of personal teaching efficacy and pupil achievement at one extreme and pupil attitudes at the other extreme (as seen in Figures 6 and 7, pages 126 and 128). Because of the method in which the groups were defined, the expectation was that if groups were going to cluster they would do so according to the following criteria: (1) collaboration groups would separate from the non-collaboration group, and (2) collaboration groups utilizing direct classroom observation would separate from collaboration groups not utilizing direct classroom observation. As seen in Figures 6 and 7 (pages 126 and 128) the general trend is for the collaboration groups utilizing direct classroom observation to form a cluster as expected (i.e., the collaborative consultation group and the collaborative consultation in a team teaching situation group are positioned side by side in discriminant space). However, the separation of the two collaboration groups not utilizing direct classroom observation was not expected (i.e., the separation in discriminant space of the collaborative consultation without direct classroom observation by the teaching partner group and the collegial consultation without direct classroom observation by the teaching partner group shown in Figure 6, page 126). The clustering of the collaborative consultation group not utilizing direct observation with the non-collaboration group was also unexpected (i.e., the clustering of the collaborative consultation without direct classroom observation by the teaching partner group with the no consultation group in discriminant

space shown in Figure 7, page 128). One possible explanation for

this unexpected phenomenon is that the conferences held by the

collaborative consultation without direct classroom observation

by the teaching partner group teachers with their teaching

partners may have been so informal and lacking in specific

direction that these teachers were not achieving anything

substantially different from what the no consultation group

teachers obtained from casual "lunch-room" type conversations

with peers.

Specific Research Question 3: Testing the Relationship Between Cell 1 and Cell 2

(3)   After accounting for the covariation of the variables within
      the first cell (trust for the teaching partner, and the
      teaching partner's preferred mode of interaction) and within
      the second cell (teacher efficacy, and teacher reflection)
      of the framework, are trust for the teaching partner and the
      teaching partner's preferred mode of interaction related to
      teacher efficacy and teacher reflection?

The lack of relationship between the variables in cell 1 and

the variables in cell 2 does seem to contradict many of the

authors (e.g., Cogan, 1973; Goldhammer et al., 1980; Lovell and

Wiles, 1983; Acheson and Gall, 1992; Grimmett and Erickson, 1988;

Sergiovanni and Starratt, 1993) who suggest that: (1) the

development and maintenance of teacher trust and professional

respect for the teaching-partner is imperative, and (2) teachers

should be treated as competent professionals who are accountable

for their professional performance and in control of their

professional development--in other words, calling for supervisory interaction that is not directive. However, a cursory examination of the frequency distributions for teacher trust for the teaching partner (ITS2T) and the teaching partner's supervisory beliefs (SBI2) reveals that a ceiling effect and floor effect respectively may have been reached in measuring both of these variables. In retrospect, the lack of association should have been expected given the circumstances under which the groups of teachers were formed. All teachers in the collaboration groups chose their own partners. Presumably they chose people who were already trusted and respected professionally by the teachers. It is unlikely that any teacher would choose to collaborate with someone who was not trusted. It is also unlikely that teachers, particularly experienced teachers, would willingly choose to collaborate with someone who would be directive during a teacher/teaching partner conference. It is possible that if some of the teachers had been assigned a teaching partner with whom to work, that the increased variability in SBI2 and ITS2T may have resulted in obtaining a significant relationship between cell 1 and cell 2. In the present study, the variables in cell 1 appear to be pre-conditions met to a very large degree by all teachers in the four collaboration groups.

Specific Research Question 4: Testing the Relationship Between

Cell 2 and Cell 3

(4) After accounting for the covariation of the variables within
     the second cell (teacher efficacy, and teacher reflection)
     and within the third cell (teacher classroom behaviours) of
     the framework, how strong is the relationship and what are
     the underlying links between teacher reflection and teacher
     efficacy, and teacher classroom behaviours?

From the review of the literature, it was expected that the

general construct of teacher efficacy was related to teacher

classroom behaviour (e.g., Bandura, 1977; Grimmett and Erickson,

1988). However, it was surprising to find that general teaching

efficacy, rather than personal teaching efficacy as suggested by

Ashton et al. (1983), was positively related to teacher classroom

behaviours such as feedback to pupils, the opportunity for pupils

to learn new subject matter, providing structuring comments

(i.e., lesson overviews), teacher enthusiasm, and lesson pacing.

Yet, general teaching efficacy was found to be negatively related

to the teacher behaviour of "task orientation" (i.e., the extent

to which the classroom is business-like). This negative

relationship may be due to the grade levels of the pupils--

elementary--forming the sample in this study. It is possible that

the pupils in the grades sampled for this study are not

perceiving many learning activities as "work" but rather as

"play." This would lead pupils to assign low scores (after

adjusting for items of reverse polarity) to those items on the OCIW scale addressing task orientation.[36]

This lack of relationship between personal teaching efficacy and teacher behaviour contradicts Ashton's *et al.* (1983) assertion that "Personal teaching efficacy is . . . the best predictor of teaching behaviour" (p. 2). It also counters Cavers' (1988) use of personal teaching efficacy for predicting teaching behaviour. However, if personal teaching efficacy is not related to the teacher behaviours measured by the OCIW subscales,[37] the following question needs to be asked: "To what teacher behaviours is the personal teaching efficacy construct related?"

A common theme of the items forming the OCIW questionnaire appears to be the pronounced emphasis on the pupils as a group within the teacher's classroom. Of the 40 items making up the OCIW scale, 27 items refer to the pupils as a collective group using the pronouns we, and us.[38] By contrast, the TES items

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[36]e.g., item 35, Our teacher lets us play a lot of games in school; item 5, Our teacher thinks it's more important to learn than to have fun at school.

[37]To check for a possible relationship between personal teaching efficacy and the Didactic instruction sub-scale of the OCIW which was purposely not used in the multivariate analyses, a post-hoc univariate Pearson correlation was determined. The correlation was found to be non-significant ($r = -.09$); less than 1% of the variance in one variable was explained by the other variable.

[38]e.g., item 12 reads "Our teacher lets *us* know when we do good work," item 21 reads "*We* always spend a lot of time doing our school work," item 23 reads "Our teacher never lets *us* know when we do good work," item 34 "*We* always have enough time to do our schoolwork," and item 40 "*We* are always working in our class" (emphasis added).

related to personal teaching efficacy refer primarily to what the teacher does or can do for individual "students" rather than for the collective group of pupils. Of the 9 personal teaching efficacy items in the TES, 7 items refer specifically to what the teacher can do for the individual pupil.[39] However, of the 7 TES items related to general teaching efficacy, 4 items refer to pupils in the collective sense.[40] It is possible that an answer to the question posed in the previous paragraph may lie in pupil perceptions regarding toward whom the teacher behaviours are primarily directed: the group of pupils, or the individual pupil. In other words, it is plausible that personal teaching efficacy is more closely related to teacher behaviours directed at individual pupils than teacher behaviours directed at the group of pupils within the classroom.

Specific Research Question 5: Testing the Relationship Between Cell 3 and Cell 4

(5)   After accounting for the covariation of the variables within the third cell (teacher classroom behaviours) and fourth cell (pupil outcomes) of the framework, how strong is the relationship and what are the underlying links between teacher classroom behaviours, and pupil outcomes?

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[39]e.g., item 5 "When *a student* is having difficulty with an assignment . . .," item 10 "If *a student* masters a new math concept quickly . . .," item 15 "If *one of my students* couldn't do a class assignment . . ." (emphasis added).

[40]e.g., item 2 "The hours in my class have little influence *on students* compared to . . .," item 11 "If *parents* would do more with *their children* I could do more" (emphasis added).

The relationship found to exist between cells 3 and 4 also proved to be slightly different from the original expectations. Pupil attitudes and behaviour were found to be moderately positively related to teacher behaviours such as: feedback to pupils, the opportunity for pupils to learn new subject matter, providing structuring comments, teacher enthusiasm, and lesson pacing. While teacher task orientation was found to be moderately negatively related to pupil attitudes and achievement, this negative relationship may again be due to the grade level of the pupils in the sample. What differed from the original expectation was that pupil achievement was not found to be related to the teacher behaviours measured by the OCIW scale. The lack of relationship between pupil achievement and pupil attitude found in the present study contradicts the work of Germann (1988) and Talton and Simpson (1987); however, it supports the work of Cannon and Simpson (1985) and of Randhawa and Van Hesteren (1983).

It appears that group centred teacher behaviours such as those measured by the OCIW are related to the affective pupil domains of attitude and behaviour rather than the cognitive domain of achievement. It is possible that individual pupil-centred teacher behaviours rather than the group centred teacher behaviours, are the link relating personal teacher efficacy positively to pupil achievement and negatively to pupil attitude.

General Research Question

>What is the relationship between teacher participation in a
>teacher collaboration programme and teaching-learning
>outcomes?

The evidence collected suggests that teacher participation
in various collaboration programs is associated with differing
teaching-learning outcomes. This study begins to provide
empirical evidence supporting Garman's (1986) assertion that
"Ultimately the reason teachers and clinical supervisors work
together is in order to enhance practice and to make education
better for students" (p. 19). However, the evidence obtained does
not provide answers which are as simple as Garman's (1986)
assertion may suggest.

In terms of personal teacher efficacy and pupil achievement,
collaboration strategies using classroom observation as the main
source of data for post-observation discussion, analysis, and
reflection stand out from those collaboration strategies not
using classroom observation. Those teachers engaging in
collaborative consultation and collaborative consultation with
team teaching differed most from those teachers who did not
collaborate or who collaborated but did not have their teaching
partners collect objective data from classroom observation.
Teachers engaged in collaborative consultation with an
observation component tended to exhibit a higher degree of
personal teacher efficacy. Furthermore, the pupils of those
teachers engaging in collaborative consultation with an

observation component tended to have higher academic achievement, but the same pupils tended to possess more negative attitudes toward school related attitudinal objects than the pupils of teachers who collaborated but did not utilize classroom observation. With respect to the relationship between personal teaching efficacy and pupil achievement, this finding is supported by Anderson *et al.* (1987) and Ashton and Webb (1986). Nothing is said in the literature of the simultaneous relationships found to exist among personal teaching efficacy, pupil achievement, and pupil attitude found in the present study.

When all groups were compared--collaborative consultation, collaborative consultation with team teaching, collaborative consultation without classroom observation, collegial consultation without classroom observation, and no consultation-- the two collaboration groups using classroom observation as the source of objective conference data differed from the other groups in the same terms as those just described above, except that pupil perceptions of teacher classroom behaviour were most negative. Furthermore, the no consultation group and the collaborative consultation group without classroom observation were most similar to each other. The teachers from these groups exhibited the lowest levels of personal teaching efficacy and the most positive pupil perceptions of teacher classroom behaviour of the five groups compared. The pupils from these two groups also exhibited the lower achievement levels, but had the most positive attitude toward school related attitudinal objects of interest.

Summary of Findings

Eight major findings present themselves as a result of the
analyses conducted and the literature reviewed for this study.
For the convenience of the reader, these findings are also
presented in tabular form in Table 12. The findings are:

1. Teacher reflection (as defined in this study) does not occur
    with any great frequency during conferences between teachers
    and their respective teaching partners. Teachers tend to be
    thoughtful about their teaching during conferences with
    their respective teaching partners.

2. Teachers who select their own teaching partners for teacher
    collaboration purposes tend to choose teaching partners whom
    they trust and with whom they like to work. In conference
    situations, these teaching partners usually interact in a
    non-directive or collaborative mode.

3. Teachers participating in collaborative consultation
    programmes which included teaching partner observation of
    the teachers' classroom, tend to exhibit higher degrees of
    personal teaching efficacy, while pupils in these teachers'
    classes tended to have higher achievement but more negative
    school related attitudes.

4. Teachers not collaborating with teaching partners, and
    teachers collaborating with teaching partners who are also
    teachers but for whom classroom observation was not an
    integral part of the collaboration relationship, tend to

Table 12. Summary of major findings and literature in agreement or not in agreement with the findings.

Findings:	Literature supporting	Literature not supporting	New Contribution
1. Teachers tend to be thoughtful not reflective during conferences.		MacKinnon (1985), (1986); Zeichner & Liston (1983)	XX
2. Teachers who select their own partners, tend to work with trusted people who are not directive.			XX
3. Teachers using collaborative consultation with observation tend to exhibit more personal teaching efficacy; pupils have higher achievement, but more neg. attitudes.	With respect to personal teaching efficacy: Ashton & Webb (1986), Anderson et al. (1987)		XX
4. Teachers who do not collaborate or who collaborate but are not observed by a teaching partner tend to have lower personal teaching efficacy; pupils have lower achievement, but more pos. attitudes.	With respect to personal teaching efficacy: Ashton & Webb (1986), Anderson et al. (1987)		XX
5. General teaching efficacy is pos. related to teacher classroom behaviour.		Armor et al. (1976) Ashton (1983, 1985) Berman et al. (1977)	XX
6. Teacher classroom behaviour is pos. related to pupil attitude.	Hypothesized by: Acheson & Gall (1992), Little (1987)		XX
7. Teacher classroom behaviour is pos. related to pupil behaviour.	Hypothesized by: Acheson Gall (1992), Little (1977)		XX
8. Pupil attitude and behaviour form one dimension distinct from another dimension consisting of achievement.	Canon & Simpson (1985), Randhawa & Van Hesteren (1983)	Germann (1988) Talton & Simpson (1987)	

exhibit lower degrees of personal teaching efficacy, while pupils in these teachers' classes tend to have lower achievement but more positive attitudes towards school.

5. General teaching efficacy is positively related to the teacher classroom behaviours of: feedback to pupils, providing opportunities for pupils to learn new subject matter, providing structuring comments, enthusiasm, and appropriate lesson pacing.

6. A positive relationship exists between teacher classroom behaviours--such as feedback to pupils, providing opportunities for pupils to learn new subject matter, providing structuring comments, enthusiasm, and appropriate lesson pacing--and pupil attitudes toward school.

7. A positive relationship exists between teacher classroom behaviours--such as feedback to pupils, providing opportunities for pupils to learn new subject matter, providing structuring comments, enthusiasm, and appropriate lesson pacing--and pupil behaviour.

8. The pupil variables of attitude, and behaviour form a dimension which is distinct from the dimension formed by the pupil achievement variable.

Conclusions and Recommendations

This section is divided into two parts. First, conclusions based on the findings and the literature reviewed for this study

are offered. Second, recommendations derived from the conclusions
reached in this study are provided.

Given the exploratory nature and the relaxed data analysis
significance level used in the present study, the conclusions
reached and the recommendations made need to be viewed very
cautiously. The recommendations for practice are necessarily
limited. This study is most useful from a theoretical perspective
because it provides a first step in obtaining empirical evidence
to show how teachers working with other teachers are affected and
how their pupils are affected.

Conclusions

Thoughtful Post-observation Conferences

Given the finding that teachers were predominantly
thoughtful rather than reflective during post-observation
conferences and given the literature indicating that teacher
reflection does occur (e.g., Elliot, 1976; Garman, 1984, 1986;
Grimmett and Crehan, 1990; Grimmett and Erickson, 1988; Schön,
1983; Zimpher and Howey, 1987), it is reasonable to conclude that
teacher reflection does occur; however, it does not occur
frequently during post-observation conferencing. In other words,
if teacher reflection occurs, it probably does so most often at
times other than during the post-observation conference between
the teacher and the teaching partner. It appears that the post-

observation conference may serve as a means for "seeding" reflective thought. The data that the teaching partner shares with the teacher during the post-observation conference is discussed and analyzed. However, the post-observation deliberation often does not move beyond the point of being thoughtful to that of being reflective.

Choice of Teaching Partners

Teachers who are not assigned teaching partners but instead select their own teaching partners are more likely to choose to work with another individual whom they already trust and respect. All teachers in the present study chose to work with individuals whom they trusted and respected. This serves to reduce the threat of risk-taking required to engage in teacher collaboration. As Acheson and Gall (1992) indicate, a threatened teacher is not likely to focus on potential problem areas in the classroom because the teaching partner may then perceive the teacher as incompetent. Teacher collaboration as a tool for promoting teacher growth cannot be effective when the relationship between the teacher and the teaching partner is not characterized by mutual trust and respect.[41] Furthermore, when the teaching partner trusts and respects the teacher, it is less likely that the teaching-partner will want to *tell* the teacher what to do.

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[41]For this reason, mutual trust and respect between the teacher and teaching partner are included as one of the defining characteristics of collaborative consultation.

The Importance of Classroom Observation

One of the general trends found in the present study was that teachers who participated in collaborative consultation programmes which included teaching partner observation of the teacher's classroom exhibited higher degrees of personal teacher efficacy and their pupils tended to have higher achievement but more negative attitudes. Classroom observation on the part of the teaching partner is an essential element of collaborative consultation if the aim is to increase personal teaching efficacy and pupil achievement. This is what can be expected when collaborative consultation is conducted using Garman's (1986) model of "reflection on action" which is based on the contextualization, by the teacher, of "stable" data in light of educational theory through interpretation, explanation, and evaluation.

Lack of Differentiation Between Collaborative Consultation Without Observation and No Collaboration

Another of the general trends found in the present study was that when teachers do not collaborate, or when they engage in collaborative consultation without direct classroom observation, the expectation is that personal teaching efficacy and pupil achievement will be low while pupil attitude will be more positive. The lack of differences between these two groups

suggests that the unplanned informal "lunchroom" discussions teachers have with colleagues serve the same function as the pre-planned conferences held between teachers who engage in collaborative consultation but do not observe one another. Therefore, it is not expected that engaging in collaborative consultation without direct classroom observation by the teaching partner will enhance personal teaching efficacy, and pupil achievement beyond that of teachers, and their pupils, who do not engage in collaborative consultation.

Relationship Among Personal Teacher Efficacy, Pupil Achievement, and Pupil Attitude

The positive relationship found between personal teacher efficacy and pupil achievement, and the negative relationship found between personal teacher efficacy and pupil attitude is one which contradicts some of the hypothesized links in the conceptual framework. Given this finding and the work of Anderson et al. (1987) and of Ashton and Webb (1986), it seems reasonable to conclude that increases in personal teaching efficacy correspond to increases in pupil achievement. Adding to this the work of Canon and Simpson (1985) and Randhawa and Van Hesteren (1983), who speculated that achievement and attitude were not directly related, it is reasonable to conclude that achievement and attitude are not similarly related to personal teaching efficacy. Rather, increases in personal teaching efficacy

correspond to decreases in pupil attitude. Furthermore, the
mechanism which relates personal teaching efficacy to pupil
achievement and attitude is not, at this time, clearly evident.

The Links Between General Teacher Efficacy and an Affective Pupil
Dimension

A second area of discrepancy between the conceptual
framework and the findings of the present study lies in the links
hypothesized to exist between teacher efficacy and pupil
outcomes. Three findings in particular point toward this problem.
First, general teacher efficacy was found to be positively
related to teacher classroom behaviour. Second, teacher classroom
behaviour was found to be positively related to pupil attitude.
Third, teacher classroom behaviour was found to be positively
related to pupil behaviour. The first of these three findings
does not support the work of Ashton (1983), who indicated that
personal teaching efficacy rather than general teaching efficacy
is related to teacher behaviour. The second and third of these
three findings are supported by Acheson and Gall (1992) and
Little (1987); however, what is of interest here is that no
relationship between teacher behaviour and pupil achievement was
found in the present study. When these findings are considered
simultaneously, it is reasonable to conclude that further changes
to the conceptual framework are in order. By recalling the work
of Canon and Simpson (1985) and Randhawa and Van Hesteren (1983),

it is reasonable to conclude that the pupil variables of attitude and behaviour form a dimension which is best described as an affective dimension which is distinct from the dimension formed by the pupil achievement variable which is best described as a cognitive dimension.

Recommendations

The recommendations fall into two categories. The first category includes recommendations for theory and research. The second category includes recommendations for practice.

Recommendations for Theory and Further Research

This study relied on previous research to synthesize a conceptual framework. Similarly, the recommendations that follow are meant to be helpful to other researchers. From the seven conclusions presented above emerge seven recommendations for future research. Overshadowing these recommendations is the general recommendation that this study be replicated under different conditions with other subjects to test the veracity of the assertions made here.

<u>Recommendation 1</u>. The first recommendation centres on changes to the conceptual framework for use in guiding future
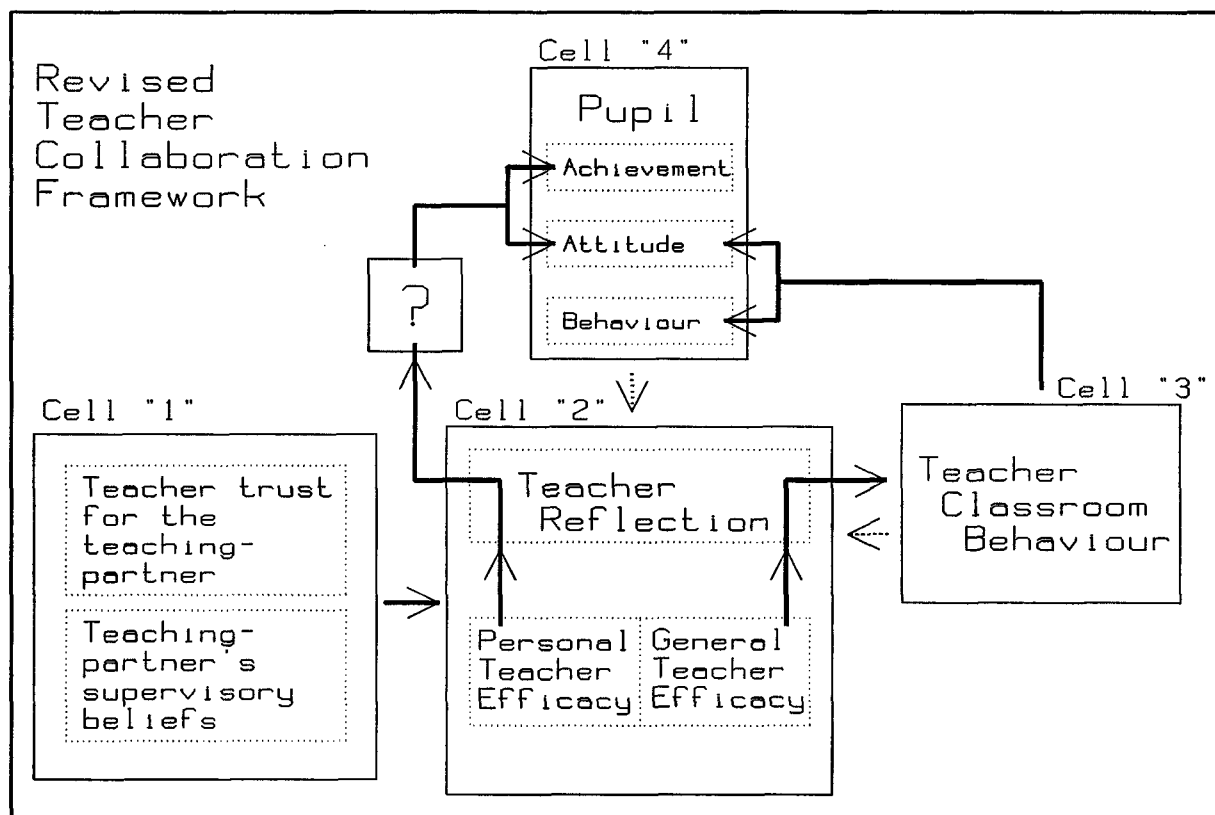
Figure 9: The revised teacher collaboration framework.

research. In light of the present findings and the conclusions drawn, it appears that three modifications should be made to the conceptual framework (see Figure 9). First, in cell 2, teacher efficacy should be split into its two main components of personal teaching efficacy and general teaching efficacy. Second, general teaching efficacy should, through teacher reflection, be linked to cell 3, teacher classroom behaviour. Cell 3 should, in turn, be linked to pupil behaviour and pupil attitude. Third, personal teaching efficacy should, through teacher reflection, be linked

to pupil achievement and to pupil attitude--recall that the latter is a negative relationship.

Recommendation 2. Based on the conclusion that teachers were predominantly thoughtful rather than reflective (as defined in this study) during post-conferences, the call is made here for a critical analysis of the concept of "reflective thinking." Questions such as "Can thinking ever not be reflective?" and "What is thinking?" should be addressed.

Recommendation 3. Given the conclusion that post-observation deliberation often does not move beyond the point of being thoughtful to that of being reflective, it is recommended that future research in the area of teacher reflection should address two problems. The first problem is concerned with determining: (1) when teacher reflection occurs, and (2) whether teacher reflection is stimulated by teacher/teaching partner conferencing. The second problem is concerned with developing a method of quantifying teacher reflection without inadvertently changing the "amount" or "quality" of reflection (i.e., by having teachers keep a journal).

Recommendation 4. To help understand the mechanism which relates personal teaching efficacy to pupil achievement and attitude, it is recommended that a factor analysis of the pupil attitude data should be conducted to determine the nature of the

dimensions which underlie the attitude construct. It is possible, even likely, that when pupil attitudes change according to any one of the SASC sub-scales used in the present study, that pupil favourableness towards or against other psychological objects of interest may also change.

Recommendation 5. A call is made for further research to investigate the function of teacher reflection in the relationship between and among personal teaching efficacy, pupil achievement and pupil attitude. Similarly, the function of teacher reflection in the relationship between and among general teaching efficacy, teacher behaviour, pupil attitude, and pupil behaviour needs to be better understood. Furthermore, if personal teacher efficacy is not related to teacher behaviour, future research should investigate what links this construct positively with pupil achievement and negatively with pupil attitudes. This is not to say that the framework should be carved into smaller parts and tested fragment by fragment. This fragmentation is precisely what was being avoided in this study by attempting to test the "whole" framework simultaneously through the use of multivariate statistical techniques.

Recommendation 6. The nature of the linkages between cell 1 (teacher trust for the teaching partner and the teaching partner's supervisory beliefs) and cell 2 (teacher reflection, and general and personal teacher efficacy) of the framework

should be investigated further, perhaps by studying cases in which teachers and teaching partners have been assigned to work together so that teacher trust for the teaching partner and the teaching partner's supervisory beliefs are more variable. Because of the negative impact of assigning teachers to work together, as discussed earlier, it is strongly recommended that this type of situation not be created specifically for the purposes of an investigation.

This type of study should only be conducted when the decision to have teachers assigned to be partners has previously been made by district administrators. Note that assigning teaching partners to teachers for the purpose of teacher collaboration is not recommended because of the potential for lack of trust and respect between the teacher and the teaching partner.

Recommendation 7. Further research should be conducted to investigate why teachers, and their pupils, engaged in teacher collaboration without teaching partner observation were found to be so similar to teachers, and their pupils, who did not collaborate with other teachers. In other words, the general expectation that teachers, and their pupils, engaged in collaborative consultation without teaching partner observation and teachers, and their pupils, engaged in collegial consultation without teaching partner observation would be very similar to

each other does not appear to be founded; why this occurred should be investigated further.

Recommendations for Practice

From the seven conclusions emerge two recommendations for practice. The following recommendations are made under the assumptions that: (1) teacher participation in a teacher collaboration programme is not mandated by district administrative personnel, and (2) teachers select the pedagogic areas in which they wish to change or improve.

Recommendation 8. When implementing a collaborative consultation program, teachers volunteering for the program should not be assigned to collaborative relationships arbitrarily. Teachers should be encouraged to select teaching partners who are trusted, respected colleagues.

Recommendation 9. Collaborative consultation-type programs, in which classroom observation by the teaching partner is an integral part of the design, should be encouraged since they seem to be more positively associated with increased personal teacher efficacy and higher pupil achievement than "non-observation" collaboration approaches. Typically, teaching partners must be provided "release time" from their own classrooms to observe the teacher and his or her class so that the teacher can be provided

with what Garman (1984) calls "stable data." Despite its desirability, providing release time for a teaching partner to observe in a teacher's classroom is expensive and often problematic logistically.

One solution to the release time problem is through the use of team-teaching. In addition to providing the teaching partner with opportunities to observe the teacher, it also helps to break the problem of teacher isolation noted by several authors (e.g., Anastos and Ancowitz, 1987; Ashton and Webb, 1986; Ashton *et al.*, 1983; Barnett, 1982; Johnson, 1976; Lesnik, 1987; Little, 1987; Lortie, 1975). However, the caveat is that teachers should choose to work together in a team-teaching situation. They should not be told that since they are partners for teacher collaboration purposes, they will also share a classroom--a team-teaching situation is not one desired by many teachers.

Closing Comment

This study began by describing and then synthesizing the work of other researchers in the areas of teacher collaboration, teacher reflection, teacher efficacy, and pupil achievement, attitudes, and behaviour. The central theme of the investigation centred on how teachers working with other teachers affected themselves as well as their pupils. Some answers were provided to this end. Collaborative consultation is seen here as a means of providing teachers with the opportunity to develop professionally

through self examination and the development of classroom behaviours such that the individual's values and beliefs are not ignored. Collaborative consultation appears to be a viable means of improving education for teachers and pupils without having teachers feel ". . . overwhelmed by the new expectations when their actions are continually shaped by the directives of others" (Grimmett et al., 1992, p. 186).

Empirically, some direction regarding the nature of the links among the various constructs investigated was also provided. This study provides some preliminary evidence suggesting how teachers and their pupils might be affected when teachers collaborate. Indeed, the evidence collected here does suggest that teachers are one school level factor promoting, among other things, higher student achievement. For the practitioner, this study identifies the potential for collaborative consultation and also warns of undesirable "side-effects" (e.g., more negative pupil attitude). As might have been expected, the conclusions drawn in this study confirmed some of the earlier studies and contradicted others. The present study also added some new findings to the teacher collaboration literature, but most importantly, new questions worthy of exploration or clarification are asked.

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APPENDIX A

Three Examples of Conference Transcripts Coded for RI.

Sample Transcript #1

Note that coding done by the researcher is shown in ▓▓▓▓▓ ▓▓▓▓ and that all names used are pseudonyms.

Teacher: Sabastion (S) (classroom teacher)
Teaching partner: Gerdena (G) (school level resource teacher)

Date: Oct. 13/91
Time: 12:00 PM

G: Rielle phoned, really wired last night.

S: Wired? Like upset.

G: Yeah, she must be have...sounds like they're really under pressure from the district...I've got all this stuff, I mean I'm so busy and ... I was just trying to find out from her what she really, what's the next step for me. She said "Well if the parents and the teacher"; cause then I said "You're very firm about wanting specific information on these students, this isn't just a half-way thing"; ... "well if's that what they really want I would prefer to just get it overwith now"--do the testing now. Almost to the point where she was saying that being in the classroom and observing and going over their records is one pathway to take or we do the formal testing...

S: We... are doing... in the classroom observing and looking at the anecdotal...if she's worried about coming in spending hours doing it, then she needn't...

G: Yeah, it is time, it's a time issue.

S: If that's the concern to come in and do the testing...

G: Well, she knows...Sam and Calabash are not going to show up with a big enough discrepancy on what they're able to achieve to be labelled, I mean they are not going to be labelled, they're not going to be given a government label.

S: Are we really sure about that though.

G: Yeah. Julie said she was pretty good at picking them out at a distance, and she said that they've

got to be ... two place... off the norm... or below what ever; but what we want to know ... is formal testing what we want for them. Is that the information we want. Or in chatting with Jane this morning, what we really want to know is specifically what are their weaknesses. And Rielle has described herself as an identifying person and Cindy has described herself as the programming side of it.

S: Cindy?

G: Cindy Pava...as the programming side of it. So really, what I can see wanting from Rielle is, okay... what are the underlying weaknesses.

S: I can see underlying weaknesses and I am... and you are too... in math and stuff... working with it. But, take Sam's case, I am seeing an underlying weakness in spelling for instance. Not that spelling is that god awful important but the thing is, here is a kid that can't take a list of twenty words...

G: Uh hmm...

S: ...some of them difficult, but some of them not very difficult at all. Five letter words like...debts...

G: And no strategies, nowhere to begin...

S: And no strategies, nowhere to begin. I mean, I can work on that with him too, but ... I just find myself wondering... he is quite convinced that he's totally incapable of doing this and...there you have it.

G: Of doing it or of not doing it?

S: He is convinced that he is quite incapable of getting 18 or 19 or 20 out of 20 no matter how much time he spends studying. And a preliminary... look at it on my part--which is not in depth at all--and I might backtrack on that later, indicates that he is not real far off on... how he is studying for spelling per sé. Uhmm, it looks like, as we have been told by the parents earlier in the year...

A problem is identified with respect to 2 pupils who have learning difficulties.

G: Uhm hmm.

S: ... and all these other things, that there are some kind of specific short-term memory thing.

G: Yep.

S: Now that is something... and I can work with this guy and give him strategies and work on this...it would sure help me if I had a label. (knock on the door, S answers then comes back and pauses tape recorder.)

S: I was wondering...but...

G: Yeah, no, that's exactly...

S: To me, I can see it in class... and I can try to work around it, not quite knowing exactly what it is; but that to me sounds like something that the formal test should be done so that there can be some kind of specific identifier.

G: Yeah, well what we can ask Rielle is "what ever method she chooses we would like to know please identify that underlying weakness, is it a perception problem, is it a memory problem, what are the patterns in the weakness...

S: Yeah, with both Calabash and Sam, I would be interested in something in ... memory, short term memory, long term memory and ...

G: Yeah, what are the patterns, when are they happening...and then that was the point at which...

S: ...or learning styles, you see that's something else that maybe I'm not doing right for them ...that maybe formal testing can pinpoint... and maybe I can alter what I'm doing...

G: Yeah...

S: You know...is it a case that there's not a short or long term memory problem there, but there's...a learning style that I'm not presenting there.

The teacher draws on past experience regarding pupil preferred learning styles.

G: Yeah, a way of presenting, a way of cuing in, and in fact that's where Cindy...who's experience as an LD can say "Okay now we know whatever Rielle gives us, on the descriptive side, here is the weakness, it is this, this is the pattern." Then she can assist us on the other, okay, now how do we implement it in the classroom. Are you and uhmm...what about the parents, are they definite that it must be formal testing or it just must be a solution to these questions.

S: I think ... in Sam's case ... we didn't go into depth with the parent, we just asked them. You know...

G: Just said there is district involvement. Yeah.

S: ... and got her to sign the form, so I don't think it matters so much there; although, I am more interested in the formal stuff maybe than the parents are. But with Calabash's case... I think the parent would like to see formal testing happening...

G: Uhm hmm.

S: ...because, I was not able to initially answer that question about when it would be done. We got into this discussion about what was happening at the district level and this kind of thing and she had indicated to me...she had asked me if I wanted her to call and to raise hell and I said no...

G: Yeah, we'll see how it goes...

S: ...I think for everyone's ... and not just for (tape inaudible) sake. I mean as far as formal versus nonformal we need to do something very specific here.

G: Uhm hmm. Yeah.

S: Just to make the parents...feel better about it better too.

G: That's good. Yeah, Cindy...Rielle...

S: ...I haven't back so ... we were talking about the same fellow... and we made a reference a parent to a local doctor, what was his name...

G: Swintee.

S: Swintee, and I haven't heard back on from them on that either, they've gone to their doctor, I take it, for a reference...

G: A referral.

S: And ... we should be hearing on that soon, but what I'm saying is that the parents have taken steps on their own obviously, they are taking him in to this Swintee guy... getting the referral, she thinks she likes this idea of looking into the attention deficit business.

G: Yeah.

S: And that's something they can also do here with informal testing to back that kind of thing up. We certainly should be doing that, if the parent is taking the doc...you know, ...

G: Yeah.

S: You talk about formal testing or not formal testing, but if the parent is dragging the kid off to a doctor to test for something that specific we should be backing it up too.

G: Yeah, the formal testing will identify the A. D. D., the same way...so whether it becomes formal...

S: But it... I mean, I assume Swintee is going to do some kind of formal inventory on what he's doing... and the information we pick up will either back up some of the parts that he comes up with, or we'll see conflict and wonder again.

G: Well, Rielle asked me to check with you, whether you're really stuck and it really needs to be formal testing, and I said that you have no problem with laying it on the table and that we'll do that. We'll just... when we meet... just say whether that's what you want, and she'll go with it. I'm not sure where she's coming from because she's so anxious.

The discussion moves away from the pupil learning difficulty topic and centers on the problem with the political atmosphere within the district.

S: She's in between a rock and a hard place, because she's obviously being cut back at the district and

the schools are clamouring for those services that we were promised.

G: Well Jane told me there's numbers like 225 special needs kids in this district and 150 of them are already designated and have to be tested, so yeah, she's dealing with a really serious load. But we still can't, I can't see us backing up, if our questions are "What is underlying this weakness? This is what we're seeing in the classroom what's underlying it, where do we go from here?

S: Yeah, there quite specific questions, they are quite specific concerns and ... when it comes to something like this kind of testing, well I mean there's ... the one aspect of it that we were promised this backup when we...

G: I know, I know.

S: That's ... from a labour point of view, my primary concern is that we were promised this kind of backup by that kind of staff. And...I am not high enough up to get into the business of who's letting us down, whether its the district...

G: Or the board...

S: Or whether its those people who are running that program that have reorganized to some kind of extent that leaves us out in the cold or whether they are trying to back off from that kind of commitment.

G: Yeah, it...

S: To put it in a handshell... I mean, I don't know, Rielle wasn't involved, but who was the woman who came around and spoke to us who was from that ... those ... that group of people.

G: From the district? Jackie Lod.

S: Jackie Lod, was the one who came in and spoke to us, I mean she came in and told us that we would have this backup service...

G: Yeah, it probably was her.

S: Now I think, I think my self, that if she's reorganized so that she's not able to get us that support...

G: Uhm hmm.

S: ... then there's something wrong there. And I also think that if she made that pledge to us and then is sitting very quietly while she's being cut back...

G: Yeah.

S: ... and isn't raising hell and telling us what's going on so that we can help her so...

G: Yeah.

S: ...to go after the board for the funds that they need...

G: Uhm hmm, well that...

S: ... and ultimately the provincial gov't, then its wrong there. So, right now I'm inclined to turn it back to her and say Look, something has to be done, we either need to ... set things straight and get the support we were promised or we need to go after the people who are not providing you with the money to do it.

G: Yeah, and you're still left with two students sitting in your classroom who you would like prepared for grade eight.

S: Right...well I'm not from the labour perspective but from the teacher perspective, yeah, there's two kids ... who can benefit, and I don't think there's any reason...

G: So we say No we'll handle it on our own...

S: Yeah, yeah.

Teacher and teaching partner return to the discussion regarding the two pupils' learning difficulties and how best to address them.

G: No ... no, I'd prefer to pursue it. What I've left with Rielle is originally we said we'd use our friday school support meetings... and review those two clients, so those will be the guys that'll be on for the 22nd. And she asked that the past teacher and the present teacher, so that we have a longer picture... are you comfortable with that?

S: Yeah, yeah, yeah... okay, I was just trying to think whether it was someone who was in the school now... its Cory.

G: Yeah, its Cory, so that's why I've made him up a note...

S: Good.

G: ... and its 2 o'clock, what I'd like to do is, I've got...

S: Let's sit down with him ahead of time just to hear him out so that we don't get any big shock.

G: Oh, okay. Yeah, his approach to Calabash, like last year when I first met Calabash, I went wow, this kid needs to be tested. Because I thought it was a ... situation where even medication can't give him a hand. Because that was well beyond...his tremor is well beyond nerves, or stress...

S: Yeah, but have you noticed him not doing that quite so much?

G: Oh, he isn't?

S: I think it a maturity thing. I ... mean I have already pinpointed this as a big part of Calabash's problem and that's something that they can test for and that's just the ... plain old pressure...

G: Yeah.

S: ... that he puts on himself and his inability to deal with situations where he finds himself getting into a little bit of trouble. I mean, right from the beginning of the year I was working with him on that...

G: Well Don will be at that meeting too.

Teacher begins discussing what he has been doing in class to assist one of the pupils--teacher is drawing on data through recollection.

S: Yeah, Don will probably back me up and help me out on that. I mean my approach to him is not ... in that respect to send him out for help or get him into ... I know he'll get into a little bit of

trouble, he'll get that tremor, that nervous tick, he'll get himself deeper and deeper into trouble because he reacts so badly to any adversity.

G: Yeah.

S: And my reaction to that right from the beginning of the year has been to, you know if he writes a bad test, I'll walk over and...

G: Where has he...

S: ...slap it on his desk and ahh, big deal, do it better next time...

G: Yeah...Yeah.

S: ... and take it easy, you know when he starts exhibiting that freakout type of behaviour and I catch it quick enough...and even when he gets himself into big trouble, my reaction has been to say "Calabash you blew it, now you've got to pay the price, big deal, pay the price and ...

G: And continue.

S: and get on with it. Don't...You know I've even stopped him at a couple of points and I've given him heck and he's gotten that tick, that tremor, and he's all of a sudden acting like that. I'll say look at how you're acting, you're going to go in there back into this classroom right now you're going to get into more trouble...

G: (tape inaudible)

S: ... aren't ya? And ... he admits it now. Like he'll say "Yah" and I'll say "Well, okay, relax, you're not... going in front of a judge in a couple of minutes to face the death penalty...

G: Uhm hmm.

S: ... let's put this in perspective.

G: Yeah, where are you going to get the most accurate reading of where Chris is at? From observation by district people or from formal testing, or just worried ... is Calabash in a formal testing mode, or are we going to get more accuracy there, or...

S: You're not going to get accuracy, 100% accuracy
        because of this...I mean he may be nervous, all
        that kind of thing. And that'll affect Calabash
        more than it affects other people, that kind of
        testing. I ... am just wanting to make sure, I
        mean I know that I can cope with helping Calabash
        along ... as I am so far working with him. You've
        been into that too. His behaviour and his adverse
        reaction to problems and all that kind of thing,
        just making it easy and making it enjoyable for
        him when ever I can and at the same point making
        him...

The teacher seems to be suggesting, in the paragraph above, that
what he has been doing is helping and he will continue with
the present strategy. This suggests that the teacher is not
questioning the data and attempting to reformulate the
problem.

G: Yeah, making him accountable.

S: ... and try to be accountable. But I also want to
        know if there's a specific math problems, you
        know...

G: Good.

S: ... is there something specific there that I have
        to know about before I go approaching him. Like I
        did with Sam the other day, you know where, ... I
        wasn't really, ... we've been into this business
        of does he need testing, he's not going to test
        out and all that kind of stuff and so ... I talk
        to the whole class and tell them that my
        expectation is that they're ready to get 19 or 20
        on the spelling test and the way he freaks out, he
        goes storming out of the back of room and I have
        to go out and deal with him and talk to him and
        calm him down...

G: Hmm hmm.

S: ... has me backing up again and saying "Am I being
        to tough there?" Is it...

G: Or is it (tape inaudible)

S: ... should I be ... I can tell him right now
        (knock on the door... S pauses the tape.)

Tape starts again

S: Yeah, we've got to wrap up.

G: You want...

S: I'll eat my yogurt.

Teacher identifies a problem he senses when Cindy comes into his classroom to observe the pupils.

G: Yeah, so we can get back to.... I'd like to have Cindy come in and also observe...

S: Uhm hmm.

G: ... because she's more on the programming side, I was a little discouraged. I hope Rielle, she's coming in Monday, and I gave you that note.

S: I wish, yeah...

G: I hope she gets ... a little more involved with them.

S: I hope she gets a little more relaxed about that we're not enemies...

G: Yeah.

S: She kind of stormed into the back of the class and sat down and didn't have two words to say to me and...

G: Well, I know you wanted to introduce her and there really wasn't a sort of nice time to say "Here, do you want to join our group." You know...

S: No ... she really didn't make it ... with her demeanour... na its too hard.

G: Yeah, but anyway.

S: She, she, you've got to get on with it.

The teaching partner draws the discussion back to the central focus of the meeting: the two pupils' learning problems.

G: So you're fine with "we'd like to know specifically with what their areas are? What's the underlying disability, or difficulty, whether its a memory or perception or whatever--as you said learning style. And what the pattern of this weakness is, are you going to present it in

another style. And then will grow out of that, onto the question of it, is formal what we want or ...

S: And what are the goals that I should be setting for these guys?

G: Right. Okay.

S: What are the . . . is it fair for me to say "Sam could be trying harder in spelling?" I don't know that yet.

G: Right.

Teacher and teaching partner agree on the steps to take next regarding the learning problem concerning the 2 pupils.

The teacher now focuses on the problem he is facing with the writing of report cards for the two pupils.

S: I've got to write a report card so I've got to know what proper expectations for these kids are.

G: And that occurs, as you said, in spelling for Sam, and math for Calabash...

S: ... and math for Calabash...

G: ... and math for Calabash, and ...

S: ... and writing for Sam ...

G: Okay, writing...

S: ...writing for Calabash...

G: Yeah, yeah, she looked at Sam...

S: ... short term memory job chores.

G: For both?

S: ... study, more so for Sam than for Calabash.

G: Okay, but there's...

S: I find that when Calabash studies, I think he's more capable. I mean my feeling is that he's... kind of capable and that Sam has some problems... that make him incapable as assigned currently. But I mean, I need to be able to comment on these on

the report cards so I need to be able to set
proper goals for these two guys...

G: Yeah, and feel like you've got the background to
make the statement.

S: Yeah, that's the biggest thing about the testing,
I can't do that right now.

Teacher and teaching partner now begin to discuss the arrangement
of a meeting with other people from the school and the
district.

G: Yeah, that's right. You mentioned getting hold of
Cory. Would you like to sit down with him ahead of
time?

S: Yeah, I could speak with him informally.

G: Oh, okay.

S: I just don't want to sit down at a table where
we're pushing for testing for these two guys...and
hear at that point that he doesn't think they need
testing.

G: Yeah, yeah.

S: You know, you play the game of politics.

G: Yeah, no. And also now that we know you would like
and I will transfer these ideas over to the
"teacher wants list" also. Maybe you'd like to
review them yourself.

S: Sure...

G: Which way you feel your...

S: Are we doing okay with the math? You know we're
doing that.

G: Yeah,... and then we've been interrupted by a lot
of ...

S: And setting up this remembrance day assembly took
a lot.

G: Well, those are yours, hand that on to Cory if and
when you're okay with it.

S: October 25th, Friday at 2 o'clock.

G: Yeah, I'm not too happy with the two o'clock, she's all tied up writing something.

S: What ever it takes.

G: Yeah, but we can only ask you guys to stick around for an hour after that point.

S: This is the report card writing day, isn't it? and I've got to find out if I'm getting my computer yet, because I want to ... do my report cards on it.

End of meeting.

During this conference, the teacher identifies three problems: (1) learning difficulties of two pupils, (2) political atmosphere in the district, and (3) the demeanour of a district specialist when she observes in the teacher's classroom. With respect to the first problem, the teacher begins to draw on his experience with pupil learning styles; however, he does not develop this train of thought--the problem is not reformulated. This conference is best classified as "thoughtful."

Sample Transcript #2

Note that coding done by the researcher is shown in ▓shaded▓ ▓form▓ and that all names used are pseudonyms.

Teacher: Anthony (A) (classroom teacher)

Teaching partner: Louise (L) (classroom teacher)

Date: May 23/92

Time: 3:15 pm.

▓The teaching partner begins by reviewing what she did during the classroom observation of the teacher and his pupils.▓

L: Okay Anthony, I'll go first. You've asked me to observe your lesson for 20 minutes and I'm supposed to watch, or I was to watch which groups were on task the most during the 20 minute lesson. Now they were doing cooperative learning and the deal was they had to work together as a group and they had a task master and a cheerleader and ... (tape inaudible). And what I've done here is just done a tally; I've completed a checklist of times that I noticed a group off-task, seems a little negative but its a little easier than watching who's on task. Hopefully this tally will assist you in some way to find out which groups were working the hardest.

A: Yes, I just want to say that, from my perception, what you did was exactly what I'd asked.

▓The teacher confirms that the teaching partner did as she was asked; the teaching partner then provides the teacher with her observations.▓

L: ...you've asked for. Okay, well it was quite simple to do. Basically I decided they were off task if, one, they were talking about something that had nothing to do with the topic, or two, just fooling around or just not working as hard as possible. So, that ... my interpretation of off-task might not be the same as yours, but...

A: But you found you could... hear pretty well when you moved around from their discussions whether they were off or on...

L: Yes, I could hear quite well. Now, basically
       speaking, because maybe 20 minutes or an excellent
       topic, most seem to be on task most of the time.
       Of the seven groups, number one group over there,
       was by far the farthest ahead, I never saw them
       off task once. Then, would be groups three and
       seven, they were off task twice... I sort of
       calculated there. Group two was off task four
       times. And groups three, five and six were pretty
       close, they were off task just three times each.
       So although one was right ahead, the rest were not
       off task all that often. It seemed to be just one
       or two people that would get them off task...

A: Okay, I know we didn't go really go into it, but
       did you try and keep any record of how long they
       were off task when they were off task.

L: Actually, I didn't keep a record but I did notice
       when I walked by they would very quickly get back
       on task.

A: Cause...

L: I stood there, so they weren't off task for very
       long.

The data suggest that the pupil groups under observation were not
off-task very often; and when they were off-task, it was for
a short period of time.

A: Okay, but your influence probably had some effect,
       or your presence had some influence.

L: Yeah, it could have. I think even being off task
       was minimal, I didn't think they were off task a
       lot. So ... they might have gone back to work
       quite quickly had I not even walked by, and I was
       looking for any little thing that looked like they
       were off task, not a major disruption, but just
       enough so that I could put something on the check
       list.

A: Okay, so we have this one group who is obviously
       doing better in staying on task than all of the
       others. Now looking at that group I'm not sure if
       I can pinpoint why that is. I don't know if you
       want to give any thoughts or suggestions as to why
       that is with that one group.

The teacher appears to be trying to create a problem to discuss
with the teaching partner.

L: No, I don't know why, it seemed to be just well placed. You know all four of them, just luck, they work well together. I don't have a real reason, I you've done a good job in putting them in groups. It just didn't seem to be that one person to get them off task, they were fortunate today.

A: So, I wonder if we need to do this again Louise, and ... see if the same sort of situation develops where you have that same group on task virtually all the time, the other ones sometimes off task or whether its a fluke.

L: I would be interested to see if it happened again, if it happened again, I think we could almost come to that assumption that group of four works well together, for what ever reason. You know, I think the topic, what they were working on, wasn't because it was less interest in other areas it was, maybe take a guess that group just seems to be working well, but we would have to definitely do it again, I think, to prove that.

A: Okay, well I find the information you've gathered quite useful and as you say, maybe we'll have to do this once again later on. Thank you.

L: You're welcome.

End of conference.

This conference appears to have been contrived for the benefit of the researcher. The teacher has not mindfully identified a problem which is perplexing to him. This "problem" was selected even though the data suggest that pupils were on task almost all of the time. It would appear that the teacher was trying to make the conference last longer by engaging the teaching partner in some dialogue. As can be seen from this transcript neither the teacher nor the teaching partner gave the problem any consideration. This conference does not show evidence of: (1) identification of a perplexing or surprising event or condition, (2) relating past experience to the current problem, nor (3) deriving hypotheses and testing them logically. This conference is an example of "data exchange."

Sample Transcript #3

Note that coding done by the researcher is shown in shaded form and that all names used are pseudonyms.

Teacher: Jackie (J) (classroom teacher)

Teaching partner: Mary (M) (classroom teacher)

Date: Oct 29, 1991

Time: 2:00 pm.

Teaching partner and teacher begin by reviewing what they saw as the focus of the classroom observation.

J: Thank you, I enjoyed being in your classroom, and observing the students working with you. Just to go over what we were looking at was we were looking at the students' ability to follow directions, and try to reinforce the skill that we have been working with the skill of precision and accuracy; trying to do that in the context of an art lesson which involves a great deal of listening and following through on directions.

M: That's right. We need to stress that this was for listening to directions rather than reading written directions.

J: Right. Okay. So I was paying attention to your directions. I was also paying attention largely though to the student comments, the student questions.

M: So you were to discover how well they understood my directions by walking around and listening to their conversations as they tried to do the task. Is that right?

The teaching partner begins sharing the data. The teacher responds by clarifying or asking questions of the teaching partner for further clarification.

J: As well as their questions, perhaps, of one another. And the questions that they raised in the general session. So,... as the lesson proceeded...I noticed some of your comments that really stressed the need to be precise and really accurate.

M: So do you feel that it was good that I used that terminology?

J: Well, I feel that it was extremely consistent with what you were trying to achieve... the students kept hearing that. And that's a term they'd heard before.

M: Oh, so a complement to the types of activities you've been doing with them in the thinking lessons.

J: Right, and they were... very clear on the purpose of your lesson. They certainly knew that the idea was for them to follow directions and to be precise. You also mention, later on, "Keeping the ruler as consistent as you can." You were once again reinforcing that. There were a number of comments that came up, in particular this one comment, I heard it a number of times where a student would say "Oh yeah, I get it" as they watched you... demonstrate. After they saw it once, I'd hear someone say that, then you'd do it again...

M: It's interesting that you heard that. Now that's something I wasn't tuned into. I was concentrating so much on just getting the idea across that I didn't hear that. It's good to have that from you.

J: It was very consistent throughout the class. A number of people at different points said "Oh, I get it." But... and then you mentioned once again "Just for the sake of your understanding, I am going to go completely through one part." Once again emphasizing your understanding. What was interesting was that you asked "Any questions so far?" and there were no hands at that point.

M: Do you think that's because they understood or they were overwhelmed? Cause we could look at that two ways.

J: What would your impression be?

M: I had the feeling that they were catching on.

J: Uhm hmm.

M: I also had the feeling that they were quite intrigued with the process.

J: And as a result, I think... they were quite keen on the result that they got, because it was quite a tedious process as you mentioned. But many of them really stuck with that. So, I would agree, I think you were very clear in your directions and, quite frankly, they did catch on as I could tell from the comments, "Oh I get it." But that was an interesting point that at that point there were no questions. And your comment again "The hardest task is being patient." Once again

reinforcing that concept. I also noticed you reinforcing the concepts that we have done on meta-cognition, because you said "It wise to keep saying to yourself, I'm inside, I'm outside."

M: Oh, I see, of the line. Yeah.

J: And that's sort of thinking about you thinking, self talk, keeping yourself on track. I just noted that ...

M: That was an accident, I didn't plan that.

J: Well it certainly reinforced what I've been doing with the students. You asked a question "How many students have discovered this is like weaving?" That was an interesting one a number of students responded to. And so I was trying to track your direction at that point. Now did you have any feedback or an insights on that?

M: Well for some reason, I feel as a teacher, great disappointment when no-one asks a question. I don't know why exactly. You almost feel that that's an indicator that the students are tuned in and turned onto the idea.

J: But it's interesting, we place a lot of value on questioning with our students.

M: Yes, we do.

The discussion moves away from the data collected to addressing different types of pupil questions and when they should be expected by teachers.

J: You and I both feel quite strongly about getting kids to ask thoughtful questions, and this is such a different kind of activity where you are giving a direction and the kind of question that would come out of that would not be so much a thoughtful question as a clarification question. And really, it seemed to me that the directions were so clear they didn't need to ask those kinds of question.

M: So the task was cut and dried.

J: Yeah, it wasn't...the goal of the activity wasn't really to stimulate...

M: stimulate thought...

J: ... thinking...

M: ...yeah, I understand...

J: ...as much as to follow the directions and to be precise.

M: That's true. So maybe I should accept the thought that it was precise.

J: Uhh hmm. And its interesting that at some points when we're teaching, the lack of questions is a disappointment...

M: It almost throws you off.

J: ... you want them to be curious. Like, for example, when you're doing your ancient Greece unit; you know, if you have no questions about the ancient Greeks or the ancient Egyptians that would be disappointing.

M: Uhh hmm.

J: But if they have no questions about how to complete that project, it can indicate something different.

M: Yeah, I agree with you.

J: And I think that's something we're just becoming aware of in teaching is the difference in questioning. You know, questions to just clarify or directions and questions that are thoughtful.

M: And our point, you know, was to see if they could follow a task, step by step. We do so much in the way of thinking activities now that we're almost worried that they can't do the other. Well, what was their reaction when they started to work.

J: Okay, the comments...

Beginning of editorial comment.

M: Should we review here what the task was...for the sake of the listener.

J: Maybe you could go through that.

M: Alright, its important, I think, for the listener of this tape to realize that the students just had to do a paper-pencil task, a very simple art project in which heart figures were drawn and then straight lines were woven in and out of the heart--the outline of the heart. So that when they finished with an entire piece, the hearts would show through as a result of the spacing of the lines rather than as a result of the outline.

End of editorial comment, the discussion moves back to data-sharing (i.e., student comments).

J: Uhh hmm, it's a very effective finished product. Some of the interesting comments, questions that I heard. You know, can you put a heart with an arrow, was one; to which you responded "Yes." So that was a question where someone maybe wanted to go beyond what the example had shown.

M: And I felt then at that point that maybe I should have included that, I had made it as simple as possible. And that child was telling me "I want to do something a little more elaborate here." And I needed to get the idea across that you can change the outside shape any way you want, it won't affect the technique of weaving.

J: That's interesting that you welcomed that kind of variation. There were comments from some students "I don't know how to draw a heart." And that threw some of them, it was interesting how other students ... solved that. Other students ... showed them and that was an interesting comment.

M: That's not . . . I assumed that, I assumed that they could draw a human heart. Maybe next time I should say take two human ears and put them together, or some kind of comparison like that.

J: Okay, there's one comment, "I'm getting frustrated already and I've hardly started.

M: An impatient person I would guess.

J: Yeah. And that's one of the things, that they'll need to persevere and to stick with it. Let's see, "Do we have to use felt pens, was another" question that arose.

M: I don't remember how I answered that one.

J: Don't you. I don't have recorded the answer for that one. That may have been answered by another student.

M: Another student, yeah. I don't remember receiving that question, so maybe I didn't.

J: Because I did notice some students were using ink pens as well.

M: Now that's something I should probably explain further to them next time. That felts have a nice width on the tip so that you can make the lines a little more quickly

straight across the page, where as a pen is too fine, a
pencil crayon is too fine. Takes too long.

J: Another comment, "I can't make a heart." Which was a
stumbling block for some. Another student commented "I'm
just going to use one colour, it's too hard with more
than one."

M: That was an option as I recall. It was interesting how
many students choose to do a variety of colours and
create a pattern with that.

J: And what I found interesting was the number of
variations that there were even in that structured
activity.

M: Uhh hmm.

J: In terms of the number of colours the students used, the
heart shapes, they could have been extremely simple
right up to the person who wanted to put an arrow in the
heart and get quite a bit more elaborate with the
colours. Lets see, a comment "Shall I put the lines this
way?" That's one that wanted to go diagonally.

M: I remember talking to one student who was using diagonal
lines, and I said "That's a very interesting technique."
And that's fine, as long as they were all consistent. If
you start that way you should finish that way. And I
expected that.

J: And that's something I did notice. The students did not
seem hesitant to try ... the variations on the page. You
get some people asking the questions to clarify that
there was an openness to try new things.

M: I suppose you could look at that two ways.... I didn't
decide before I gave the task... I didn't make the
decision that I wanted thirty one all the same. But
neither did I tell the students that you may come up
with variations. It was interesting how they did that on
their own, now that could be sign that they feel very
comfortable. Generally, that the atmosphere, the
atmosphere is your individual ideas are always
important. So I like that kind of feedback.

J: Right, it does indicate that at least they are not
afraid to try something...

M: Uhh hmm.

J: ... that if they have an idea they can run with it.

M: Uhh hmm.

J: We had few separate comments, "We don't have a ruler" and ...

M: That's typical of the age group, grade sevens are like that.

J: Comment, "Do you think this is a good colour?" directed at a neighbour.

M: Oh, oh.

J: Just checking what his neighbour thought. Just as grade sevens are prone to do. And I thought a nice comment I heard a number of students say "This is fun."

M: Oh, I'm glad.

J: Which is an interesting comment because you had mentioned so much the . . . of how it can be a bit tedious, but sometimes they were really... I noticed quite intent on the task, it was quite difficult for them to stop at the end of the session. They weren't sure they could finish it at some other point. But they certainly were well onto the task and you know, but many of them were so pleased with the results. Many of them found it quite satisfying. It though it was very tedious in and of itself.

The focus of the discussion moves away from pupil questions and comments in general to how specific pupils coped with the teacher's verbal instructions during the observation.

M: Do you think that the people like John and Venessa who have some trouble comprehending general information would be able to do this successfully. Did you happen to tune into a couple of those students?

J: Now I didn't... I can't recall tuning in too much to Venessa. But, I did pay particular attention to John, because he was sitting on the end. And I do know that, you know, he requires quite a bit of help, and he was very much involved in the activity. He drew quite a number of hearts on his page. And, from my listening to him, although he's not a highly verbal child, I did make an effort to dialogue with him a little bit. And I'm aware that that probably wasn't part of my task, but... his attitude was really good, and he was able to do the task. I didn't have to, at any point, have to instruct him further. And I certainly didn't get any questions from him on how to do the task. He was working away on

it, and he really lit up when I commented on him...you know his design.

M: Oh, that's good to hear.

J: So it was interesting, I found it particularly interesting, he was able to do the task just like everyone else and there was no sense in which he was frustrated by it or confused about how to carry it out. So obviously, the directions that were given reached his level of comprehension.

M: Well, Jackie, I'm really thankful that you came because its important for me as a teacher to know that I can find a task, have a purpose for the task, and reach thirty-one children with 31 different view points and different levels of ability. So I'm glad that we were successful, and I really thank you for your time.

Teacher and teaching partner appear to begin to conclude the conference.

J: Well, thank you. And what I was interested in was how engaged all of those 31 kids were in the process at what ever level and that was really interesting because you really do have such a range of abilities in there. Is there anything in just in conclusion that strikes you ... that your goal was reached of the direction.

M: I had a fairly good feeling about it. I was a little frustrated in that in my walking around the room I seem to be answering the same questions over and over. But then I had to go back and realize that in the first set of instructions I must have said 6 or 7 different things, that there were 6 or 7 steps. And reviewing that in my own mind, I would try to reduce my requirement of their memories to three basic steps, because for many children, many adults too, we tend to think in terms of three points, or three steps, or three rules and we can hang onto that. I had a feeling that there was a little bit of a break down because there was too much to absorb. But the results that are on the door now are beautiful.

In the statement above, Mary identifies a problem that is perplexing (or as she put it: frustrating), she reframes it in light of the instructions she had given and her past experience with the number of instructions children and adults can keep track of at one time. Then, she hypothesises that reducing the number of steps in the future will help reduce the repetitive nature of the questions pupils will ask.

J: Right.

M: And so that helps to really enjoy it.... It sure is
    great that two teachers can work together in a team
    approach like this so that we can benefit from our
    learning. Now if you hadn't come, I might not have the
    kind of positive feedback that you gave me.

J: Thank you.

M: Let's do it again.

    End Conference.

    During this conference, it appears that the teacher had
asked the teaching partner to observe her class to satisfy a
curiosity. However, at the end of the conference the teacher
very quickly identifies a problem or frustration and then
reframes it. The teacher even provides evidence of mentally
testing a hypothesis. Although evidence of the three points
signifying reflective thought occur only briefly at the end
of the conference, they provide evidence that the teacher
has indeed reflected about what occurred. It appears that
this reflection took place before the teacher and teaching
partner met for this conference.

APPENDIX B

Examples of Determining Excessive Kurtosis and Skewness

The obtained value for kurtosis, for each variable, was tested for significance against the null hypothesis that kurtosis was equal to zero (H_0: $v^2 = 0$) using the following formula to convert kurtosis values to z-scores:

$$z_{obs} = \frac{K - 0}{s_k}$$

In the preceding formula, K is the value reported for kurtosis and s_k is the reported standard error for kurtosis. With $\alpha = 0.01$, H_0 can be tested using a z-table; H_0 is tenable if:

$$-2.326 < z_{obs} < 2.326$$

Using the values reported by SPSS-PC+ Frequencies (1990) for ITS2, one finds that: $K = 5.804$, $s_k = 0.887$. Substituting these into the equation above:

$$z_{obs} = \frac{5.804 - 0}{0.887} = 6.543$$

$$z_{obs} = 6.543 > 2.326$$

The null hypothesis that kurtosis is equal to zero is rejected. It is concluded that kurtosis for this variable is significantly different from normal.

The significance of the skewness values for each variable were tested similarly to kurtosis. The obtained value was tested for significance against the null hypothesis that skewness was equal to zero (H_0: S = 0) using the following formula to convert skewness values to z-scores:

$$z_{obs} = \frac{S - 0}{s_S}$$

where S is the value reported for skewness and s_S is the reported standard error for skewness. Setting $\alpha = 0.01$, the null hypothesis is tenable if:

$$-2.326 < z_{obs} < 2.326$$

Using the values reported by SPSS-PC+ Frequencies (1990) for ITS2, one finds that: $S = -2.361$, and $s_S = 0.456$. Substituting these into the equation above:

$$z_{obs} = \frac{-2.361 - 0}{0.456} = -5.178$$

$$z_{obs} = -5.178 < -2.326$$

The null hypothesis that skewness is equal to zero is rejected and it is concluded that skewness for this variable is significantly different from normal.

APPENDIX C

Data Screening Output from the
SPSS/PC+ Frequencies and Regression Program

DATA SCREENING -- PRE- AND POST-MEASURES
COMMAND FILE: B:\DATASCRN.COM

```
SET WIDTH=132.
SET LENGTH=24.
TITLE 'DATA SCREENING'.
DATA LIST FILE='B:\N30DATA.ASC'/
      GROUP 12 ITS1 178-181(2) ITS1T 158-161(2) SBI1 168-171(1)
      EF1G 14-17(2) EF1P 19-22(2)
      OCIW1 38-41(2) ACH1 28-31(2) BEH1 33-36(2) ATT1 43-46(2)
      ITS2 183-186(2) ITS2T 163-166(2) SBI2 173-176(1)
      EF2G 48-51(2) EF2P 53-56(2) OCIW2 68-71(2)
      ACH2 58-61(2) BEH2 63-66(2) ATT2 73-76(2)
      ENTH2 123-126(2) FDB2 128-131(2) INST2 133-136(2) OPP2 138-141(2)
      PACE2 143-146(2) STRC2 148-151(2) TASK2 153-156(2).
DESCRIPTIVES ITS1 ITS1T SBI1 EF1G EF1P OCIW1 ACH1 BEH1 ATT1
             ITS2 ITS2T SBI2 EF2G EF2P OCIW2 ACH2 BEH2 ATT2
             ENTH2 FDB2 INST2 OPP2 PACE2 STRC2 TASK2/
      OPTIONS=3.
FREQUENCIES VARIABLES=ZITS1 ZITS1T ZSBI1 ZEF1G ZEF1P
             ZOCIW1 ZACH1 ZBEH1 ZATT1
             ZITS2 ZITS2T ZSBI2 ZEF2G ZEF2P ZOCIW2 ZACH2 ZBEH2 ZATT2
             ZENTH2 ZFDB2 ZINST2 ZOPP2 ZPACE2 ZSTRC2 ZTASK2/
      HISTOGRAM=NORMAL/FORMAT=NOTABLE/STATISTICS=ALL.
SET LENGTH=59.
REGRESSION
      MISSING=MEANS/
      VARIABLES=GROUP ITS1T SBI1 EF1G EF1P OCIW1 ACH1 BEH1 ATT1/
      STATISTICS=COEF TOL/
      DEP=GROUP/
      ENTER/
      SCATTERPLOT(*RES,*PRE)/
      RESIDUALS=OUTLIERS(MAHAL) DURBIN.
REGRESSION
      MISSING=MEANS/
      VARIABLES=GROUP ITS2T SBI2 EF2G EF2P OCIW2 ACH2 BEH2 ATT2/
      STATISTICS=COEF TOL/
      DEP=GROUP/
      ENTER/
      SCATTERPLOT(*RES,*PRE)/
      RESIDUALS=OUTLIERS(MAHAL) DURBIN.
REGRESSION
      MISSING=MEANS/
      VARIABLES=GROUP ENTH2 FDB2 INST2 OPP2 PACE2 STRC2 TASK2/
      STATISTICS=COEF TOL/
      DEP=GROUP/
      ENTER/
      SCATTERPLOT(*RES,*PRE)/
      RESIDUALS=OUTLIERS(MAHAL) DURBIN.
DOS.
```

           SPSS/PC+ The Statistical Package for IBM PC
3/12/93

```
SET WIDTH=132.
SET LENGTH=24.
TITLE 'DATA SCREENING'.
DATA LIST FILE='B:\N30DATA.ASC'/
      GROUP 12 ITS1 178-181(2) ITS1T 158-161(2) SBI1 168-171(1)
      EF1G 14-17(2) EF1P 19-22(2)
      OCIW1 38-41(2) ACH1 28-31(2) BEH1 33-36(2) ATT1 43-46(2)
      ITS2 183-186(2) ITS2T 163-166(2) SBI2 173-176(1)
      EF2G 48-51(2) EF2P 53-56(2) OCIW2 68-71(2)
      ACH2 58-61(2) BEH2 63-66(2) ATT2 73-76(2)
      ENTH2 123-126(2) FDB2 128-131(2) INST2 133-136(2) OPP2 138-141(2)
      PACE2 143-146(2) STRC2 148-151(2) TASK2 153-156(2).
DESCRIPTIVES ITS1 ITS1T SBI1 EF1G EF1P OCIW1 ACH1 BEH1 ATT1
The raw data or transformation pass is proceeding
```

Number of Valid Observations (Listwise) =   26.00

Variable	Mean	Std Dev	Minimum	Maximum	N	Label
ITS1	6.68	.33	5.80	7.00	26	
ITS1T	.77	.18	.40	1.00	26	
SB11	8.35	6.54	.0	26.0	26	
EF1G	3.75	.61	.0	26.0	26	
EF1P	4.56	.39	2.29	4.71	30	
OCIW1	2.68	.11	3.78	5.67	30	
ACH1	1.74	.24	2.47	2.93	30	
BEH1	1.63	.23	1.25	2.20	30	
ATT1	2.67	.25	.96	1.92	30	
ITS2	6.70	.45	2.05	3.05	30	
ITS2T	6.82	.20	5.20	7.00	26	
SB12	6.85	5.95	.30	1.00	26	
EF2G	3.62	.76	.0	20.0	26	
EF2P	4.53	.50	1.86	4.57	30	
OCIW2	2.68	.11	3.11	5.67	30	
ACH2	1.77	.28	2.47	2.93	30	
BEH2	1.61	.23	1.15	2.21	30	
ATT2	1.69	.24	.93	1.90	30	
ENTH2	2.83	.36	2.26	3.07	30	
FDB2	2.94	.26	2.08	3.48	30	
INST2	2.63	.13	2.40	3.63	30	
OPP2	2.40	.24	2.31	2.89	30	
PACE2	2.76	.26	1.84	2.94	30	
STRC2	2.60	.23	1.96	3.02	30	
TASK2	2.72	.22	2.17	3.08	30	

The following z-score variables have been saved on your active file:

From Variable	To Variable	Z-score Weighted Valid N
ITS1	ZITS1	26
ITS1T	ZITS1T	26
SB11	ZSB11	26
EF1G	ZEF1G	26
EF1P	ZEF1P	30
OCIW1	ZOCIW1	30
ACH1	ZACH1	30
BEH1	ZBEH1	30
ATT1	ZATT1	30
ITS2	ZITS2	30
ITS2T	ZITS2T	26
SB12	ZSB12	26
EF2G	ZEF2G	26
EF2P	ZEF2P	30
OCIW2	ZOCIW2	30
ACH2	ZACH2	30
BEH2	ZBEH2	30
ATT2	ZATT2	30
ENTH2	ZENTH2	30
FDB2	ZFDB2	30
INST2	ZINST2	30
OPP2	ZOPP2	30
PACE2	ZPACE2	30
STRC2	ZSTRC2	30
TASK2	ZTASK2	30

This procedure was completed at 20:05:37

ZITS1   ZSCORE(ITS1)

```
     Count   Midpoint
         0     -2.85
         1     -2.60  ████
         0     -2.35  :
         1     -2.10  :████
         0     -1.85  .
         0     -1.60     .
         2     -1.35  ███████:
         0     -1.10       .
         2      -.85  ██████████:█
         0      -.60
         4      -.35  ████████████████:█████
         0      -.10           .
         2       .15  ████████:      .
         5       .40  ███████████████:█████████████
         2       .65  █████████:.
         7       .90  ████████████████:█████████████████████████████
         0      1.15
               I....+....I....+....I....+....I....+....I....+....I
               0         2         4         6         8        10
                            Histogram frequency
```
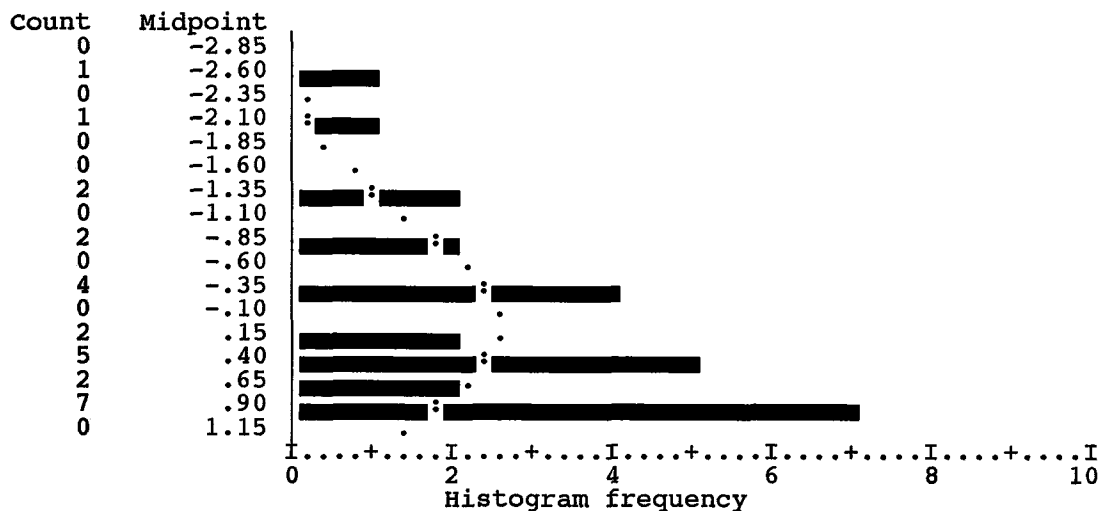
ZITS1   ZSCORE(ITS1)

Mean	-8.284E-16	Std err	.196	Median	.370
Mode	.971	Std dev	1.000	Variance	1.000
Kurtosis	.754	S E Kurt	.887	Skewness	-1.152
S E Skew	.456	Range	3.608	Minimum	-2.636
Maximum	.971	Sum	-2.154E-14		

Valid cases   26   Missing cases   4

ZITS1T   ZSCORE(ITS1T)

```
     Count   Midpoint
         1     -2.0  :████
         0     -1.8  .
         0     -1.6     .
         3     -1.4  :████████████████
         0     -1.2       .
         2     -1.0  :█████████
         0      -.8       .
         0      -.6
         6      -.4  ████████████████████████:█
         0      -.2           .
         0       .0           .
         5       .2  ██████████████████████:████
         0       .4
         2       .6  █████████:█
         0       .8       .
         0      1.0        .
         7      1.2  :████████████████████████████████████████
               I....+....I....+....I....+....I....+....I....+....I
               0         2         4         6         8        10
                            Histogram frequency
```
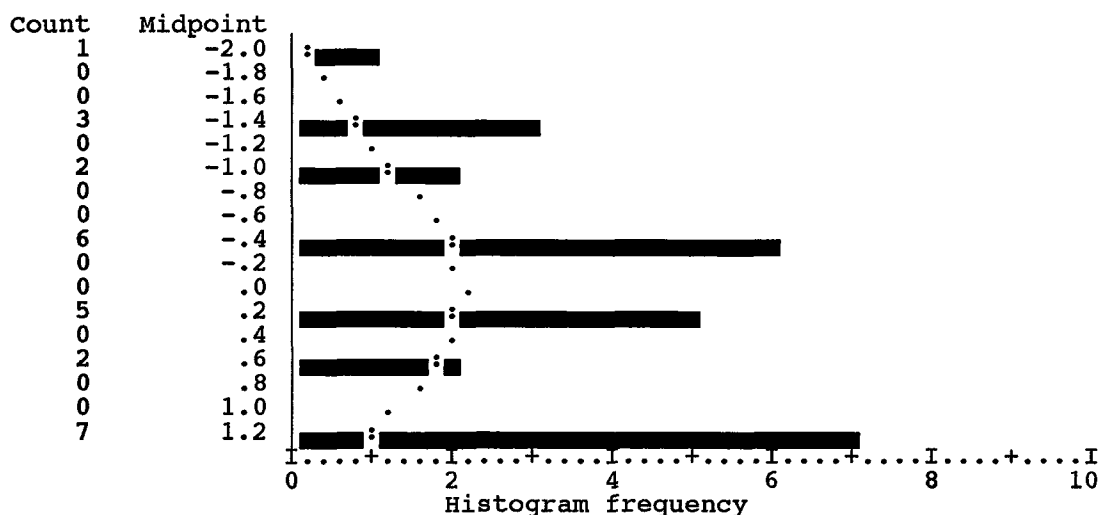
ZITS1T   ZSCORE(ITS1T)

Mean	-1.452E-16	Std err	.196	Median	.146
Mode	1.230	Std dev	1.000	Variance	1.000
Kurtosis	-.891	S E Kurt	.887	Skewness	-.274
S E Skew	.456	Range	3.252	Minimum	-2.022
Maximum	1.230	Sum	-3.775E-15		

Valid cases   26   Missing cases   4

ZSBI1   ZSCORE(SBI1)

```
    Count    Midpoint
        4      -1.30
        0      -1.05
        0       -.80
        0       -.55
       14       -.30
        0       -.05
        0        .20
        0        .45
        3        .70
        2        .95
        0       1.20
        0       1.45
        2       1.70
        0       1.95
        0       2.20
        0       2.45
        1       2.70
            I....+....I....+....I....+....I....+....I....+....I
            0        4        8       12       16       20
                      Histogram frequency
```
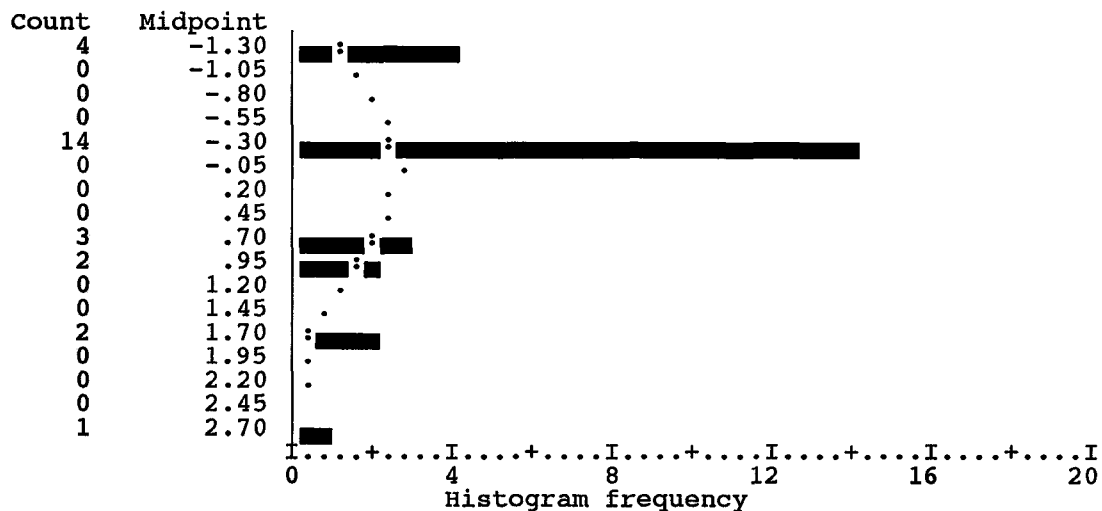
ZSBI1   ZSCORE(SBI1)

Mean	-3.416E-17	Std err	.196	Median	-.359
Mode	-.359	Std dev	1.000	Variance	1.000
Kurtosis	.989	S E Kurt	.887	Skewness	1.059
S E Skew	.456	Range	3.978	Minimum	-1.277
Maximum	2.701	Sum	-8.882E-16		

Valid cases   26   Missing cases   4

ZEF1G   ZSCORE(EF1G)

```
    Count    Midpoint
        1      -2.40
        2      -2.15
        0      -1.90
        0      -1.65
        0      -1.40
        0      -1.15
        0       -.90
        5       -.65
        6       -.40
        1       -.15
        3        .10
        0        .35
        3        .60
        6        .85
        2       1.10
        0       1.35
        1       1.60
            I....+....I....+....I....+....I....+....I....+....I
            0        2        4        6        8       10
                      Histogram frequency
```
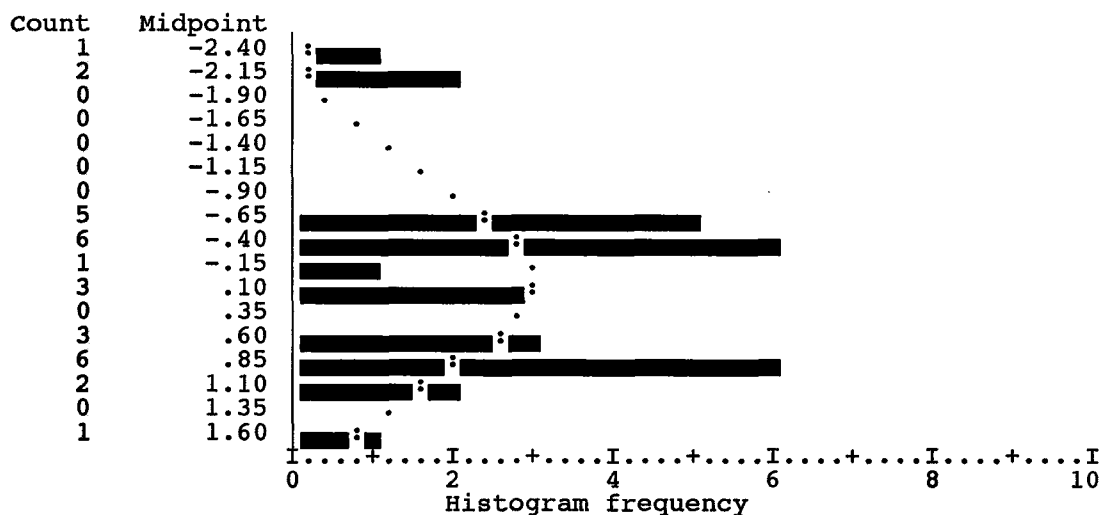
ZEF1G   ZSCORE(EF1G)

Mean	3.7007E-16	Std err	.183	Median	.060
Mode	-.295	Std dev	1.000	Variance	1.000
Kurtosis	.631	S E Kurt	.833	Skewness	-.892
S E Skew	.427	Range	3.997	Minimum	-2.409
Maximum	1.588	Sum	1.1102E-14		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

ZEF1P   ZSCORE(EF1P)

```
Count  Midpoint
    1     -2.0
    0     -1.7
    1     -1.4
    3     -1.1
    3      -.8
    2      -.5
    4      -.2
    4       .1
    2       .4
    1       .7
    8      1.0
    0      1.3
    0      1.6
    0      1.9
    0      2.2
    0      2.5
    1      2.8
          I....+....I....+....I....+....I....+....I....+....I
          0         2         4         6         8        10
                   Histogram frequency
```
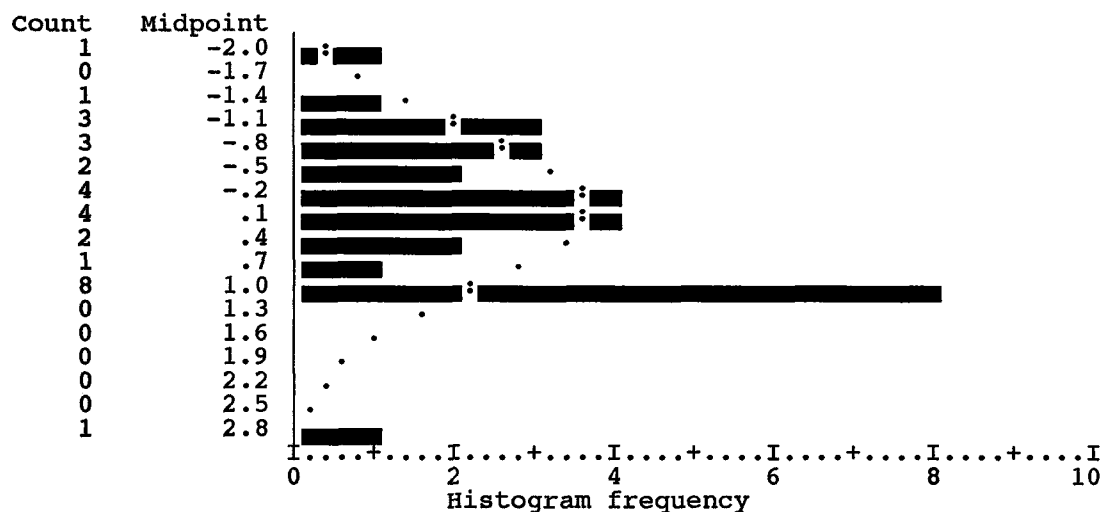
ZEF1P   ZSCORE(EF1P)

Mean	3.9820E-15	Std err	.183	Median	.012
Mode	.852	Std dev	1.000	Variance	1.000
Kurtosis	.847	S E Kurt	.833	Skewness	.492
S E Skew	.427	Range	4.813	Minimum	-1.975
Maximum	2.839	Sum	1.1946E-13		

Valid cases   30   Missing cases   0

ZOCIW1   ZSCORE(OCIW1)

```
Count  Midpoint
    1    -1.85
    1    -1.60
    2    -1.35
    1    -1.10
    1     -.85
    4     -.60
    3     -.35
    3     -.10
    1      .15
    3      .40
    4      .65
    0      .90
    3     1.15
    1     1.40
    1     1.65
    0     1.90
    1     2.15
          I....+....I....+....I....+....I....+....I....+....I
          0         1         2         3         4         5
                   Histogram frequency
```
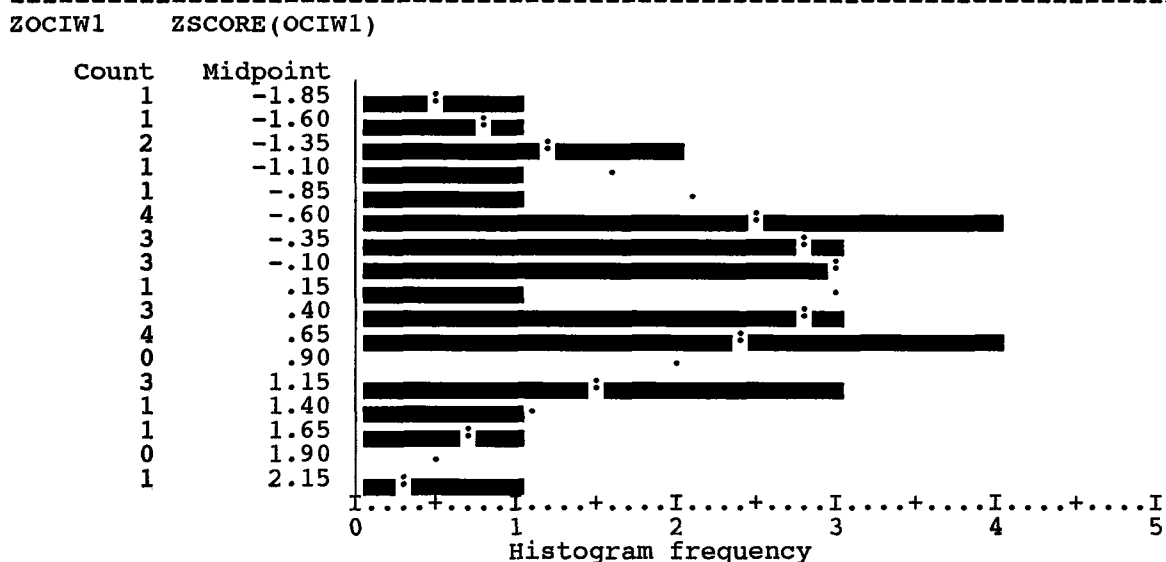
ZOCIW1   ZSCORE(OCIW1)

Mean	-1.347E-15	Std err	.183	Median	-.036
Mode	.595	Std dev	1.000	Variance	1.000
Kurtosis	-.368	S E Kurt	.833	Skewness	.107
S E Skew	.427	Range	4.148	Minimum	-1.930
Maximum	2.218	Sum	-4.041E-14		

Valid cases   30   Missing cases   0

ZACH1   ZSCORE(ACH1)

```
Count  Midpoint
    1     -2.05
    1     -1.80
    0     -1.55
    2     -1.30
    1     -1.05
    2      -.80
    4      -.55
    2      -.30
    2      -.05
    2       .20
    5       .45
    2       .70
    2       .95
    0      1.20
    2      1.45
    1      1.70
    1      1.95
          I....+....I....+....I....+....I....+....I....+....I
          0         1         2         3         4         5
                     Histogram frequency
```

ZACH1   ZSCORE(ACH1)

Mean	1.2953E-15	Std err	.183	Median	.077
Mode	.391	Std dev	1.000	Variance	1.000
Kurtosis	-.370	S E Kurt	.833	Skewness	-.093
S E Skew	.427	Range	3.984	Minimum	-2.041
Maximum	1.943	Sum	3.8858E-14		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

ZBEH1   ZSCORE(BEH1)

```
Count  Midpoint
    1     -2.85
    0     -2.60
    0     -2.35
    0     -2.10
    1     -1.85
    1     -1.60
    1     -1.35
    1     -1.10
    1      -.85
    3      -.60
    1      -.35
    1      -.10
    5       .15
    1       .40
    6       .65
    5       .90
    2      1.15
          I....+....I....+....I....+....I....+....I....+....I
          0         2         4         6         8        10
                     Histogram frequency
```

ZBEH1   ZSCORE(BEH1)

Mean	3.4047E-16	Std err	.183	Median	.198
Mode	.155	Std dev	1.000	Variance	1.000
Kurtosis	.895	S E Kurt	.833	Skewness	-1.118
S E Skew	.427	Range	4.098	Minimum	-2.876
Maximum	1.222	Sum	1.0214E-14		
Valid cases	30	Missing cases	0		

ZATT1   ZSCORE(ATT1)

```
     Count  Midpoint
         1     -2.50
         0     -2.25
         0     -2.00
         0.    -1.75
         2     -1.50
         1     -1.25
         2     -1.00
         3      -.75
         1      -.50
         3      -.25
         2       .00
         1       .25
         5       .50
         4       .75
         1      1.00
         2      1.25
         2      1.50
               I....+....I....+....I....+....I....+....I....+....I
               0         1         2         3         4         5
                         Histogram frequency
```
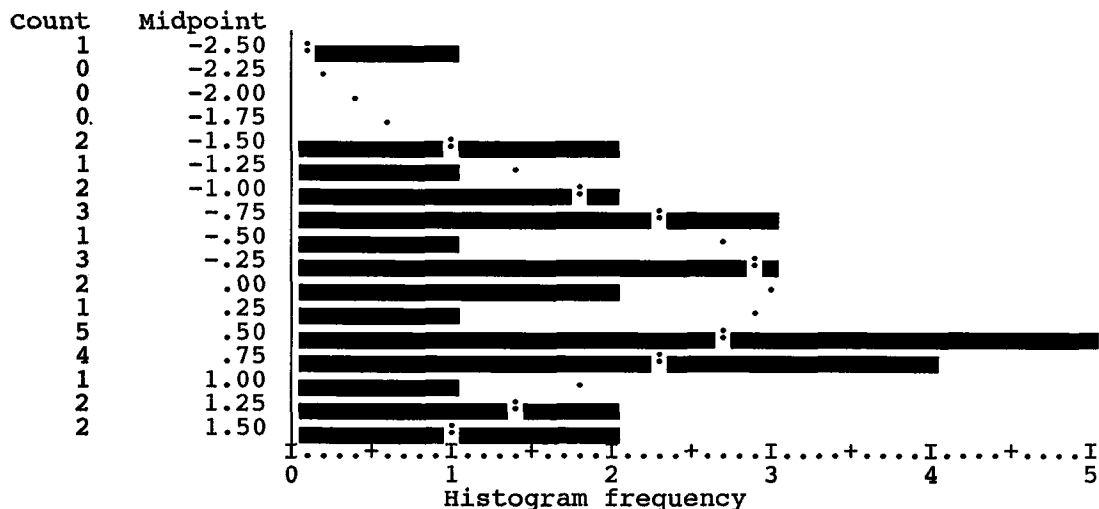
ZATT1   ZSCORE(ATT1)

Mean	1.8948E-15	Std err	.183	Median	.145
Mode	-1.609	Std dev	1.000	Variance	1.000
Kurtosis	-.178	S E Kurt	.833	Skewness	-.543
S E Skew	.427	Range	3.986	Minimum	-2.486
Maximum	1.500	Sum	5.6843E-14		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

ZITS2   ZSCORE(ITS2)

```
     Count  Midpoint
         1     -3.35
         0     -3.10
         0     -2.85
         1     -2.60
         0     -2.35
         0     -2.10
         0     -1.85
         0     -1.60
         0     -1.35
         0     -1.10
         0      -.85
         2      -.60
         5      -.35
         0      -.10
         5       .15
         1       .40
        11       .65
               I....+....I....+....I....+....I....+....I....+....I
               0         4         8        12        16        20
                         Histogram frequency
```
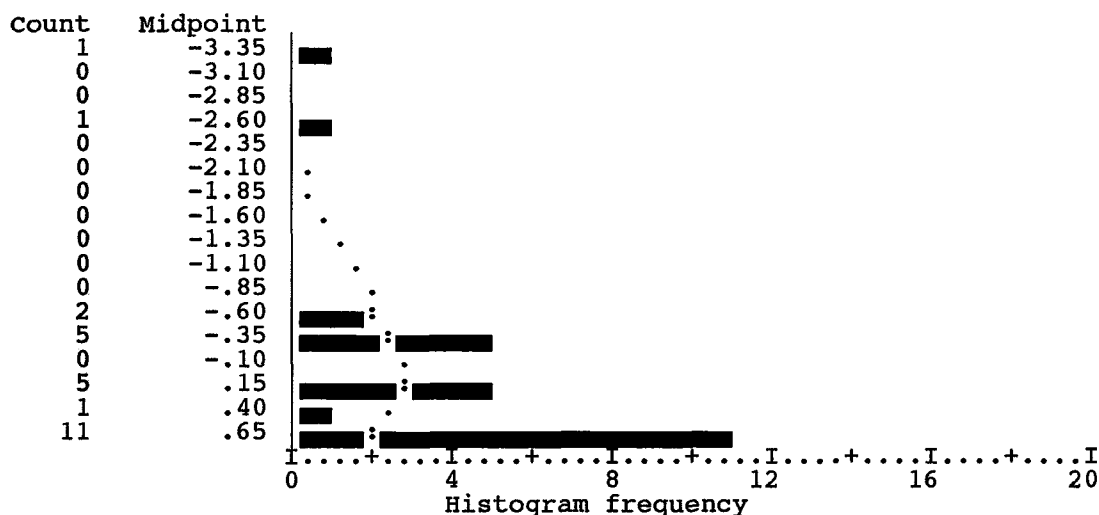
ZITS2   ZSCORE(ITS2)

Mean	-4.740E-16	Std err	.196	Median	.214
Mode	.660	Std dev	1.000	Variance	1.000
Kurtosis	5.804	S E Kurt	.887	Skewness	-2.361
S E Skew	.456	Range	4.013	Minimum	-3.353
Maximum	.660	Sum	-1.232E-14		

Valid cases   26   Missing cases   4

```
ZITS2T      ZSCORE(ITS2T)

    Count   Midpoint
        0    -2.80  |
        1    -2.55  ██
        0    -2.30  |
        1    -2.05  :█
        0    -1.80  .
        0    -1.55     .
        0    -1.30        .
        3    -1.05  ███:███
        0     -.80        .
        4     -.55  ██████:███
        0     -.30        .
        5     -.05  ███████:████
        0      .20        .
        1      .45  ███   .
        0      .70        .
       11      .95  ███:████████████████████
        0     1.20  .
              I....+....I....+....I....+....I....+....I....+....I
              0         4         8        12        16        20
                           Histogram frequency
```
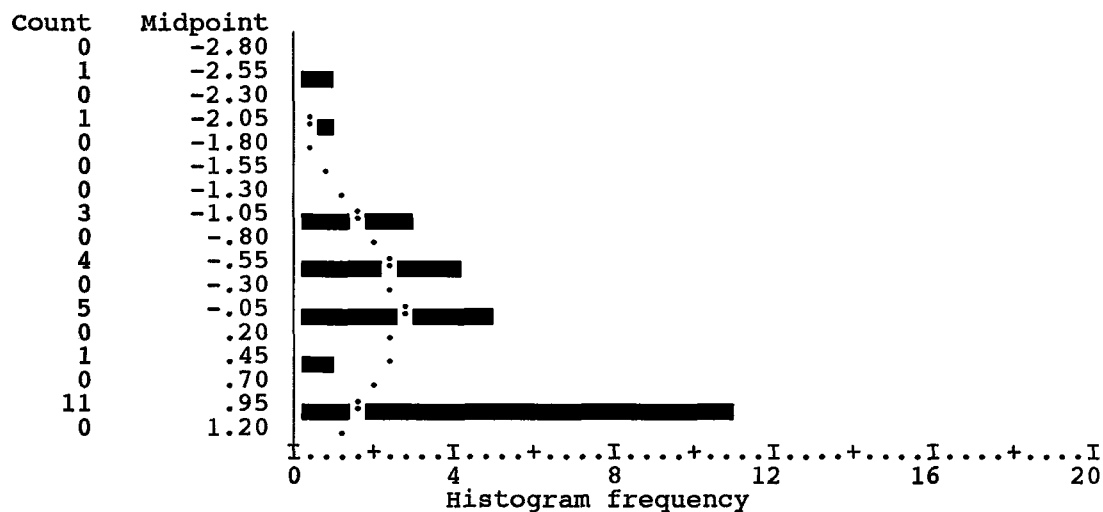
```
ZITS2T      ZSCORE(ITS2T)
Mean       6.8321E-17    Std err         .196    Median       -.076
Mode            .917     Std dev        1.000    Variance     1.000
Kurtosis        .325     S E Kurt        .887    Skewness     -.928
S E Skew        .456     Range          3.476    Minimum     -2.559
Maximum         .917     Sum       1.7764E-15

Valid cases      26      Missing cases      4
```

```
ZSBI2       ZSCORE(SBI2)

    Count   Midpoint
        0    -1.45  .
        7    -1.20  ██:███████████████
        0     -.95        .
        0     -.70        .
        0     -.45        .
       12     -.20  █████████████:████████████████████████
        0      .05        .
        0      .30        .
        0      .55        .
        0      .80        .
        4     1.05  ████:██████
        1     1.30  ██ .
        0     1.55        .
        0     1.80  .
        0     2.05  .
        2     2.30  ██████
        0     2.55  .
              I....+....I....+....I....+....I....+....I....+....I
              0         4         8        12        16        20
                           Histogram frequency
```
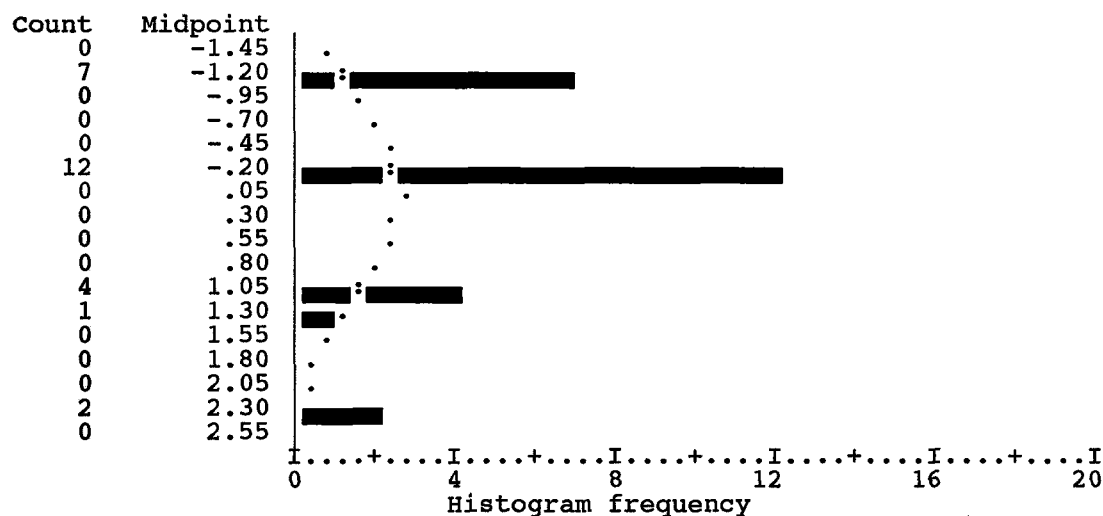
```
ZSBI2       ZSCORE(SBI2)
Mean       2.0496E-16    Std err         .196    Median       -.142
Mode           -.142     Std dev        1.000    Variance     1.000
Kurtosis       -.006     S E Kurt        .887    Skewness      .740
S E Skew        .456     Range          3.361    Minimum     -1.150
Maximum        2.210     Sum       5.3291E-15

Valid cases      26      Missing cases      4
```

ZEF2G   ZSCORE(EF2G)

```
Count  Midpoint
   0     -2.55  |.
   1     -2.30  █:
   0     -2.05  | .
   1     -1.80  ███:
   1     -1.55  ████:.
   2     -1.30  ██████:
   2     -1.05  ███████:
   1      -.80  ████      .
   4      -.55  ████████████████:
   0      -.30  |        .
   1      -.05  ████
   4       .20  ████████████████:
   2       .45  ████████    .
   3       .70  ████████████:
   4       .95  ████████████████:
   4      1.20  ████████████████:
   0      1.45  | .
          I....+....I....+....I....+....I....+....I....+....I
          0         1         2         3         4         5
                       Histogram frequency
```
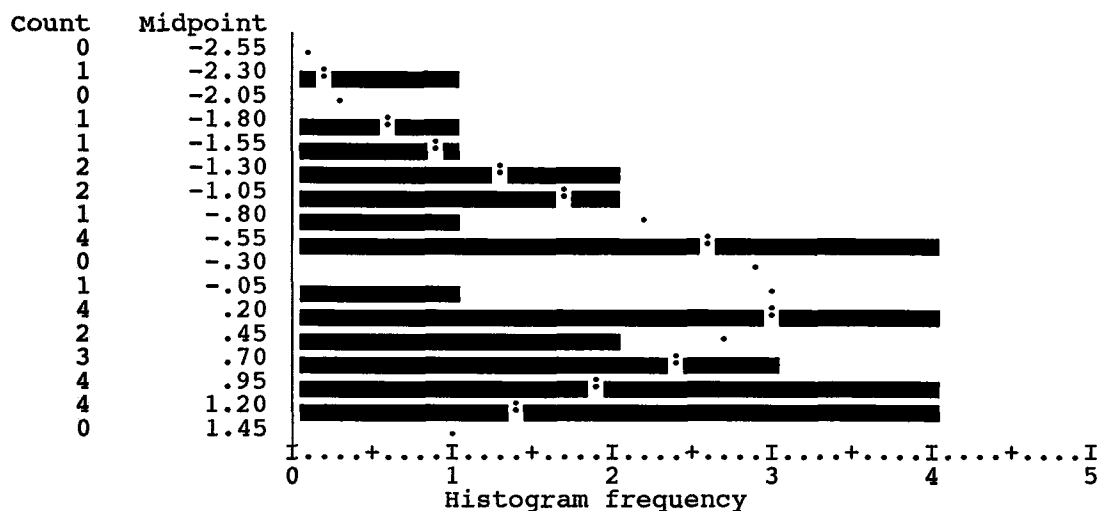
ZEF2G   ZSCORE(EF2G)

Mean	-5.921E-17	Std err	.183	Median	.221
Mode	1.251	Std dev	1.000	Variance	1.000
Kurtosis	-.635	S E Kurt	.833	Skewness	-.560
S E Skew	.427	Range	3.558	Minimum	-2.306
Maximum	1.251	Sum	-1.776E-15		

Valid cases   30   Missing cases   0

ZEF2P   ZSCORE(EF2P)

```
Count  Midpoint
   1    -2.964  |███
   0    -2.631  |.
   0    -2.298  |.
   0    -1.965  |  .
   0    -1.632  |   :
   1    -1.299  |███    .
   4     -.966  ████████████████:
   1     -.633  ████      .
   9     -.300  ████████████████████████████████████
   2      .033  ████████  .
   4      .366  ████████████████:█
   2      .699  ████████    .
   4     1.032  ████████████████:
   0     1.365  |   .
   1     1.698  ████:
   0     2.031  |.
   1     2.364  |:
          I....+....I....+....I....+....I....+....I....+....I
          0         2         4         6         8        10
                       Histogram frequency
```
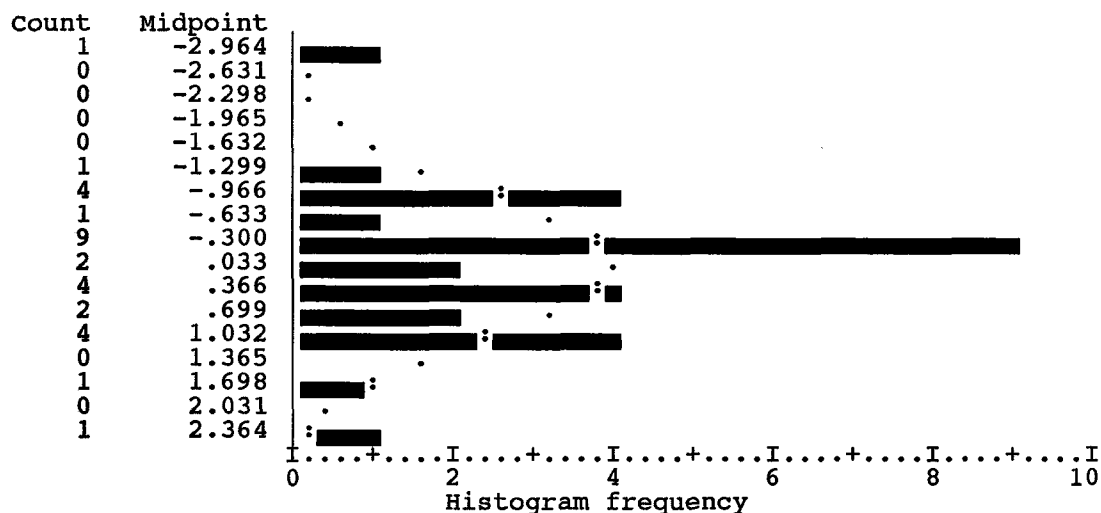
ZEF2P   ZSCORE(EF2P)

Mean	2.1020E-15	Std err	.183	Median	-.185
Mode	-.185	Std dev	1.000	Variance	1.000
Kurtosis	1.406	S E Kurt	.833	Skewness	-.230
S E Skew	.427	Range	5.073	Minimum	-2.821
Maximum	2.253	Sum	6.3061E-14		

Valid cases   30   Missing cases   0

ZOCIW2   ZSCORE(OCIW2)

```
   Count   Midpoint
     1      -1.85
     1      -1.60
     2      -1.35
     2      -1.10
     1       -.85
     4       -.60
     2       -.35
     3       -.10
     1        .15
     3        .40
     4        .65
     0        .90
     3       1.15
     1       1.40
     1       1.65
     0       1.90
     1       2.15
            I....+....I....+....I....+....I....+....I....+....I
            0        1        2        3        4        5
                       Histogram frequency
```

ZOCIW2   ZSCORE(OCIW2)

Mean	4.1300E-15	Std err	.183	Median	-.015
Mode	.607	Std dev	1.000	Variance	1.000
Kurtosis	-.488	S E Kurt	.833	Skewness	.133
S E Skew	.427	Range	4.086	Minimum	-1.880
Maximum	2.206	Sum	1.2390E-13		

Valid cases   30   Missing cases   0

ZACH2   ZSCORE(ACH2)

```
   Count   Midpoint
     0      -2.30
     1      -2.05
     0      -1.80
     2      -1.55
     1      -1.30
     1      -1.05
     2       -.80
     3       -.55
     3       -.30
     4       -.05
     3        .20
     2        .45
     0        .70
     1        .95
     5       1.20
     2       1.45
     0       1.70
            I....+....I....+....I....+....I....+....I....+....I
            0        1        2        3        4        5
                       Histogram frequency
```

ZACH2   ZSCORE(ACH2)

Mean	2.2204E-16	Std err	.183	Median	-.088
Mode	-.088	Std dev	1.000	Variance	1.000
Kurtosis	-.617	S E Kurt	.833	Skewness	-.155
S E Skew	.427	Range	3.720	Minimum	-2.158
Maximum	1.562	Sum	6.6613E-15		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

```
ZBEH2        ZSCORE(BEH2)
     Count  Midpoint
         1    -2.80
         0    -2.55
         0    -2.30
         0    -2.05
         1    -1.80
         1    -1.55
         1    -1.30
         0    -1.05
         4     -.80
         3     -.55
         0     -.30
         1     -.05
         5      .20
         5      .45
         0      .70
         3      .95
         5     1.20
               I....+....I....+....I....+....I....+....I....+....I
               0         1         2         3         4         5
                              Histogram frequency
```

ZBEH2   ZSCORE(BEH2)

Mean	-7.105E-16	Std err	.183	Median	.277
Mode	-.452	Std dev	1.000	Variance	1.000
Kurtosis	.922	S E Kurt	.833	Skewness	-.967
S E Skew	.427	Range	4.158	Minimum	-2.895
Maximum	1.263	Sum	-2.132E-14		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

ZATT2   ZSCORE(ATT2)

```
     Count  Midpoint
         2    -1.7
         1    -1.5
         2    -1.3
         0    -1.1
         4     -.9
         2     -.7
         0     -.5
         1     -.3
         1     -.1
         2      .1
         4      .3
         1      .5
         3      .7
         2      .9
         0     1.1
         2     1.3
         3     1.5
               I....+....I....+....I....+....I....+....I....+....I
               0         1         2         3         4         5
                              Histogram frequency
```
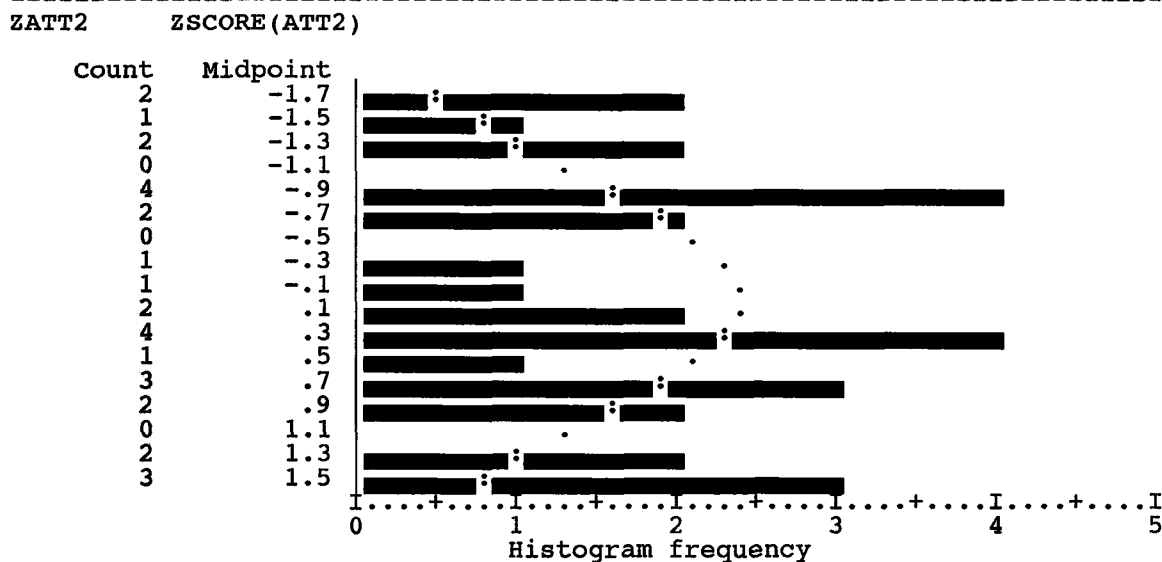
ZATT2   ZSCORE(ATT2)

Mean	1.9984E-16	Std err	.183	Median	.189
Mode	-1.216	Std dev	1.000	Variance	1.000
Kurtosis	-1.069	S E Kurt	.833	Skewness	-.144
S E Skew	.427	Range	3.347	Minimum	-1.795
Maximum	1.552	Sum	5.9952E-15		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

ZENTH2   ZSCORE(ENTH2)

```
  Count   Midpoint
      2     -2.15
      0     -1.90
      1     -1.65
      0     -1.40
      2     -1.15
      2      -.90
      2      -.65
      0      -.40
      2      -.15
      5       .10
      7       .35
      0       .60
      3       .85
      1      1.10
      1      1.35
      0      1.60
      2      1.85
              I....+....I....+....I....+....I....+....I....+....I
              0         2         4         6         8        10
                          Histogram frequency
```

ZENTH2   ZSCORE(ENTH2)

Mean	-2.220E-16	Std err	.183	Median	.158
Mode	-.571	Std dev	1.000	Variance	1.000
Kurtosis	-.033	S E Kurt	.833	Skewness	-.416
S E Skew	.427	Range	3.925	Minimum	-2.113
Maximum	1.812	Sum	-6.661E-15		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

ZFDB2   ZSCORE(FDB2)

```
  Count   Midpoint
      1      -2.1
      2      -1.8
      1      -1.5
      1      -1.2
      0       -.9
      2       -.6
      3       -.3
      7        .0
      7        .3
      1        .6
      2        .9
      1       1.2
      1       1.5
      0       1.8
      0       2.1
      0       2.4
      1       2.7
              I....+....I....+....I....+....I....+....I....+....I
              0         2         4         6         8        10
                          Histogram frequency
```
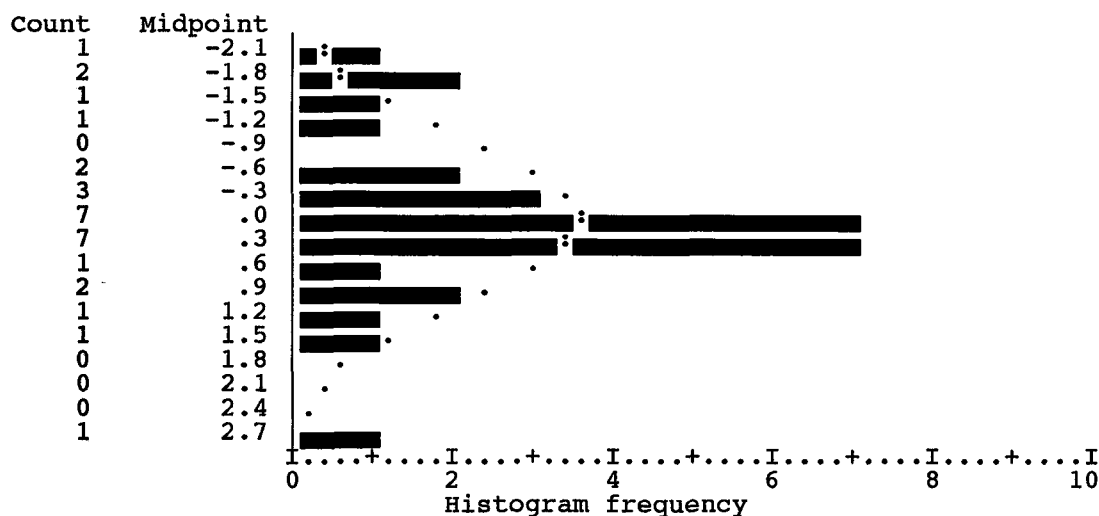
ZFDB2   ZSCORE(FDB2)

Mean	1.0362E-16	Std err	.183	Median	.093
Mode	-.218	Std dev	1.000	Variance	1.000
Kurtosis	1.264	S E Kurt	.833	Skewness	.113
S E Skew	.427	Range	4.789	Minimum	-2.087
Maximum	2.702	Sum	3.1086E-15		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

ZINST2   ZSCORE(INST2)

```
Count  Midpoint
    0    -2.6  |.
    1    -2.3  :▓▓▓▓
    0    -2.0  |.
    1    -1.7  ▓▓▓:
    1    -1.4  ▓▓▓   .
    3    -1.1  ▓▓▓▓▓▓▓▓:▓▓▓▓▓
    2     -.8  ▓▓▓▓▓▓▓▓▓   .
    2     -.5  ▓▓▓▓▓▓▓▓▓
    3     -.2  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓.
    2      .1  ▓▓▓▓▓▓▓▓▓   .
    6      .4  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓:▓▓▓▓▓▓▓▓▓▓▓
    2      .7  ▓▓▓▓▓▓▓▓▓
    6     1.0  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓:▓▓▓▓▓▓▓▓▓▓▓
    0     1.3  .
    0     1.6  |.
    1     1.9  ▓▓:▓▓▓
    0     2.2  |.
          I....+....I....+....I....+....I....+....I....+....I
          0        2        4        6        8       10
                    Histogram frequency
```
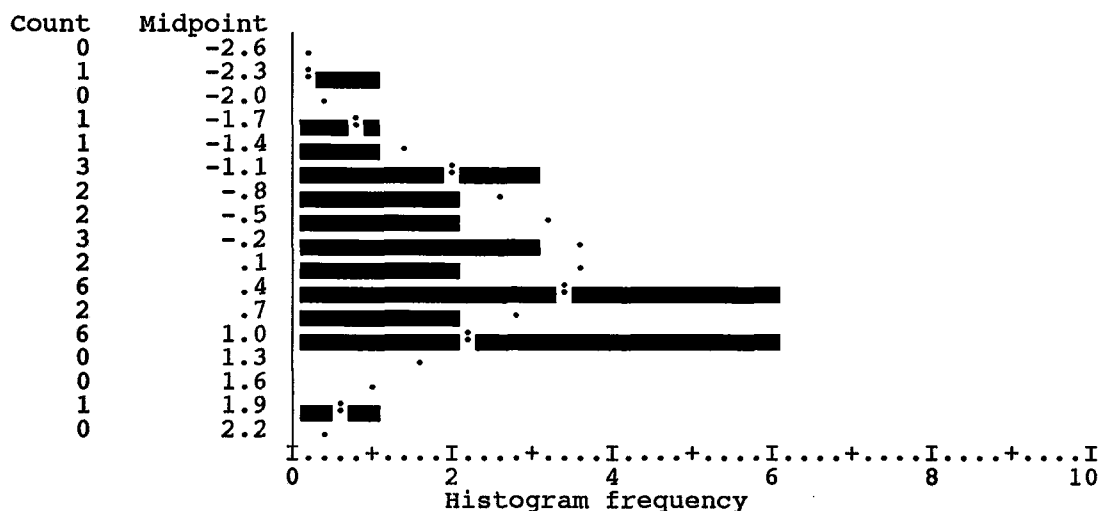
ZINST2   ZSCORE(INST2)

Mean	5.1070E-16	Std err	.183	Median	.255
Mode	.403	Std dev	1.000	Variance	1.000
Kurtosis	-.235	S E Kurt	.833	Skewness	-.427
S E Skew	.427	Range	4.300	Minimum	-2.340
Maximum	1.960	Sum	1.5321E-14		

Valid cases   30   Missing cases   0

ZOPP2   ZSCORE(OPP2)

```
Count  Midpoint
    1    -2.4  :▓▓▓▓▓▓▓▓
    0    -2.1  |.
    0    -1.8  .
    2    -1.5  ▓▓▓▓▓▓▓▓▓▓▓▓▓:▓▓▓▓▓
    0    -1.2  |.
    4     -.9  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓:▓▓▓▓▓▓▓▓▓▓▓▓
    3     -.6  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓:
    4     -.3  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓:▓▓▓
    3      .0  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓  .
    3      .3  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓:  .
    5      .6  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓:▓▓▓▓▓▓▓▓▓
    1      .9  ▓▓▓▓▓▓▓▓▓▓  .
    1     1.2  ▓▓▓▓▓▓▓▓▓▓    .
    1     1.5  ▓▓▓▓▓▓▓▓▓▓.
    1     1.8  ▓▓▓▓▓▓▓▓▓▓:
    0     2.1  |.
    1     2.4  :▓▓▓▓▓▓▓▓
          I....+....I....+....I....+....I....+....I....+....I
          0        1        2        3        4        5
                    Histogram frequency
```
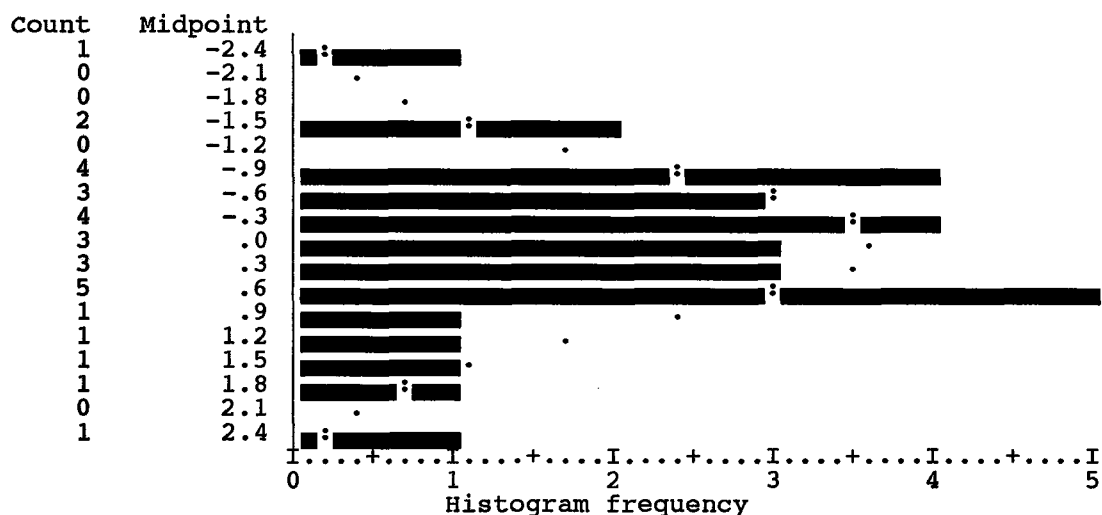

ZOPP2   ZSCORE(OPP2)

Mean	2.0576E-15	Std err	.183	Median	.001
Mode	-.849	Std dev	1.000	Variance	1.000
Kurtosis	.427	S E Kurt	.833	Skewness	.010
S E Skew	.427	Range	4.675	Minimum	-2.378
Maximum	2.296	Sum	6.1728E-14		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

ZPACE2   ZSCORE(PACE2)

```
    Count  Midpoint
        1    -2.40  :
        1    -2.15  :
        0    -1.90  .
        1    -1.65  :
        0    -1.40     .
        2    -1.15        :
        3     -.90           :
        0     -.65           .
        1     -.40
        2     -.15           .
        3      .10           :
        8      .35           :
        1      .60
        4      .85        :
        0     1.10     .
        1     1.35     .
        2     1.60  :
             I....+....I....+....I....+....I....+....I
             0         2         4         6         8        10
                       Histogram frequency
```

ZPACE2   ZSCORE(PACE2)

Mean	1.3471E-15	Std err	.183	Median	.265
Mode	.457	Std dev	1.000	Variance	1.000
Kurtosis	.226	S E Kurt	.833	Skewness	-.729
S E Skew	.427	Range	3.920	Minimum	-2.348
Maximum	1.572	Sum	4.0412E-14		

Valid cases   30   Missing cases   0

ZSTRC2   ZSCORE(STRC2)

```
    Count  Midpoint
        1    -2.9
        0    -2.6  .
        0    -2.3  .
        0    -2.0     .
        0    -1.7        .
        3    -1.4           :
        0    -1.1           .
        2     -.8           .
        4     -.5              :
        4     -.2              :
        6      .1              :
        2      .4           .
        3      .7              :
        0     1.0              .
        4     1.3           :
        0     1.6        .
        1     1.9
             I....+....I....+....I....+....I....+....I
             0         2         4         6         8        10
                       Histogram frequency
```
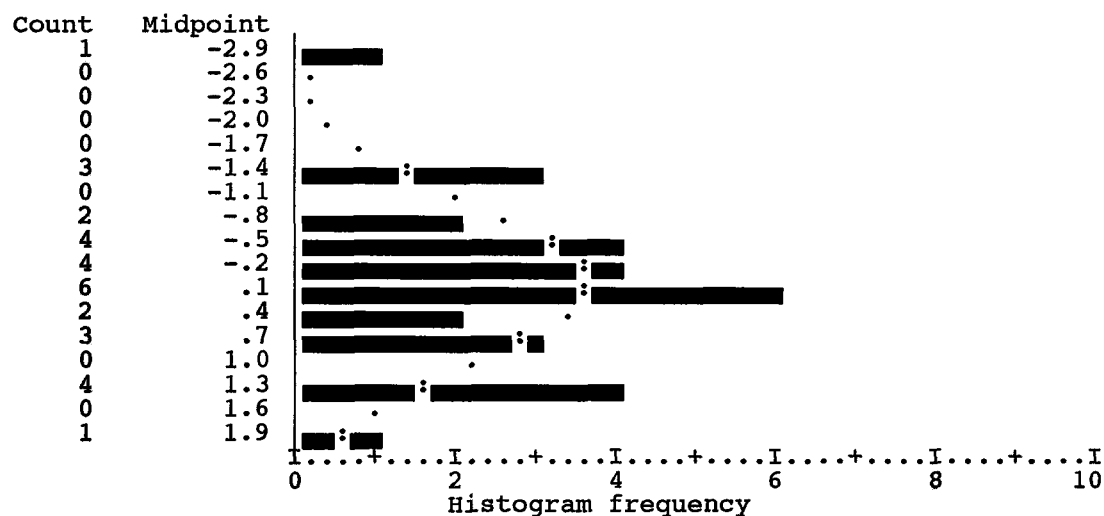
ZSTRC2   ZSCORE(STRC2)

Mean	1.5691E-15	Std err	.183	Median	.112
Mode	.198	Std dev	1.000	Variance	1.000
Kurtosis	.807	S E Kurt	.833	Skewness	-.455
S E Skew	.427	Range	4.563	Minimum	-2.772
Maximum	1.791	Sum	4.7073E-14		

Valid cases   30   Missing cases   0

ZTASK2   ZSCORE(TASK2)

```
    Count   Midpoint
        1     -2.45  |:███████
        0     -2.20  |   .
        0     -1.95  |  .
        0     -1.70  |     .
        1     -1.45  |███████:
        1     -1.20  |███████       .
        4      -.95  |███████████████:████████████████
        1      -.70  |███████          .
        4      -.45  |███████████████:████████████████
        2      -.20  |███████████████       .
        3       .05  |███████████████████████:
        1       .30  |███████                .
        3       .55  |███████████████:███████
        3       .80  |███████████████:███████
        2      1.05  |██████████████:
        2      1.30  |██████████:████
        2      1.55  |███████:████████
               I....+....I....+....I....+....I....+....I....+....I
               0         1         2         3         4         5
                             Histogram frequency
```
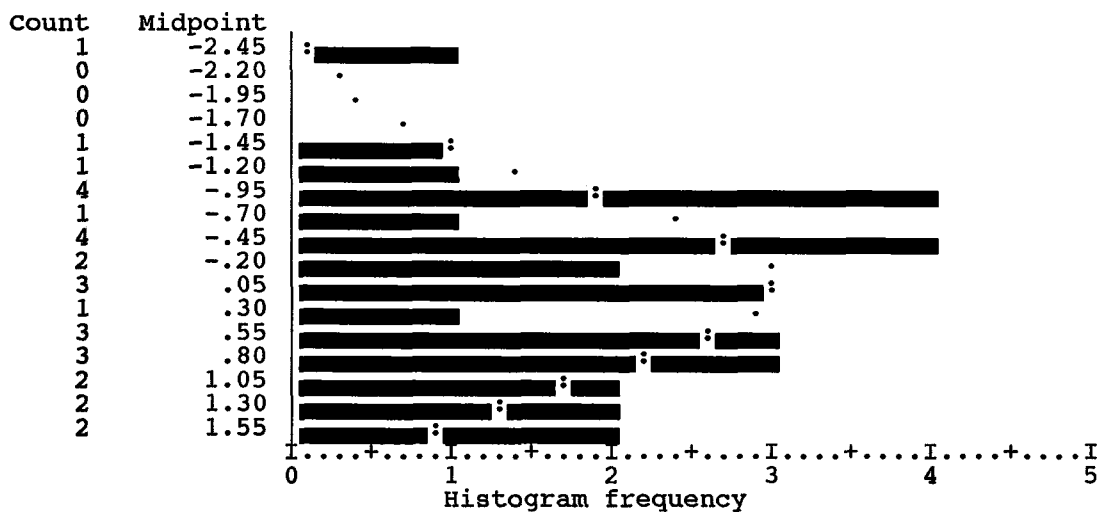
ZTASK2   ZSCORE(TASK2)

Mean	-3.227E-15	Std err	.183	Median	-.020
Mode	-1.056	Std dev	1.000	Variance	1.000
Kurtosis	-.156	S E Kurt	.833	Skewness	-.349
S E Skew	.427	Range	4.190	Minimum	-2.529
Maximum	1.661	Sum	-9.681E-14		

* Multiple modes exist. The smallest value is shown.
Valid cases   30   Missing cases   0

This procedure was completed at 20:05:59
SET LENGTH=59.
REGRESSION
    MISSING=MEANS/
    VARIABLES=GROUP ITS1T SBI1 EF1G EF1P OCIW1 ACH1 BEH1 ATT1/
    STATISTICS=COEF TOL/
    DEP=GROUP/
    ENTER/
    SCATTERPLOT(*RES,*PRE)/
    RESIDUALS=OUTLIERS(MAHAL) DURBIN.

----

        * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Mean Substituted for Missing Data

Equation Number 1   Dependent Variable..   GROUP

Block Number 1. Method: Enter

Variable(s) Entered on Step Number 1..   ATT1
                                    2..   SBI1
                                    3..   ITS1T
                                    4..   EF1G
                                    5..   BEH1
                                    6..   OCIW1
                                    7..   EF1P
                                    8..   ACH1

```
--------Variables in the Equation ----------------------------

Variable          B        SE B      Beta  Tolerance      VIF        T   Sig T

ATT1         -.187335   1.197389  -.036578   .706658    1.415    -.156  .8772
SBI1        3.608931E-04  .044138  .001705   .888735    1.125     .008  .9936
ITS1T        -1.249846  1.609360  -.166665   .838694    1.192    -.777  .4460
EF1G          .535696    .470878   .252462   .784356    1.275    1.138  .2681
BEH1         -.731350   1.396873  -.133347   .595461    1.679    -.524  .6061
OCIW1        1.396121   2.498290   .120523   .830434    1.204     .559  .5822
EF1P          .095029    .748644   .029045   .737751    1.355     .127  .9002
ACH1         -1.363733  1.442887  -.253139   .538471    1.857    -.945  .3553
(Constant)   1.772326   7.213474                                 .246  .8083


End Block Number   1   All requested variables entered.
```

       * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1   Dependent Variable..   GROUP

Residuals Statistics:

```
                  Min        Max       Mean   Std Dev   N

*PRED           1.9915     4.0645    2.9333    .5583    30
*ZPRED         -1.6869     2.0260     .0000   1.0000    30
*SEPRED          .3773     1.1920     .7251    .1730    30
*ADJPRED        1.6367     4.5077    2.9970    .7351    30
*RESID         -1.6656     2.3447     .0000   1.1571    30
*ZRESID        -1.2250     1.7243     .0000    .8510    30
*SRESID        -1.3720     1.7948    -.0180    .9820    30
*DRESID        -2.0894     2.5403    -.0636   1.5655    30
*SDRESID       -1.4033     1.9037    -.0124    .9981    30
*MAHAL          1.2667    21.3205    7.7333   4.0147    30
*COOK D          .0024      .1063     .0390    .0286    30
*LEVER           .0437      .7352     .2667    .1384    30

Total Cases =        30


Durbin-Watson Test =      .85441
```


       *

Outliers - Mahalanobis' Distance

```
   Case #        *MAHAL

       10       21.32051
       17       12.59299
       19       11.83687
       29       11.07712
       22       10.82685
        4       10.66906
       28       10.40257
       13       10.22167
       16        9.46953
       23        9.34268
```

Standardized Scatterplot
Across - *PRED   Down - *RESID

```
Out
  3 +
  2 +
  1 +
  0 +
 -1 +
 -2 +
 -3 +
Out
    -3    -2    -1    0     1     2     3  Out
```

Symbols:

    Max N

    .   1.0
    :   2.0
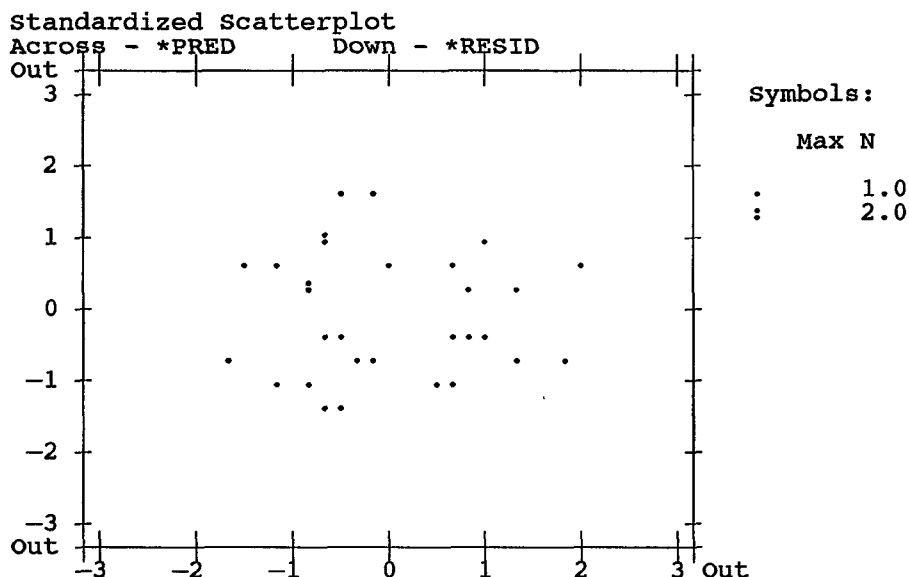
This procedure was completed at 20:06:10
REGRESSION
    MISSING=MEANS/
    VARIABLES=GROUP ITS2T SBI2 EF2G EF2P OCIW2 ACH2 BEH2 ATT2/
    STATISTICS=COEF TOL/
    DEP=GROUP/
    ENTER/
    SCATTERPLOT(*RES,*PRE)/
    RESIDUALS=OUTLIERS(MAHAL) DURBIN.

---

* * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Mean Substituted for Missing Data
Equation Number 1   Dependent Variable..   GROUP
Block Number 1. Method: Enter
Variable(s) Entered on Step Number 1..   ATT2
                                    2..   SBI2
                                    3..   EF2P
                                    4..   ACH2
                                    5..   ITS2T
                                    6..   EF2G
                                    7..   BEH2
                                    8..   OCIW2

------------------------------ Variables in the Equation

Variable	B	SE B	Beta	Tolerance	VIF	T	Sig T
ATT2	.056312	1.480286	.010608	.361547	2.766	.038	.9700
SBI2	.006277	.041606	.026994	.877966	1.139	.151	.8815
EF2P	-.550925	.463769	-.216377	.847336	1.180	-1.188	.2481
ACH2	-2.734483	.930282	-.606475	.660380	1.514	-2.939	.0078
ITS2T	-.990860	1.277256	-.144206	.813587	1.229	-.776	.4465
EF2G	.155721	.371416	.092330	.579671	1.725	.419	.6793
BEH2	.576866	1.277656	.104751	.522277	1.915	.452	.6563
OCIW2	1.123327	2.727647	.098443	.491994	2.033	.412	.6846
(Constant)	6.368818	6.647334				.958	.3489

* * * *   **M U L T I P L E   R E G R E S S I O N**   *** * * ***

Equation Number 1   Dependent Variable..   GROUP

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	1.1414	5.0117	2.9333	.8223	30
*ZPRED	-2.1792	2.5276	.0000	1.0000	30
*SEPRED	.3126	.8445	.6222	.1310	30
*ADJPRED	1.2256	5.0249	2.9658	.8569	30
*RESID	-1.7122	1.9746	.0000	.9871	30
*ZRESID	-1.4760	1.7022	.0000	.8510	30
*SRESID	-1.6239	1.8217	-.0127	.9884	30
*DRESID	-2.0735	2.3851	-.0325	1.3528	30
*SDRESID	-1.6947	1.9375	-.0038	1.0162	30
*MAHAL	1.1389	14.4041	7.7333	3.3779	30
*COOK D	.0000	.1692	.0412	.0478	30
*LEVER	.0393	.4967	.2667	.1165	30

Total Cases =   30

Durbin-Watson Test =   .87535

                                 *

* * * * * * * *

Outliers - Mahalanobis' Distance

Case #	*MAHAL
24	14.40414
17	12.51458
22	12.04765
2	11.72815
29	10.99670
9	10.99421
21	10.62584
19	10.50040
4	10.01715
20	9.85719

Standardized Scatterplot
Across - *PRED   Down - *RESID

Symbols:

Max N

.   1.0
:   2.0
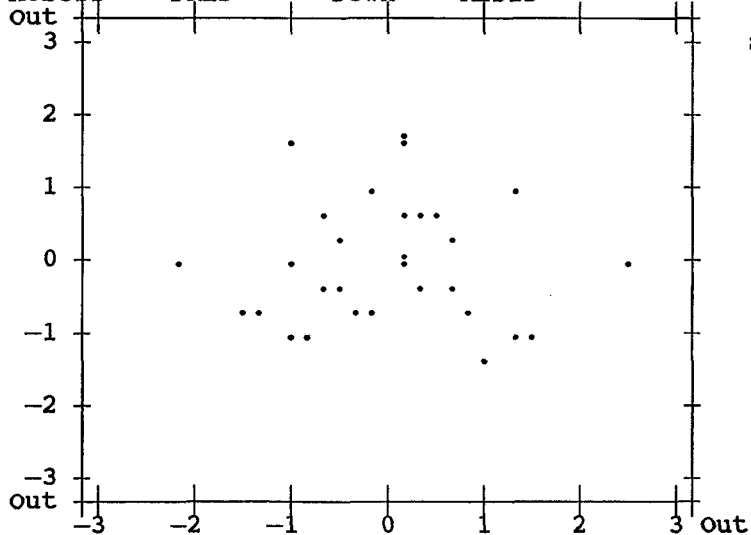
```
This procedure was completed at 20:06:16
REGRESSION
     MISSING=MEANS/
     VARIABLES=GROUP ENTH2 FDB2 INST2 OPP2 PACE2 STRC2 TASK2/
     STATISTICS=COEF TOL/
     DEP=GROUP/
     ENTER/
     SCATTERPLOT(*RES,*PRE)/
     RESIDUALS=OUTLIERS(MAHAL) DURBIN.
```
----
* * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Mean Substituted for Missing Data

Equation Number 1   Dependent Variable..   GROUP

Block Number 1. Method: Enter

Variable(s) Entered on Step Number   1..   TASK2
                                     2..   INST2
                                     3..   OPP2
                                     4..   PACE2
                                     5..   STRC2
                                     6..   ENTH2
                                     7..   FDB2

------------------------------ Variables in the Equation

Variable	B	SE B	Beta	Tolerance	VIF	T	Sig T
TASK2	1.447249	1.551593	.244663	.606574	1.649	.933	.3611
INST2	-.623204	2.397489	-.065424	.658802	1.518	-.260	.7973
OPP2	-.771582	1.357410	-.141318	.675205	1.481	-.568	.5755
PACE2	.020010	1.411844	.004053	.510415	1.959	.014	.9888
STRC2	.990653	2.052133	.179134	.303084	3.299	.483	.6340
ENTH2	.725394	1.290938	.201419	.324807	3.079	.562	.5799
FDB2	.027203	1.824167	.005438	.313798	3.187	.015	.9882
(Constant)	-2.284653	7.164185				-.319	.7528

End Block Number   1   All requested variables entered.
----
* * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1   Dependent Variable..   GROUP

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	2.3301	3.8858	2.9333	.3676	30
*ZPRED	-1.6411	2.5911	.0000	1.0000	30
*SEPRED	.4614	1.1503	.7045	.1940	30
*ADJPRED	1.5717	4.0580	2.8641	.5950	30
*RESID	-2.2304	2.1182	.0000	1.2310	30
*ZRESID	-1.5780	1.4987	.0000	.8710	30
*SRESID	-1.7093	1.5969	.0176	.9969	30
*DRESID	-3.0580	2.7061	.0693	1.6497	30
*SDRESID	-1.7933	1.6593	.0176	1.0168	30
*MAHAL	2.1239	18.2425	6.7667	4.3585	30
*COOK D	.0000	.2695	.0448	.0617	30
*LEVER	.0732	.6291	.2333	.1503	30

Total Cases =   30

Durbin-Watson Test =   .92986

        *

Outliers - Mahalanobis' Distance

    Case #   *MAHAL

        12   18.24250
        15   16.09246
        10   13.71040
        13   12.34356
        25   12.22768
         9   10.52644
        16   10.51928
        19   8.91720
         1   8.88178
         6   8.28399

Standardized Scatterplot
Across - *PRED   Down - *RESID

Symbols:

    Max N

.   1.0
:   2.0
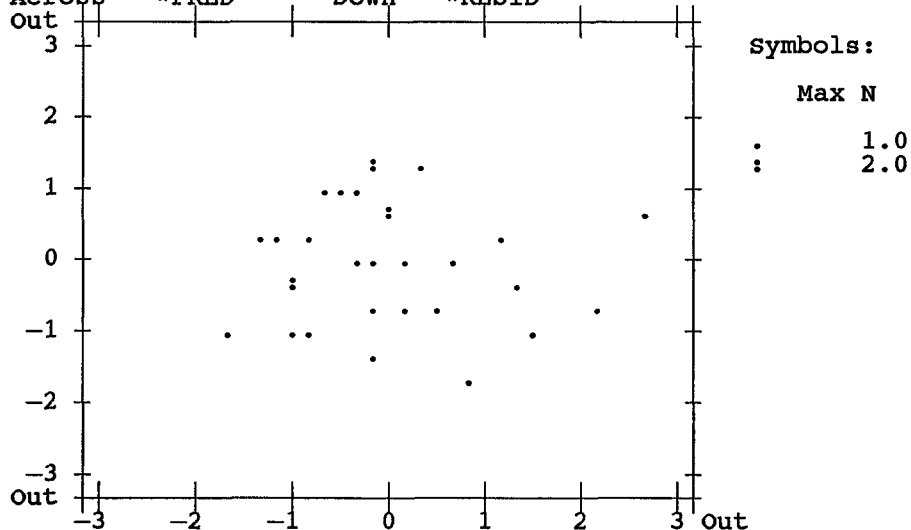
APPENDIX D

Individualized Trust Scale

Individualized Trust Scale
1978 Lawrence R. Wheeless, Ph.D.

We are interested in how much you trust your peer-observer. Each pair of adjectives on the next page describes a slightly different aspect of a relationship; please indicate the degree to which each pair of adjectives applies to your relationship with your peer-observer.

Example:

You will see a list of word pairs that look like this:

genuine ____:____:____:____:____:____:____ phoney

If you feel that when interacting with your peer-observer he or she is extremely genuine with you, place an "X" near genuine.

genuine __**X**_:____:____:____:____:____:____ phoney

If you feel that when interacting with your peer-observer he or she is extremely phoney with you, place an "X" near phoney.

genuine ____:____:____:____:____:____:__**X**_ phoney

If you feel that when interacting with your peer-observer he or she is sometimes genuine and sometimes phoney, place an "X" in the closer to the middle of the scale but toward the side you favour.

Important:

1. Place your "X" in the center of the spaces, not on the boundaries.

2. Be sure you mark an "X" for every word pair.

3. Make only **one** "X" on a word pair.

Name:_____
School:_____

MY RELATIONSHIP WITH MY PEER-OBSERVER

1. Trustworthy ___:___:___:___:___:___:___ Untrustworthy

2. Distrustful of
    this person ___:___:___:___:___:___:___ trustful of
    this person

3. Confidential ___:___:___:___:___:___:___ Divulging

4. Exploitive ___:___:___:___:___:___:___ Benevolent

5. Dangerous ___:___:___:___:___:___:___ Safe

6. Candid ___:___:___:___:___:___:___ Deceptive

7. Deceitful ___:___:___:___:___:___:___ Not deceitful

8. Straightforward ___:___:___:___:___:___:___ Tricky

9. Disrespectful ___:___:___:___:___:___:___ Respectful

10. Considerate ___:___:___:___:___:___:___ Inconsiderate

11. Dishonest ___:___:___:___:___:___:___ Honest

12. Reliable ___:___:___:___:___:___:___ Unreliable

13. Faithful ___:___:___:___:___:___:___ Unfaithful

14. Insincere ___:___:___:___:___:___:___ Sincere

15. Careful ___:___:___:___:___:___:___ Careless

APPENDIX E

Supervisory Beliefs Inventory

Supervisory Beliefs Inventory
Dr. C.D. Glickman and Dr. R.T. Tamashiro, 1981

Name:_____

School:_____

Please circle either "A" or "B" for each item. You may not completely agree with either choice, but choose the one that is closest to how you feel.

1. A. Teaching-partners should give teachers a large degree of autonomy and initiative within broadly defined limits.[42]
   B. Teaching-partners should give teachers directions about methods that will help them improve their teaching.

2. A. It is important for teachers to set their own goals and objectives for professional growth.
   B. It is important for teaching-partners to help teachers reconcile their personalities and teaching styles with the philosophy and direction of the school.

3. A. Teachers are likely to feel uncomfortable and anxious if the objectives on which they will be evaluated are not clearly defined by the teaching-partner.
   B. Evaluations of teachers are meaningless if teachers are not able to define with their teaching-partners the objectives for evaluation.

4. A. An open, trusting, warm, and personal relationship with teachers is the most important ingredient in supervising teaching.
   B. A teaching-partner who is too intimate with teachers risks being less effective and less respected than a teaching partner who keeps a certain degree of professional distance from teachers.

---

[42]The term teaching-partner has been substituted for Glickman and Tamashiro's original term, supervisor. This has been done to maintain consistency with the terminology used in this study.

5. A. My role during collaborative consultation conferences is
       to make the interaction positive, to share realistic
       information, and to help teachers plan their own solutions
       to problems.
    B. The methods and strategies I use with teachers in a
       conference are aimed at our reaching agreement over the
       needs for future improvement.

6. In the initial phase of working with a teacher:
    A. I develop objectives with each teacher that will help
       accomplish school goals.
    B. I try to identify the talents and goals of individual
       teacher so they can work on their own improvement.

7. When several teachers have a similar classroom problem. I
    prefer to:
    A. Have the teachers form an ad hoc group and help them work
       together to solve the problem.
    B. Help teachers on an individual basis find their strengths,
       abilities and resources so that each one fins his or her
       own solution to the problem.

8. The most important clue that an in-service workshop is needed
    occurs when:
    A. The teaching-partner perceives that several teachers lack
       knowledge or skill in a specific area, which is resulting
       in low morale, undue stress, and less effective teaching.
    B. Several teachers perceive the need to strengthen their
       abilities in the same instructional area.

9. A. The supervisory staff should decide the objectives of an
       in-service workshop since they have a broad perspective on
       the teachers' abilities and the school's needs.
    B. Teachers and supervisory staff should reach consensus
       about the objectives of an in-service workshop before the
       workshop is held.

10. A. Teachers who feel they are growing personally will be more
       effective than teachers who are not experiencing personal
       growth.
    B. The knowledge and ability of teaching strategies and
       methods that have been proved over the years should be
       taught and practice by all teachers to be effective in
       their classrooms.

11. When I perceive that a teacher might be scolding a student unnecessarily:
    A. I explain, during a conference with the teacher, why the scolding was excessive.
    B. I ask the teacher about the incident, but do not interject my judgements.

12. A. One effective way to improve teacher performance is to formulate clear behavioural objectives and create meaningful incentives for achieving them.
    B. Behavioural objectives are rewarding and helpful to some teachers but stifling to others; some teacher benefit from behavioural objectives in some situations but not in others.

13. During a pre-observation conference:
    A. I suggest to the teacher what I could observe, but I let the teacher make the final decision about the objectives and methods of observation.
    B. The teacher and I mutually decide the objectives and methods of observation.

14. A. Improvement occurs very slowly if teachers are left on their own; but when a group of teachers work together on a specific problem, they learn rapidly and their morale remains high.
    B. Group activities may be enjoyable, but I find that individual, open discussion with a teacher about a problem and its possible solutions leads to more sustained results.

15. When an in-service or staff development workshop is scheduled:
    A. All teachers who participated in the decision to hold the workshop should be expected to attend it.
    B. Teachers, regardless of their role in forming a workshop, should be able to decide if the workshop is relevant to their personal or professional growth and, if not, should not be expected to attend.

APPENDIX F

Teacher Efficacy Scale

TEACHER EFFICACY SCALE
1983 Sherry Gibson, Ph.D.

Name:_____ School:_____

Please indicate the degree to which you agree or disagree with each statement below by circling the appropriate number to the right of each statement.[43]

	Strongly disagree				Strongly agree	
1. When a student does better than usual, many times it is because I exerted a little extra effort.	1	2	3	4	5	6
2. The hours in my class have little influence on students compared to the influence of their home environment.	1	2	3	4	5	6
3. The amount that a student can learn is primarily related to family background.	1	2	3	4	5	6
4. If students aren't disciplined at home, they aren't likely to accept any discipline.	1	2	3	4	5	6
5. When a student is having difficulty with an assignment, I am usually able to adjust it to his/her level.	1	2	3	4	5	6
6. When a student gets a better grade than he or she usually gets, it is usually because I found better ways of teaching that student.	1	2	3	4	5	6
7. When I really try, I can get through to the most difficult students.	1	2	3	4	5	6

---

[43]Strongly disagree = 1; Moderately disagree = 2; Disagree slightly more than agree = 3; Agree slightly more than disagree = 4; Moderately agree = 5; Strongly agree = 6.

	Strongly disagree				Strongly agree	
8. A teacher is very limited in what he/she can achieve because a student's home environment is a large influence on his/her achievement.	1	2	3	4	5	6
9. When the grades of my students improve, it is usually because I found more effective teaching approaches.	1	2	3	4	5	6
10. If a student masters a new math concept quickly, this might be because I knew the necessary steps in teaching that concept.	1	2	3	4	5	6
11. If parents would do more with their children I could do more.	1	2	3	4	5	6
12. If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson.	1	2	3	4	5	6
13. If a student in my class becomes disruptive and noisy, I fell assured that I know some techniques to redirect him or her quickly.	1	2	3	4	5	6
14. The influences of a student's home experiences can be overcome by good teaching.	1	2	3	4	5	6
15. If one of my students couldn't do a class assignment, I would be able to accurately assess whether this assignment was at the correct level of difficulty.	1	2	3	4	5	6
16. Even a teacher with good teaching abilities may not reach many students.	1	2	3	4	5	6

APPENDIX G

Our Class and Its Work Scale

OUR CLASS AND ITS WORK
M.J. Eash, and H.C. Waxman, 1983

DIRECTIONS:
This is not a test. The statements inside are to find out what your class is like. Please answer all the statements. If the statement describes your class well, circle SA, Strongly Agree. If the statement describes how your class is a lot of the time, circle A, Agree. If the statement does not describe how your class is a lot of the time, circle D, Disagree. If the statement does not describe your class at all, circle SD, Strongly Disagree.

EXAMPLE:

MARK YOUR ANSWER

1. Our classroom is noisy.	SA	A	D	SD

If you think that your classroom is noisy almost all the time, circle SA like this:

1. Our classroom is noisy.	SA	A	D	SD

If you think that your classroom is noisy but not all the time, circle A like this:

1. Our classroom is noisy.	SA	A	D	SD

If you think that your classroom is not usually noisy, circle D like this:

1. Our classroom is noisy.	SA	A	D	SD

If you think that your classroom is not noisy at any time, circle SD like this:

1. Our classroom is noisy.	SA	A	D	SD

OUR CLASS AND ITS WORK
M.J. Eash, and H.C. Waxman, 1983

1. Our teacher brings new and different
   materials into the classroom.   SA   A   D   SD

2. Our teacher spends too much time
   asking questions.   SA   A   D   SD

3. Our teacher carefully chicks all
   our work.   SA   A   D   SD

4. Some students bother the class when
   we're working.   SA   A   D   SD

5. Our teacher thinks it's more important
   to learn than to have fun at school.   SA   A   D   SD

6. Before we start a lesson, our teacher
   tells us that we will enjoy it.   SA   A   D   SD

7. We all understand what our teacher is
   talking about.   SA   A   D   SD

8. Students usually get to work with
   other students.   SA   A   D   SD

9. There are many interruptions in our
   classroom.   SA   A   D   SD

10. Students should only do things
    according to the teacher's way.   SA   A   D   SD

11. Our teacher gives us work that is too
    easy for us.   SA   A   D   SD

12. Our teacher lets us know when we act
    well in class.   SA   A   D   SD

13. Our teacher lets us do things on our own.　　SA　A　D　SD

14. Our teacher immediately tells students if their answers are right or wrong.　　SA　A　D　SD

15. Our teacher always rushes us to finish our work.　　SA　A　D　SD

16. Many students do not finish all their work.　　SA　A　D　SD

17. After we've read a lesson, our teacher asks us what we think.　　SA　A　D　SD

18. Our teacher lets us know what we'll do tomorrow.　　SA　A　D　SD

19. Our teacher spends too much time going over work.　　SA　A　D　SD

20. Students do get a chance to ask questions in our class.　　SA　A　D　SD

21. We always spend a lot of time doing our schoolwork.　　SA　A　D　SD

22. We waste a lot of time in school.　　SA　A　D　SD

23. Our teacher never lets us know when we do good work.　　SA　A　D　SD

24. Our teacher assigns us a lot of work to do.　　SA　A　D　SD

25. Students are allowed to select activities on their own.　　SA　A　D　SD

26. Our teacher often reviews yesterday's
    work.   SA   A   D   SD

27. Our teacher asks us questions which
    are too difficult to answer.   SA   A   D   SD

28. We try new and different things in
    the classroom.   SA   A   D   SD

29. We always have an assignment to
    work on.   SA   A   D   SD

30. Our teacher lets us know if the
    questions we answer are right or wrong. SA   A   D   SD

31. Our teacher gets excited about things
    that he or she teaches.   SA   A   D   SD

32. It's difficult for our class to get
    down to work.   SA   A   D   SD

33. We always have enough time to do our
    school-work.   SA   A   D   SD

34. Our class assignments are very
    interesting.   SA   A   D   SD

35. Our teacher lets us play a lot of
    games in school.   SA   A   D   SD

36. Our teacher always gives us homework.   SA   A   D   SD

37. Our teacher has us work too slowly
    in reading and math (arithmetic).   SA   A   D   SD

38. We always have to wait for the teacher
    to tell us what to do before we can
    get started on our work.   SA   A   D   SD

39. Our teacher usually teaches the whole
    class at once.   SA   A   D   SD

40. We are always working in our class.   SA   A   D   SD

APPENDIX H

School Attitudes Scales for Children

ATT #

YOUR NAME:_____

YOUR TEACHER'S NAME:_____

<u>CAREFULLY REMOVE THIS SLIP AND PLACE IT ON THE CORNER OF YOUR</u>
<u>DESK TO BE PICKED UP LATER.</u>

===

School Attitude Scale for Children
Prof. B.S. Randhawa, and Prof. F. Van Hesteren

ATTITUDE SCALES INSTRUCTIONS

How students feel about themselves, the people around them, and their schools is very important, therefore you are asked to fill out the response sheets that go with these instructions.
THIS IS NOT A TEST. There are no "right" or "wrong" answers. The important thing is to tell how you feel about the person, or subject you are considering. You do this by placing an "X" in the center of the space chosen. Examples of how to mark the scales are given on the next page.
When completing the scales, please work quickly. It is better to give your first feelings rather than to think hard about each pair of words. Notice that you are not being asked to place your name on the sheets on which the scales are printed; your opinions will be confidential.

IF YOU DO NOT KNOW THE MEANING OF SOME OF THE WORDS, PLEASE ASK!

\#

EXAMPLE: Please indicate the degree to which you feel the pair of adjectives describes the **sun on a clear day.**

```
          v                           v
          e                           e
          r              n            r
          y              e            y
                  a      i      a
          m              t            m
          u      b       h      b     u
          c      i       e      i     c
          h      t       r      t     h
```

		very much	a bit	neither	a bit	very much	
#1	Bright	____	____	____	____	____	Dim
#2	White	____	____	____	____	____	Black
#3	Cold	____	____	____	____	____	Hot
#4	Square	____	____	____	____	____	Triangular
#5	helpful	____	____	____	____	____	Harmful

Important:
1. Place you "**X**" in the center of the space, not on the boundaries.

2. Be sure you mark an "**X**" for every word pair.

3. Make only **one** "**X**" on a word pair.

Remember:
1. If both words do not apply to the item being rated, select "neither."

2. If the words apply to the item being rated, and the item is being rated mid-way; select "neither" also.

If you are unclear about how to mark the scale, please ask!

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO BEGIN

Please indicate the degree to which you feel each pair of adjectives applies to **yourself**:

```
v                           v
e                           e
r             n             r
y             e             y
       a      i      a
m             t             m
u      b      h      b      u
c      i      e      i      c
h      t      r      t      h
```

Kind ____ ____ ____ ____ ____ Cruel

Clean ____ ____ ____ ____ ____ Dirty

Bad ____ ____ ____ ____ ____ Good

Sad ____ ____ ____ ____ ____ Happy

Beautiful ____ ____ ____ ____ ____ Ugly

Dishonest ____ ____ ____ ____ ____ Honest

Strong ____ ____ ____ ____ ____ Weak

Unfair ____ ____ ____ ____ ____ Fair

Interesting ____ ____ ____ ____ ____ Boring

Awful ____ ____ ____ ____ ____ Nice

MARK THIS SCALE IN REFERENCE TO YOURSELF

DO NOT GO ON TO THE NEXT SCALE UNTIL YOU HAVE BEEN INSTRUCTED TO.

Please indicate the degree to which you feel each pair of adjectives applies to your **classmates in general:**

	very much	a bit	neither	a bit	very much	
Kind	___	___	___	___	___	Cruel
Clean	___	___	___	___	___	Dirty
Bad	___	___	___	___	___	Good
Sad	___	___	___	___	___	Happy
Beautiful	___	___	___	___	___	Ugly
Dishonest	___	___	___	___	___	Honest
Strong	___	___	___	___	___	Weak
Unfair	___	___	___	___	___	Fair
Interesting	___	___	___	___	___	Boring
Awful	___	___	___	___	___	Nice

MARK THIS SCALE IN REFERENCE TO YOUR CLASSMATES IN GENERAL

DO NOT GO ON TO THE NEXT SCALE UNTIL YOU HAVE BEEN INSTRUCTED TO.

Please indicate the degree to which you feel each pair of adjectives applies to your **regular teacher in general:**

```
       v                        v
       e                        e
       r          n             r
       y          e             y
             a    i     a
       m          t           m
       u     b    h     b     u
       c     i    e     i     c
       h     t    r     t     h
```

Kind	___	___	___	___	___	Cruel
Clean	___	___	___	___	___	Dirty
Bad	___	___	___	___	___	Good
Sad	___	___	___	___	___	Happy
Beautiful	___	___	___	___	___	Ugly
Dishonest	___	___	___	___	___	Honest
Strong	___	___	___	___	___	Weak
Unfair	___	___	___	___	___	Fair
Interesting	___	___	___	___	___	Boring
Awful	___	___	___	___	___	Nice

MARK THIS SCALE IN REFERENCE TO YOUR REGULAR TEACHER IN GENERAL

DO NOT GO ON TO THE NEXT SCALE UNTIL YOU HAVE BEEN INSTRUCTED TO.

Please indicate the degree to which you feel each pair of adjectives applies to your **school**:

```
v                       v
e                       e
r           n           r
y           e           y
        a   i   a
m           t           m
u       b   h   b       u
c       i   e   i       c
h       t   r   t       h
```

Kind ____ ____ ____ ____ ____ Cruel

Clean ____ ____ ____ ____ ____ Dirty

Bad ____ ____ ____ ____ ____ Good

Sad ____ ____ ____ ____ ____ Happy

Beautiful ____ ____ ____ ____ ____ Ugly

Dishonest ____ ____ ____ ____ ____ Honest

Strong ____ ____ ____ ____ ____ Weak

Unfair ____ ____ ____ ____ ____ Fair

Interesting ____ ____ ____ ____ ____ Boring

Awful ____ ____ ____ ____ ____ Nice

MARK THIS SCALE IN REFERENCE TO YOUR SCHOOL

DO NOT GO ON TO THE NEXT SCALE UNTIL YOU HAVE BEEN INSTRUCTED.

Please indicate the degree to which you feel each pair of adjectives applies to **learning in general**:

```
            v                     v
            e                     e
            r           n         r
            y           e         y
                  a     i     a
            m           t         m
            u     b     h     b   u
            c     i     e     i   c
            h     t     r     t   h
```

Kind	___	___	___	___	___	Cruel
Clean	___	___	___	___	___	Dirty
Bad	___	___	___	___	___	Good
Sad	___	___	___	___	___	Happy
Beautiful	___	___	___	___	___	Ugly
Dishonest	___	___	___	___	___	Honest
Strong	___	___	___	___	___	Weak
Unfair	___	___	___	___	___	Fair
Interesting	___	___	___	___	___	Boring
Awful	___	___	___	___	___	Nice

MARK THIS SCALE IN REFERENCE TO LEARNING IN GENERAL

DO NOT GO ON TO THE NEXT SCALE UNTIL YOU HAVE BEEN INSTRUCTED TO.

Please indicate the degree to which you feel each pair of adjectives applies to **language arts**:

```
              v               v
              e               e
              r       n       r
              y       e       y
                  a   i   a
              m       t       m
              u   b   h   b   u
              c   i   e   i   c
              h   t   r   t   h
```

Kind	___	___	___	___	___	Cruel
Clean	___	___	___	___	___	Dirty
Bad	___	___	___	___	___	Good
Sad	___	___	___	___	___	Happy
Beautiful	___	___	___	___	___	Ugly
Dishonest	___	___	___	___	___	Honest
Strong	___	___	___	___	___	Weak
Unfair	___	___	___	___	___	Fair
Interesting	___	___	___	___	___	Boring
Awful	___	___	___	___	___	Nice

MARK THIS SCALE IN REFERENCE TO LANGUAGE ARTS

DO NOT GO ON TO THE NEXT SCALE UNTIL YOU HAVE BEEN INSTRUCTED TO.

Please indicate the degree to which you feel each pair of adjectives applies to **social studies**:

```
v                           v
e                           e
r               n           r
y               e           y
        a       i       a
m               t           m
u       b       h       b   u
c       i       e       i   c
h       t       r       t   h
```

	very much	a bit	neither	a bit	very much	
Kind	___	___	___	___	___	Cruel
Clean	___	___	___	___	___	Dirty
Bad	___	___	___	___	___	Good
Sad	___	___	___	___	___	Happy
Beautiful	___	___	___	___	___	Ugly
Dishonest	___	___	___	___	___	Honest
Strong	___	___	___	___	___	Weak
Unfair	___	___	___	___	___	Fair
Interesting	___	___	___	___	___	Boring
Awful	___	___	___	___	___	Nice

MARK THIS SCALE IN REFERENCE TO SOCIAL STUDIES

DO NOT GO ON TO THE NEXT SCALE UNTIL YOU HAVE BEEN INSTRUCTED TO.

Please indicate the degree to which you feel each pair of adjectives applies to **math or arithmetic:**

```
v                    v
e                    e
r         n          r
y         e          y
     a    i    a
m         t          m
u    b    h    b     u
c    i    e    i     c
h    t    r    t     h
```

Kind	___	___	___	___	___	Cruel
Clean	___	___	___	___	___	Dirty
Bad	___	___	___	___	___	Good
Sad	___	___	___	___	___	Happy
Beautiful	___	___	___	___	___	Ugly
Dishonest	___	___	___	___	___	Honest
Strong	___	___	___	___	___	Weak
Unfair	___	___	___	___	___	Fair
Interesting	___	___	___	___	___	Boring
Awful	___	___	___	___	___	Nice

MARK THIS SCALE IN REFERENCE TO MATH OR ARITHMETIC

THIS IS THE LAST SCALE

PLEASE CHECK THAT YOU HAVE NOT SKIPPED ANY WORD PAIRS.