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## Teacher voice tone and student academic achievement.

James Myron Henderer  
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TEACHER VOICE TONE AND STUDENT  
ACADEMIC ACHIEVEMENT

A dissertation Presented

By

JAMES MYRON HENDERER

Submitted to the Graduate School of the  
University of Massachusetts in  
partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May                      1971  
(month)                      (year)

Major Subject Psychology

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TEACHER VOICE TONE AND STUDENT  
ACADEMIC ACHIEVEMENT

A Dissertation

By

James Myron Henderer

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May 1971

## FOREWORD

It is a very difficult undertaking to impress upon each of those who assisted me in my work the importance of his or her unique contribution and how deeply grateful I am for that contribution.

I am particularly grateful to my chairman, Cass Turner. His commitment, availability and insightful, constructive approach to my research is largely responsible for its successful completion. In addition, his presence has made my work both a privilege and a pleasure. I am also thankful to Dee Appley and Dick Haase, members of my dissertation committee, whose timely and perceptive assistance was most helpful to me.

I want to express my appreciation to George Banks, Bob Carkhuff and Bernie Berenson, whose constructive comments and assistance played an important part in the definition of my proposal.

Needless to say I am indebted to the Buffalo Board of Education, especially Mr. Ronald Banks, Director of Research and Curriculum Evaluation. And to those principals, teachers and students (whom I have been asked not to name) without whose cooperation there would have been no study. But I am even more indebted to Mazie Earle Wagner who made it all possible. She is truly a friend indeed.

My thanks to Gene Zanor, Linda Sobelman, Lois Munson, John Mooreland, Vic Savicki and Bill Barry, who were my raters. Also to Dr. Ian Thomas of the Department of Electrical Engineering who

graciously provided the necessary electronic equipment necessary for my work.

A very special note of thanks to Dick Damon and Biff Ebacher whose remarkable little gray cells and tireless commitment made the computer do some very nice things.

I am also grateful for the encouragement of many friends, in particular Jackie (Disch) Kaalund, Stan Sheets and his son Kevin, who recorded the student stimuli, those at the Niagara Frontier Ballet "Rez" and especially the Feits, whose timely friendship and comments added much to my work.

And where would I be without my parents? I am most grateful to them. They believed in my work and stood behind me through it all.

From such a long list it is obvious that my work depended on a great number of people and that I never could have done it or enjoyed it so much without all of them. So, with humility, I say thank you all.

J.M.H.  
Ashfield, Mass.  
Spring 1971

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## CHAPTER I

Insofar as communication is a central ingredient to all human relations, it seems reasonable to consider its various modes. It has come to be realized, as the result of a recent surge in the research of nonlinguistic (or nonverbal) behaviors, that semantic content is only the top part of the iceberg of human communication.

In a review of the literature, Duncan (1969) suggests a list of nonverbal communication modalities might include: (a) body motion or kinesic behavior: gestures and other body movements, including facial expression, eye movement, and posture; (b) paralanguage: voice qualities, speech nonfluencies, and such nonlanguage sounds as laughing, yawning, and grunting; (c) proxemics: use of "social and personal space and man's perception of it" (Hall, 1966, p.1); (d) olfaction; (e) skin sensitivity to touch and temperature; and (f) use of artifacts, such as dress and cosmetics.

The present study was concerned with paralinguistics; more specifically, it was concerned with one aspect of voice quality, that of voice tone. What is meant by voice tone is simply the feeling expressed in the voice. Here the statement, "It wasn't what he said; it was the way he said it," finds meaning. The purpose of this study was to demonstrate the effects of voice tone on the intellectual development of children. In more specific terms, the aim of this study was to evaluate the effects of the feeling expressed in a teacher's voice in terms of the students' cognitive development.

That teachers have feelings in the classroom is acknowledged. What appears questionable is whether teachers communicate those feelings and if so, whether such communication makes a difference. The assumption on which the present research was based is provided by Pittenger et al. (1960) as the principle of immanent reference. This principle states that no matter what else human beings may be communicating about, or may think they are communicating about, they are always communicating about themselves, about one another, and about the immediate context of the communication. From this it follows that anything anyone ever says is true, when the truth of a communication is seen as that which has caused it to occur. Accordingly, teachers are always truthfully communicating their feelings about themselves, their students and their circumstances. It seems possible that this communication may well be of great importance in the teaching process. It is the impact of this communication that this study sought to explore.

The literature provides two studies (both postdictions) on the effects of voice tone in human relations. Milmo et al. (1967) found voice tone could be used to postdict doctors' success in the referral of alcoholic patients. Ratings were made under three conditions: (1) normal, in which ordinary tape recordings were used; (2) tone-only, in which tape recordings which were specially filtered to eliminate the recognition of the words themselves were used, and; (3) content-only, in which transcripts were used. Doctors whose voice tone was judged less angry in the tone-only condition and more anxious in the normal condition were more successful in referring alcoholics for further treatment. It was also found, although not with



statistical significance, that when greater sympathy was shown in the tone-only channel, alcoholic patients were more successfully influenced to seek treatment. Further, it was suggested that sympathetic content may be "invalidated" by an accompanying lack of sympathy in the tone of voice.

These findings are important. However, the study has its limitations. Although the ratings were made from completely spontaneously elicited speech, this speech was not obtained from the referral interview itself (indeed, a full year elapsed before transcriptions were made), and as such, could not reflect helpee and contextual variables critical to the success or failure of a given referral (Carkhuff, 1969). It is granted that this is the postdiction procedure, but at least recordings should have been made of the doctors in the referral or helping process. Ideally, if recordings of the interview itself were used, ratings would have allowed predictions to be made with the benefit of all the relevant variables.

A second study by Milroe et al. (1968) found a mother's voice to be a postdictor of aspects of her baby's behavior. Again, ratings were made in a normal condition and a tone-only condition. Overall, filtered ratings were at least as postdictive as unfiltered ones; in some instances, they were more so. There were also different findings for mothers of girls and mothers of boys.

Ratings of anxiety and anger in both conditions were associated with various signs of irritability and insecurity in the children, such as fretting and crying, early upset following separation from mother (boys only), and physical closeness to mother. Anxiety was also

related to lack of expression of positive affect in boys. Daughters of mothers with "anxious" voices tended to be more attentive and cautious. It was also found that ratings of warmth and pleasantness in the filtered condition were related to various indexes of attention to a human voice.

As in the previous study the ratings were made from recordings of a brief interview, not of an interaction with the individual whose behavior is in question, in this instance, the child. The authors admit to an additional limitation. The ratings may reflect the transitory situational emotional state of the mother. The suggestion for future research is that recordings tap different situations in an attempt to transcend the momentary and obtain a broader sample of behavior.

Other work relevant to the effects of voice tone in human relations is extant in the literature. Research designed to assess both vocal and lexical aspects of a therapist's style of participation in therapy relate these aspects to case outcome (Rice, 1965). Early in therapy, therapist style characterized by distorted voice quality (Type II) is predictive of unsuccessful case outcome, while there is some suggestion that therapist style characterized by voice quality which tends to be even and relatively uninflected, seldom expressive and never distorted (Type I), may be followed by successful outcome. Late in therapy, the findings are more clear-cut. There is again a significantly negative relationship between Type II style and therapist's and client's judgments as to the success of outcome (questionnaires). Relationships with other outcome measures are negative, but do not reach significance. The relationship between therapist style characterized by an expressive voice quality (Type III) and therapist's

judgment of outcome is significantly positive, as are relationships with two other indexes. The relationship of Type III style to client's judgment and changes on the Barron Es scale are positive, but do not reach significance.

In summary, the presence of Type II therapist style either early or late in therapy is characteristic of therapies that are seen as unsuccessful by both therapist and client. The appearance of Type III style early in therapy seems to be unrelated to outcome, but its appearance late in therapy is clearly related to successful outcome as viewed by both therapist and client. Type III style seems to be a correlate, but not a predictor of therapeutic success. There is some suggestion that the appearance of Type I style early in therapy may be predictive of successful outcome. These findings indicate that aspects of vocal, as well as verbal, behavior are clearly related to case outcome.

There are three important studies concerning the effect of voice tone on learning. In the first (Brooks et al., 1969), middle and lower-class children played learning games in which the reward for learning was praise. Praise came in two forms: the objective words "right" and "correct," and the more evaluative words "good" and "fine." All four words were spoken sometimes in a positive tone of voice and sometimes neutrally. The child's responsiveness to the verbal and vocal parts of the praise-reward was measured by how much he learned.

The positive intonation proved to have a dramatic effect on the learning rate of the lower-class children. They learned much faster when the vocal part of the message was positive than when it was neutral.

No such effect was evident for the middle-class children. The middle-class children learned equally well when words were spoken in a neutral tone of voice as when words were spoken in a positive tone of voice. The effect of voice tone is clearly demonstrated, but the importance of the socioeconomic variable is also demonstrated.

A second study by Brooks et al. (1969) offered support for the findings of the first study. In this study, negative words and a negative tone were used in addition to positive words and a positive tone and a neutral expression for both positive and negative words. Again, middle-class children learned equally well under conditions where words were spoken neutrally or with affect (either positive or negative) while lower-class children learned only under conditions where words were spoken with affect. However, lower-class children were found to learn better from positive words said in a positive tone than from negative words said in a negative tone.

In an attempt to extend the effects of voice tone to a more complex communication situation, Kashinsky and Wiener (1969) simulated a typical classroom situation in which a child is given a set of instructions and then has to work on his own. Instructions were given to middle and lower-class children in a positive tone, a neutral tone and a negative tone. Under conditions where instructions were presented in a positive tone, lower-class children, as predicted, performed better than under conditions where instructions were presented in a neutral or negative tone. Middle-class children performed similarly under all conditions. Thus, the authors conclude, additional support is given to two established phenomena: (1) lower-class children,



in contrast to middle-class children, are differently responsive to tonal variations in communication, and (2) for lower-class children, positive voice tone seems to be the most effective for producing increases in "learning" and performance.

It would appear that any research addressing itself to the effects of voice tone in the learning situation must take the socio-economic variable into account. As for voice tone per se, its impact in the above limited learning situations is clear. The implications for broader learning are also clear.

There are also studies in the literature that demonstrate the importance of the vocal mode for the communication of meaning. Williams and Sundene (1965) state that dimensions of recognition appear applicable to emotional states, no matter whether such states are depicted in a visual, vocal, or combined visual-vocal mode of presentation. Mehrabian and Ferris (1967) found that facial and vocal components do not interact and that the facial component has a stronger effect than the vocal component. However, they also found, contrary to their prediction, that the effect due to the vocal component is also significant.

In a second study, it was found, consistent with the hypothesis, that the variability of inferences about communicator attitude on the basis of information available in content and tone combined is mainly contributed by variations in tone alone. For example, when the attitude communicated in content contradicted the attitude communicated by a negative tone, the total message was judged as communicating a negative attitude (Mehrabian and Wiener, 1967). In discussing the limitations

of the work, the authors suggest that an alternate methodology could have employed electronically filtered speech (resulting in sounds resembling unintelligible speech heard through a wall) for assessing the independent effects of tone. Future use of this technique should offer new evidence that, when no additional information about the communicator is available, the tonal component makes a disproportionately greater contribution to the interpretation of the total message than does the content component.

Finally there are a number of studies which attest to the fact that voice sounds alone carry important information concerning the emotional state of the speaker (Davitz and Davitz, 1959; Eisenberg and Zalawitz, 1938; Kramer, 1964a; Pfaff, 1954; Soskin and Kauffman, 1961; Starkweather, 1956a, 1961). Feelings can be communicated reliably by content-free speech. Variation in pitch, intensity, quality of voice, rate, inflection and rhythm seem to be capable of revealing feelings. Further, these feelings can be reliably identified. These findings support the statement that what one says must share importance with how one says it.

In view of the findings that voice tone has an impact in referral, mothering, therapy and certain learning situations, as well as that voice tone is a significant mode of communication, this study has sought to expand the known effects of voice tone to the classroom. In so doing, it benefited procedurally by what has been learned from previous studies.

A second goal of the present research was to establish that a relationship exists between differential voice tone quality and

differential functioning on a number of facilitative dimensions of human encounter. Such a goal is consistent with the suggestion of Carkhuff and Berenson (1967) that the effective therapist offers clients high levels of nonverbal qualities positively correlated with good process and outcome, as well as communicates to them high levels of facilitative and action-oriented conditions. In his review of the literature, Duncan (1969) poses a question to be answered by future research: can patterns of nonverbal behaviors be discovered which aid discrimination of individual functioning? By demonstrating that those teachers whose voice tone has a positive effect on students' learning are those teachers who are functioning at higher levels of facilitative dimensions, this study hoped at least partially to explicate the effects of voice tone in the learning situation and, indeed, in all human relations.

Predicated on the pioneering work of Sapir (1927), attempts to relate voice quality to personality and/or differential functioning (these two overlap considerably) are abundant in the literature. Despite some doubts expressed by Starkweather (1961), the bulk of the findings are in agreement: there is a definite relationship between voice qualities and both personality traits and personality types (Allport and Cantril, 1934; Duncan, 1945; Friedman et al., 1969; Holzman et al., 1967; Kramer, 1963; Luft, 1951; Mallory and Miller, 1958; Markel, 1969; Markel et al., 1964; Moore, 1939; Pear, 1931; Spoerri, 1966; Stagner, 1936; Starkweather, 1956b, 1969). Agreement that personality variables are mediated by the voice seems reasonable. Kramer (1964b) states that the word "personality" derives from the Latin

personare, "to sound through." Apparently, the word referred to the mouth opening in the mask of an actor. Eventually, the term shifted to mean the actor himself, and then to mean any particular individual; but the etymological origin of "personality" is in the voice of the speaker.

Important research shows changes in acoustics as well as in speech patterns of patients as a result of psychotherapy (Eldred and Price, 1958; Ostwald, 1963). Client voice quality and expressive style have also been shown to be indexes of productive psychotherapy (Rice and Wagstaff, 1967). The assumption is that voice change is a concomitant of personality change.

Of great importance is a study by Duncan, Rice and Butler (1968) entitled "Therapists' Paralanguage in Peak and Poor Psychotherapy Hours." Results showed that paralinguistic description appears capable of yielding a differentiated and meaningful picture of therapy process. Factors were isolated and associated with either peak or poor therapy hours. In peak hours the paralinguistic behavior of the therapist gave the impression of his being serious, warm and relaxed. In those moments when "open voice" was present, the therapist would sound especially close, concerned and warm. The paralinguistic behavior of the therapist in poor hours rendered his voice dull and flat, causing him to sound rather uninvolved. When his voice took on more energy, the therapist would seem to be speaking for effect, editorializing. Thus, paralinguistic behaviors, considered alone, are seen significantly to differentiate valued from disvalued therapy hours. Despite some limitations, the major one being a lack of objective



criteria for assessing peak and poor hours, this study is the only study which successfully demonstrates differential voice quality to be associated with differential individual functioning of persons designated by society as "more knowing," in this case psychotherapists.

All the evidence does not suggest that all persons with a warm voice will be functioning at high levels of facilitative conditions. Carkhuff (1969) reports that low-level communicators yield variable results; that is, they may provide relatively high levels of one facilitative condition while providing low levels on another, almost as though they had specialties in functioning. Accordingly, a person could provide a relatively high degree of empathy or warmth, which would be reflected in his voice tone, and yet at the same time offer low levels of regard, genuineness and concreteness. (Discussion of these variables is found in Carkhuff and Berenson, 1967; Carkhuff, 1969; and Friel et al., 1971.) Evidence does suggest, however, that high level communicators tend to be consistent across all conditions (Carkhuff, 1969; Friel et al., 1971). Therefore, it seems unlikely that anyone providing high levels of conditions would be judged cool or rejecting on the basis of voice tone. Thus, it is possible to conclude that, on the whole, those persons judged by virtue of their voice tone to be warm and accepting should be functioning at relatively higher levels than those whose voice tone is judged cool and unconcerned. Further, those persons whose voice tone is judged to be cool and unconcerned can be assumed to be functioning at relatively low levels. Considered from the point of view of level of functioning, high functioners should yield consistent "warm" voice tone ratings,

whereas low functioners should yield variable ratings, some being judged to have a "warm" voice tone, while the majority are judged to have a "cool" tone of voice.

Just how voice tone relates to level of functioning in all probability depends on the circumstances of the interaction. In other words, it is possible that affect per se may not be related to level of functioning. Rather, the appropriateness of affect is what might be related. For example, the expression of affect always appropriate to the need of the second person characterizes the high functioner while the expression of inappropriate affect is true of the low functioner. What affect is appropriate to the needs of the second person may be evaluated by outcome measures. For the purposes of the present study it was assumed, on the basis of the literature cited above, that what is appropriate in the classroom is a voice tone that is warm and sympathetic, not angry or anxious. Although this may not always be so, the assumption is for the general case.

In addition to the literature concerning the relationship of voice tone to personality and/or interpersonal functioning, there is a growing body of literature relating differential functioning of teachers on a number of dimensions of human encounter to indexes of student achievement (Aspy, 1966, 1967; Aspy and Hadlock, 1967; Getzels and Jackson, 1963; Kratochvil, 1968; Lewis et al., 1965; Little and Walker, 1968; Moustakas, 1967; Reed, 1961; Ryans, 1951; Truax et al., 1964). These dimensions are basically empathy, regard, genuineness and concreteness. In one study it was found that the students of the teacher providing the highest level of facilitative conditions gained

an average of two and one-half academic years over the course of one academic year, while the students of the teacher offering the lowest level of facilitative conditions gained an average of only six achievement months over one academic year (Aspy and Hadlock, 1967). The bulk of the research is in agreement with this finding.

In light of the effect of differential teacher functioning on student achievement, it was hoped that by establishing that a relationship exists between voice tone and differential teacher functioning it would be possible in part to account for the differential effects of voice tone with regard to student achievement.

In summary, the present study tested two major hypotheses:<sup>1</sup>

Hypothesis One: There is a relationship between the voice tone of teachers and the intellectual development of their students; more specifically, students of those teachers whose voice tone is judged warmer or more sympathetic, less angry and less anxious will show significantly more gain on a measure of intellectual development than will students of teachers whose voices are judged cooler or less sympathetic, angrier and more anxious.

Hypothesis Two: Voice tone, as a mediator of personality, is a concomitant of differential individual functioning on facilitative dimensions; more specifically, those teachers whose voice tone is judged warmer or more sympathetic, less angry and less anxious will offer

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<sup>1</sup>The literature suggests that the three voice tones under consideration are closely related (Milroe et al., 1967). For example, a high rating on warmth is found in combination with low ratings on anger and anxiety. Nevertheless, each voice tone need not necessarily be similarly related to outcome. Accordingly, each voice tone will be treated separately: both of the hypotheses must be considered as three separate hypotheses, one hypothesis for each tone.

higher levels of facilitative conditions to their students than will teachers whose voice tone is judged cooler or less sympathetic, angrier and more anxious.

In testing these hypotheses, it has been the goal of this study to extend the known effects of voice tone to the classroom, and at least partially to explicate those effects.

## CHAPTER II

## METHOD

Subjects

Teachers. Six fourth grade teachers in the Buffalo, New York public schools served as teacher Ss. All six were middle class, female and white. They were selected from the teachers in six schools made available by the Buffalo Board of Education. Selection was based on several criteria. To be included in the study, it was necessary for a teacher to have a racially balanced class: a class composed of approximately an equal number of black and white students. Because of the findings concerning the importance of student socioeconomic class, teachers whose students were almost entirely of lower socioeconomic class were selected. In addition, students had to be assigned to her class by a randomized procedure. Each teacher, of course, had to agree to participate in the study as a condition of her selection. Of those selected, four teachers taught in one school, and two teachers taught in one other school. Both schools have traditionally had a particularly large representation of lower socioeconomic groups.

Students. The students of the six teachers selected to participate in the study served as the student Ss. (Fourteen students were not included in the study because they were not members of their classes for the duration of the experiment.) As stated above, these students comprised six classes that were racially balanced. In the



absence of socioeconomic data for all student Ss, a sample comprising about fifty per cent of the students (those students for whom the teacher had information) indicated that the principle wage earners of their families were mostly fathers who were employed as meat cutters, night watchmen, mechanics, construction workers, machine operators, assembly line workers and heavy laborers. They worked for such companies as Republic Steel, Hannah Furnace, Westinghouse, General Motors, Bethlehem Steel, Western Electric and Bell Aerosystems. In several homes where fathers were not present, mothers worked as practical nurses, waitresses, secretaries and factory workers. In many cases, both parents held jobs, and frequently some held two jobs. There were also those who worked for a newspaper, sold insurance or owned their own blasting and drilling company. There was one occupational therapist and one lawyer. Many families were on welfare. Student socioeconomic class, determined on the basis of the occupation of the family's principle wage earner in terms of Warner, Meeker and Eell's Revised Scale for Rating Occupation (Miller, 1964) (see Appendix A) was judged to be upper-lower to lower-middle class. This finding is consistent with the standard established for teacher selection.

There is one additional important consideration. A randomized student assignment procedure was used to create five of the six classes employed in the study. The sixth class was composed of students specially selected because of superior ability. These students were taught by a teacher with thirty-eight years teaching experience. The teachers of the five other classes had an average of four years

teaching experience, with a range of from three years to six years.

In an attempt to control for the effect of this situation, measures of student intelligence were obtained for all student Ss.

### Measures

Teachers. Three 45-minute tape recordings were made of each teacher's performance of regular classroom activities. Recordings were made over a seven week period, care being taken to avoid influences such as day-of-the-week and time-of-the-day. The only arrangements made for taping sessions were to assure that the teacher would be speaking when recordings were to be made. From the three recordings made for each teacher, five 3-minute excerpts were selected in the following manner: from each recording, 3-minute excerpts were taken early in the tape, about half-way through the tape and near the end of the tape. From the nine excerpts thus produced, five were chosen at random for use in judging voice tone and assigned numbers so raters could identify them only by number.

Students. The measure used to assess the students' academic achievement was the Stanford Achievement Test (SAT). Five SAT subtests were used: (a) Word Meaning (WM), (b) Paragraph Meaning (PM), (c) Arithmetic Computation (AC), (d) Arithmetic Concepts (AR) and (e) Arithmetic Applications (AA). The SAT is administered to fourth grade students throughout the Buffalo public schools early in the fall semester (October). The results of this testing, on file in the individual school offices, served as the pre-test for the present research. In one of the two schools (school #1), level Intermediate I, Form W of the

SAT was used. In the other (school #2), level Primary II, Form W was used. Post data was collected in April, following the completion of all tape recording, thus establishing a pre-post interval of six months. Data collection was done with the cooperation of the individual teachers to assure similarity to the previous collection process. In school #1, post-testing was done with level Intermediate I, Form X of the SAT, while level Intermediate I, Form W of the SAT was used in school #2. The choice of levels and forms to be used was made in an attempt to maximize validity. There is considerable comparability and overlap of the test forms used. The results of a standardized test of student intelligence (Otis-Lenon), similarly administered throughout the Buffalo public schools to fourth grade students early in the fall semester (October) and kept on file with the individual school offices, were also collected. In addition, information on student race and sex was gathered. All tests were machine scored by the Department of Research and Curriculum Evaluation, Buffalo Board of Education. Conversion of post-test raw scores to grade-level equivalents was done by hand.

#### Tape Filtering Process

The thirty excerpts obtained from the recordings of teachers' performances in their classrooms were re-recorded in a randomized order, thus forming one composite tape. This tape was then passed electronically through a filter modifier, passing only frequencies below 410 cycles per second, with an attenuation slope asymptotic to 24 decibels per octave, and once again re-recorded. A Krohn-Hite model 315-A



variable filter was used. This low-pass filtering procedure results in a content-filtered recording, which gives the effect of voices heard through an apartment wall. This filtered recording, and the unfiltered master tape, were rated by the raters with regard to voice tone quality.

### Raters and Ratings

Raters. Six advanced doctoral candidates for a degree in psychology at the University of Massachusetts served as tape raters. Their participation in this study was for remuneration. The raters were three men and three women, all white.

Ratings. The six raters rated the thirty excerpts in order to characterize the six teachers with regard to tonal quality. The ratings were made in two modes, filtered and unfiltered or normal: both the filtered and unfiltered tapes were used. The random ordering of excerpts was different on each of these two tapes. Although the raters received no training, they were told they would be listening to excerpts from teachers' performances of their daily activities in the classroom. They were told the study concerned the ability of people to infer feelings and attitudes from the voices of other people. In addition, the nature and purpose of the content filter were explained. Some comments concerning the effect of the filtering were also made. The raters were told that for some excerpts the volume was poor and the teacher's voice would be difficult to rate. However, the raters did not reject any excerpts as unrateable. It was also explained that in several excerpts it would be possible to distinguish some words. The raters were instructed not to listen for words or try to figure out what was being said: they

were simply to concentrate on the voice tone, on the feeling communicated in the voice to which they were listening.

The sixty excerpts, thirty filtered and thirty normal, were presented in a random order to all six raters at one sitting. The raters were asked to rate each excerpt on three dimensions: (1) warmth-sympathy, (2) anger-irritation, (3) anxiety-nervousness. Ratings were made on a 6-point scale (1=none, 6=a great deal). (See Appendix B.) The dimensions were not further defined. Each of the sixty excerpts was played once. After an excerpt was played, it was rated for all three dimensions. Raters were given as much time as they needed after each excerpt to make the ratings. To avoid the systematic effect of a particular rating procedure, a balanced design for the order in which the three dimensions were to be rated for a given excerpt was established. There were ten presentations of each of the six possible orderings in which the three dimensions could be rated. These presentations were randomly assigned and announced to the raters before each excerpt was played. Thus, for excerpt 1, the raters rated first for warmth, then for anger and finally for anxiety: on excerpt 2, they rated first for warmth, then for anxiety and finally for anger, and so on until each of the six possible orders for rating had been employed ten times.

### Teacher Functioning

Teacher level of functioning vis à vis communication was assessed by ratings of teachers' written responses to tape recorded standard student stimuli (Kratochvil, 1968). (See Appendix C.) The

tape recording used was made by a fourth grade boy who attended a school not used in the study. It was presented to the teachers of a given school as a group. The teachers were asked to write the response that they would make in an attempt to be most helpful if this were one of their students who was sitting across from them and speaking directly to them. The tape consisted of nine stimuli or excerpts of student problem exploration. These excerpts dealt with three problem areas (physical, intellectual and emotional) and each was explored in three student moods (depression-distress; anger-agitation and elation-excitement). Ratings were made by trained raters for the interpersonal dimensions of empathy, regard, genuineness and concreteness. (See Appendix D.) Training in the use of scales to measure these dimensions was obtained by the raters in an intensive training course given by Robert R. Carkhuff, Center for Human Relations and Community Affairs, American International College.

## CHAPTER III

## RESULTS

DescriptionsTeacher Voice Tone

Each of the six teachers was rated on scales from 1 (low) to 6 (high) for warmth, anger and anxiety in both filtered and normal modes. The ratings were made by six raters (three male and three female) on five tape recording excerpts, thus making the highest possible rating for any teacher on any dimension-mode a score of 180. The results of rating all the teachers on all the dimension-modes are presented in Table 1. In only one instance for each of three teachers (teacher 1, warmth-normal; teacher 2, warmth-filtered; teacher 3, warmth-filtered) did any teacher receive a total rating in any dimension-mode that placed her in the upper one-third of possible scores. By contrast, twenty-three of the thirty-six total ratings placed teachers in the lower half of possible scores. Although the ratings of teacher voice tone clearly made it possible to label teachers warmer or cooler, angrier or less angry and more anxious or less anxious, in general they made it difficult to label any teacher warm, angry or anxious.

Table 2 presents the coded ratings of the six teachers on the six voice tone dimension-modes. The coded ratings were arrived at by assigning the value 1 to the three teachers with the highest ratings in a given dimension-mode and by assigning the value 2 to the three teachers with the lowest ratings in a given dimension-mode. Only teachers 1 and 5 showed the same pattern of coded ratings in both the filtered and normal modes.

TABLE 1  
Total Ratings of Teachers on the Six Voice Tone  
Dimension-Modes\*

Dimension- Mode	Teacher					
	1	2	3	4	5	6
Warmth- Filtered	110	123	123	99	95	100
Anger- Filtered	53	56	70	67	80	64
Anxiety- Filtered	60	56	70	74	87	64
Warmth- Normal	137	110	81	113	66	96
Anger- Normal	46	79	110	57	106	70
Anxiety- Normal	66	69	97	69	85	77

\*180=highest possible rating



TABLE 2

Coded Ratings of the Six Teachers on the Six Voice  
Tone Dimension-Modes\*

Dimension- Mode	Teacher					
	1	2	3	4	5	6
Warmth- Filtered	1	1	1	2	2	2
Anger- Filtered	2	2	1	2	1	1
Anxiety- Filtered	2	2	1	1	1	2
Warmth- Normal	1	1	2	1	2	2
Anger- Normal	2	1	1	2	1	2
Anxiety- Normal	2	2	1	2	1	1

\*1=high rated teacher

2=low rated teacher

Teacher 3 received high ratings in all but one of the six dimension-modes. It is interesting to note that some teachers (teachers 2 and 6 in the normal mode and teachers 3 and 4 in the filtered mode) received similar ratings for both warmth and anger. The intercorrelation of dimension-mode ratings will be considered later.

### Teacher Level of Functioning

Each of the six teachers was rated on four scales of interpersonal encounter (empathy, regard, genuineness and concreteness). The ratings, with a possible range from 1 (low) to 5 (high), were made by two raters on nine written responses by each teacher to tape recorded standard student stimuli. An average of the four scale scores for each teacher, provided a rating of her average level of functioning. Table 3 presents the average level of functioning findings for the six teachers. No teacher was rated as high as 3.00, considered the minimal level of facilitative functioning (Carkhuff and Berenson, 1967). While teachers rated above 2.00 could be said to be functioning at relatively higher levels than those rated under 2.00, no teachers could be called high functioners.

### Student Level of Achievement

The data presented in Table 4 shows the average grade level at which the six classes involved in the study scored on the pre-test and the post-test of academic achievement. It also shows the average change exhibited by each class across the six month pre-post interval. Finally it shows the average achievements and change for the six

TABLE 3  
Ratings of Average Level of Functioning  
for the Six Teachers\*

Teacher	Average Level of Functioning
1	2.04
2	2.32
3	1.80
4	2.53
5	1.89
6	1.43

\*5.00=highest possible rating

TABLE 4

Average Grade Level Achievement on Pre- and Post-Tests and Average Change for Each of the Six Classes and for All the Classes Combined

Class	Pre	Post	Pre-Post Change*
1	3.29	3.58	2.90
2	3.42	3.86	4.40
3	2.95	3.46	5.10
4	2.92	3.46	5.40
5	3.03	3.85	8.20
6	4.15	5.36	12.10
Total	3.29	3.93	6.35

\*Changes given in academic months. Ten months equal one academic year. **Pre and post scores are given in academic years.**

combined classes. Only one of the six fourth grade classes (#6)<sup>1</sup> showed fourth grade achievement on the pre-test, while two classes (#3 and #4) showed an average achievement of less than third grade level. On the post-test, all of the classes were achieving somewhere within the third grade level except one (#6), which was achieving above fifth grade level. The Average Change scores for each class show four of the six classes (all but #5 and #6) gaining less than six academic months in six months time. One class (#6) gained well over one academic year in the same six month period. While the results for the six combined classes show a gain of a little more than six academic months during the pre-post interval, they also show that the six combined fourth grade classes moved from low third grade achievement to high third grade achievement during most of their stay in the fourth grade.

Fig. 1 shows the average achievement on the pre-test and the post-test for males and females, black students and white students and students of high and low functioning teachers. For each of the variables, student subgroups showed increased achievement on the post-test. Also for each of the variables, the relative achievement of student subgroups remained the same on the post-test as it was on the pre-test: females, whites and students of low functioning teachers showed greater achievement than males, blacks and students of high functioning teachers.

The average achievement on the pre-test and the post-test for students of teachers rated high and low on each of the six voice tone

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<sup>1</sup>Class #6, as mentioned in Chapter II, was a specially selected class of superior ability.



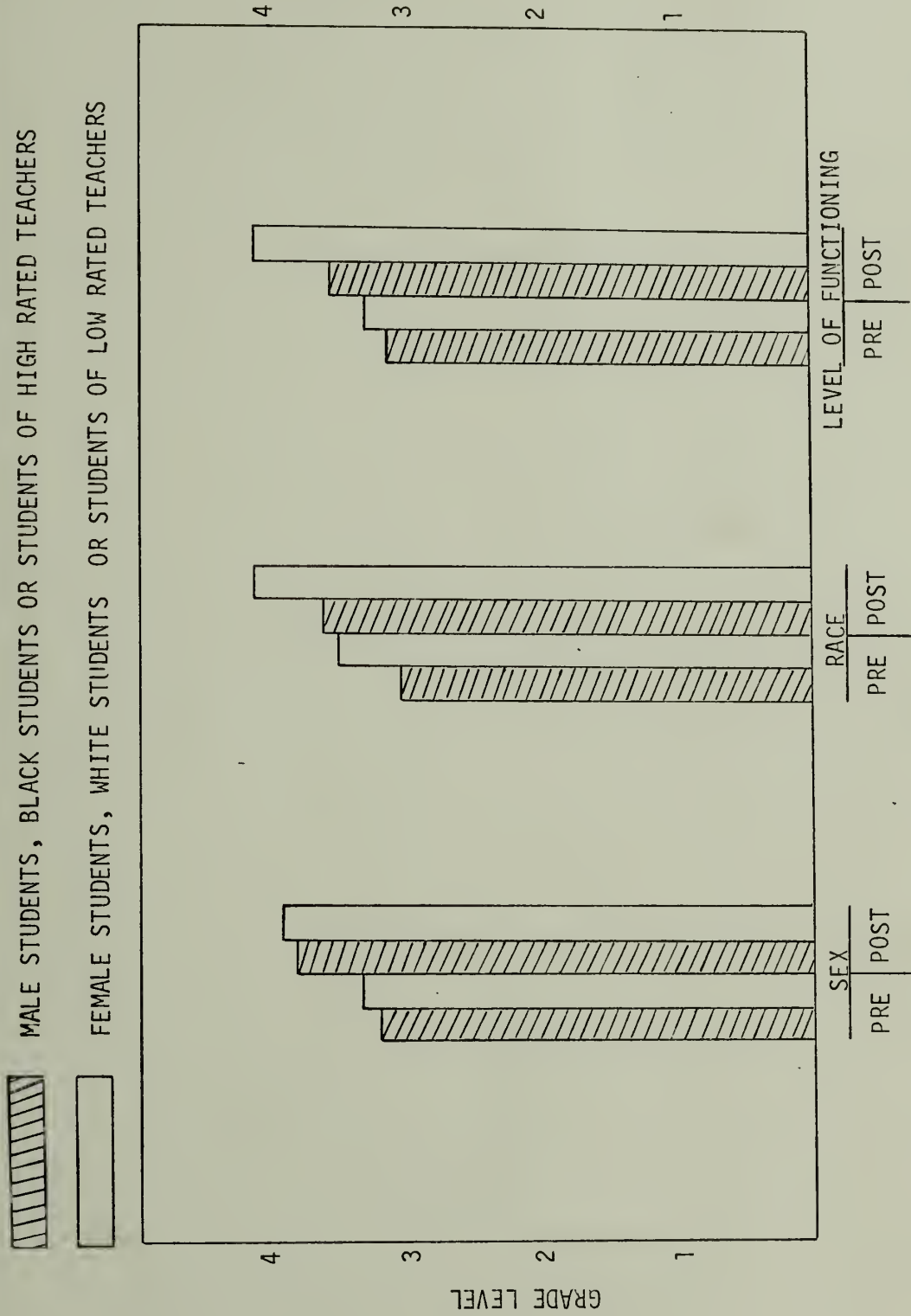


Fig. 1.--Average achievement on pre and post tests for male and female students, black and white students, and students of teachers rated high and low on scales of interpersonal functioning.

dimension-modes is presented in Fig. 2. For all dimension-modes except anxiety-normal, students showed increased achievement on the post-test. The relative achievement of student subgroups was the same on the post-test as it was on the pre-test for all dimension-modes: students of low-rated teachers outperformed students of high-rated teachers with one exception, anger-filtered, where students of teachers rated high-anger performed better than students of teachers rated low-anger.

### Reliability

#### Teacher Voice Tone

The reliability of ratings of teacher voice tone was computed according to Haggard (1958). A reliability was calculated for each tonal dimension (warmth, anger, anxiety) within each rating mode (filtered and normal) for male, female and total raters. The intra-class correlations obtained are shown in Table 5. Significance was determined with reference to a table of F values (Lindquist, 1953) by first converting the correlation coefficients to F values.

Table 5 shows there were low reliabilities obtained for ratings by male raters for anger-filtered and anxiety-normal. Low reliability was also found for female ratings for anxiety-normal. There were two instances where higher reliabilities were found for male ratings than for total ratings (warmth-normal and anger-normal) and two instances where female ratings had higher reliabilities than total ratings (warmth-filtered and anger-normal). Higher reliabilities were found in three instances for male ratings than for female ratings (anxiety-

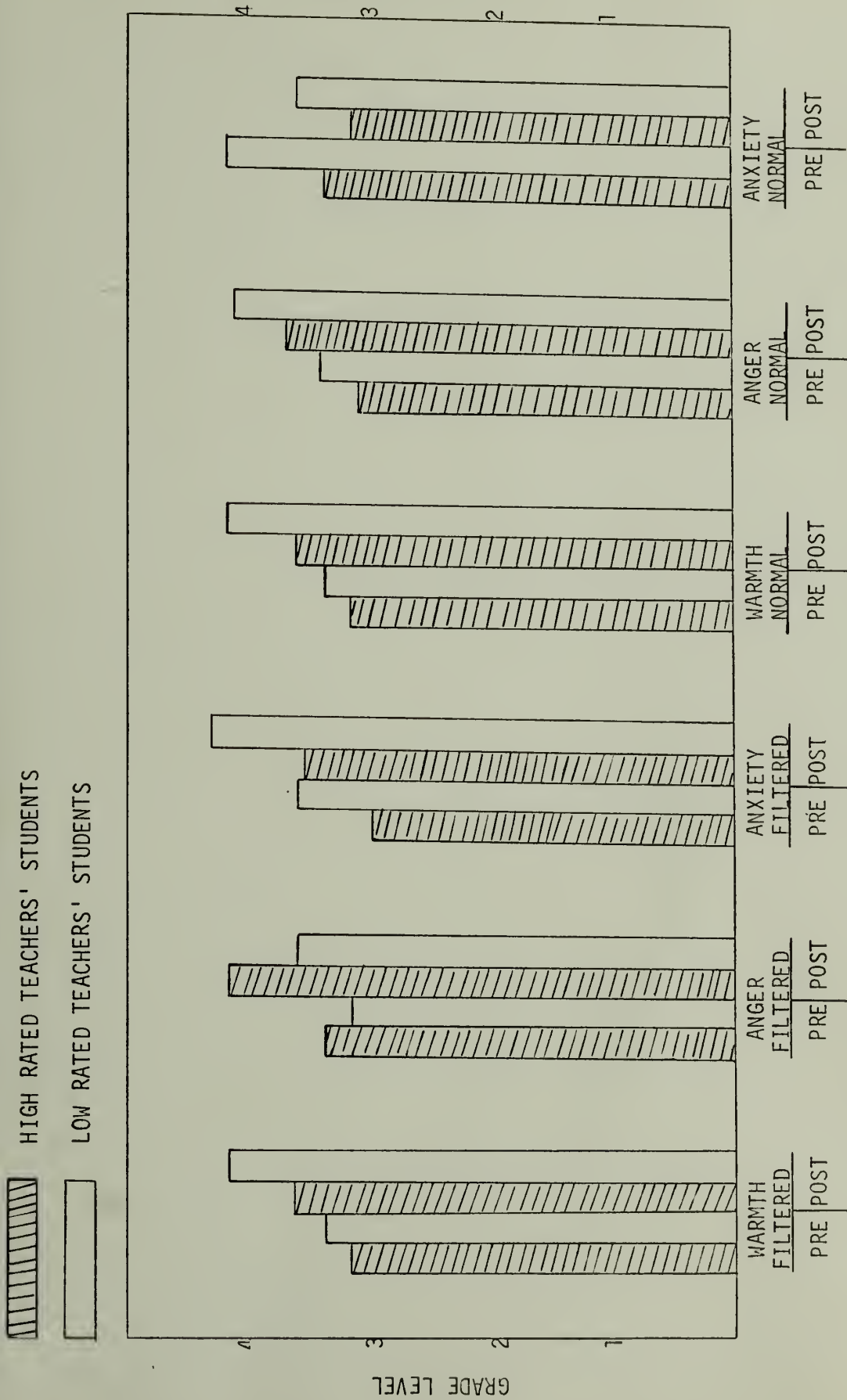


Fig. 2.--Average achievement on pre and post tests for students of teachers rated high and low on each of the six voice tone dimension-modes.

TABLE 5

Reliabilities<sup>1</sup>

for Ratings of Teacher Voice Tone

	Male Raters	Female Raters	Total Raters
Warmth- Filtered	.28*	.76**	.56**
Anger- Filtered	.06	.48**	.73**
Anxiety- Filtered	.58**	.51**	.79**
Warmth- Normal	.42**	.31**	.36**
Anger- Normal	.40**	.48**	.39**
Anxiety- Normal	.19	.17	.48**

<sup>1</sup>Haggard Intraclass Correlations, df=5, 144

\*p ≤ .05

\*\*p ≤ .01

filtered, warmth-normal and anxiety-normal) while in the same number of instances female ratings had higher reliabilities than male ratings (warmth-filtered, anxiety-filtered and anger-normal). Total ratings had higher reliabilities than male or female ratings in three instances (anger-filtered, anxiety-filtered and anxiety-normal). Only total ratings had high reliabilities for all dimensions and modes. Although this was the case, findings based on the ratings of male and female rater groups (wherever reliable) are presented as well as findings based on total ratings. Where ratings were found to be unreliable, the findings based on these ratings were considered to be very tenuous and therefore are not presented.

#### Teacher Level of Functioning

The reliability of ratings of teacher level of functioning was computed according to Haggard (1958). An intraclass correlation of 0.94 ( $p \leq .01$ ,  $df=5, 18$ ) was obtained for the two raters' ratings of the six teachers on four interpersonal dimensions (empathy, regard, genuineness and concreteness).

#### Teacher Voice Tone and Student Academic Achievement

##### The Model

The teacher voice tone data was analyzed on the CDC 3600 using the program for the least squares technique of the analysis of variance by Harvey (1968). This program was selected because of its ability to handle unequal cell frequencies and to list those cell frequencies, which is very useful in the elimination of confounding in the data.



For the analysis a model was established which included the following independent variables: (1) teacher voice tone (high, low on a given dimension-mode combination as determined by a given group of raters), (2) student sex (male, female), (3) student race (black, white), (4) student IQ (high, low as determined by dividing the student Ss in half on the basis of intelligence test scores) and (5) student initial level of academic achievement (henceforth referred to as IA) (high, medium, low as determined by whether the student performed at the fourth grade level or better, the third grade level, or below the third grade level on the pre-test of academic achievement). The following two-factor interactions were also included in the model: (1) voice with sex, (2) voice with race, (3) voice with IQ and (4) voice with IA. Finally the model included the covariate student intelligence (uncoded intelligence test scores were used). Voice tone and its interaction with the other independent variables were central to testing Hypothesis One, that students of those teachers whose voice tone is judged warmer or more sympathetic, less angry and less anxious will show significantly more gain on a measure of intellectual development than will students of teachers whose voices are judged cooler or less sympathetic, angrier and more anxious. The other independent variables and the covariate were of interest primarily as control variables. The principle outcome measure was a student's average change score across the five subtests of the Stanford Achievement Test (SAT) after the six month pre-post interval (Average Change). In addition, each of the five subtests was considered individually.

Average Change

Analysis of the data regarding voice tone and academic achievement yielded the results shown in Table 6. Although ratings of anxiety in teacher voice (in either mode by any group of raters) were not significantly related to student academic achievement, significant results were obtained in both modes of the anger and warmth dimensions. While total ratings of anger showed significant results in both filtered and normal modes, only female ratings produced significant results in the filtered mode for anger as did only male ratings in the normal mode for anger. As concerns the dimension of warmth, ratings by all groups of raters in both modes yielded significant results.

Although there are small discrepancies between the absolute values of the obtained means for some rater groups within a given dimension-mode combination, the direction of the differences between these means for high-rated voice tones and low-rated voice tones is consistent in each dimension-mode combination. The one exception to this rule is for female raters for anger-normal. The means indicate that the students of teachers rated warmer by all groups of raters in both the filtered and normal modes showed significantly less achievement than did the students of teachers rated cooler. Results for ratings in the two modes of anger do not show similar agreement. The students of teachers rated angry in the filtered mode showed significantly more achievement than did the students of teachers rated less angry. However, results of ratings of anger in the normal mode reveal that the students of teachers rated less angry achieved significantly more than the students of teachers rated angrier and more irritated. Although this was not the case with regard to female raters (students of teachers rated angrier outperformed students of teachers rated less angry), the results did not reach statistical significance.

TABLE 6

Means and F Values for Voice Tone and Student Average Academic Change

Dimension- Mode	Rater Group	Means <sup>1</sup>		F Value
		high voice	low voice	
Warmth- Filtered	Male	2.86	8.38	55.91**
	Female	3.43	7.30	16.65**
	Total	2.86	8.38	55.91**
Anger- Filtered	Male <sup>2</sup>			
	Female	7.80	2.60	42.07**
	Total	7.80	2.60	42.07**
Anxiety- Filtered	Male	7.86	6.01	1.97
	Female	6.85	6.21	0.31
	Total	6.85	6.21	0.31
Warmth- Normal	Male	3.20	7.32	16.11**
	Female	3.38	7.99	35.49**
	Total	3.38	7.99	35.49**
Anger- Normal	Male	4.71	6.87	5.58*
	Female	6.99	6.37	0.23
	Total	4.71	6.87	5.58*
Anxiety- Normal	Male <sup>2</sup>			
	Female <sup>2</sup>			
	Total	6.99	6.37	0.23

<sup>1</sup>Means given in academic months. Ten months equal one academic year.<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .05

\*\*p ≤ .001

df=1, 146

Tables 7-18 present the findings pertaining to academic achievement and the independent variables, covariate and interactions described above, considered within the context of the statistical model established for each rater group within a given voice tone dimension-mode. Tables 7-12 indicate that in all instances outside the filtered mode for warmth, the only result of statistical significance for the independent variables and the covariate is the frequent finding of a linear relationship between student intelligence test scores and academic achievement. Within warmth-filtered, the linear relationship between student IQ and achievement was a consistent finding across rater groups. Another consistent finding was that the initial level of student achievement was significantly related to student achievement during the pre-post interval. The means presented reveal that those students who pre-tested at the fourth grade level or better gained less in the six month period than did students who pre-tested at the third grade level and that all of these students gained less than did those who scored below third grade level on the pre-test.

In Tables 13-18 it can be seen that there were no significant interactions for results of either mode of rating for anxiety or for the normal mode of rating for anger. In the three remaining dimension-mode combinations, the only significant interaction found was between voice tone ratings and student initial level of academic achievement. While this interaction was found for ratings by total raters in both modes of warmth, the results were corroborated only as the result of male ratings in the warmth-filtered mode and female ratings in the warmth-normal mode. In the filtered mode for rating anger, ratings by total raters and female raters yielded significant results concerning the interaction of voice tone with IA.

Means and F Values for Sex, Race, IQ, IA and the Covariate Student Intelligence and Student Average Academic Change for Warmth-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	5.68	0.03
		Female	5.56	
	Race	Black	5.20	1.52
		White	6.04	
	IQ	High	6.12	1.04
		Low	5.11	
	IA	High	3.74	6.20**
		Medium	5.37	
		Low	7.74	
	Covariate			13.49***
<u>Female</u>	Sex	Male	5.41	0.01
		Female	5.31	
	Race	Black	4.97	0.89
		White	5.75	
	IQ	High	6.02	1.30
		Low	4.70	
	IA	High	3.51	4.51*
		Medium	5.05	
		Low	7.53	
	Covariate			9.17**
<u>Total</u>	Sex	Male	5.68	0.03
		Female	5.56	
	Race	Black	5.20	1.52
		White	6.04	
	IQ	High	6.12	1.04
		Low	5.11	
	IA	High	3.74	6.20**
		Medium	5.37	
		Low	7.74	
	Covariate			13.49***

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      \*\*p ≤ .005      \*\*\*p ≤ .001

df for IA=2, 144      df for all others=1, 146



Means and F Values for Sex, Race, IQ, IA and the Covariate Student Intelligence and Student Average Academic Change for Anger-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<hr/>				
<u>Male</u> <sup>2</sup>				
<u>Female</u>	Sex	Male	5.25	0.02
		Female	5.15	
	Race	Black	4.93	0.47
		White	5.47	
	IQ	High	5.49	0.28
		Low	4.91	
	IA	High	3.55	3.45
		Medium	5.08	
		Low	6.96	
	Covariate			11.88*
<hr/>				
<u>Total</u>	Sex	Male	5.25	0.02
		Female	5.15	
	Race	Black	4.93	0.47
		White	5.47	
	IQ	High	5.49	0.28
		Low	4.91	
	IA	High	3.55	3.45
		Medium	5.08	
		Low	6.96	
	Covariate			11.88*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\* $p \leq .001$  df for IA=2, 144 df for all others=1, 146

TABLE 9

Means and F Values for Sex, Race, IQ, IA and the Covariate Student Intelligence and Student Average Academic Change for Anxiety-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	6.94	0.00
		Female	6.94	
	Race	Black	6.68	0.35
		White	7.19	
	IQ	High	7.90	2.52
		Low	5.97	
	IA	High	7.78	2.77
		Medium	5.48	
		Low	7.55	
	Covariate			4.77*
<u>Female</u>	Sex	Male	6.37	0.16
		Female	6.69	
	Race	Black	6.26	0.42
		White	6.81	
	IQ	High	7.48	2.32
		Low	5.59	
	IA	High	7.31	1.62
		Medium	5.39	
		Low	6.89	
	Covariate			3.30
<u>Total</u>	Sex	Male	6.37	0.16
		Female	6.69	
	Race	Black	6.26	0.42
		White	6.81	
	IQ	High	7.48	2.32
		Low	5.59	
	IA	High	7.31	1.62
		Medium	5.39	
		Low	6.89	
	Covariate			3.30

<sup>1</sup>Means given in academic months. Ten months equal one academic year.  
 df for IA=2, 144      df for all others=1, 146  
 \*p ≤ .01

TABLE 10

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Means and F Values for Sex, Race, IQ, IA and the Covariate Student Intelligence and Student Average Academic Change for Warmth-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	5.02	0.33
		Female	5.50	
	Race	Black	4.83	0.96
		White	5.69	
	IQ	High	6.28	2.99
		Low	4.24	
	IA	High	3.77	2.59
		Medium	5.14	
		Low	6.87	
	Covariate			1.19
<u>Female</u>	Sex	Male	5.54	0.16
		Female	5.82	
	Race	Black	5.29	1.18
		White	6.08	
	IQ	High	6.31	1.41
		Low	5.06	
	IA	High	4.46	3.12
		Medium	5.37	
		Low	7.21	
	Covariate			6.27*
<u>Total</u>	Sex	Male	5.54	0.16
		Female	5.82	
	Race	Black	5.29	1.18
		White	6.08	
	IQ	High	6.31	1.41
		Low	5.06	
	IA	High	4.46	3.12
		Medium	5.37	
		Low	7.21	
	Covariate			6.27*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for IA=2, 144      df for all others=1, 146

TABLE 11

Means and F Values for Sex, Race, IQ, IA and the Covariate Student Intelligence and Student Average Academic Change for Anger-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	5.74	0.02
		Female	5.84	
	Race	Black	5.41	0.91
		White	6.18	
	IQ	High	6.65	2.16
		Low	4.93	
	IA	High	4.46	2.99
		Medium	5.38	
		Low	7.54	
	Covariate			7.14*
<u>Female</u>	Sex	Male	6.74	0.02
		Female	6.62	
	Race	Black	6.34	0.59
		White	7.02	
	IQ	High	7.65	0.50
		Low	5.72	
	IA	High	7.45	2.51
		Medium	5.25	
		Low	7.35	
	Covariate			2.76
<u>Total</u>	Sex	Male	5.74	0.02
		Female	5.84	
	Race	Black	5.41	0.91
		White	6.18	
	IQ	High	6.65	2.16
		Low	4.93	
	IA	High	4.46	2.99
		Medium	5.38	
		Low	7.54	
	Covariate			7.14*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .01      df for IA=2, 144      df for all others=1, 146

TABLE 12

Means and F Values for Sex, Race, IQ, IA and the Covariate Student Intelligence and Student Average Academic Change for Anxiety-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male<sup>2</sup></u>				
<u>Female<sup>2</sup></u>				
<u>Total</u>	Sex	Male	6.74	0.10
		Female	6.62	
	Race	Black	6.34	0.00
		White	7.02	
	IQ	High	7.65	0.50
		Low	5.72	
	IA	High	7.45	1.13
		Medium	5.25	
		Low	7.35	
	Covariate			2.23

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df for IA=2, 144

df for all others=1, 146



Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
and Student Average Academic Change for Warmth-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male</u>	Sex	Male	3.14	Male	8.22	0.44	
		Female	2.58	Female	8.54		
	Race	Black	2.48	Black	7.91	0.02	
		White	3.24	White	8.85		
	IQ	High	3.12	High	9.12	0.40	
		Low	2.59	Low	7.63		
	IA	High	-1.78	High	9.26	7.95*	
		Medium	3.78	Medium	6.96		
		Low	6.58	Low	8.91		
	<u>Female</u>	Sex	Male	3.69	Male	7.13	0.27
			Female	3.16	Female	7.46	
		Race	Black	2.91	Black	7.04	0.10
White			3.95	White	7.56		
IQ		High	3.81	High	8.24	0.35	
		Low	3.05	Low	6.36		
IA		High	-0.54	High	7.56	2.80	
		Medium	3.94	Medium	6.17		
		Low	6.88	Low	8.17		
<u>Total</u>		Sex	Male	3.14	Male	8.22	0.44
			Female	2.58	Female	8.54	
		Race	Black	2.48	Black	7.91	0.02
	White		3.24	White	8.85		
	IQ	High	3.12	High	9.12	0.40	
		Low	2.59	Low	7.63		
	IA	High	-1.78	High	9.26	7.95*	
		Medium	3.78	Medium	6.96		
		Low	6.58	Low	8.91		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .001      df for Voice X IA=2, 144      df for all others=1, 146

TABLE 14

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
and Student Average Academic Change for Anger-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male<sup>2</sup></u>							
<u>Female</u>	Sex	Male	7.90	Male	2.59	0.02	
		Female	7.70	Female	2.60		
	Race	Black	7.39	Black	2.46	0.12	
		White	8.21	White	2.73		
	IQ	High	8.59	High	2.38	1.35	
		Low	7.00	Low	2.81		
	IA	High	9.09	High	-1.99	7.56*	
		Medium	6.13	Medium	4.04		
		Low	8.18	Low	5.74		
	<u>Total</u>	Sex	Male	7.90	Male	2.59	0.02
			Female	7.70	Female	2.60	
		Race	Black	7.39	Black	2.46	0.12
White			8.21	White	2.73		
IQ		High	8.59	High	2.38	1.35	
		Low	7.00	Low	2.81		
IA		High	9.09	High	-1.99	7.56*	
		Medium	6.13	Medium	4.04		
		Low	8.18	Low	5.74		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\* $p \leq .001$  df for Voice X IA=2, 144 df for all others=1, 146

TABLE 15

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
and Student Average Academic Change for Anxiety-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male</u>	Sex	Male	8.00	Male	5.87	0.11	
		Female	7.72	Female	6.15		
	Race	Black	7.39	Black	5.97	0.25	
		White	8.34	White	6.05		
	IQ	High	8.70	High	7.09	0.07	
		Low	7.02	Low	4.92		
	IA	High	9.22	High	6.33	0.43	
		Medium	5.79	Medium	5.18		
		Low	8.58	Low	6.52		
	<u>Female</u>	Sex	Male	7.16	Male	5.59	1.40
			Female	6.54	Female	6.84	
		Race	Black	6.33	Black	6.19	0.33
White			7.37	White	6.24		
IQ		High	7.76	High	7.20	0.01	
		Low	5.94	Low	5.23		
IA		High	7.82	High	6.81	1.08	
		Medium	4.93	Medium	5.85		
		Low	7.81	Low	5.98		
<u>Total</u>		Sex	Male	7.16	Male	5.59	1.40
			Female	6.54	Female	6.84	
		Race	Black	6.33	Black	6.19	0.33
	White		7.37	White	6.24		
	IQ	High	7.76	High	7.20	0.01	
		Low	5.94	Low	5.23		
	IA	High	7.82	High	6.81	1.08	
		Medium	4.93	Medium	5.85		
		Low	7.81	Low	5.98		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for Voice X IA=2, 144

df for all others=1, 146

TABLE 16

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
and Student Average Academic Change for Warmth-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male</u>	Sex	Male	2.88	Male	7.16	0.04	
		Female	3.52	Female	7.47		
	Race	Black	2.67	Black	7.00	0.06	
		White	3.74	White	7.64		
	IQ	High	3.95	High	8.60	0.31	
		Low	2.45	Low	6.03		
	IA	High	-1.00	High	8.53	3.77	
		Medium	4.28	Medium	6.00		
		Low	6.33	Low	7.42		
	<u>Female</u>	Sex	Male	2.99	Male	8.10	0.51
			Female	3.77	Female	7.88	
		Race	Black	2.93	Black	7.66	0.03
White			3.83	White	8.32		
IQ		High	3.58	High	9.04	1.07	
		Low	3.18	Low	6.94		
IA		High	-0.66	High	9.59	7.54*	
		Medium	4.39	Medium	6.36		
		Low	6.41	Low	8.02		
<u>Total</u>		Sex	Male	2.99	Male	8.10	0.51
			Female	3.77	Female	7.88	
		Race	Black	2.93	Black	7.66	0.03
	White		3.83	White	8.32		
	IQ	High	3.58	High	9.04	1.07	
		Low	3.18	Low	6.94		
	IA	High	-0.66	High	9.59	7.54*	
		Medium	4.39	Medium	6.36		
		Low	6.41	Low	8.02		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .001      df for Voice X IA=2, 144      df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
and Student Average Academic Change for Anger-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	5.11	Male	6.38	1.30	
		Female	4.32	Female	7.36		
	Race	Black	4.12	Black	6.70	0.27	
		White	5.31	White	7.04		
	IQ	High	5.24	High	8.06	0.54	
		Low	4.18	Low	5.68		
	IA	High	1.59	High	7.33	2.35	
		Medium	4.73	Medium	6.02		
		Low	7.82	Low	7.27		
	Female	Sex	Male	7.63	Male	5.86	1.90
			Female	6.36	Female	6.88	
		Race	Black	6.52	Black	6.16	0.08
White			7.47	White	6.58		
IQ		High	7.91	High	7.37	0.01	
		Low	6.07	Low	5.36		
IA		High	8.29	High	6.61	0.80	
		Medium	4.76	Medium	5.74		
		Low	7.93	Low	6.76		
Total		Sex	Male	5.11	Male	6.38	1.30
			Female	4.32	Female	7.36	
		Race	Black	4.12	Black	6.70	0.27
	White		5.31	White	7.04		
	IQ	High	5.24	High	8.06	0.54	
		Low	4.18	Low	5.68		
	IA	High	1.59	High	7.33	2.35	
		Medium	4.73	Medium	6.02		
		Low	7.82	Low	7.27		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.  
df for Voice X IA=2, 144                      df for all others=1, 146



TABLE 18

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
and Student Average Academic Change for Anxiety-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value
		High Voice		Low Voice		
		Students	Months	Students	Months	
<u>Male<sup>2</sup></u>						
<u>Female<sup>2</sup></u>						
<u>Total</u>	Sex	Male	7.63	Male	5.86	1.90
		Female	6.36	Female	6.88	
	Race	Black	6.52	Black	6.16	0.08
		White	7.47	White	6.58	
	IQ	High	7.91	High	7.37	0.01
		Low	6.07	Low	5.36	
	IA	High	8.29	High	6.61	0.80
		Medium	4.76	Medium	5.74	
		Low	7.93	Low	6.76	

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df for Voice X IA=2, 144

df for all others=1, 146

The same pattern of means is displayed in both modes of warmth by each group of raters, despite small discrepancies in the absolute value of the obtained means. Briefly, those students who scored the highest on the pre-test showed the greatest achievement of any IA group when taught by a teacher rated cooler, while high IA students taught by a teacher rated warmer and more sympathetic showed the least academic achievement (in fact, they lost on the average more than one academic month in the six month period) of any IA group. With regard to the results based on ratings of anger in the filtered mode, there was again a consistent finding. Both female and total ratings showed that as a group, students who scored highest on the pre-test achieved more than other IA groups when taught by angrier teachers and that high IA students when taught by less angry teachers showed the least academic gain (a loss of almost two academic months) of any IA group. In addition no IA group showed more achievement with warmer, less angry teachers than it did with cooler, angrier teachers.

### Subtests

The results regarding voice tone and student performance on the five subtests of the SAT are presented in Tables 19-20 (two English subtests) and Tables 21-23 (three arithmetic subtests). In very few instances were voice tone ratings found to be significantly related to performance on the Word Meaning (WM) subtest and in no instances at all were they found to be significantly related to the Paragraph Meaning (PM) subtest. By contrast, there were numerous instances where voice tone ratings were significantly related to all three arithmetic subtests. However, for all five subtests the means reveal a consistent pattern of

Means and F Values for Voice Tone and the Word Meaning (WM) Subtest  
of the Stanford Achievement Test

Dimension- Mode	Rater Group	Means <sup>1</sup>		F Value
		High Voice	Low Voice	
<u>Warmth- Filtered</u>	Male	5.82	7.23	1.26
	Female	7.01	6.38	0.67
	Total	5.82	7.23	1.26
<u>Anger- Filtered</u>	Male <sup>2</sup>			
	Female	7.34	4.94	3.40
	Total	7.34	4.94	3.40
<u>Anxiety- Filtered</u>	Male	11.53	6.30	8.14*
	Female	10.74	5.85	9.39**
	Total	10.74	5.85	9.39**
<u>Warmth- Normal</u>	Male	6.60	6.54	0.00
	Female	5.80	7.21	1.28
	Total	5.80	7.21	1.28
<u>Anger- Normal</u>	Male	7.16	6.94	0.03
	Female	11.40	6.32	8.13*
	Total	7.16	6.94	0.03
<u>Anxiety- Normal</u>	Male <sup>2</sup>			
	Female <sup>2</sup>			
	Total	11.40	6.32	8.13*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .01

\*\*p ≤ .005

df=1, 146

TABLE 20

Means and F Values for Voice Tone and the Paragraph Meaning (PM) Subtest  
of the Stanford Achievement Test

Dimension- Mode	Rater Group	Means <sup>1</sup>		F Value
		High Voice	Low Voice	
<u>Warmth- Filtered</u>	Male	7.41	6.13	0.89
	Female	7.95	6.38	1.05
	Total	7.41	6.13	0.89
<u>Anger- Filtered</u>	Male <sup>2</sup>			
	Female	6.25	7.48	0.75
	Total	6.25	7.48	0.75
<u>Anxiety- Filtered</u>	Male	6.15	7.39	0.39
	Female	7.23	7.81	0.12
	Total	7.23	7.81	0.12
<u>Warmth- Normal</u>	Male	5.93	6.48	0.11
	Female	7.02	6.14	0.42
	Total	7.02	6.14	0.42
<u>Anger- Normal</u>	Male	7.02	6.86	0.01
	Female	6.83	7.17	0.03
	Total	7.02	6.86	0.01
<u>Anxiety- Normal</u>	Male <sup>2</sup>			
	Female <sup>2</sup>			
	Total	6.83	7.17	0.03

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df=1, 146

TABLE 21

Means and F Values for Voice Tone and the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test

Dimension- Mode	Rater Group	Means <sup>1</sup>		F Value
		High Voice	Low Voice	
<u>Warmth- Filtered</u>	Male	3.13	8.67	17.55*
	Female	5.46	6.87	0.78
	Total	3.13	8.67	17.55*
<u>Anger- Filtered</u>	Male <sup>2</sup>			
	Female	8.03	2.83	13.24*
	Total	8.03	2.83	13.24*
<u>Anxiety- Filtered</u>	Male	4.98	5.98	0.24
	Female	4.48	5.92	0.64
	Total	4.48	5.92	0.64
<u>Warmth- Normal</u>	Male	0.59	8.62	25.82*
	Female	3.18	8.94	18.83*
	Total	3.18	8.94	18.83*
<u>Anger- Normal</u>	Male	6.31	5.60	0.24
	Female	5.22	5.97	0.14
	Total	6.31	5.60	0.24
<u>Anxiety- Normal</u>	Male <sup>2</sup>			
	Female <sup>2</sup>			
	Total	5.22	5.97	0.14

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\* $p \leq .001$        $df=1, 146$



TABLE 22

Means and F Values for Voice Tone and the Arithmetic Concepts (AR) Subtest  
of the Stanford Achievement Test

Dimension- Mode	Rater Group	Means <sup>1</sup>		F Value
		High Voice	Low Voice	
<u>Warmth- Filtered</u>	Male	2.71	12.25	36.27***
	Female	3.08	10.63	15.81***
	Total	2.71	12.25	36.27***
<u>Anger- Filtered</u>	Male <sup>2</sup>			
	Female	10.62	3.81	14.72***
	Total	10.62	3.81	14.72***
<u>Anxiety- Filtered</u>	Male	9.26	7.86	0.28
	Female	6.52	9.12	1.23
	Total	6.52	9.12	1.23
<u>Warmth- Normal</u>	Male	4.83	10.39	6.92**
	Female	4.76	10.94	13.50***
	Total	4.76	10.94	13.50***
<u>Anger- Normal</u>	Male	5.17	9.69	6.12*
	Female	5.80	9.20	1.68
	Total	5.17	9.69	6.12*
<u>Anxiety- Normal</u>	Male <sup>2</sup>			
	Female <sup>2</sup>			
	Total	5.80	9.20	1.68

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .05

\*\*p ≤ .01

\*\*\*p ≤ .001

df=1, 146

TABLE 23

Means and F Values for Voice Tone and the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test

Dimension- Mode	Rater Group	Means <sup>1</sup>		F Value
		High Voice	Low Voice	
<u>Warmth- Filtered</u>	Male	-4.60	9.48	101.28*
	Female	-4.68	7.09	39.94*
	Total	-4.60	9.48	101.28*
<u>Anger- Filtered</u>	Male <sup>2</sup>			
	Female	8.33	-6.10	97.43*
	Total	8.33	-6.10	97.43*
<u>Anxiety- Filtered</u>	Male	5.81	3.41	0.76
	Female	4.51	3.11	0.33
	Total	4.51	3.11	0.33
<u>Warmth- Normal</u>	Male	-1.65	5.85	12.39*
	Female	-3.46	8.26	67.17*
	Total	-3.46	8.26	67.17*
<u>Anger- Normal</u>	Male	-2.16	6.68	23.23*
	Female	4.27	4.30	0.00
	Total	-2.16	6.68	23.23*
<u>Anxiety- Normal</u>	Male <sup>2</sup>			
	Female <sup>2</sup>			
	Total	4.27	4.30	0.00

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .001

df=1, 146

performance similar to that seen for Average Change. Students of cooler, angrier and more anxious teachers significantly outperformed students of warmer, less angry and less anxious teachers, with one exception. The exception is for ratings of anger in the normal mode. In this dimension-mode, students of less angry teachers showed significantly more achievement than did students of angrier teachers, but only with regard to two arithmetic subtests, Arithmetic Concepts (AR) and Arithmetic Applications (AA). For the English subtest WM, the pattern of students of the teachers whose voice tones were rated angrier achieving significantly more than students of less angry teachers was again evidenced. It is interesting to note that in some cases (anger-filtered, female and total raters, arithmetic subtest Arithmetic Applications (AA)), differences in achievement exceeded fourteen academic months and involved the loss of over six academic months in the six month experimental interval.

Tables 24-53 present the results for the additional independent variables and the covariate for the English (Tables 24-35) and arithmetic (Tables 36-53) subtests. Similarly, in Tables 54-83 the results for the interaction of voice with the additional independent variables are presented for the English (Tables 54-65) and arithmetic (Tables 66-83) subtests. An overview of the findings presented in Tables 24-53 indicates that with regard to the independent variables and the covariate, achievement on the English subtests (Tables 24-35) differed significantly for black students and white students, for students with different initial levels of academic achievement and for students above and below the median student IQ (93.14). A significant linear relationship between student IQ and performance on these subtests was also found. All of

Means and F Values for Sex, Race, IQ, IA and the Covariate Student Intelligence for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male Female	6.38 6.68	0.07
	Race	Black White	4.64 8.42	10.44**
	IQ	High Low	6.84 6.22	0.13
	IA	High Medium Low	5.84 5.63 8.12	1.77
	Covariate			4.26*
<u>Female</u>	Sex	Male Female	6.38 6.46	0.00
	Race	Black White	4.66 8.18	7.83**
	IQ	High Low	6.95 5.89	0.36
	IA	High Medium Low	5.66 5.69 7.91	1.30
	Covariate			3.84
<u>Total</u>	Sex	Male Female	6.38 6.68	0.07
	Race	Black White	4.64 8.42	10.44**
	IQ	High Low	6.84 6.22	0.13
	IA	High Medium Low	5.84 5.63 8.12	1.77
	Covariate			4.26*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      \*\*p ≤ .005

df for IA=2, 144      df for all others =1, 146

TABLE 25

Means and F Values for Sex, Race, IQ, IA and the Covariate Student Intelligence for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male<sup>2</sup></u>				
<u>Female</u>	Sex	Male	6.11	0.00
		Female	6.17	
	Race	Black	4.80	4.29*
		White	7.48	
	IQ	High	5.97	0.04
		Low	6.31	
	IA	High	5.82	1.01
		Medium	5.30	
		Low	7.31	
	Covariate			5.26*
<u>Total</u>				
Sex	Male	6.11	0.00	
	Female	6.17		
Race	Black	4.80	4.29*	
	White	7.48		
IQ	High	5.97	0.04	
	Low	6.31		
IA	High	5.82	1.01	
	Medium	5.30		
	Low	7.31		
Covariate			5.26*	

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .05      df for IA=2, 144      df for all others=1, 146



Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	8.82	0.03
		Female	9.01	
	Race	Black	7.16	8.45**
		White	10.66	
	IQ	High	8.96	0.00
		Low	8.86	
	IA	High	13.30	5.79*
		Medium	5.36	
		Low	8.08	
	Covariate			4.66*
<u>Female</u>	Sex	Male	8.08	0.15
		Female	8.51	
	Race	Black	6.46	9.71**
		White	10.12	
	IQ	High	8.37	0.01
		Low	8.22	
	IA	High	11.87	4.08*
		Medium	5.67	
		Low	7.34	
	Covariate			4.22*
<u>Total</u>	Sex	Male	8.08	0.15
		Female	8.51	
	Race	Black	6.46	9.71**
		White	10.12	
	IQ	High	8.37	0.01
		Low	8.22	
	IA	High	11.87	4.08*
		Medium	5.67	
		Low	7.34	
	Covariate			4.22*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      \*\*p ≤ .005      df for IA=2, 144      df for all others=1, 146

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Warmth-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	6.40	0.08
		Female	6.75	
	Race	Black	5.06	5.34*
		White	8.09	
	IQ	High	6.85	0.10
		Low	6.29	
	IA	High	6.65	1.61
		Medium	5.30	
		Low	7.77	
	Covariate			2.99
<u>Female</u>	Sex	Male	6.28	0.15
		Female	6.72	
	Race	Black	4.64	10.22**
		White	8.36	
	IQ	High	6.58	0.01
		Low	6.42	
	IA	High	6.10	2.03
		Medium	5.39	
		Low	8.02	
	Covariate			4.42*
<u>Total</u>	Sex	Male	6.28	0.15
		Female	6.72	
	Race	Black	4.64	10.22**
		White	8.36	
	IQ	High	6.58	0.01
		Low	6.42	
	IA	High	6.10	2.03
		Medium	5.39	
		Low	8.02	
	Covariate			4.42*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      \*\*p ≤ .005      df for IA=2, 144      df for all others=1, 146

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	6.91	0.06
		Female	7.19	
	Race	Black	5.11	10.88**
		White	9.00	
	IQ	High	7.62	0.44
		Low	6.49	
	IA	High	7.60	1.34
		Medium	5.80	
		Low	7.76	
	Covariate			2.30
<u>Female</u>	Sex	Male	8.85	0.00
		Female	8.87	
	Race	Black	7.00	9.19**
		White	10.72	
	IQ	High	9.24	0.20
		Low	8.49	
	IA	High	13.40	5.53*
		Medium	5.42	
		Low	7.77	
	Covariate			3.09
<u>Total</u>	Sex	Male	6.91	0.06
		Female	7.19	
	Race	Black	5.11	10.88**
		White	9.00	
	IQ	High	7.62	0.44
		Low	6.49	
	IA	High	7.60	1.34
		Medium	5.80	
		Low	7.76	
	Covariate			2.30

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      \*\*p ≤ .005      df for IA=2, 144      df for all others=1, 146

TABLE 29

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male<sup>2</sup></u>				
<u>Female<sup>2</sup></u>				
<u>Total</u>	Sex	Male	8.85	0.00
		Female	8.87	
	Race	Black	7.00	9.19**
		White	10.72	
	IQ	High	9.24	0.20
		Low	8.49	
	IA	High	13.40	5.53*
		Medium	5.42	
		Low	7.77	
	Covariate			3.09

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\* $p \leq .05$       \*\* $p \leq .005$       df for IA=2, 144      df for all others=1, 146

TABLE 30

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Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male Female	6.96 6.58	0.10
	Race	Black White	5.95 7.59	1.71
	IQ	High Low	9.79 3.75	11.11*
	IA	High Medium Low	6.97 7.28 6.06	0.37
	Covariate			0.90
<u>Female</u>	Sex	Male Female	7.71 6.62	0.65
	Race	Black White	6.30 8.03	1.66
	IQ	High Low	10.54 3.79	12.95**
	IA	High Medium Low	8.08 7.33 6.09	0.43
	Covariate			1.11
<u>Total</u>	Sex	Male Female	6.96 6.58	0.10
	Race	Black White	5.95 7.59	1.71
	IQ	High Low	9.79 3.75	11.11*
	IA	High Medium Low	6.97 7.28 6.06	0.37
	Covariate			0.90

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .005

\*\*p ≤ .001

df for IA=2, 144

df for all others=1, 146



TABLE 31

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male<sup>2</sup></u>				
<u>Female</u>	Sex	Male	6.90	0.00
		Female	6.82	
	Race	Black	5.58	3.34
		White	8.15	
	IQ	High	9.90	9.91*
		Low	3.82	
	IA	High	6.45	1.06
		Medium	8.09	
		Low	6.04	
	Covariate			1.05
<u>Total</u>	Sex	Male	6.90	0.00
		Female	6.82	
	Race	Black	5.58	3.34
		White	8.15	
	IQ	High	9.90	9.91*
		Low	3.82	
	IA	High	6.45	1.06
		Medium	8.09	
		Low	6.04	
	Covariate			1.05

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\* $p \leq .005$       df for IA=2, 144      df for all others=1, 146

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male Female	6.92 6.62	0.06
	Race	Black White	6.35 7.20	0.43
	IQ	High Low	9.69 3.85	10.25*
	IA	High Medium Low	9.91 6.75 5.67	0.41
	Covariate			1.37
<u>Female</u>	Sex	Male Female	7.87 7.17	0.34
	Race	Black White	6.46 8.57	2.78
	IQ	High Low	10.61 4.43	11.12*
	IA	High Medium Low	9.07 7.68 5.80	1.00
	Covariate			2.04
<u>Total</u>	Sex	Male Female	7.87 7.17	0.34
	Race	Black White	6.46 8.57	2.78
	IQ	High Low	10.61 4.43	11.12*
	IA	High Medium Low	9.07 7.68 5.80	1.00
	Covariate			2.04

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .005      df for IA=2, 144      df for all others=1, 146

TABLE 33

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test Warmth-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	6.05	0.06
		Female	6.36	
	Race	Black	5.55	0.88
		White	6.86	
	IQ	High	8.68	6.83*
		Low	3.75	
	IA	High	6.64	0.18
		Medium	6.40	
		Low	5.57	
	Covariate			0.29
<u>Female</u>	Sex	Male	6.81	0.13
		Female	6.36	
	Race	Black	5.82	1.45
		White	7.34	
	IQ	High	9.52	10.14**
		Low	3.64	
	IA	High	6.69	0.36
		Medium	7.12	
		Low	5.93	
	Covariate			0.42
<u>Total</u>	Sex	Male	6.81	0.13
		Female	6.36	
	Race	Black	5.82	1.45
		White	7.34	
	IQ	High	9.52	10.14**
		Low	3.64	
	IA	High	6.69	0.36
		Medium	7.12	
		Low	5.93	
	Covariate			0.42

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05

\*\*p ≤ .005

df for IA=2, 144

df for all others=1, 146

TABLE 34

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Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	7.28	0.31
		Female	6.60	
	Race	Black	6.24	1.20
		White	7.64	
	IQ	High	9.97	10.53*
		Low	3.91	
	IA	High	7.65	0.47
		Medium	7.29	
		Low	5.88	
	Covariate			0.86
<u>Female</u>	Sex	Male	7.39	0.37
		Female	6.61	
	Race	Black	6.13	1.65
		White	7.88	
	IQ	High	10.11	11.17*
		Low	3.89	
	IA	High	8.41	0.31
		Medium	6.67	
		Low	5.93	
	Covariate			1.20
<u>Total</u>	Sex	Male	7.28	0.31
		Female	6.60	
	Race	Black	6.24	1.20
		White	7.64	
	IQ	High	9.97	10.53*
		Low	3.91	
	IA	High	7.65	0.47
		Medium	7.29	
		Low	5.88	
	Covariate			0.86

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .005      df for IA=2, 144      df for all others=1, 146

TABLE 35

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male<sup>2</sup></u>				
<u>Female<sup>2</sup></u>				
<u>Total</u>	Sex	Male	7.39	0.37
		Female	6.61	
	Race	Black	6.13	1.65
		White	7.88	
	IQ	High	10.11	11.17*
		Low	3.89	
	IA	High	8.41	0.31
		Medium	6.67	
		Low	5.93	
	Covariate			1.20

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .005      df for IA=2, 144      df for all others=1, 146



these variables except levels of student IQ were found to pertain to performance on the WM subtest, but only levels of student IQ were found pertinent to the PM subtest. Briefly, the means show that in general white students performed better than black students, students with the highest initial level of achievement showed the most gain of any IA group and students with above median IQ's achieved more than students with below median IQ's.

For the arithmetic subtests (Tables 36-53), initial level of student achievement was the only significant independent variable. Again a linear relationship between student IQ and subtest performance was found for both subtest Arithmetic Computation (AC) and subtest Arithmetic Concepts (AR). This was the only significant finding pertaining to subtest Arithmetic Concepts (AR). There were no significant findings for subtest Arithmetic Applications (AA). The means for the subtest Arithmetic Computations (AC) indicate a reversal of the finding for IA for the English subtest WM. In this instance, the students with the poorest initial level of academic achievement showed the greatest gain of any IA group.

With regard to the interaction of voice tone and the additional independent variables relevant to the English subtests (Tables 54-65), there were frequent significant findings for the interaction of voice with initial level of student achievement and student race. There is also one instance where the interaction of voice tone and student sex was found to be significant. Although the means indicate no general pattern of results for the voice-race interaction, a general finding for the voice-IA interaction is that students who performed at the highest initial level of achievement showed greater gains with angrier, more anxious teachers than did any other IA group under any other voice

TABLE 36

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Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	6.87	2.67
		Female	4.92	
	Race	Black	5.27	1.05
		White	6.53	
	IQ	High	6.35	0.26
		Low	5.44	
	IA	High	5.20	6.76*
		Medium	3.70	
		Low	8.79	
	Covariate			8.15
<u>Female</u>	Sex	Male	7.14	1.95
		Female	5.20	
	Race	Black	5.47	1.03
		White	6.87	
	IQ	High	6.89	0.56
		Low	5.44	
	IA	High	6.55	6.51*
		Medium	3.37	
		Low	8.59	
	Covariate			4.99*
Total	Sex	Male	6.87	2.67
		Female	4.92	
	Race	Black	5.27	1.05
		White	6.53	
	IQ	High	6.35	0.26
		Low	5.44	
	IA	High	5.20	6.76*
		Medium	3.70	
		Low	8.79	
	Covariate			8.15

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for IA=2, 144      df for all others=1, 146

TABLE 37

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u> <sup>2</sup>				
<u>Female</u>	Sex	Male	6.28	1.62
		Female	4.57	
	Race	Black	4.82	0.73
		White	6.03	
	IQ	High	5.90	0.24
		Low	4.95	
	IA	High	5.17	5.54*
		Medium	3.01	
		Low	8.10	
	Covariate			7.27**
<u>Total</u>				
	Sex	Male	6.28	1.62
		Female	4.57	
	Race	Black	4.82	0.73
		White	6.03	
	IQ	High	5.90	0.24
		Low	4.95	
	IA	High	5.17	5.54*
		Medium	3.01	
		Low	8.10	
	Covariate			7.27**

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .05      \*\*p ≤ .01      df for IA=2, 144      df for all others=1, 146

TABLE 38

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	6.25	1.39
		Female	4.71	
	Race	Black	5.63	1.59
		White	6.33	
	IQ	High	6.48	1.11
		Low	4.48	
	IA	High	3.47	5.16*
		Medium	4.15	
		Low	8.82	
	Covariate			4.91*
<u>Female</u>	Sex	Male	5.87	1.15
		Female	4.52	
	Race	Black	4.64	0.70
		White	5.75	
	IQ	High	6.26	1.18
		Low	4.14	
	IA	High	3.90	4.03*
		Medium	3.59	
		Low	8.11	
	Covariate			4.13*
<u>Total</u>	Sex	Male	5.87	1.15
		Female	4.52	
	Race	Black	4.64	0.70
		White	5.75	
	IQ	High	6.26	1.18
		Low	4.14	
	IA	High	3.90	4.03*
		Medium	3.59	
		Low	8.11	
	Covariate			4.13*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for IA=2, 144      df for all others=1, 146

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Warmth-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	4.96	0.32
		Female	4.25	
	Race	Black	3.76	1.56
		White	5.44	
	IQ	High	5.50	0.96
		Low	3.71	
<u>Female</u>	IA	High	2.99	4.48*
		Medium	3.34	
		Low	7.49	
	Covariate			1.53
	Sex	Male	6.69	1.09
		Female	5.43	
<u>Total</u>	Race	Black	5.36	1.29
		White	6.77	
	IQ	High	6.44	0.17
		Low	5.69	
	IA	High	5.91	5.39*
		Medium	3.89	
		Low	8.38	
<u>Total</u>	Covariate			4.92*
	Sex	Male	6.69	1.09
		Female	5.43	
	Race	Black	5.36	1.29
		White	6.77	
	IQ	High	6.44	0.17
		Low	5.69	
<u>Total</u>	IA	High	5.91	5.39*
		Medium	3.89	
		Low	8.38	
	Covariate			4.92*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for IA=2, 144      df for all others=1, 146



TABLE 40

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Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	6.51	0.78
		Female	5.41	
	Race	Black	5.36	0.87
		White	6.56	
	IQ	High	6.61	0.49
		Low	5.30	
	IA	High	6.11	5.62*
		Medium	3.49	
		Low	8.27	
	Covariate			5.96*
<u>Female</u>	Sex	Male	6.38	1.44
		Female	4.81	
	Race	Black	4.98	0.76
		White	6.20	
	IQ	High	6.20	0.40
		Low	4.99	
	IA	High	4.09	4.51*
		Medium	4.04	
		Low	8.65	
	Covariate			4.93*
<u>Total</u>	Sex	Male	6.51	0.78
		Female	5.41	
	Race	Black	5.36	0.87
		White	6.56	
	IQ	High	6.61	0.49
		Low	5.30	
	IA	High	6.11	5.62*
		Medium	3.49	
		Low	8.27	
	Covariate			5.96*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for IA=2, 144      df for all others=1, 146

TABLE 41

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male<sup>2</sup></u>				
<u>Female<sup>2</sup></u>				
<u>Total</u>	Sex	Male	6.38	1.44
		Female	4.81	
	Race	Black	4.98	0.76
		White	6.20	
	IQ	High	6.20	0.40
		Low	4.99	
	IA	High	4.09	4.51*
		Medium	4.04	
		Low	8.65	
	Covariate			4.93*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .05      df for IA=2, 144      df for all others=1, 146

TABLE 42

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Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	7.08	0.31
		Female	7.88	
	Race	Black	8.51	1.95
		White	6.45	
	IQ	High	7.36	0.01
		Low	7.60	
	IA	High	3.57	2.92
		Medium	8.61	
		Low	10.26	
	Covariate			10.91*
<u>Female</u>	Sex	Male	6.20	0.62
		Female	7.50	
	Race	Black	7.88	1.55
		White	5.82	
	IQ	High	6.55	0.07
		Low	7.15	
	IA	High	3.11	1.83
		Medium	7.99	
		Low	9.46	
	Covariate			8.40*
<u>Total</u>	Sex	Male	7.08	0.31
		Female	7.88	
	Race	Black	8.51	1.95
		White	6.45	
	IQ	High	7.36	0.01
		Low	7.60	
	IA	High	3.57	2.92
		Medium	8.61	
		Low	10.26	
	Covariate			10.91*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .005      df for IA=2, 144      df for all others=1, 146

TABLE 43

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male<sup>2</sup></u>				
<u>Female</u>	Sex	Male	6.94	0.11
		Female	7.48	
	Race	Black	8.27	1.45
		White	6.16	
	IQ	High	7.13	0.01
		Low	7.30	
	IA	High	3.59	1.93
		Medium	8.75	
		Low	9.30	
	Covariate			7.76*
<u>Total</u>				
Sex	Male	6.94	0.11	
	Female	7.48		
Race	Black	8.27	1.45	
	White	6.16		
IQ	High	7.13	0.01	
	Low	7.30		
IA	High	3.59	1.93	
	Medium	8.75		
	Low	9.30		
Covariate			7.76*	

<sup>1</sup>Means given in academic years. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .01      df for IA=2, 144      df for all others=1, 146

TABLE 44

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student  
Intelligence for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

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Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	7.81	0.80
		Female	9.31	
	Race	Black	9.49	1.14
		White	7.63	
	IQ	High	9.36	0.43
		Low	7.76	
	IA	High	6.47	0.46
		Medium	9.05	
		Low	10.16	
	Covariate			5.17*
<u>Female</u>	Sex	Male	6.90	1.29
		Female	8.74	
	Race	Black	8.90	1.59
		White	6.73	
	IQ	High	8.40	0.21
		Low	7.24	
	IA	High	5.94	0.34
		Medium	8.48	
		Low	9.03	
	Covariate			3.03
<u>Total</u>	Sex	Male	6.90	1.29
		Female	8.74	
	Race	Black	8.90	1.59
		White	6.73	
	IQ	High	8.40	0.21
		Low	7.24	
	IA	High	5.94	0.34
		Medium	8.48	
		Low	9.03	
	Covariate			3.03

<sup>1</sup>Means given in academic years. Ten months equal one academic year.

\*p ≤ .05      df for IA=2, 144      df for all others=1, 146



TABLE 45

79

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Warmth-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	6.90	0.69
		Female	8.31	
	Race	Black	8.27	0.53
		White	6.95	
	IQ	High	9.12	1.55
		Low	6.10	
	IA	High	3.73	1.80
		Medium	9.59	
		Low	9.50	
	Covariate			1.35
<u>Female</u>	Sex	Male	7.16	0.83
		Female	8.54	
	Race	Black	8.77	1.36
		White	6.93	
	IQ	High	8.39	0.22
		Low	7.31	
	IA	High	5.03	1.35
		Medium	9.00	
		Low	9.51	
	Covariate			4.17*
<u>Total</u>	Sex	Male	7.16	0.83
		Female	8.54	
	Race	Black	8.77	1.36
		White	6.93	
	IQ	High	8.39	0.22
		Low	7.31	
	IA	High	5.03	1.35
		Medium	9.00	
		Low	9.51	
	Covariate			4.17*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for IA=2, 144      df for all others=1, 146

TABLE 46

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	6.70	0.88
		Female	8.16	
	Race	Black	8.36	1.34
		White	6.50	
	IQ	High	7.88	0.15
		Low	6.98	
	IA	High	3.56	2.05
		Medium	8.57	
		Low	10.15	
	Covariate			7.07*
<u>Female</u>	Sex	Male	6.77	0.74
		Female	8.24	
	Race	Black	8.26	0.70
		White	6.75	
	IQ	High	8.02	0.18
		Low	6.99	
	IA	High	4.60	0.76
		Medium	8.18	
		Low	9.74	
	Covariate			3.55
<u>Total</u>	Sex	Male	6.70	0.88
		Female	8.16	
	Race	Black	8.36	1.34
		White	6.50	
	IQ	High	7.88	0.15
		Low	6.98	
	IA	High	3.56	2.05
		Medium	8.57	
		Low	10.15	
	Covariate			7.07*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .005      df for IA=2, 144      df for all others=1, 146

TABLE 47

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male<sup>2</sup></u>				
<u>Female<sup>2</sup></u>				
Total	Sex	Male	6.77	0.74
		Female	8.24	
	Race	Black	8.26	0.70
		White	6.75	
	IQ	High	8.02	0.18
		Low	6.99	
	IA	High	4.60	0.76
		Medium	8.18	
		Low	9.74	
	Covariate			3.55

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scoreds not reported because of the low reliability of voice tone ratings.

df for IA=2, 144      df for all others=1, 146

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	2.24	0.11
		Female	2.65	
	Race	Black	2.68	0.14
		White	2.20	
	IQ	High	1.27	1.56
		Low	3.62	
	IA	High	-0.63	2.50
		Medium	3.08	
		Low	4.88	
	Covariate			2.15
<u>Female</u>	Sex	Male	0.56	0.62
		Female	1.85	
	Race	Black	1.59	0.22
		White	0.82	
	IQ	High	0.19	0.79
		Low	2.22	
	IA	High	-3.48	3.14
		Medium	2.40	
		Low	4.70	
	Covariate			2.00
<u>Total</u>	Sex	Male	2.24	0.11
		Female	2.65	
	Race	Black	2.68	0.14
		White	2.20	
	IQ	High	1.27	1.56
		Low	3.62	
	IA	High	-0.63	2.50
		Medium	3.08	
		Low	4.88	
	Covariate			2.15

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for IA=2, 144

df for all others=1, 146

TABLE 49

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u> <sup>2</sup>				
<u>Female</u>	Sex	Male	0.91	0.08
		Female	1.31	
	Race	Black	1.91	1.22
		White	0.31	
	IQ	High	-0.55	2.77
		Low	2.77	
	IA	High	-1.29	1.74
		Medium	1.25	
		Low	3.38	
	Covariate			2.34
<u>Total</u>	Sex	Male	0.91	0.08
		Female	1.31	
	Race	Black	1.91	1.22
		White	0.31	
	IQ	High	-0.55	2.77
		Low	2.77	
	IA	High	-1.29	1.74
		Medium	1.25	
		Low	3.38	
	Covariate			2.34

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for IA=2, 144

df for all others=1, 146



TABLE 50

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	4.87	0.09
		Female	4.35	
	Race	Black	5.54	1.06
		White	3.68	
	IQ	High	5.06	0.13
		Low	4.15	
<u>Female</u>	IA	High	5.76	0.14
		Medium	3.79	
		Low	4.27	
	Covariate			0.02
	Sex	Male	3.24	0.47
		Female	4.38	
<u>Total</u>	Race	Black	4.94	1.62
		White	2.68	
	IQ	High	4.02	0.03
		Low	3.60	
	IA	High	5.02	0.25
		Medium	2.82	
		Low	3.59	
<u>Total</u>	Covariate			0.03
	Sex	Male	3.24	0.47
		Female	4.38	
	Race	Black	4.94	1.62
		White	2.68	
	IQ	High	4.02	0.03
		Low	3.60	
<u>Total</u>	IA	High	5.02	0.25
		Medium	2.82	
		Low	3.59	
	Covariate			0.03

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for IA=2, 144

df for all others=1, 146

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Warmth-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	1.99	0.02
		Female	2.21	
	Race	Black	2.39	0.10
		White	1.81	
	IQ	High	2.22	0.01
		Low	1.98	
	IA	High	0.72	0.28
		Medium	2.38	
		Low	3.20	
	Covariate			1.84
<u>Female</u>	Sex	Male	1.90	0.60
		Female	2.90	
	Race	Black	2.98	0.75
		White	1.82	
	IQ	High	1.73	0.48
		Low	3.07	
	IA	High	0.94	0.51
		Medium	2.92	
		Low	3.36	
	Covariate			0.00
<u>Total</u>	Sex	Male	1.90	0.60
		Female	2.90	
	Race	Black	2.98	0.75
		White	1.82	
	IQ	High	1.73	0.48
		Low	3.07	
	IA	High	0.94	0.51
		Medium	2.92	
		Low	3.36	
	Covariate			0.00

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for IA=2, 144

df for all others=1, 146

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male</u>	Sex	Male	2.14	0.02
		Female	2.38	
	Race	Black	2.78	0.42
		White	1.73	
	IQ	High	1.75	0.19
		Low	2.76	
	IA	High	-1.46	2.04
		Medium	3.05	
		Low	5.18	
	Covariate			1.46
<u>Female</u>	Sex	Male	4.03	0.08
		Female	4.54	
	Race	Black	5.26	1.05
		White	3.31	
	IQ	High	4.56	0.05
		Low	4.00	
	IA	High	5.04	0.06
		Medium	3.76	
		Low	4.05	
	Covariate			0.03
<u>Total</u>	Sex	Male	2.14	0.02
		Female	2.38	
	Race	Black	2.78	0.42
		White	1.73	
	IQ	High	1.75	0.19
		Low	2.76	
	IA	High	-1.46	2.04
		Medium	3.05	
		Low	5.18	
	Covariate			1.46

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for IA=2, 144

df for all others=1, 146

TABLE 53

Means and F Values for Sex, Race, IQ, IA, and the Covariate Student Intelligence for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source	Means <sup>1</sup>		F Value
		Students	Months	
<u>Male<sup>2</sup></u>				
<u>Female<sup>2</sup></u>				
Total	Sex	Male	4.03	0.08
		Female	4.54	
	Race	Black	5.26	1.05
		White	3.31	
	IQ	High	4.56	0.05
		Low	4.00	
	IA	High	5.04	0.06
		Medium	3.76	
		Low	4.05	
	Covariate			0.03

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df for IA=2, 144                      df for all others=1, 146

TABLE 54

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Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	6.11	Male	6.66	0.59	
		Female	5.54	Female	7.81		
	Race	Black	4.93	Black	4.36	2.87	
		White	6.72	White	10.11		
	IQ	High	6.27	High	7.40	0.05	
		Low	5.38	Low	7.07		
	IA	High	4.79	High	6.89	0.51	
		Medium	5.71	Medium	5.55		
		Low	6.96	Low	9.27		
	Female	Sex	Male	6.03	Male	6.73	0.15
			Female	5.63	Female	7.30	
		Race	Black	4.46	Black	4.86	0.39
White			7.20	White	9.17		
IQ		High	6.86	High	7.04	0.49	
		Low	4.80	Low	6.98		
IA		High	4.51	High	6.81	0.29	
		Medium	5.78	Medium	5.61		
		Low	7.21	Low	8.62		
Total		Sex	Male	6.11	Male	6.66	0.59
			Female	5.54	Female	7.81	
		Race	Black	4.93	Black	4.36	2.87
	White		6.72	White	10.11		
	IQ	High	6.27	High	7.40	0.05	
		Low	5.38	Low	7.07		
	IA	High	4.79	High	6.89	0.51	
		Medium	5.71	Medium	5.55		
		Low	6.96	Low	9.27		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for Voice X IA=2, 144

df for all others=1, 146



TABLE 55

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male<sup>2</sup></u>							
<u>Female</u>	Sex	Male	6.86	Male	5.37	0.58	
		Female	7.83	Female	4.50		
	Race	Black	4.46	Black	5.14	5.67*	
		White	10.23	White	4.74		
	IQ	High	7.27	High	4.67	0.02	
		Low	7.41	Low	5.21		
	IA	High	7.18	High	4.46	0.49	
		Medium	5.77	Medium	4.82		
		Low	9.09	Low	5.53		
	<u>Total</u>	Sex	Male	6.86	Male	5.37	0.58
			Female	7.83	Female	4.50	
		Race	Black	4.46	Black	5.14	5.67*
White			10.23	White	4.74		
IQ		High	7.27	High	4.67	0.02	
		Low	7.41	Low	5.21		
IA		High	7.18	High	4.46	0.49	
		Medium	5.77	Medium	4.82		
		Low	9.09	Low	5.53		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\* $p \leq .05$       df for Voice X IA=2, 144      df for all others=1, 146

TABLE 56

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Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	11.80	Male	5.84	0.38	
		Female	11.26	Female	6.75		
	Race	Black	10.14	Black	4.19	0.35	
		White	12.92	White	8.40		
	IQ	High	11.58	High	6.35	0.00	
		Low	11.48	Low	6.24		
	IA	High	21.38	High	5.22	5.93*	
		Medium	4.41	Medium	6.31		
		Low	8.80	Low	7.36		
	Female	Sex	Male	10.99	Male	5.18	0.70
			Female	10.49	Female	6.52	
Race		Black	8.96	Black	3.97	0.01	
		White	12.52	White	7.73		
IQ		High	11.00	High	5.74	0.08	
		Low	10.47	Low	5.96		
IA		High	8.45	High	5.30	5.27*	
		Medium	5.14	Medium	6.19		
		Low	8.63	Low	6.06		
Total		Sex	Male	10.99	Male	5.18	0.70
			Female	10.49	Female	6.52	
	Race	Black	8.96	Black	3.97	0.01	
		White	12.52	White	7.73		
	IQ	High	11.00	High	5.74	0.08	
		Low	10.47	Low	5.96		
	IA	High	8.45	High	5.30	5.27*	
		Medium	5.14	Medium	6.19		
		Low	8.63	Low	6.06		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\* $p \leq .05$  df for Voice X IA=2, 144 df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Warmth-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male</u>	Sex	Male	6.27	Male	6.52	0.06	
		Female	6.93	Female	6.56		
	Race	Black	6.17	Black	3.94	2.74	
		White	7.03	White	9.14		
	IQ	High	6.32	High	7.38	0.61	
		Low	6.88	Low	5.70		
	IA	High	7.27	High	6.02	0.09	
		Medium	4.98	Medium	5.62		
		Low	7.56	Low	7.98		
	<u>Female</u>	Sex	Male	5.44	Male	7.13	0.07
			Female	6.16	Female	7.28	
		Race	Black	5.40	Black	3.88	6.26
White			6.20	White	10.53		
IQ		High	5.70	High	7.46	0.07	
		Low	5.90	Low	6.95		
IA		High	5.49	High	6.70	0.10	
		Medium	4.92	Medium	5.85		
		Low	6.98	Low	9.06		
<u>Total</u>		Sex	Male	5.44	Male	7.13	0.07
			Female	6.16	Female	7.28	
		Race	Black	5.40	Black	3.88	6.26
	White		6.20	White	10.53		
	IQ	High	5.70	High	7.46	0.07	
		Low	5.90	Low	6.95		
	IA	High	5.49	High	6.70	0.10	
		Medium	4.92	Medium	5.85		
		Low	6.98	Low	9.06		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for Voice X IA=2, 144

df for all others=1, 146

TABLE 58

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Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	7.99	Male	5.84	2.88	
		Female	6.34	Female	8.04		
	Race	Black	5.60	Black	4.61	0.42	
		White	8.72	White	9.27		
	IQ	High	8.45	High	6.78	1.20	
		Low	5.87	Low	7.10		
	IA	High	8.93	High	6.27	0.55	
		Medium	5.06	Medium	6.54		
		Low	7.50	Low	8.02		
	Female	Sex	Male	12.35	Male	5.35	2.79
			Female	10.46	Female	7.29	
		Race	Black	9.45	Black	4.55	0.02
White			13.36	White	8.09		
IQ		High	12.13	High	6.35	0.29	
		Low	10.68	Low	6.29		
IA		High	20.98	High	5.82	4.69*	
		Medium	4.92	Medium	5.91		
		Low	8.31	Low	7.23		
Total		Sex	Male	7.99	Male	5.84	2.88
			Female	6.34	Female	8.04	
		Race	Black	5.60	Black	4.61	0.42
	White		8.72	White	9.27		
	IQ	High	8.45	High	6.78	1.20	
		Low	5.87	Low	7.10		
	IA	High	8.93	High	6.27	0.55	
		Medium	5.06	Medium	6.54		
		Low	7.50	Low	8.02		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for Voice X IA=2, 144      df for all others=1, 146

TABLE 59

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Word Meaning (WM) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source Voice X.	Means <sup>1</sup>				F Value
		High Voice		Low Voice		
		Students	Months	Students	Months	
<u>Male<sup>2</sup></u>						
<u>Female<sup>2</sup></u>						
<u>Total</u>	Sex	Male	12.35	Male	5.35	2.79
		Female	10.46	Female	7.29	
	Race	Black	9.45	Black	4.55	0.02
		White	13.36	White	8.09	
	IQ	High	12.13	High	6.35	0.29
		Low	10.68	Low	6.29	
	IA	High	20.98	High	5.82	4.69*
		Medium	4.92	Medium	5.91	
		Low	8.31	Low	7.23	

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\* $p \leq .05$       df for Voice X IA=2, 144      df for all others=1, 146



TABLE 60

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Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	7.44	Male	6.49	0.07	
		Female	7.37	Female	5.78		
	Race	Black	5.17	Black	6.73	5.11*	
		White	9.64	White	5.54		
	IQ	High	10.21	High	9.37	0.10	
		Low	4.60	Low	2.90		
	IA	High	7.36	High	6.59	0.02	
		Medium	8.05	Medium	6.51		
		Low	6.82	Low	5.31		
	Female	Sex	Male	9.09	Male	6.33	0.80
			Female	6.82	Female	6.43	
		Race	Black	6.26	Black	6.35	1.54
White			9.65	White	6.41		
IQ		High	12.14	High	8.95	1.13	
		Low	3.77	Low	3.80		
IA		High	9.25	High	6.92	0.06	
		Medium	7.79	Medium	6.87		
		Low	6.83	Low	5.35		
Total		Sex	Male	7.44	Male	6.49	0.07
			Female	7.37	Female	5.78	
		Race	Black	5.17	Black	6.73	5.11*
	White		9.64	White	5.54		
	IQ	High	10.21	High	9.37	0.10	
		Low	4.60	Low	2.90		
	IA	High	7.36	High	6.59	0.02	
		Medium	8.05	Medium	6.51		
		Low	6.82	Low	5.31		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for Voice X IA=2, 144      df for all others=1, 146

TABLE 61

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male<sup>2</sup></u>							
<u>Female</u>	Sex	Male	6.83	Male	6.97	0.68	
		Female	5.66	Female	7.98		
	Race	Black	6.20	Black	4.95	3.09	
		White	6.29	White	10.00		
	IQ	High	9.80	High	10.00	0.44	
		Low	2.70	Low	4.95		
	IA	High	6.72	High	6.18	1.02	
		Medium	6.17	Medium	10.01		
		Low	5.85	Low	6.24		
	<u>Total</u>	Sex	Male	6.83	Male	6.97	0.68
			Female	5.66	Female	7.98	
		Race	Black	6.20	Black	4.95	3.09
White			6.29	White	10.00		
IQ		High	9.80	High	10.00	0.44	
		Low	2.70	Low	4.95		
IA		High	6.72	High	6.18	1.02	
		Medium	6.17	Medium	10.01		
		Low	5.85	Low	6.24		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df for Voice X IA=2, 144

df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	5.73	Male	8.12	0.82	
		Female	6.58	Female	6.67		
	Race	Black	7.27	Black	5.42	5.56*	
		White	5.03	White	9.37		
	IQ	High	8.72	High	10.66	0.24	
		Low	3.58	Low	4.13		
	IA	High	9.45	High	6.37	1.09	
		Medium	4.45	Medium	9.04		
		Low	4.56	Low	6.77		
	Female	Sex	Male	7.30	Male	8.43	0.21
			Female	7.15	Female	7.19	
Race		Black	7.32	Black	5.61	3.18	
		White	7.14	White	10.00		
IQ		High	10.43	High	10.78	0.03	
		Low	4.02	Low	4.84		
IA		High	11.76	High	6.39	3.99*	
		Medium	4.55	Medium	10.80		
		Low	5.37	Low	6.24		
Total		Sex	Male	7.30	Male	8.43	0.21
			Female	7.15	Female	7.19	
	Race	Black	7.32	Black	5.61	3.18	
		White	7.14	White	10.00		
	IQ	High	10.43	High	10.78	0.03	
		Low	4.02	Low	4.84		
	IA	High	11.76	High	6.39	3.99*	
		Medium	4.55	Medium	10.80		
		Low	5.37	Low	6.24		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for Voice X IA=2, 144      df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Warmth-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	4.34	Male	7.76	4.68*	
		Female	7.52	Female	5.20		
	Race	Black	5.50	Black	5.60	0.10	
		White	6.37	White	7.35		
	IQ	High	7.10	High	10.22	2.85	
		Low	4.77	Low	2.74		
	IA	High	7.63	High	5.66	0.38	
		Medium	5.28	Medium	7.53		
		Low	4.90	Low	6.24		
	Female	Sex	Male	6.17	Male	7.44	3.06
			Female	7.87	Female	4.85	
		Race	Black	6.12	Black	5.52	0.05
White			7.92	White	6.77		
IQ		High	9.27	High	9.77	0.92	
		Low	4.77	Low	2.51		
IA		High	7.65	High	5.74	0.22	
		Medium	7.69	Medium	6.56		
		Low	5.73	Low	6.13		
Total		Sex	Male	6.17	Male	7.44	3.06
			Female	7.87	Female	4.85	
		Race	Black	6.12	Black	5.52	0.05
	White		7.92	White	6.77		
	IQ	High	9.27	High	9.77	0.92	
		Low	4.77	Low	2.51		
	IA	High	7.65	High	5.74	0.22	
		Medium	7.69	Medium	6.56		
		Low	5.73	Low	6.13		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for Voice X IA=2, 144      df for all others=1, 146

TABLE 64

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Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	7.82	Male	6.75	0.54	
		Female	6.22	Female	6.97		
	Race	Black	6.21	Black	6.27	0.03	
		White	7.83	White	7.45		
	IQ	High	10.69	High	9.24	0.80	
		Low	3.35	Low	4.47		
	IA	High	8.44	High	6.86	0.32	
		Medium	6.63	Medium	7.96		
		Low	6.00	Low	5.76		
	Female	Sex	Male	7.54	Male	7.24	0.25
			Female	6.12	Female	7.10	
Race		Black	6.10	Black	6.16	0.04	
		White	7.57	White	8.19		
IQ		High	10.10	High	10.13	0.05	
		Low	3.57	Low	4.21		
IA		High	10.12	High	6.71	1.67	
		Medium	4.51	Medium	8.82		
		Low	5.87	Low	5.98		
Total		Sex	Male	7.82	Male	6.75	0.54
			Female	6.22	Female	6.97	
	Race	Black	6.21	Black	6.27	0.03	
		White	7.83	White	7.45		
	IQ	High	10.69	High	9.24	0.80	
		Low	3.35	Low	4.47		
	IA	High	8.44	High	6.86	0.32	
		Medium	6.63	Medium	7.96		
		Low	6.00	Low	5.76		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for Voice X IA=2, 144

df for all others=1, 146



TABLE 65

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value
		High Voice		Low Voice		
		Students	Months	Students	Months	
<u>Male<sup>2</sup></u>						
<u>Female<sup>2</sup></u>						
<u>Total</u>	Sex	Male	7.54	Male	7.24	0.25
		Female	6.12	Female	7.10	
	Race	Black	6.10	Black	6.16	0.04
		White	7.57	White	8.19	
	IQ	High	10.10	High	10.13	0.05
		Low	3.57	Low	4.21	
	IA	High	10.12	High	6.71	1.67
		Medium	4.51	Medium	8.82	
		Low	5.87	Low	5.98	

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df for Voice X IA=2, 144

df for all others=1, 146

tone conditions. Nevertheless, in several instances (not a majority of instances), medium and/or low IA groups showed more achievement with teachers rated less angry and less anxious (anxiety-filtered, female and total raters, subtest PM; anxiety-filtered, all rater groups, subtest WM; and anger-normal, female raters, subtest WM).

For the arithmetic subtests (Tables 66-83), the most frequent significant finding concerns the interaction of voice and initial level of student achievement. Also the interaction of voice with level of student IQ and, in one instance, with student sex was found to be significant. With regard to the significant interaction of voice and level of student IQ, both high and low IQ students showed more achievement on subtest AR when taught by cooler teachers than by warmer teachers; however, when taught by teachers rated less angry in the normal mode, both high and low IQ students made greater academic gains on subtest AR than did high or low IQ students with teachers rated angrier in the normal mode. Pertaining to the significant findings for the voice-IA interaction the means reveal three findings of particular interest. With one exception (warmth-filtered, male raters, subtest AR) students with the highest pre-test scores performed better for cooler teachers than did any other IA group under teachers rated warmer or cooler in either mode. However, there were five instances in which medium and/or low IA groups achieved more for warmer teachers than for cooler teachers (warmth-normal, all rater groups, subtest AR and warmth-normal, male raters, subtest AA). Further, high IA students performed better for teachers rated angrier in the filtered mode than did any other IA group under teachers rated angrier or less angry, but also did so for

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male</u>	Sex	Male	4.49	Male	9.25	0.45	
		Female	1.76	Female	8.09		
	Race	Black	3.01	Black	7.53	0.69	
		White	3.24	White	9.81		
	IQ	High	3.61	High	9.09	0.00	
		Low	2.64	Low	8.24		
	IA	High	0.68	High	9.71	1.47	
		Medium	1.04	Medium	6.36		
		Low	7.65	Low	9.94		
	<u>Female</u>	Sex	Male	7.07	Male	7.21	0.85
			Female	3.86	Female	6.53	
Race		Black	4.70	Black	6.23	0.01	
		White	6.22	White	7.51		
IQ		High	5.61	High	8.17	0.54	
		Low	5.32	Low	5.57		
IA		High	5.66	High	7.43	0.47	
		Medium	2.06	Medium	4.68		
		Low	8.67	Low	8.50		
<u>Total</u>		Sex	Male	4.49	Male	9.25	0.45
			Female	1.76	Female	8.09	
	Race	Black	3.01	Black	7.53	0.69	
		White	3.24	White	9.81		
	IQ	High	3.61	High	9.09	0.00	
		Low	2.64	Low	8.24		
	IA	High	0.68	High	9.71	1.47	
		Medium	1.04	Medium	6.36		
		Low	7.65	Low	9.94		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for Voice X IA=2, 144

df for all others=1, 146

TABLE 67

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male<sup>2</sup></u>							
<u>Female</u>	Sex	Male	9.03	Male	3.53	0.05	
		Female	7.02	Female	2.12		
	Race	Black	7.48	Black	2.16	0.01	
		White	8.57	White	3.49		
	IQ	High	8.53	High	3.27	0.00	
		Low	7.53	Low	2.38		
	IA	High	9.47	High	0.87	0.96	
		Medium	5.36	Medium	0.67		
		Low	9.26	Low	6.94		
	<u>Total</u>	Sex	Male	9.03	Male	3.53	0.05
			Female	7.02	Female	2.12	
		Race	Black	7.48	Black	2.16	0.01
White			8.57	White	3.49		
IQ		High	8.53	High	3.27	0.00	
		Low	7.53	Low	2.38		
IA		High	9.47	High	0.87	0.96	
		Medium	5.36	Medium	0.67		
		Low	9.26	Low	6.94		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df for Voice X IA=2, 144

df for all others=1, 146

TABLE 68

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Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male</u>	Sex	Male	5.66	Male	6.84	0.02	
		Female	4.29	Female	5.12		
	Race	Black	2.95	Black	6.30	2.98	
		White	7.01	White	5.66		
	IQ	High	5.73	High	7.22	0.11	
		Low	4.22	Low	4.74		
	IA	High	-1.08	High	8.02	2.18	
		Medium	5.94	Medium	2.36		
		Low	10.07	Low	7.56		
	<u>Female</u>	Sex	Male	5.63	Male	6.11	0.59
			Female	3.33	Female	5.72	
Race		Black	3.42	Black	5.87	0.56	
		White	5.54	White	5.97		
IQ		High	5.13	High	7.39	0.30	
		Low	3.83	Low	4.44		
IA		High	-0.44	High	8.23	2.27	
		Medium	4.70	Medium	2.49		
		Low	9.17	Low	7.04		
<u>Total</u>		Sex	Male	5.63	Male	6.11	0.59
			Female	3.33	Female	5.72	
	Race	Black	3.42	Black	5.87	0.56	
		White	5.54	White	5.97		
	IQ	High	5.13	High	7.39	0.30	
		Low	3.83	Low	4.44		
	IA	High	-0.44	High	8.23	2.27	
		Medium	4.70	Medium	2.49		
		Low	9.17	Low	7.04		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

df for Voice X IA=2, 144

df for all others=1, 146



TABLE 69

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Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Warmth-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	0.87	Male	9.05	0.01	
		Female	0.30	Female	8.19		
	Race	Black	-0.45	Black	7.98	0.09	
		White	1.63	White	9.26		
	IQ	High	1.78	High	9.21	0.16	
		Low	-0.60	Low	8.03		
	IA	High	-5.21	High	11.18	3.92*	
		Medium	1.73	Medium	4.95		
		Low	5.25	Low	9.73		
	Female	Sex	Male	3.85	Male	9.52	0.01
			Female	2.51	Female	8.36	
		Race	Black	1.90	Black	8.81	0.85
White			4.46	White	9.07		
IQ		High	3.73	High	9.14	0.06	
		Low	2.64	Low	8.74		
IA		High	0.81	High	11.01	1.59	
		Medium	2.01	Medium	5.77		
		Low	6.73	Low	10.04		
Total		Sex	Male	3.85	Male	9.52	0.01
			Female	2.51	Female	8.36	
		Race	Black	1.90	Black	8.81	0.85
	White		4.46	White	9.07		
	IQ	High	3.73	High	9.14	0.06	
		Low	2.64	Low	8.74		
	IA	High	0.81	High	11.01	1.59	
		Medium	2.01	Medium	5.77		
		Low	6.73	Low	10.04		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for Voice X IA=2, 144      df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	7.21	Male	5.80	0.32	
		Female	5.41	Female	5.40		
	Race	Black	5.08	Black	5.63	0.96	
		White	7.55	White	5.56		
	IQ	High	5.96	High	7.26	1.95	
		Low	6.67	Low	3.94		
	IA	High	4.72	High	7.50	1.34	
		Medium	3.86	Medium	3.11		
		Low	10.36	Low	6.18		
	Female	Sex	Male	6.25	Male	6.51	0.14
			Female	4.18	Female	5.43	
Race		Black	4.58	Black	5.39	0.00	
		White	5.86	White	6.55		
IQ		High	5.26	High	7.13	0.58	
		Low	5.17	Low	4.81		
IA		High	0.46	High	7.72	1.42	
		Medium	4.91	Medium	3.16		
		Low	10.28	Low	7.02		
Total		Sex	Male	7.21	Male	5.80	0.32
			Female	5.41	Female	5.40	
	Race	Black	5.08	Black	5.63	0.96	
		White	7.55	White	5.56		
	IQ	High	5.96	High	7.26	1.95	
		Low	6.67	Low	3.94		
	IA	High	4.72	High	7.50	1.34	
		Medium	3.86	Medium	3.11		
		Low	10.36	Low	6.18		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.  
df for Voice X IA=2, 144                      df for all others=1, 146

TABLE 71

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Computation (AC) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value
		High Voice		Low Voice		
		Students	Months	Students	Months	
<u>Male<sup>2</sup></u>						
<u>Female<sup>2</sup></u>						
<u>Total</u>	Sex	Male	6.25	Male	6.51	0.14
		Female	4.18	Female	5.43	
	Race	Black	4.58	Black	5.39	0.00
		White	5.86	White	6.55	
	IQ	High	5.26	High	7.13	0.58
		Low	5.17	Low	4.81	
	IA	High	0.46	High	7.72	1.42
		Medium	4.91	Medium	3.16	
		Low	10.28	Low	7.02	

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df for Voice X IA=2, 144

df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	2.99	Male	11.16	0.94	
		Female	2.42	Female	13.34		
	Race	Black	4.06	Black	12.96	0.19	
		White	1.36	White	11.54		
	IQ	High	1.94	High	12.78	0.63	
		Low	3.47	Low	11.72		
	IA	High	-5.49	High	12.62	4.65*	
		Medium	6.50	Medium	10.72		
		Low	7.11	Low	13.40		
	Female	Sex	Male	2.49	Male	9.91	0.01
			Female	3.67	Female	11.34	
Race		Black	4.27	Black	11.50	0.04	
		White	1.88	White	9.76		
IQ		High	0.83	High	12.28	4.35*	
		Low	5.33	Low	8.97		
IA		High	-3.09	High	9.31	1.08	
		Medium	5.82	Medium	10.16		
		Low	6.50	Low	12.41		
Total		Sex	Male	2.99	Male	11.16	0.94
			Female	2.42	Female	13.34	
	Race	Black	4.06	Black	12.96	0.19	
		White	1.36	White	11.54		
	IQ	High	1.94	High	12.78	0.63	
		Low	3.47	Low	11.72		
	IA	High	-5.49	High	12.62	4.65*	
		Medium	6.50	Medium	10.72		
		Low	7.11	Low	13.40		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for Voice X IA=2, 144      df for all others=1, 146

TABLE 73

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male<sup>2</sup></u>							
<u>Female</u>	Sex	Male	9.91	Male	3.98	0.29	
		Female	11.33	Female	3.64		
	Race	Black	11.72	Black	4.82	0.00	
		White	9.51	White	2.80		
	IQ	High	10.86	High	3.39	0.12	
		Low	10.37	Low	4.21		
	IA	High	12.65	High	-5.47	5.93*	
		Medium	8.91	Medium	8.60		
		Low	10.31	Low	8.29		
	<u>Total</u>	Sex	Male	9.91	Male	3.98	0.29
			Female	11.33	Female	3.64	
		Race	Black	11.72	Black	4.82	0.00
White			9.51	White	2.80		
IQ		High	10.86	High	3.39	0.12	
		Low	10.37	Low	4.21		
IA		High	12.65	High	-5.47	5.93*	
		Medium	8.91	Medium	8.60		
		Low	10.31	Low	8.29		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\* $p \leq .005$  df for Voice X IA=2, 144 df for all others=1, 146



Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male</u>	Sex	Male	8.27	Male	7.35	0.08	
		Female	10.25	Female	8.36		
	Race	Black	8.77	Black	10.20	2.63	
		White	9.75	White	5.52		
	IQ	High	10.44	High	8.27	0.16	
		Low	8.08	Low	7.45		
	IA	High	3.79	High	9.15	1.37	
		Medium	10.46	Medium	7.64		
		Low	13.54	Low	6.79		
	<u>Female</u>	Sex	Male	5.82	Male	7.97	0.08
			Female	7.21	Female	10.27	
Race		Black	6.59	Black	11.22	1.35	
		White	6.45	White	7.02		
IQ		High	6.87	High	9.93	0.06	
		Low	6.17	Low	8.30		
IA		High	1.85	High	10.04	1.09	
		Medium	7.63	Medium	9.33		
		Low	10.08	Low	7.99		
<u>Total</u>		Sex	Male	5.82	Male	7.97	0.08
			Female	7.21	Female	10.27	
	Race	Black	6.59	Black	11.22	1.35	
		White	6.45	White	7.02		
	IQ	High	6.87	High	9.93	0.06	
		Low	6.17	Low	8.30		
	IA	High	1.85	High	10.04	1.09	
		Medium	7.63	Medium	9.33		
		Low	10.08	Low	7.99		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.  
df for Voice X IA=2, 144                      df for all others=1, 146

TABLE 75

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions 110  
for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Warmth-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	4.92	Male	8.89	0.86	
		Female	4.73	Female	11.89		
	Race	Black	4.55	Black	11.98	1.08	
		White	5.11	White	8.80		
	IQ	High	7.76	High	10.48	2.07	
		Low	1.89	Low	10.30		
	IA	High	-5.40	High	12.86	4.91*	
		Medium	10.21	Medium	8.98		
		Low	9.68	Low	9.33		
	Female	Sex	Male	4.47	Male	9.84	0.28
			Female	5.05	Female	12.04	
		Race	Black	4.97	Black	12.56	0.79
White			4.54	White	9.32		
IQ		High	5.37	High	11.40	0.01	
		Low	4.14	Low	10.48		
IA		High	-3.92	High	13.99	7.32**	
		Medium	9.27	Medium	8.74		
		Low	8.92	Low	10.10		
Total		Sex	Male	4.47	Male	9.84	0.28
			Female	5.05	Female	12.04	
		Race	Black	4.97	Black	12.56	0.79
	White		4.54	White	9.32		
	IQ	High	5.37	High	11.40	0.01	
		Low	4.14	Low	10.48		
	IA	High	-3.92	High	13.99	7.32**	
		Medium	9.27	Medium	8.74		
		Low	8.92	Low	10.10		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .005      \*\*p ≤ .001

df for Voice X IA=2, 144

df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	4.29	Male	9.11	0.04	
		Female	6.04	Female	10.27		
	Race	Black	5.67	Black	11.05	0.28	
		White	4.66	White	8.33		
	IQ	High	3.83	High	11.93	3.94*	
		Low	6.50	Low	7.45		
	IA	High	-2.38	High	9.51	2.24	
		Medium	7.55	Medium	9.59		
		Low	10.34	Low	9.96		
	Female	Sex	Male	5.09	Male	8.45	0.00
			Female	6.52	Female	9.96	
Race		Black	6.01	Black	10.51	0.35	
		White	5.60	White	7.90		
IQ		High	5.71	High	10.33	0.41	
		Low	5.90	Low	8.08		
IA		High	0.10	High	9.10	1.23	
		Medium	6.72	Medium	9.63		
		Low	10.59	Low	8.88		
Total		Sex	Male	4.29	Male	9.11	0.04
			Female	6.04	Female	10.27	
	Race	Black	5.67	Black	11.05	0.28	
		White	4.66	White	8.33		
	IQ	High	3.83	High	11.93	3.94*	
		Low	6.50	Low	7.45		
	IA	High	-2.38	High	9.51	2.24	
		Medium	7.55	Medium	9.59		
		Low	10.34	Low	9.96		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for Voice X IA=2, 144      df for all others=1, 146

TABLE 77

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Concepts (AR) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value
		High Voice		Low Voice		
		Students	Months	Students	Months	
<u>Male<sup>2</sup></u>						
<u>Female<sup>2</sup></u>						
<u>Total</u>	Sex	Male	5.09	Male	8.45	0.00
		Female	6.52	Female	9.96	
	Race	Black	6.01	Black	10.51	0.35
		White	5.60	White	7.90	
	IQ	High	5.71	High	10.33	0.41
		Low	5.90	Low	8.08	
	IA	High	0.10	High	9.10	1.23
		Medium	6.72	Medium	9.63	
		Low	10.59	Low	8.88	

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df for Voice X IA=2, 144

df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Warmth-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	-5.70	Male	10.18	2.06	
		Female	-3.50	Female	8.79		
	Race	Black	-4.91	Black	10.27	0.71	
		White	-4.29	White	8.70		
	IQ	High	-6.11	High	8.65	0.22	
		Low	-3.08	Low	10.32		
	IA	High	-15.33	High	14.08	17.65*	
		Medium	-1.39	Medium	7.55		
		Low	2.94	Low	6.82		
	Female	Sex	Male	-6.53	Male	7.66	2.23
			Female	-2.83	Female	6.53	
Race		Black	-4.91	Black	8.09	0.57	
		White	-4.45	White	6.10		
IQ		High	-5.81	High	6.19	0.01	
		Low	-3.56	Low	8.00		
IA		High	-17.39	High	10.43	10.30*	
		Medium	-0.03	Medium	4.83		
		Low	3.38	Low	6.03		
Total		Sex	Male	-5.70	Male	10.18	2.06
			Female	-3.50	Female	8.79	
	Race	Black	-4.91	Black	10.27	0.71	
		White	-4.29	White	8.70		
	IQ	High	-6.11	High	8.65	0.22	
		Low	-3.08	Low	10.32		
	IA	High	-15.33	High	14.08	17.65*	
		Medium	-1.39	Medium	7.55		
		Low	2.94	Low	6.82		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*  $p \leq .001$

df for Voice X IA=2, 144

df for all others=1, 146



TABLE 79

Means and F Value for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Anger-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male<sup>2</sup></u>							
<u>Female</u>	Sex	Male	8.58	Male	-6.76	0.45	
		Female	8.07	Female	-5.45		
	Race	Black	8.94	Black	-5.12	0.07	
		White	7.71	White	-7.09		
	IQ	High	8.01	High	-9.10	2.91	
		Low	8.63	Low	-3.10		
	IA	High	12.68	High	-15.27	12.69*	
		Medium	6.73	Medium	-4.23		
		Low	5.57	Low	1.19		
	<u>Total</u>	Sex	Male	8.58	Male	-6.76	0.45
			Female	8.07	Female	-5.45	
		Race	Black	8.94	Black	-5.12	0.07
White			7.71	White	-7.09		
IQ		High	8.01	High	-9.10	2.91	
		Low	8.63	Low	-3.10		
IA		High	12.68	High	-15.27	12.69*	
		Medium	6.73	Medium	-4.23		
		Low	5.57	Low	1.19		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

\*p ≤ .001      df for Voice X IA=2, 144      df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Anxiety-Filtered

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
<u>Male</u>	Sex	Male	7.89	Male	1.85	4.29*	
		Female	3.73	Female	4.97		
	Race	Black	6.24	Black	4.84	0.31	
		White	5.38	White	1.98		
	IQ	High	5.74	High	4.38	0.28	
		Low	5.88	Low	2.43		
	IA	High	5.07	High	6.45	0.30	
		Medium	6.19	Medium	1.39		
		Low	6.16	Low	2.38		
	<u>Female</u>	Sex	Male	5.19	Male	1.29	2.26
			Female	3.83	Female	4.94	
		Race	Black	4.47	Black	5.41	1.69
White			4.55	White	0.81		
IQ		High	4.65	High	3.40	0.01	
		Low	4.36	Low	2.83		
IA		High	2.85	High	7.19	1.05	
		Medium	5.51	Medium	0.13		
		Low	5.17	Low	2.02		
<u>Total</u>		Sex	Male	5.19	Male	1.29	2.26
			Female	3.83	Female	4.94	
		Race	Black	4.47	Black	5.41	1.69
	White		4.55	White	0.81		
	IQ	High	4.65	High	3.40	0.01	
		Low	4.36	Low	2.83		
	IA	High	2.85	High	7.19	1.05	
		Medium	5.51	Medium	0.13		
		Low	5.17	Low	2.02		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .05      df for Voice X IA=2, 144      df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Warmth-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	-0.52	Male	4.50	2.05	
		Female	-2.78	Female	7.19		
	Race	Black	-2.18	Black	6.96	0.82	
		White	-1.12	White	4.74		
	IQ	High	-2.88	High	7.32	1.84	
		Low	-0.43	Low	4.38		
	IA	High	-8.94	High	10.38	5.19*	
		Medium	0.13	Medium	4.63		
		Low	3.86	Low	2.54		
	Female	Sex	Male	-3.84	Male	7.65	0.03
			Female	-3.07	Female	8.88	
		Race	Black	-3.51	Black	9.48	0.90
White			-3.40	White	7.05		
IQ		High	-5.55	High	9.01	3.51	
		Low	-1.37	Low	7.51		
IA		High	-12.24	High	14.11	17.47**	
		Medium	-1.36	Medium	7.19		
		Low	3.23	Low	3.48		
Total		Sex	Male	-3.84	Male	7.65	0.03
			Female	-3.07	Female	8.88	
		Race	Black	-3.51	Black	9.48	0.90
	White		-3.40	White	7.05		
	IQ	High	-5.55	High	9.01	3.51	
		Low	-1.37	Low	7.51		
	IA	High	-12.24	High	14.11	17.47**	
		Medium	-1.36	Medium	7.19		
		Low	3.23	Low	3.48		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .01      \*\*p ≤ .001      df for Voice X IA=2, 144      df for all others=1, 146

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions<sup>117</sup>  
for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Anger-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value	
		High Voice		Low Voice			
		Students	Months	Students	Months		
Male	Sex	Male	-2.48	Male	6.76	0.07	
		Female	-1.85	Female	6.60		
	Race	Black	-2.31	Black	7.87	0.68	
		White	-2.02	White	5.48		
	IQ	High	-2.90	High	6.40	0.06	
		Low	-1.43	Low	6.96		
	IA	High	-13.19	High	10.27	8.69*	
		Medium	2.58	Medium	3.52		
		Low	4.12	Low	6.24		
	Female	Sex	Male	4.51	Male	3.55	0.31
			Female	4.04	Female	5.04	
		Race	Black	4.90	Black	5.61	0.12
White			3.64	White	2.98		
IQ		High	4.92	High	4.21	0.14	
		Low	3.62	Low	4.39		
IA		High	3.13	High	6.96	1.05	
		Medium	5.90	Medium	1.62		
		Low	3.79	Low	4.31		
Total		Sex	Male	-2.48	Male	6.76	0.07
			Female	-1.85	Female	6.60	
		Race	Black	-2.31	Black	7.87	0.68
	White		-2.02	White	5.48		
	IQ	High	-2.90	High	6.40	0.06	
		Low	-1.43	Low	6.96		
	IA	High	-13.19	High	10.27	8.69*	
		Medium	2.58	Medium	3.52		
		Low	4.12	Low	6.24		

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\*p ≤ .001

df for Voice X IA=2, 144

df for all others=1, 146

TABLE 83

Means and F Values for Voice by Sex, Race, IQ, and IA Interactions  
for the Arithmetic Applications (AA) Subtest of the Stanford Achievement Test  
Anxiety-Normal

Rater Group	Source Voice X	Means <sup>1</sup>				F Value
		High Voice		Low Voice		
		Students	Months	Students	Months	
<u>Male<sup>2</sup></u>						
<u>Female<sup>2</sup></u>						
<u>Total</u>	Sex	Male	4.51	Male	3.55	0.31
		Female	4.04	Female	5.04	
	Race	Black	4.90	Black	5.61	0.12
		White	3.64	White	2.98	
	IQ	High	4.92	High	4.21	0.14
		Low	3.62	Low	4.39	
	IA	High	3.13	High	6.96	1.05
		Medium	5.90	Medium	1.62	
		Low	3.79	Low	4.31	

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

<sup>2</sup>Scores not reported because of the low reliability of voice tone ratings.

df for Voice X IA=2, 144

df for all others=1, 146



teachers rated less angry in the normal mode. This pattern of high achievement for cooler, angrier teachers with the exception of the anger-normal dimension-mode is consistent with the pattern of results obtained in other aspects of the study. In addition, there were frequent instances of a considerable differential in achievement by students scoring highest on the pre-test depending on teacher voice tone. In two instances (warmth-filtered, total raters, subtest AA and warmth-filtered, male raters, subtest AA), this differential was more than twenty-nine academic months, almost three full school years. Finally, involved in these instances of considerable differential achievement were numerous instances of loss of academic ground. In one case (warmth-filtered, female raters, subtest AA), students (initially the highest achievers) lost an average of more than seventeen academic months in the six month pre-post interval with teachers whose voices were rated high.

Examination of the data provides one possible explanation for the exceptionally large loss of academic time. All those high IA students who lost academic time on the AA subtest were members of either one of two classes which were tested with the subtest late in the day and following testing with the two other arithmetic subtests. Clearly the students were tired. Coupled with the fact that their pre-test scores were very high and thus allowed much room for loss, the students' fatigue seriously hampered their performance on this subtest. By contrast, only two of the eight high IA students involved showed an overall loss on the average change score for the five SAT subtests. Also, despite their losses, the eight students showed an

average grade level performance of 3.76, which is only slightly below the average post-test level of achievement of all the students in the six classes across the five SAT subtests (3.93). This is not to say that losses in academic achievement have no significance. There were too many losses to discount them. However, an extreme loss like the one discussed here should be considered overinflated by factors such as those mentioned.

In general, these findings do not support Hypothesis One: there was significantly more academic achievement shown by students of cooler, angrier, more anxious teachers than by students of teachers rated warmer, less angry and less anxious. These results will be discussed in Chapter IV.

#### Teacher Voice Tone and Teacher Level of Functioning

The ratings of the six teachers in each of the eighteen dimension-mode rater group combinations of teacher voice tone were correlated with ratings of the six teachers for average level of functioning, an average based on ratings of the four scales of interpersonal encounter (empathy, regard, genuineness and concreteness). These correlations were critical to testing Hypothesis Two, that those teachers whose voice tone is judged warmer or more sympathetic, less angry and less anxious will offer higher levels of facilitative conditions to their students than will teachers whose voice tone is judged cooler or less sympathetic, angrier and more anxious.

The Pearson product-moment correlation coefficients are presented in Table 84. Of the fifteen coefficients reported, six were significant.

TABLE 84

Correlation of Voice Tone Ratings and Average Ratings  
of Teacher Level of Functioning

Dimension-Mode	Rater Group	r
<u>Warmth-Filtered</u>	Male	0.18
	Female	0.06
	Total	0.11
<u>Anger-Filtered</u>	Male <sup>1</sup>	
	Female	-0.40*
	Total	-0.39*
<u>Anxiety-Filtered</u>	Male	0.04
	Female	-0.05
	Total	-0.01
<u>Warmth-Normal</u>	Male	0.34
	Female	0.46**
	Total	0.45*
<u>Anger-Normal</u>	Male	-0.37*
	Female	-0.28
	Total	-0.33
<u>Anxiety-Normal</u>	Male <sup>1</sup>	
	Female <sup>1</sup>	
	Total	-0.51**

<sup>1</sup>Correlation not reported because of the low reliability of voice tone ratings.

\*p ≤ .05

\*\*p ≤ .01

df=28

In the filtered mode, ratings by female and total raters for anger were significantly related to teacher average level of functioning. The direction of the coefficients reveals that the higher teachers were rated on levels of interpersonal functioning, the more they were rated warmer and less angry. In the normal mode, ratings by female and total raters for warmth, male raters for anger and total raters for anxiety produced significant results. The findings here corroborate those in the filtered mode: teachers functioning at relatively high levels on interpersonal dimensions were warmer, less angry and less anxious than teachers functioning at relatively low levels on the same interpersonal dimensions. In general these results support Hypothesis Two. Further discussion of these results will be found in Chapter IV.

#### Additional Results

Results were obtained for analyses of data relevant to two additional problems:

- 1) the relationship of teacher level of functioning to student academic achievement and
- 2) the interrelatedness of teacher voice tone ratings.

Although no hypotheses were made concerning the results of these analyses, the findings with regard to functioning and its interaction with the other independent variables were considered important with regard to Hypothesis Two, while the findings concerning the interrelatedness of tonal ratings were considered important to a full understanding of Hypothesis One.



Teacher Level of Functioning and Student Academic Achievement

The Model. The analysis of the teacher functioning data was performed in the same manner as that for teacher voice tone. For the analysis a similar model was established. The model included the same independent variables, interactions and covariate, with the exception of the substitution of teacher level of functioning (high, low as determined by ratings) for teacher voice tone and the subsequent substitution of levels of functioning for voice tone in the interactions with the additional independent variables. Again the principle outcome measure was Average Change, and each of the five subtests was considered individually.

Average Change. The results of analyses for all the variables considered in the model with regard to Average Change are presented in Tables 85-86. There were three significant findings. Students of teachers rated as functioning at relatively low levels on interpersonal dimensions achieved significantly more than students of teachers rated as functioning at relatively high levels on the same dimensions. The interaction of teacher level of functioning and initial level of student achievement also yielded significant results. Briefly, those students who attained the highest scores on the pre-test achieved more when taught by low functioning teachers than did any other IA group under teachers rated high or low functioners. By contrast, high IA students showed the least academic achievement (a loss of more than one-half month) of any IA group taught by high or low functioning teachers when taught by teachers functioning at relatively high levels on interpersonal dimensions. Both medium and low IA groups also showed greater



TABLE 85

Means and F Values for Level of Functioning, Sex, Race, IQ, IA and Student Intelligence (Covariate) for Student Average Academic Change

Source	Means <sup>1</sup>		F Value
	Students	Months	
Level of Functioning	High	3.38	35.49**
	Low	7.99	
Sex	Male	5.54	0.16
	Female	5.82	
Race	Black	5.29	1.18
	White	6.08	
IQ	High	6.31	1.41
	Low	5.06	
IA	High	4.46	3.12
	Medium	5.37	
	Low	7.21	
Student Intelligence (Covariate)			6.27*

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\* .05      \*\* .001      df for IA=2, 144      df for all others=1, 146

TABLE 86

Means and F Values for the Interaction of Functioning  
with Sex, Race, IQ and IA for Student Average Academic Change

Source	Means <sup>1</sup>				F Value
Level of FunctioningX	High Functioning		Low Functioning		
	Students	Months	Students	Months	
Sex	Male	2.99	Male	8.10	0.51
	Female	3.77	Female	7.88	
Race	Black	2.93	Black	7.66	0.03
	White	3.83	White	8.32	
IQ	High	3.58	High	9.04	1.07
	Low	3.18	Low	6.94	
IA	High	-0.66	High	9.59	7.54*
	Medium	4.39	Medium	6.36	
	Low	6.41	Low	8.02	

<sup>1</sup>Means given in academic months. Ten months equal one academic year.

\* .001      df for IA=2, 144      df for all others=1, 146

academic achievement with teachers rated as low functioners than with teachers rated as functioning at relatively high levels on interpersonal dimensions. Further, it was found that a linear relationship existed between student intelligence and academic achievement.

Subtests. Tables 87-91 present the findings for all the variables with regard to the five subtests. Although teacher level of functioning yielded no significant results pertaining to the English subtests (Tables 87-88), results for all three arithmetic subtests (Tables 89-91) were significant. Consistently students of low functioning teachers achieved more than students of high functioning teachers. Infrequently, significant results were obtained for race, IQ, IA and the interaction of functioning with race. The interaction of functioning with IA also showed findings of significance for two arithmetic subtests. Again, as in the results for Average Change, in both cases students with the highest initial level of achievement achieved more than any other IA group with any teacher when taught by teachers functioning at relatively low levels and showed the least achievement (in one instance, a loss of more than twelve academic months) of any IA group with any teachers when taught by teachers functioning at relatively high levels on interpersonal dimensions. In every instance but one (medium IA, subtest AR) medium and low IA groups performed better with teachers rated as functioning at relatively low levels on interpersonal dimensions than with teachers rated as functioning at relatively high levels. It was also found that performance on one of the English subtests and two of the arithmetic subtests bore a significant linear relationship to student intelligence.

Means and F Values for Functioning, Between Variables, Covariate  
and the Interaction of Functioning with the Between Variables  
for the Word Meaning (WM) Subtest of the Stanford Achievement Test

Source	Students	Means <sup>1</sup>		F Value
		Months	Functioning High Low	
Functioning	High	5.80		1.28
	Low	7.21		
Sex	Male	6.28		0.15
	Female	6.72		
Race	Black	4.64		10.22**
	White	8.36		
IQ	High	6.58		0.01
	Low	6.42		
IA	High	6.10		2.03
	Medium	5.39		
	Low	8.02		
Functioning X Sex	Male		5.44 7.13	0.07
	Female		6.16 7.28	
Functioning X Race	Black		5.40 3.88	6.26*
	White		6.20 10.53	
Functioning X IQ	High		5.70 7.46	0.07
	Low		5.90 6.95	
Functioning X IA	High		5.49 6.70	0.11
	Medium		4.92 5.85	
	Low		6.98 9.06	
Covariate				4.42*

<sup>1</sup>Means are given in academic months. Ten months equal one academic year.

\*p ≤ .05      \*\*p ≤ .005      df for IA=2, 144      df for all others=1, 146

Means and F Values for Functioning, Between Variables, Covariate  
and the Interaction of Functioning with the Between Variables  
for the Paragraph Meaning (PM) Subtest of the Stanford Achievement Test

Source	Students	Means <sup>1</sup>		F Value
		Months	Functioning High Low	
Functioning	High	7.02		0.42
	Low	6.14		
Sex	Male	6.81		0.13
	Female	6.36		
Race	Black	5.82		1.45
	White	7.34		
IQ	High	9.52		10.14*
	Low	3.64		
IA	High	6.69		0.36
	Medium	7.12		
	Low	5.93		
Functioning X Sex	Male		6.17	3.06
	Female		7.87	
Functioning X Race	Black		6.12	0.05
	White		7.92	
Functioning X IQ	High		9.27	0.92
	Low		4.77	
Functioning X IA	High		7.65	0.22
	Medium		7.69	
	Low		5.73	
Covariate				0.42

<sup>1</sup>Means are given in academic months. Ten months equal one academic year.

\*p ≤ .005      df for IA=2, 144      df for all others=1, 146



Means and F Values for Functioning, Between Variables, Covariate  
and the Interaction of Functioning with the Between Variables  
for the Arithmetic Computation (AC) Subtest  
of the Stanford Achievement Test

Source	Students	Means <sup>1</sup>		F Value
		Months	Functioning High Low	
Functioning	High Low	3.18 8.94		18.83***
Sex	Male Female	6.69 5.43		1.09
Race	Black White	5.36 6.77		1.29
IQ	High Low	6.44 5.69		0.17
IA	High Medium Low	5.91 3.89 8.38		5.39**
Functioning X Sex	Male Female		3.85 2.51 9.52 8.36	0.01
Functioning X Race	Black White		1.90 4.46 8.81 9.07	0.85
Functioning X IQ	High Low		3.73 2.64 9.14 8.74	0.06
Functioning X IA	High Medium Low		0.81 2.01 11.01 5.77 6.73 10.04	1.59
Covariate				4.92*

<sup>1</sup>Means are given in academic months. Ten months equal one academic year.

\* $p \leq .05$     \*\* $p \leq .01$     \*\*\* $p \leq .001$

df for IA=2, 144    df for all others=1, 146

Means and F Values for Functioning, Between Variables, Covariate  
and the Interaction of Functioning with the Between Variables  
for the Arithmetic Concepts (AR) Subtest  
of the Stanford Achievement Test

Source	Students	Means <sup>1</sup>		F Value
		Months	Functioning High Low	
Functioning	High	4.76		
	Low	10.94		13.50**
Sex	Male	7.16		
	Female	8.54		0.83
Race	Black	8.77		
	White	6.93		1.36
IQ	High	8.39		
	Low	7.31		0.22
IA	High	5.03		
	Medium	9.00		1.35
	Low	9.51		
Functioning X Sex	Male		4.47	
	Female		5.05	9.84 12.04
				0.28
Functioning X Race	Black		4.97	
	White		4.54	12.56 9.32
				0.79
Functioning X IQ	High		5.37	
	Low		4.14	11.40 10.48
				0.01
Functioning X IA	High		- 3.92	
	Medium		9.27	13.99 8.74
	Low		8.92	10.10
				7.32**
Covariate				4.17*

<sup>1</sup>Means are given in academic months. Ten months equal one academic year.

\*p ≤ .05

\*\*p ≤ .001

df for IA=2, 144

df for all others=1, 146

TABLE 91

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Means and F Values for Functioning, Between Variables, Covariate  
and the Interaction of Functioning with the Between Variables  
for the Arithmetic Applications (AA) Subtest  
of the Stanford Achievement Test

Source	Students	Means <sup>1</sup>		F Value
		Months	Functioning High Low	
Functioning	High Low	-3.46 8.26		67.17*
Sex	Male Female	1.90 2.90		0.60
Race	Black White	2.98 1.82		0.75
IQ	High Low	1.73 3.07		0.48
IA	High Medium Low	0.94 2.92 3.36		0.51
Functioning X Sex	Male Female		-3.84 -3.07 7.65 8.88	0.03
Functioning X Race	Black White		-3.51 -3.40 9.48 7.05	0.90
Functioning X IQ	High Low		-5.55 -1.37 9.01 7.51	3.51
Functioning X IA	High Medium Low		-12.24 -1.36 14.11 7.19 3.23 3.48	17.47*
Covariate				0.00

<sup>1</sup>Means are given in academic months. Ten months equal one academic year.

\* $p \leq .001$  df for IA=2, 144 df for all others=1, 146

In general, the pattern of the findings for both Average Change and the five subtests is very similar to that of the findings concerning voice tone and academic achievement. This similarity will be discussed further in Chapter IV.

#### Intercorrelation of Voice Tone Ratings

The results of intercorrelating ratings of the eighteen teacher voice tone dimension-mode rater group combinations are presented in Table 92. The following is a list of the results that were generally expected to be obtained:

- 1) high positive correlations between rater groups within a given voice tone dimension-mode;
- 2) high positive correlations between rater groups of a voice tone dimension-mode and rater groups of the other mode of the same voice tone dimension;
- 3) high negative correlations between rater groups of both warmth-filtered and warmth-normal and rater groups of anger and anxiety in both modes;
- 4) high positive correlations between rater groups of both anger-filtered and anger-normal and rater groups of anxiety in both modes.

An overview of the data reveals that there is considerable variation in the findings. Significance was determined with reference to a table of Pearson product-moment correlation coefficients (Underwood et al., 1954). While some of the expected results were obtained, many were not. For example, high positive correlations were found between

TABLE 92

Intercorrelation of Voice Tone Dimension-Mode Rater Group Combinations

	1	2	3	4	5	6	7	8	9
	Warmth- Filtered- Male	Warmth- Filtered- Female	Warmth- Filtered- Total	Anger- Filtered- Male	Anger- Filtered- Female	Anger- Filtered- Total	Anxiety- Filtered- Male	Anxiety- Filtered- Female	Anxiety- Filtered- Total
1	1.00	0.73**	0.90**	-0.86**	-0.04	-0.36**	-0.68**	-0.05	-0.37**
2		1.00	0.96**	-0.72**	-0.25**	-0.46**	-0.93**	-0.33**	-0.67**
3			1.00	-0.83**	-0.18*	-0.45**	-0.89**	-0.23**	-0.59**
4				1.00	0.52**	0.77**	0.79**	0.55**	0.74**
5					1.00	0.95**	0.38**	0.92**	0.78**
6						1.00	0.58**	0.89**	0.86**
7							1.00	0.54**	0.84**
8								1.00	0.91**
9									1.00

\* .05

\*\* .01

df=148



TABLE 92--Continued

	10	11	12	13	14	15	16	17	18
	Warmth- Normal- Male	Warmth- Normal- Female	Warmth- Normal- Total	Anger- Normal- Male	Anger- Normal- Female	Anger- Normal- Total	Anxiety- Normal- Male	Anxiety- Normal- Female	Anxiety- Normal- Total
1	-0.09	0.37**	0.17*	0.34**	0.15	0.25**	0.31**	0.29**	0.33**
2	-0.32**	0.49**	0.12	0.41**	0.06	0.25**	0.43**	-0.12	0.16
3	-0.24**	0.47**	0.15	0.41**	0.10	0.27**	0.41**	0.05	0.24**
4	-0.33**	-0.77**	-0.62**	0.11	0.36**	0.24**	0.05	0.19*	0.14
5	-0.72**	-0.92**	-0.91**	0.74**	0.86**	0.81**	0.71**	0.90**	0.89**
6	-0.66**	-0.98**	-0.91**	0.59**	0.78**	0.70**	0.55**	0.75**	0.72**
7	0.08	-0.63**	-0.32**	-0.18*	0.20*	0.00	-0.35**	0.25**	-0.04
8	-0.64**	-0.86**	-0.83**	0.64**	0.86**	0.76**	0.47**	0.84**	0.73**
9	-0.37**	-0.87**	-0.70**	0.32**	0.65**	0.49**	0.13	0.66**	0.45**
10	1.00	0.64**	0.90**	-0.95**	-0.89**	-0.94**	-0.85**	-0.58**	-0.78**
11		1.00	0.92**	-0.59**	-0.80**	-0.71**	-0.51**	-0.77**	-0.71**
12			1.00	-0.84**	-0.93**	-0.90**	-0.74**	-0.75**	-0.82**
13				1.00	0.92**	0.98**	0.90**	0.73**	0.89**
14					1.00	0.98**	0.72**	0.84**	0.86**
15						1.00	0.83**	0.80**	0.90**
16							1.00	0.65**	0.90**
17								1.00	0.92**
18									1.00

\* .05

\*\* .01

df=148

rater groups within a voice tone dimension-mode, but high positive correlations were not always obtained between rater groups of a voice tone dimension-mode and rater groups of the other mode of the same voice tone dimension. Further reference will be made to this data in the discussion of the results in an attempt to explicate specific findings.

## CHAPTER IV

## DISCUSSION

The general finding concerning the effect of teacher voice tone on student academic achievement was that students of teachers whose voice tones were rated cooler, angrier and more anxious showed greater academic achievement than students taught by teachers whose voice tones were rated warmer, less angry and less anxious. This finding does not support Hypothesis One. There were, however, some exceptions to this finding. The most widespread exception pertained to the dimension-mode anger-normal (male and total raters, voice tone, student average academic change; male and total raters, voice tone, subtests AR and AA; female raters, voice tone X IA, subtest WM; male and total raters, voice tone X IQ, subtest AR; and male and total raters, voice tone X IA, subtest AA). Here the predicted results were obtained: students of teachers rated less angry showed greater academic achievement than students of teachers rated angrier or more irritable. Exceptions were also found in the anxiety-filtered, warmth-normal and anxiety-normal dimension-modes, although their occurrence was less widespread than in the case of anger-normal (anxiety-filtered: female and total raters, voice tone X IA, subtests WM and PM; warmth-normal: all rater groups, voice tone X IA, subtest AR and male raters, voice tone X IA, subtest AA; anxiety-normal: total raters, voice tone X IA, subtest WM).

It is interesting to note that the great majority of exceptions to the general trend of the findings occurs in the normal mode of tape

rating. This suggests that there may have been some characteristic of the normal tapes that contributed to this occurrence. One possible explanation concerns the relative impurity of normal tapes: normal tapes are contaminated with speech content. It seems likely that although the raters were instructed to concentrate on and rate only voice tone in the normal tapes, in many instances their ratings reflect their response to speech content as well as to voice tone. One effect of such an occurrence would be seen in the reliabilities: reliabilities would be lower for the normal mode of rating. Table 5 (p. 32) shows that in six of the nine instances, the reliability for the normal mode is much lower than for the filtered mode. Accordingly, it seems reasonable to question whether or not the raters were rating the same construct on a given excerpt. For example, while some raters were attending only to the anger in the voice tone, others might have tempered the angry tone with words they felt to be sympathetic, thus confusing warmth and anger. The outcome would be to place different teachers in the "more" or "less" categories for the three voice tone dimensions as a result of normal ratings than were placed by filtered ratings. As is shown in Table 2 (p. 24), for each dimension, one-third of the teachers were placed in different categories as the result of ratings in the normal mode. It is possible that the resultant shift in data might bring about (although not necessarily cause) a shift in the findings. The most consistent shift in the findings concerned the dimension of anger, where, in the normal mode, students of teachers rated less angry outperformed students of teachers rated angrier or more irritable. It would appear to be more than coincidence

that the two teachers who were placed in different anger categories as a result of normal ratings were teachers whose students demonstrated a large discrepancy in average pre-post achievement. (See Table 4, p. 27.) Teacher #2 was shifted to the "angrier" category by normal ratings, while teacher #6 was shifted to the "less angry" category, thus increasing the average pre-post achievement of the students of teachers rated "less angry." Teachers' shifts as a result of normal ratings for other voice tone dimensions did not involve such a large discrepancy in students' pre-post achievement, hence the likelihood of a shift in the findings for the other dimensions is diminished. Thus explained, the exceptions to the general findings offer no support for the hypothesis, but are understood only in relation to the general findings.

To understand the general finding that students of teachers rated cooler, angrier and more anxious showed greater academic achievement than students of teachers rated warmer, less angry and less anxious, it is important to consider the absolute level at which the teachers were rated on the three dimensions of voice tone. The ratings of teacher voice tone (Table 1, p. 23) indicate that even though a teacher could be labeled "more" or "less" on any of the three voice tone dimensions, no teacher (with the exception of teacher #1, who could be called "not angry") could be described as "warm" or "cold," "angry" or "not angry," "anxious" or "not anxious": all six teachers exhibited warmth, anger and anxiety in moderate amounts. It is only within the limits of moderation that a teacher could be characterized as "warm" or "cold," "angry" or "not angry," "anxious" or "not anxious." Henceforth, any



characterization of teachers on the three voice tone dimensions is done with the understanding that moderation sets the limits. Once the absolute level at which the teachers were rated on the three voice tone dimensions is understood, it is possible to present some thoughts on the effect of the teachers' characteristics on their students' behavior.

Basic to understanding the effect of the teachers' characteristics on their students' behavior is an appreciation of the students' perception of their school experience. Although the teachers' union forbade asking students any questions that might be considered evaluative of teachers or schools, it is possible to make inferences about the students' classroom experience on the basis of the tape recordings that were collected for the study. It is evident from listening to these tape recordings that humor had very little, if any place in the classroom. This finding is corroborated by Aspy (personal communication), who found humor in only about five per cent of over two hundred tape recorded elementary classroom hours. It seems reasonable to suggest that a somber, restrictive atmosphere characterizes the typical classroom.

It is in the context of a somber, restrictive classroom atmosphere that the students react to their teacher's characteristics. As can be seen in Table 2 (p. 24), the teachers can be divided into two groups on the basis of their characteristics, those who are "cold," "angry" and "anxious" and those who are "warm" and neither "angry" nor "anxious." This division is supported by the results obtained from the intercorrelation of voice tone dimension-mode rater group combinations (Table 92, pp. 133-134). It seems likely that students of "cold,"

"angry," "anxious" teachers would see their teacher's characteristics as consistent with the atmosphere with which they were familiar and which they had come to expect in the classroom. Accordingly, these students would know that they could expect their teacher to be harsh if they were not obedient or productive. "Cold," "angry," "anxious" teachers have obedient, productive students because their students are afraid to be otherwise. (It is important to note that in general there was only enough fear to make the students productive, not to be debilitating.) The somber, restrictive classroom atmosphere is maintained and provides the structure necessary for the completion of the daily classroom routine.

By contrast, the students of "warm" teachers who are neither "angry" nor "anxious" are confronted with a very different situation. For these students, their teacher's characteristics are not consistent with what they have come to expect in the classroom. As they test their limits, the students come to realize they have less need to fear their teacher than they anticipated they would have. They see their teacher's warmth or sympathy as a weakness that allows the discipline and structure in the classroom to break down. There is relief from the somber, restrictive atmosphere; and the students become less obedient and productive in the new permissive atmosphere. With the loss of fear, there is the loss of the principle motive for classroom productivity. Consequently, the students of teachers who are "warm," "not angry" and "not anxious" show less academic achievement than the students of "cold," "angry," "anxious" teachers.

It could be said that the school offers a negative inducement to learn, the avoidance of the teacher's anger, rather than provides a

a positive inducement. Without a truly warm teacher, there is little to excite, entice or encourage the students to learn. In the absence of a strong positive stimulus to produce, the students achieved more in an attempt to avoid the negative impact of interaction with a cold, angry, anxious teacher than in an attempt to elicit interaction with a teacher who was capable of providing only a modicum of positive qualities. It is a sad comment concerning those schools employed in this study that they were not staffed with teachers who were capable of offering their students more than a modicum of positive qualities, to say nothing of the fact that they were staffed with teachers who offered even less. Moreover, there is little reason to believe that these schools differ markedly in this regard from others in the same school system or other school systems. The schools used in this study are felt to be representative of the educational scene at the national level.

The presence or absence of fear in the classroom might serve to explain the fact that results contrary to those predicted were obtained, but no revision of the hypothesis that students of teachers whose voice tone is judged warmer, less angry and less anxious will show significantly more academic achievement than will students of teachers whose voices are judged cooler, angrier and more anxious is intended. It is contended that this hypothesis was not fully tested: the limited range of teacher characteristics obtained did not allow an adequate test of the hypothesis. In light of the results of this study, the hypothesis might be revised to read that with regard to a middle range of teacher characteristics students of teachers rated cooler, angrier and more anxious will show greater academic achievement

than students of teachers rated warmer, less angry and less anxious, but this is not intended to indicate that this would be the case if a wider range of teacher characteristics were involved. The present study offers no evidence that such a result, or for that matter any particular result, would be obtained if a wider range of teacher characteristics were involved. However, from the indications in the literature, it still seems reasonable to hypothesize that if teachers were obtained whose characteristics could be called in absolute terms warm or cold, angry or not angry, anxious or not anxious, the results may be those stated by the original hypothesis. Cold, angry, anxious teachers might have students who would be debilitated by their fear. But what is more important is that teachers who are truly warm and neither angry nor anxious might be able to fill the motivational void students encounter when confronted by these characteristics in moderation. A high degree of warmth and understanding might serve as a positive stimulus for student productivity, as opposed to the negative stimulus of fear, and provide the structure and direction necessary for student productivity.

Congruent with the retention of the original hypothesis is the statement that the results of this study are in no way intended to offer coolness, anger and anxiety as a prescription for effective teaching. Perhaps, within the limited range of teacher characteristics studied, these qualities do lead to greater academic achievement than their counterparts. However, it is important to inquire into the impact of such a classroom experience on the students. Along with achievement, do students concomitantly come to view learning as a dull, dreary process



to be borne under duress or do they contract an inquisitiveness and a yearning that only the discovery of the unknown satisfies? Have they learned facts at the cost of killing their natural curiosity and desire to know? It is a possibility. Moreover, the limited academic achievement thus attained (students of "cold," "angry," "anxious" teachers show roughly five months greater average academic achievement in the period studied) suggests there are more effective means of teaching.

If the results of this study do not offer coolness, anger and anxiety as a prescription for effective teaching, what does the study offer in the way of a direction for teaching or teacher training? It is from Hypothesis Two that such a direction is found. Hypothesis Two states that those teachers whose voice tone is judged warmer, less angry and less anxious will offer higher levels of facilitative conditions to their students than will teachers whose voice tone is judged cooler, angrier and more anxious. The data obtained (Table 84, p. 121) supports this hypothesis. Teachers rated "warm," "not angry" and "not anxious" provided their students with higher levels of empathy, positive regard, genuineness and concreteness than did teachers rated "cold," "angry" and "anxious." As stated in Chapter I, teachers functioning at high levels of these dimensions of facilitative conditions have been found to bring about high levels of academic achievement in their students. Accordingly, teacher training should incorporate a systematic program for the enhancement of functioning on the dimensions of empathy, positive regard, genuineness and concreteness. As teachers come to function at higher levels on these dimensions of interpersonal



relations, they will also exhibit higher levels of warmth and lower levels of anger and anxiety, as indicated by the support of Hypothesis Two, and consequently become more potent in terms of their ability to bring about student academic achievement. Thus the relating of tonal qualities to dimensions of interpersonal functioning posits one possible direction in teacher training that could help produce more effective teachers.

The positing of this direction for teacher training is not without its problems. An important additional finding of the present study concerning teacher level of functioning and student academic achievement is in direct contradiction to the general finding reported in the literature mentioned in Chapter I: students of teachers rated as functioning at relatively low levels on the interpersonal dimensions of empathy, positive regard, genuineness and concreteness achieved significantly more than students of teachers rated as functioning at relatively high levels on the same dimensions. (See Table 85, p. 124.) How then can such a direction be offered in the face of this finding? Here again, as was the case with regard to voice tone, the limited range and generally low level of functioning displayed by the teachers employed in the study is felt to be responsible for this finding. The results only have meaning within the limited range of those levels of functioning studied and offer no evidence that similar results would be obtained were a broader range of levels of functioning employed. Therefore, it seems reasonable, in light of the fact that results opposite to those obtained in the present study were obtained in studies using a broader range of levels of functioning (Aspy, 1966), to posit

a program for the enhancement of teacher functioning on the dimensions of empathy, positive regard, genuineness and concreteness as one means toward training more effective teachers.

Admittedly, conflicting findings, whatever the levels of functioning involved, raise questions. More research must be done concerning level of functioning and academic achievement. With regard to the present study, the limited range and generally low level of functioning must be considered a limitation. The limited range and generally moderate level of teacher voice tones employed must also be considered a limitation. Future research should use measures of both level of functioning and voice tone as indexes of teacher selection. Further, the number of teachers (six), schools (two) and school districts (one) used in the study could be said to limit the generalizability of the findings. The call is for research using a broader sample or numerous replications. In addition, two steps to improve the reliability of voice tone ratings are suggested. The use of a filter modifier with an attenuation slope asymptotic to 60 decibels per octave, as opposed to 24 decibels per octave characteristic of that used in the present study, would improve the audibility of the excerpts and probably increase the reliability of voice tone ratings. Reliability would also most likely be increased by training voice tone raters. This could be accomplished simply by presenting the raters with sample excerpts of the various voice tones to be rated. Finally, future research would benefit from expanding its scope to include other non-verbals, for example posture and gesture, as well as other variables, such as teacher expectation.

It is interesting that both the finding for level of functioning and academic achievement and that for voice tone and academic achievement were obtained contrary to expectation. Further, there is notable similarity between the mean average change for students of teachers rated as functioning at relatively low levels on the interpersonal dimensions (7.99 months) and the mean average change for students of "cold" teachers (8.38 months, filtered mode; 7.99 months, normal mode)<sup>1</sup> as well as between the mean average change for students of teachers rated as functioning at relatively high levels on the interpersonal dimensions (3.38 months) and the mean average change for students of "warm" teachers (2.86 months, filtered mode; 3.38 months, normal mode).<sup>2</sup> Such similarities provide additional support for Hypothesis Two. Teacher tonal quality and teacher level of functioning are two closely related phenomena.

At the outset of the present study it was intended that the demonstration of the fact that teacher tonal quality and teacher level of functioning were two closely related phenomena would at least partially explicate the observed effects of teacher tonal quality. In addition to understanding the relationship of these two variables to each other, perhaps the effects of both of these variables might better be understood by positing their participation in a larger phenomenon which might be designated "the effective person." As participants in the phenomenon of the effective person, tonal quality and level of functioning become two expressions of effectiveness, tonal quality being a non-verbal mode of expression and level of functioning being a

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<sup>1</sup>Means are given for total raters.

<sup>2</sup>Ibid.

mode of expression which relies heavily on verbal content. An attempt to represent the interrelationship of these phenomena is made in Figure 3. Thus viewed, voice tone and level of functioning are two of a number of possible variables that participate in the phenomenon of the effective person and which could be said to be effective agents of change, be it with regard to academic achievement, political opinion or personality variables, in their own right.

The results of the present study have thus made it possible to make the following conclusions:

Conclusion One: Teacher voice tone does effect student academic achievement; more specifically, the expressions of warmth, anger and anxiety (more importantly warmth and anger) in teacher voice tone have a direct effect on student academic achievement. In establishing this conclusion, the first goal of the study, to extend the known effects of voice tone to the classroom, is realized.

Conclusion Two: Teacher voice tone and teacher level of functioning are two closely related phenomena. In establishing this conclusion and positing the participation of these two phenomena in the larger phenomenon of the effective person, the second goal of the study, a partial explication of the observed effects of teacher voice tone, is realized. In addition, by relating tonal qualities to dimensions of interpersonal functioning, this conclusion points to one possible avenue toward more effective teacher training.

These two conclusions have implications for all human relations. The effect of voice tone may well be realized far beyond the teacher-student relationship. Although reports of the effect of voice tone are



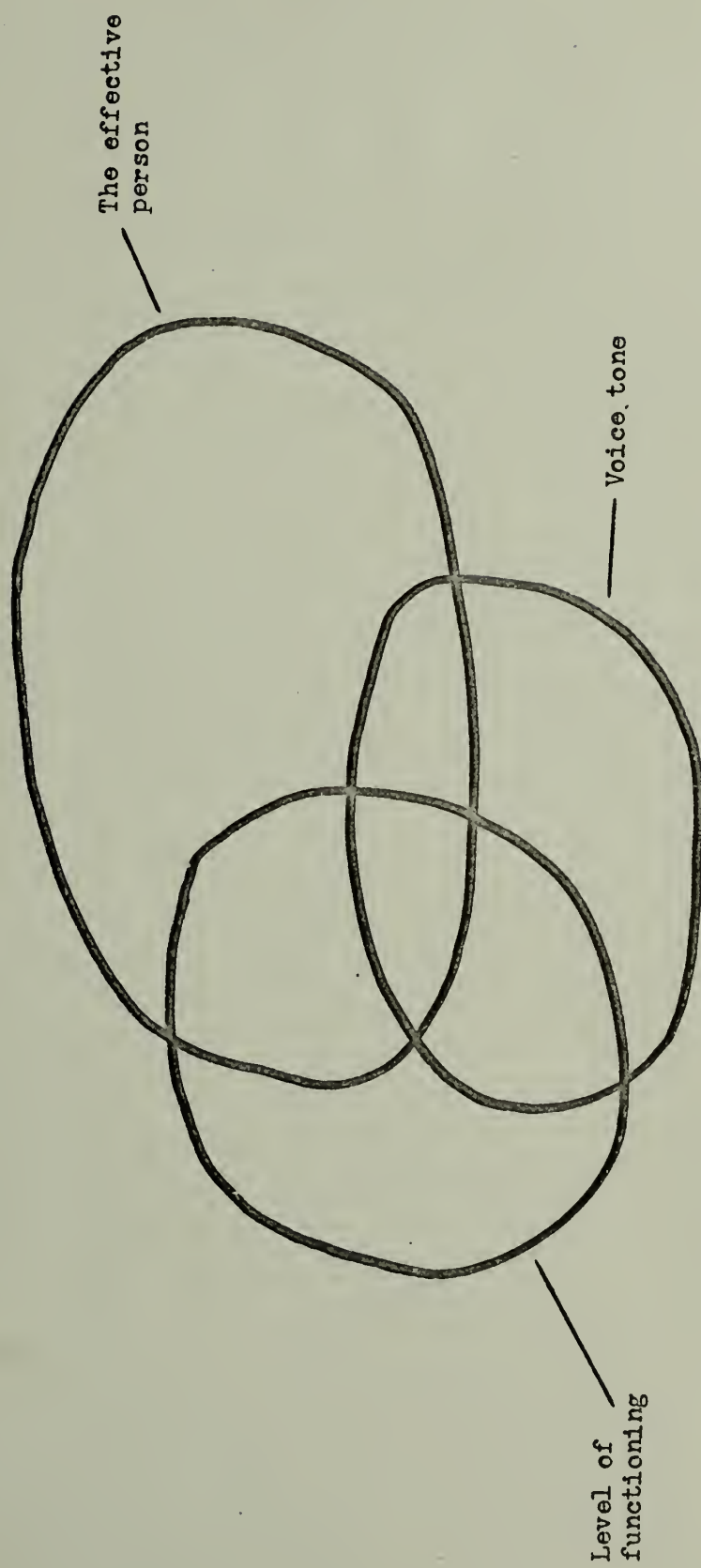


Fig.3.--The interrelatedness of voice tone and level of functioning and the larger phenomenon of the effective person.



visible in the literature, its extent is yet unknown. Findings such as those reported in the present study provide a strong rationale for continued research concerning the effect of voice tone. Moreover, they suggest one possible method of enhancing the expression of positive tonal qualities so that their effect might be more fully realized.

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APPENDIX A

Rating Assigned to Occupation	Professionals	Proprietors and Managers	Business Men	Clerks and Kindred Workers, Etc.	Manual Workers	Protective and Service Workers	Farmers
1	Lawyers, doctors, dentists, engineers, judges, high-school superintendents, veterinarians, ministers (graduated from divinity school), chemists, etc., with postgraduate training, architects	Businesses valued at \$75,000 and over	Regional and divisional managers of large financial and industrial enterprises	Certified Public Accountants			Gentlemen farmers
2	High-school teachers, trained nurses, chiropractors, undertakers, ministers (some training), newspaper editors, librarians (graduate)	Businesses valued at \$20,000 to \$75,000	Assistant managers and office and department managers of large businesses, assistants to executives, etc.	Accountants, salesmen of real estate and insurance, postmasters			Large farm owners, farm owners
3	Social workers, grade-school teachers, optometrists, librarians (not graduate), undertaker's assistants, ministers (no training)	Businesses valued at \$5,000 to \$20,000	All minor officials of businesses	Auto salesmen, bank clerks and cashiers, postal clerks, secretaries to executives, supervisors of railroad, telephone, etc., justices of the peace	Contractors		
4		Businesses valued at \$2,000 to \$5,000		Stenographers, bookkeepers, rural mail clerks, railroad ticket agents, sales people in dry goods stores, etc.	Factory foreman, electricians, plumbers, carpenters, watchmakers (own business)	Dry cleaners, butchers, sheriffs, railroad engineers and conductors	
5		Businesses valued at \$500 to \$2,000		Dime store clerks, hardware salesmen, beauty operators, telephone operators	Carpenters, plumbers, electricians (apprentice), timekeepers, linemen, telephone or telegraph, radio repairmen, medium skilled workers	Barbers, firemen, butcher's apprentices, practical nurses, policemen, seamstresses, cooks in restaurant, bartenders	Tenant farmers
6		Businesses valued at less than \$500			Moulders, semi-skilled workers, assistants to carpenter, etc.	Baggage men, night policemen and watchmen, taxi and truck drivers, gas station attendants, waitresses in restaurants	Small tenant farmers, laborers
7					Heavy labor, migrant work, odd-job men, miners	Janitors, scrubwomen, newsboys	Migrant farm laborers

## APPENDIX B

A Scale for the Measurement of  
Feeling in the Voice

F

WARMTH - SYMPATHY

not warm at all,  
completely cool

extremely  
warm, sympathetic

excerpt #	1.	1	2	3	4	5	6
	2.	1	2	3	4	5	6
	3.	1	2	3	4	5	6
	4.	1	2	3	4	5	6
	5.	1	2	3	4	5	6
	6.	1	2	3	4	5	6
	7.	1	2	3	4	5	6
	8.	1	2	3	4	5	6
	9.	1	2	3	4	5	6
	10.	1	2	3	4	5	6
	11.	1	2	3	4	5	6
	12.	1	2	3	4	5	6
	13.	1	2	3	4	5	6
	14.	1	2	3	4	5	6
	15.	1	2	3	4	5	6
	16.	1	2	3	4	5	6
	17.	1	2	3	4	5	6
	18.	1	2	3	4	5	6
	19.	1	2	3	4	5	6
	20.	1	2	3	4	5	6

Circle one number for each excerpt



# A Scale for the Measurement of Feeling in the Voice

F

## SCALE - SUMMARY

Scale for the Measurement of  
Feeling in the Voice

Scale for the Measurement of  
Feeling in the Voice

100	1	2	3	4	5	6
90	1	2	3	4	5	6
80	1	2	3	4	5	6
70	1	2	3	4	5	6
60	1	2	3	4	5	6
50	1	2	3	4	5	6
40	1	2	3	4	5	6
30	1	2	3	4	5	6
20	1	2	3	4	5	6
10	1	2	3	4	5	6

Scale for the Measurement of  
Feeling in the Voice

A Scale for the Measurement of  
Feeling in the Voice

ANGER - IRRITATION

not angry at all,  
completely unprovoked

extremely  
angry, irritated

example 1.	1	2	3	4	5	6
2.	1	2	3	4	5	6
3.	1	2	3	4	5	6
4.	1	2	3	4	5	6
5.	1	2	3	4	5	6
6.	1	2	3	4	5	6
7.	1	2	3	4	5	6
8.	1	2	3	4	5	6
9.	1	2	3	4	5	6
10.	1	2	3	4	5	6
11.	1	2	3	4	5	6
12.	1	2	3	4	5	6
13.	1	2	3	4	5	6
14.	1	2	3	4	5	6
15.	1	2	3	4	5	6
16.	1	2	3	4	5	6
17.	1	2	3	4	5	6
18.	1	2	3	4	5	6
19.	1	2	3	4	5	6
20.	1	2	3	4	5	6

Circle one number for each example.

A Scale for the Measurement of  
Feeling in the Voice

F

ANGER - IRRITATION

not angry at all,  
completely un irritated

extremely  
angry, irritated

excerpt # 21.	1	2	3	4	5	6
22.	1	2	3	4	5	6
23.	1	2	3	4	5	6
24.	1	2	3	4	5	6
25.	1	2	3	4	5	6
26.	1	2	3	4	5	6
27.	1	2	3	4	5	6
28.	1	2	3	4	5	6
29.	1	2	3	4	5	6
30.	1	2	3	4	5	6

Circle one number for each excerpt

A Table for the Measurement of  
Feeding in the Field

W

## ANNEX

1. Number of birds  
observed feeding

2. Number of  
birds feeding; displaced

1.	1	2	3	4	5	6
2.	1	2	3	4	5	6
3.	1	2	3	4	5	6
4.	1	2	3	4	5	6
5.	1	2	3	4	5	6
6.	1	2	3	4	5	6
7.	1	2	3	4	5	6
8.	1	2	3	4	5	6
9.	1	2	3	4	5	6
10.	1	2	3	4	5	6
11.	1	2	3	4	5	6
12.	1	2	3	4	5	6
13.	1	2	3	4	5	6
14.	1	2	3	4	5	6
15.	1	2	3	4	5	6
16.	1	2	3	4	5	6
17.	1	2	3	4	5	6
18.	1	2	3	4	5	6
19.	1	2	3	4	5	6
20.	1	2	3	4	5	6

A Scale for the Measurement of  
Feeling in the Voice

F

## APPENDIX

not raised at all,  
completely calm

extremely  
nervous, displeased

sample # 21.	1	2	3	4	5	6
22.	1	2	3	4	5	6
23.	1	2	3	4	5	6
24.	1	2	3	4	5	6
25.	1	2	3	4	5	6
26.	1	2	3	4	5	6
27.	1	2	3	4	5	6
28.	1	2	3	4	5	6
29.	1	2	3	4	5	6
30.	1	2	3	4	5	6

Circle one number for each sample



## APPENDIX C

## DIRECTIONS

The following are nine statements made by children in elementary school. If you are a parent imagine that the statements are made by your child. If you are a teacher imagine that the statements are made by one of your students. If you are a fifth-grade student imagine that the statements are made by one of your classmates.

Also imagine that the person (child, student or classmate) is sitting across from you, that there is nobody else in the room, and that he is speaking directly to you.

For Student Statement #1 imagine that the person is telling you exactly what is written in statement 1. Read statement 1. Now, think of what you would say to this person who is sitting directly across from you; decide what you think would be most helpful to say. On the answer sheet (by "1") write down what you would say, using the exact wording you would use if you were speaking to the person.

For Statements #2 through #9 use the same directions. Remember: the person is speaking directly to you and your written statement should consist of the exact wording you would use if you were actually speaking to the student.

## STUDENT STATEMENTS

1. I feel so bad--I have no friends. Nobody likes me. All the other kids eat lunch together and play together. They always leave me out--as if they don't even care about me. Sometimes when I'm alone and all the other kids are together I feel like crying. Why doesn't anyone like me? I try to be nice, but nothing seems to work. I guess there is nothing I can do.
2. It makes me so mad! Everybody is always telling me what to do and what not to do. When I'm at home, my parents tell me what is best for me. At school it's the teacher. Even my friends bother me. Everybody pushes me around. Sometimes I feel like punching them all in the nose! They had just better leave me alone and let me do things the way I want to.
3. I'm so excited and everything is going so great! I ran for president of my class and I won; I guess the other kids really like me. And today, my teacher said I was one of the best students she had ever had; she makes me feel all warm inside. And next week, during spring vacation, I'm going to have a great time with my family. I'm so happy. It's unbelievable. Some people make me feel so good.
4. I just don't know what to do. I try very hard in school, but nothing seems to sink in. I guess I'm not very smart. Nobody seems to care that I try. What really hurts is when I see my parents bragging to others about how smart my brother is; they never even mention me--they even change the subject when I'm mentioned. Oh, I wish I could do better, but I can't. The smart kids are really lucky--everybody likes them because they are smart. Sometimes I even get mad at myself because I can't do any better.
5. I get so angry in school! Everyone tells you what you have to learn, and they don't even care about what you are interested in. You are supposed to like whatever they want to teach you. And some of the stupid things they make you do just to get a good grade. I learn more than some kids who get all "A's." For me school is a waste of time. The people there make me so mad that sometimes I want to tell them that I just don't care about all their stupid subjects. But, I can't, because I'd get into trouble and that would make me even more angry. I could scream and blow the school up every time I see it.
6. Each day I get up at the crack of dawn and people wonder why. I do because I have a longing to learn about myself and the things around me. It's so exciting! Each moment I see or learn something new--caterpillars become butterflies, the sun is actually bigger than the earth, or my body is made of many tiny cells. I feel like I'm bubbling over with excitement. I want to learn and discover things all day long!

7. Whenever we divide up to choose sides to play, I'm always the last one picked. I'm so awkward and I don't seem to play the way the others want me to. No one ever wants me on their side. It really makes me feel bad to be the last one left. When everybody is playing I just lean against the nearest wall---sometimes I could cry; when I do, I simply feel worse than ever---and all the other kids laugh at me then. I hate my body; why couldn't I have gotten a different one?
8. People get me so mad! Sometimes I feel like really letting them have it. That would at least make them stop making fun of the way I look. Just because I'm bigger than most kids my age, they call me names. The other kids call me "lardy" or "fatso." Sometimes my teacher says I'm a big bully. Even my dad and mom don't like the way I look; they kid me by saying "you'll grow out of it, we hope." Well, they just better watch out because I'll show them I can really be a bully if I want to. I'm not going to let them make fun of me and get away with it.
9. I could just run and run and run. I feel so strong! In gym today I beat everybody on the physical fitness test. At home I get my work done faster than anyone else. I'm so full of energy and I have so many ways to use it. I'm so happy and so strong I could work and play and never stop.

## Appendix D



Empathic Understanding in Interpersonal Processes. IIIA Scale for Measurement<sup>1</sup>Level 1

The verbal and behavioral expressions of the helper either do not attend to or detract significantly from the verbal and behavioral expressions of the helpee(s) in that they communicate significantly less of the helpee's feelings and experiences than the helpee has communicated himself.

Example: The helper communicates no awareness of even the most obvious, expressed surface feelings of the second person. The helper may be bored or disinterested or simply operating from a preconceived frame of reference which totally excludes that of the helpee(s).

In summary, the helper does everything but express that he is listening, understanding or being sensitive to even the most obvious feelings of the helpee in such a way as to detract significantly from the communications of the helpee.

Level 2

While the helper responds to the expressed feelings of the helpee(s), he does so in such a way that he subtracts noticeable affect from the communications of the helpee.

Example: The helper may communicate some awareness of obvious surface feelings of the helpee but his communications drain off a level of the affect and distort the level of meaning. The helper may communicate his own ideas of what may be going on but these are not congruent with the expressions of the helpee.

In summary, the helper tends to respond to other than what the helpee is expressing or indicating.

Level 3

The expressions of the helper in response to the expressions of the helpee(s) are essentially interchangeable with those of the helpee in that they express essentially the same affect and meaning.

Example: The helper responds with accurate understanding of the surface feelings of the helpee but may not respond to or may misinterpret the deeper feelings.

In summary, the helper is responding so as to neither subtract from nor add to the expressions of the helpee; but he does not respond accurately to how that person really feels beneath the surface feelings, he indicates a willingness and openness to do so. Level 3 constitutes the minimal level of facilitative interpersonal functioning.

Level 4

The responses of the helper add noticeably to the expressions of the helpee(s) in such a way as to express feelings a level deeper than the helpee was able to express himself.

Example: The helper communicates his understanding of the expressions of the helpee at a level deeper than they were expressed, and thus enables the helpee to experience and/or express feelings which he was unable to express previously.

In summary, the helper's responses add deeper feeling and meaning to the expressions of the helpee.

Level 5

The helper's responses add significantly to the feeling and meaning of the expressions of the helpee(s) in such a way as to (1) accurately express feelings levels below what the person himself was able to express or (2) in the event of ongoing deep self-exploration on the helpee's part to be fully with him in his deepest moments.

Example: The helper responds with accuracy to all of the person's deeper as well as surface feelings. He is "together" with the helpee or "tuned in" on his wavelength. The helper and the other person might proceed together to explore previously unexplored areas of human existence.

In summary, the helper is responding with a full awareness of who the other person is and a comprehensive and accurate empathic understanding of his most deep feelings.

1. The present scale is a revision derived from earlier versions of empathy scales (Carkhuff, 1968; Carkhuff and Berenson, 1967; Truax and Carkhuff, 1966).

The Communication of Respect in Interpersonal Processes. IIIA Scale for Measurement <sup>1</sup>Level 1

The verbal and behavioral expressions of the helper communicate a clear lack of respect (or negative regard) for the helpee(s).

Example: The helper communicates to the helpee that the helpee's feelings and experiences are not worthy of consideration or that the helpee is not capable of acting constructively. The helper may become the sole focus of evaluation.

In summary, in many ways the helper communicates a total lack of respect for the feelings, experiences and potentials of the helpee.

Level 2

The helper responds to the helpee in such a way as to communicate little respect for the feelings and experiences and potentials of the helpee(s).

Example: The helper may respond mechanically or passively or ignore many of the feelings of the helpee.

In summary, in many ways the helper displays a lack of respect or concern for the helpee's feelings, experiences and potentials.

Level 3

The helper communicates the minimal acknowledgement of regard for the helpee's position and concern for the helpee's feelings, experiences and potentials.

Example: The helper communicates an openness to the prospect for the helpee's ability to express himself and to deal constructively with his life situation.

In summary, in many ways the helper communicates the possibility that who the helpee is and what he does may matter to the helper, at least minimally.

Level 3 constitutes the minimal level of facilitative interpersonal functioning.

Level 4

The helper clearly communicates a very deep respect and concern for the helpee.

Example: The helper's responses enable the helpee to feel free to be himself and to experience being valued as an individual.

In summary, the helper communicates a very deep caring for the feelings, experiences and potentials of the helpee.

Level 5

The helper communicates the very deepest respect for the helpee's worth as a person and his potentials as a free individual.

Example: The helper cares very deeply for the human potentials of the helpee and communicates a commitment to enabling the helpee to actualize this potential.

In summary, the helper does everything that he can to enable the helpee to act most constructively and emerge most fully.

1. The present scale is a revision derived from earlier versions of respect or regard scales (Carkhuff, 1968; Carkhuff and Berenson, 1967; Truax and Carkhuff, 1966).

Personally Relevant Concreteness or Specificity of Expression  
in Interpersonal Processes. III

A Scale for Measurement<sup>1</sup>

Level 1

The helper appears to lead or allow all discussions with the helpee(s) to deal only with vague and anonymous generalities.

Example: The helper and the helpee discuss everything on strictly an abstract and highly intellectual level.

In summary, the helper makes no attempt to lead the discussion into the realm of personally relevant specific situations and feelings.

Level 2

The helper frequently appears to lead or allow even discussions of material personally relevant to the helpee(s) to be dealt with on a vague and abstract level.

Example: The helper and the helpee may discuss "real" feelings but they do so at an abstract, intellectualized level.

In summary, the helper does not elicit discussion of most personally relevant feelings and experiences in specific and concrete terms.

Level 3

The helper is open and at times facilitative of the helpee's discussion of personally relevant material in specific and concrete terminology.

Example: The helper will help to make it possible for the discussion with the helpee(s) to center directly around most things which are personally important to the helpee(s) although there will continue to be areas not dealt with concretely and areas which the helpee does not develop fully in specificity.

In summary, the helper is open to consideration of personally relevant specific and concrete instances, but these are not always fully developed. Level 3 constitutes the minimal level of facilitative functioning.

Level 4

The helper appears frequently helpful in enabling the helpee(s) to fully develop in concrete and specific terms almost all instances of concern.

Example: The helper is able on many occasions to guide the discussion to specific feelings and experiences of personally meaningful material.

In summary, the helper is very helpful in enabling the discussion to center around specific and concrete instances of most important and personally relevant feelings and experiences.



Level 5

The helper appears always helpful in guiding the discussion so that the helpee(s) may discuss fluently, directly and completely specific feelings and experiences.

Example: The helper involves the helpee in discussion of specific feelings situations and events, regardless of their emotional content.

In summary, the helper facilitates a direct expression of all personally relevant feelings and experiences in concrete and specific terms.

1. The present scale is a revision of earlier versions of the concreteness or specificity of expression scale (Carkhuff, 1968; Carkhuff and Peranson, 1967; Truax and Carkhuff, 1966).



Facilitative Genuineness in Interpersonal Processes. IIIA Scale for Measurement<sup>1</sup>Level 1

The helper's verbalizations are clearly unrelated to what he appears otherwise to be feeling at the moment, or his only genuine responses are negative in regard to the helpee(s) and appear to have a totally destructive effect upon the helpee.

Example: The helper may appear defensive in his interaction with the helpee(s) and this defensiveness may be demonstrated in the content of his words or his voice quality and where he is defensive he does not employ his reaction as a basis for potentially valuable inquiry into the relationship.

In summary, there is evidence of a considerable discrepancy between the helper's inner experiencing and his current verbalizations or where there is no discrepancy, the helper's reactions are employed solely in a destructive fashion.

Level 2

The helper's verbalizations are slightly unrelated to what he appears otherwise to be feeling at the moment or when his responses are genuine they are negative in regard to the helpee and the helper does not appear to know how to employ his negative reactions constructively as a basis for inquiry into the relationship.

Example: The helper may respond to the helpee(s) in a "professional" manner that has a rehearsed quality or a quality concerning the way a helper "should" respond in that situation.

In summary, the helper is usually responding according to his prescribed "role" rather than to express what he personally feels or means and when he is genuine his responses are negative and he is unable to employ them as a basis for further inquiry.

Level 3

The helper provides no "negative" cues of a discrepancy between what he says and what he appears otherwise to be experiencing, but he provides no positive cues to indicate a really genuine response to the helpee(s).

Example: The helper may listen and follow the helpee(s) but, while committing nothing more of himself, communicates an openness to doing such.

In summary, the helper appears to make appropriate responses which do not seem insincere but which do not reflect any real involvement either. Level 3 constitutes the minimal level of facilitative interpersonal functioning.

Level 4

The helper presents some positive cues indicating a genuine response (whether positive or negative) in a non-destructive manner to the helpee(s).

Example: The helper's expressions are congruent with his feelings although he may be somewhat hesitant about expressing them fully.

In summary, the helper responds with many of his own feelings and there is no doubt as to whether he really means what he says and he is able to employ his responses whatever the emotional content, as a basis for further inquiry into the relationship.

Level 5

The helper appears freely and deeply himself in a non-exploitative relationship with the helpee(s).

Example: The helper is completely spontaneous in his interaction and open to experiences of all types, both pleasant and hurtful; and in the event of hurtful responses the helper's comments are employed constructively to open a further area of inquiry for both the helper and the helpee.

In summary, the helper is clearly being himself and yet employing his own genuine responses constructively.

1. The present scale is a revision derived from earlier versions of genuineness and congruence scales (Carkhuff, 1938; Truax and Carkhuff, 1966).



