

THE UNIVERSITY OF MANITOBA

THE INTERACTION EFFECT OF STUDENT ANXIETY AND  
STUDENT PERCEPTION OF TEACHER STYLE  
ON ACHIEVEMENT

BY

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## ABSTRACT

The present study was designed to determine if an interaction effect exists between student perception of his teacher's style and the student's anxiety level on achievement. The major hypothesis was that there is an interaction. The remaining hypotheses concerned the nature of this interaction, and stated that the resulting regression lines of student achievement on anxiety, nested within the two teacher styles, are curvilinear.

Three instruments: SPOTS (Student Perception of Teacher Style), IPAT Anxiety Questionnaire, and IPS (Introductory Physical Science) Achievement Test Chapters 6 - 8 Form B, were used to obtain the data. The tests were administered to a sample of 644 male and female Grade 10 science students attending schools in suburban Winnipeg. Nine different teachers had volunteered themselves and their classes. A final sample of 158 students who perceived their teacher as indirect, and 125 who perceived their teachers as direct were employed in this study.

The results showed that there is a significant disordinal interaction between student perception of teacher style and student anxiety on achievement. It was determined that the best fit regression equation for student achievement is curvilinear. It was found that a curvilinear relationship exists between student anxiety level and achievement when the students perceived their teacher as direct. When the students perceived their teacher as indirect the relationship was linear.

Results also indicated that within the range of obtained anxiety scores, students scoring below 15.14 achieved better results under a perceived indirect style, while students scoring above 18.04 achieved better under a perceived direct style.

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## CHAPTER I

### INTRODUCTION

Learning within the classroom is a process that involves at least two units, the teacher and the student. The dynamics between these units help in setting the classroom climate, or, the environment of learning. Flanders (1967) refers to classroom climate as "the qualities that consistently predominate most teacher-pupil contacts" (p. 104). Flanders emphasized the interrelationships of teacher and student within the learning process. As no two students are alike in needs and reactions and because most teachers face classrooms of more than one student at a time, the relationships between teacher and students are very complex. The teacher may be called upon to react differently to individual students. Teachers may even need to choose varying teaching styles in order to satisfy the different needs of the student.

#### The Problem

Cronbach and Snow (1977) explained that learning is a continuous search by the educator for new educational styles, hoping for improved results.

[The teacher] seeks the best style of instruction for a given purpose. Since learners differ, the search for generally superior styles should be supplemented by a search for ways to fit the instruction to each kind of learner. One can expect interactions between learner characteristics and instructional style.(p. 1)



An interaction is said to be present when a situation has one effect on one kind of person and a different effect on another. This effect may be either positive or negative. The teacher's function is to utilize different styles for different students in order to achieve optimum student achievement results. On what basis can a teacher choose a style of teaching which will best satisfy the individual student? The choice of style must be made on specific criteria—those which differentiate one student from another. Bracht (1970) suggests various student variables that might interact with teacher style. One of these was student general anxiety level. Cronbach and Snow (1977) explain that a function of educational research is to locate interactions of individual differences among learners with instructional treatments, that is, aptitude by treatment interaction (ATI). In this paradigm aptitude may be, as suggested by Bracht (1970) and reiterated by Cronbach and Snow (1977), the student variable anxiety, and treatment may be teacher style, as suggested by Cronbach and Snow (1970). Aptitude and treatment are independent variables having an effect upon some dependent variable. In a school situation the dependent variable is frequently student achievement. Thus, an ATI study involving teaching style and student anxiety might assist the teacher in choosing a particular style for a particular student by establishing criteria on which to base his judgement.

## The Variables

### Independent Variables in the ATI Paradigm

The independent variables in the ATI paradigm are aptitude and treatment, each of which will be defined below.

Aptitude. Cronbach and Snow (1977) defined aptitude as, "any characteristic of a person that forecasts his probability of success under a given treatment" (p. 6). Snow (1976) stated that personality variables might predict response to instruction within a given setting. Bracht (1970) said that anxiety, as a personality variable, has an effect upon learning and is therefore considered to be an aptitude. Thus anxiety may be used as an aptitude within the ATI paradigm.

Two types of anxious people have been identified: state anxious and trait anxious people. Spielberger (1966) has presented a conceptual distinction between state and trait anxiety. State anxiety refers to the temporary experience of anxiety and is characterized by the phrase, "anxious now." Trait anxiety refers to a stable elevation in the level of anxiety as it describes an individual. It is part of his personality characteristics and may be characterized by the phrase, "anxious person."

Cronbach and Snow (1977) stated: "While states must be brought into theoretical explanations of the consequences of trait anxiety, state measures can rarely be used practically in education" (p. 394).

Thus the student variable (aptitude within the ATI paradigm) is trait anxiety, which gives a measure of the student's general anxiety level.

Treatment. Cronbach and Snow (1977) explained that treatment covers any manipulative variable, including teacher style of instruction.

Early research using teacher style as an independent variable was carried out by Anderson (1941) and later Cogan (1958). Both defined teacher style in terms of dominative and integrative teacher behaviours. Flanders (1963), using similar characteristics of teaching style, changed the terminology to direct and indirect teaching styles. All research methods used in analyzing teacher style employed a trained observer technique. This presents several problems, such as: (a) a foreign person must enter the classroom, which might create teacher-student inhibitions; (b) a very highly trained observer is necessary; (c) a long period of time is usually deemed to be necessary in order to assume reliable measurement of teacher style; and, (d) this technique assumes that the teacher reacts as direct or indirect in terms of the whole class, whereas he might in fact be direct in style to one student and indirect in style to another. Therefore his behaviour may be deemed to be a function of his perception of the individual needs of each student.

One student related facet of ATI research is the concern for individual differences. The assumption here is that students within the same class may view the same teacher's style differently. If this assumption is made it would be reasonable to infer that students' perceptions of their teacher's style may be a potent variable in determining the outcome of a given instructional segment. Perceptual psychology would suggest that the nominal stimulus (in this case the actual directness or indirectness of a teacher's style) is of less importance than the functional stimulus (in this case the individual student's perception of the teacher's style as direct or indirect). Therefore it is proposed in this

study that students' perceptions of teacher style constitute the appropriate treatment variable rather than a corresponding index of teacher style derived from observer data.

### Hypothesis

An interaction is expected to exist between student general anxiety and student perception of teacher style on achievement. This interaction may be ordinal or disordinal. An ordinal interaction, as depicted by Figure 1 is when two regression lines converge but do not meet on the graph.

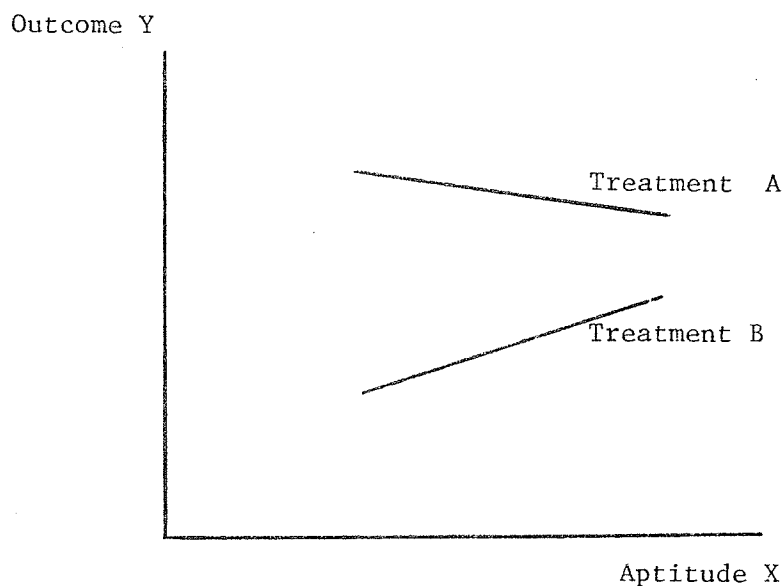


Figure 1. An ordinal interaction.

A disordinal interaction, as depicted by Figure 2, is when two regression lines converge and cross on the graph.

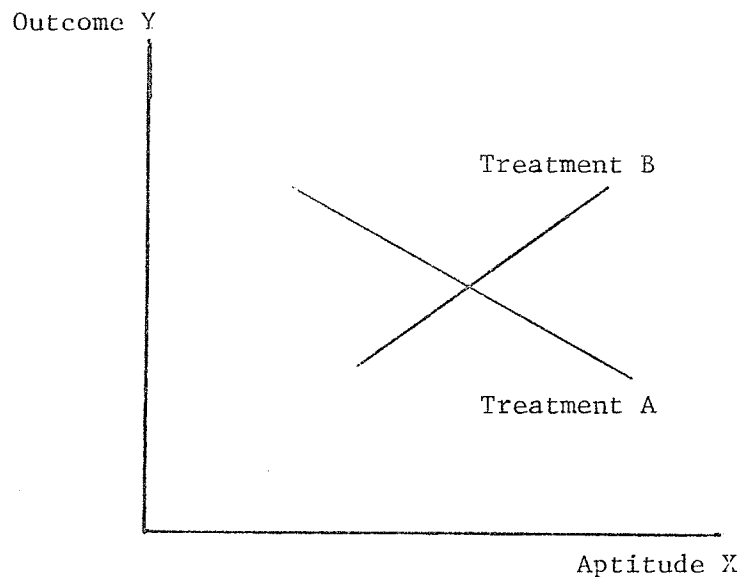


Figure 2. A disordinal interaction.

Cronbach and Snow (1977) argue that an ordinal interaction must be considered an interaction as it suggests "that the regression lines do cross, somewhere outside of the range of the sample" (p. 33). They go on to say that an ordinal interaction may be of importance with regards to program analysis and costs of instruction and therefore must be taken into serious consideration. Therefore the main hypothesis of this study or any ATI study is that there is an interaction between aptitude and treatment.

From this hypothesis a graph can be constructed depicting the interaction, either ordinal or disordinal, of the regression lines. By reading the graph added information is available. The graph will answer questions such as: (a) Can a high anxious student who perceives his teacher as direct achieve better results than one who perceives his teacher as indirect? and (b) Can a low anxious student who perceives his teacher as indirect achieve better results than one who perceives his

teacher as direct? Schools might be able to use this information in student classroom placement and within class groupings. Teachers might be able to use this information in making decisions about their interpersonal relationships with students if the research expectations are achieved.

## CHAPTER II

### A REVIEW OF THE LITERATURE

#### Introduction

Research involving teacher-student classroom relationships evolved from the early work of Anderson (1941). His research on classroom climate and his classification of teacher style into dominative and integrative categories led researchers to the use of the modern notion of aptitude by treatment interaction (ATI). Researchers, following Anderson's lead, examined classroom climate relative to two main variable categories; teacher variables and student variables. Modern research led by Cronbach and Snow (1967, 1969, 1976, 1977), combines these two independent variables in order to study their interactive effect on some dependent variable, which in the school setting often is student achievement.

#### The Effect of the Independent Variables on Achievement

Teacher Style. In order to assess the teacher aspect of classroom climate, Anderson (1941) introduced the terms dominative and integrative when referring to teacher style. He described the dominative teacher as:

- 1) Expresses or lectures about his own ideas or knowledge
- 2) Gives direction or orders
- 3) Criticizes or depreciates pupil behaviour
- 4) Justifies his own position of authority, (p. 106)

The integrative teacher was described as:

1) Accepts, clarifies and supports ideas and feelings of his students

2) Praises and encourages the pupils

3) Asks questions to stimulate pupil participation

4) Asks questions to orient pupils to schoolwork,(p. 106)

Several investigators chose to change Anderson's two category names of dominative and integrative. Cogan (1954) changed them to inclusive for an integrative style and preclusive for a dominative style. He designed an elaborate study of 33 teachers and 987 grade-school students. The students rated their teacher as inclusive or preclusive. Cogan found that, on the whole, pupils who rated their teacher as inclusive did more work for that teacher and had greater success. As an additional result he found that not all students classified their teacher in the same category. Students within the same class differed in their view of the teacher's style. Unfortunately Cogan didn't attempt to determine why this occurred.

Flanders and Amidon (1960), as reported by Amidon and Hough (1967), changed the category names of dominative and integrative to direct and indirect, respectively. Their interpretation of the terms direct and indirect were almost identical to Anderson's interpretation of dominative and integrative, however, Flanders and Amidon were more concise in their version. Their description of a direct teacher was:

1) Lectures

2) Gives direction



- 3) Criticizes or justifies authority (p. 123)

The indirect teacher description was:

- 1) Accepts pupil's feelings
- 2) Praises and/or encourages
- 3) Accepts ideas
- 4) Asks questions (p. 122)

Flanders (1960), as reported by Amidon and Hough (1967), suggested that, "When goals are unclear the effect of the indirect influence is to stimulate the expression of pupil's interest, curiosity and appreciation of several learning goals in terms of the method required to reach them" (p. 111). Under a direct influence he suggested that, "When goals are unclear, the result is to increase or to maintain the existing dependence of pupils on the teacher's control. Under these circumstances the direct influence restricts the alternative reactions to a pupil's overt compliance" (p. 112). This suggests that certain students may fair better under a particular teacher style. A student who needs to be dependent upon a teacher might possibly achieve better results under a direct influence than under an indirect influence. Thus one style may be better for a particular type of student than the other style.

Flanders' method of determining teacher style was to employ a trained observer technique. This technique has specific limitations. It necessitates the presence of an observer in the classroom which might inhibit both teachers and students. The observer must be highly trained. Flanders (1960) said that the prime problem in training observers is converting them into machines and then keeping them in that condition even

though it might deteriorate due to the unending variety of judgements that arise and require consistent treatment.

Another method of teacher style measurement is a student rating scale. Tuckman (1970) argues that one student may perceive a teacher to be direct while another student sitting in the same class may perceive the same teacher to be indirect. A crucial issue to this investigation is a suggestion made by Tuckman. Tuckman suggested that the directness or indirectness of a teacher is really relative to the student's own perceptions. He used a ten-point operational definition of directive teaching, which is as follows:

- 1) Formal planning and structuring of course work,
- 2) Minimization of informal work or small group work,
- 3) Rigid structuring of small groups as is employed,
- 4) Rigid structuring of individual and class activities,
- 5) Emphasis of factual knowledge or knowledge derived from sources of authority,
- 6) Use of absolute and justifiable punishment,
- 7) Minimization of the opportunity to make and to learn from mistakes,
- 8) Maintenance of formal relationships with students,
- 9) Assumption for total responsibility for grades,
- 10) Maintenance of formal classroom atmosphere. (p. 395)

The SPOTS (Student Perception of Teacher Style) is a 17-item rating scale designed by Tuckman. It calls for the student to rate his teacher on a nine-point directiveness scale. An example of this scale is

as follows (adapted from Tuckman, 1975, p. 397):

The teacher

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>
Makes you do what he wants you to do most of the time.			Makes you do what he wants you to do sometimes.			Lets you make your own decisions most of the time.		

Barnett (1972), in a study using SPOTS on a sample of 135 students studying Grade 10 biology, found that students who attained better achievement grades rated their teachers as non-direct by attributing to them scores at the top end of Tuckman's scale. The correlation that Barnett found between high achievement and indirect teaching style was .39.

Research on classroom climate focused on two variable groups: teacher variables and student variables. One independent variable, teacher style, has already been considered; the second independent variable, student anxiety, follows.

Anxiety. Sorenson (1964) said: "The emotions, which largely form the personality structure are the motivating forces which direct the use of one's energies. . . . Emotion-laden behavior often occurs as a response to anxiety" (p. 312). Sorenson defines anxiety as, "a state of mind characterized by tension, fear, and worry. It is a general feeling of apprehension, of discontent and distress" (p. 313). Anxiety as a personality variable has an effect on school achievement. Most researchers agree that anxiety at high levels has a debilitating effect on intellectual functioning. Castaneda (1956) wrote, "Anxiety at an intense level exerts a disorganizing effect diminishing the power of discrimination

and critical thinking" (p. 227).

The effect of anxiety level on intellectual functioning was researched in many studies. Waite et al. (1958) found that low anxious subjects mastered a pair associate learning task more rapidly than did high anxious subjects. Denny (1966) and Easterbrook (1959) found that in concept learning high anxious students had a limited perceptual field and showed less incidental learning. Reubush (1963) found a low negative correlation of  $-.12$  between anxiety and IQ. Korchin and Levine (1957) analyzed types of errors and rate of learning verbal material. They found that the more anxious subjects differed little from non-anxious subjects in the amount learned when dealing with simple and logically associated material. When difficult or unfamiliar material was presented the differences between the two groups was significant. Their interpretation was:

In the situation in which the subject has to make novel adjustments and cannot utilize existing behaviour patterns, the possibility of failure and the consequent loss of self esteem can further release anxiety and further reduce the subject's ability to develop appropriate behaviour. (pp. 223, 240)

Leah Gold Fein (1963) found that high levels of anxiety, as measured by Cattell's IPAT Anxiety Questionnaire were associated with relative failure in nursing school training. She found evidence of a curvilinear relationship between anxiety and achievement. Spence and Spence (1966) also obtained a curvilinear relationship between anxiety and intellectual functioning, with high anxiety levels hindering intellectual functioning.

Thus anxiety at high levels can affect school achievement. Since

evidence has been obtained of a curvilinear relationship, anxiety might be, to a point, an aid to achievement. Anxiety above an optimum level would be debilitating, but until that optimum level is achieved, anxiety might facilitate learning. Some basic questions arising from these data are: Under what conditions can the high anxious child achieve high results? Is there an interaction between teacher style and student anxiety level and does this effect achievement?

#### The Interaction Between Teacher Style and Student Anxiety

Cronbach (1967), Gagne (1967), Snow (1976), and Cronbach and Snow (1977) have suggested that no single instructional method produces maximum learning for all students. With a common set of goals some students will perform more successfully with one instructional program, while other students will be more successful with an alternate program. Withall (1951) demonstrated that a greater degree of general progress can be expected in a warm assuring climate, while Grimes and Allinsmith (1960) found that such support is to no avail in the absence of structure (discussed later). It follows, then, that maximum student achievement can be expected only when instruction is varied to meet the individual needs of each student. Cronbach (1967) states that these individual needs of the student interact with a particular style of instruction. An interaction occurs when under one treatment the results are better for one type of student, but that another treatment would be better for another type of student. Cronbach calls this interaction aptitude by treatment interaction (ATI).

According to Salomon (1971) ATI research can be perceived as

fulfilling two functions. The first is a rather pragmatic one, namely improving instruction and student achievement. The second function of ATI is to develop better explanatory principles concerning the nature of instruction. In order to accomplish this Salomon suggests:

ATI research, by gradually constructing a matrix of learning situations and learner's characteristics, may facilitate the development of a theory of instructions.(p. 328)

Smith and Wood (1956), and Alpert and Haber (1960) suggest that certain emotional characteristics of students may interact with methods of teaching and affect achievement. In order to research this suggestion Grimes and Allinsmith (1961) studied compulsivity, anxiety, and school achievement within two school structures, direct and indirect. They used Anderson's definition of direct and indirect teacher styles. They argued that individual differences such as emotional needs may dispose pupils to find that one or another method of teaching makes learning more palatable, easier, and more satisfying. In their study they placed elementary school children in either a direct influence or an indirect influence. They found that high anxious children taught via an indirect style scored more poorly in relation to high anxious children taught under a structured setting. In addition, the high anxious children in a structured setting achieved higher mean scores than low anxious children. Cronbach (1971), using Grimes and Allinsmith's statistics, searched for an interaction and found it to be ordinal in that the regression lines were not parallel, and would cross outside of the range of the graph.

Other studies that considered the interaction of personality and style of instruction were conducted by Wispe (1953), Smith (1956), and