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A study of principals' teaching style preference and teachers' teaching style as a source of bias in teacher evaluation

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RUCKER, DENNIS WAYNE

A STUDY OF PRINCIPALS' TEACHING STYLE PREFERENCE AND
TEACHERS' TEACHING STYLE AS A SOURCE OF BIAS IN TEACHER
EVALUATION

Iowa State University

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**A study of principals' teaching style preference and teachers'
teaching style as a source of bias in teacher evaluation**

by

Dennis Wayne Rucker

**A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
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1981

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CHAPTER I. STATEMENT OF THE PROBLEM

Introduction

During the past twenty years, American public education has witnessed a resurgent interest in basic educational accountability. Caught between increased costs and declining enrollments, professional educators have been confronted by concerned parents, lay boards, and the public in general, with demands that the school show evidence of quality in return for the educational dollar.

While this renewed scrutiny has tended to dwell on problems, it has encouraged increased analysis, on the part of educational researchers, of the highly complex teaching/learning process. Further, the accountability issue has forced educators and researchers to strive for a more objective and empirical method of evaluating the outcomes of the educational process. In part, this assessment of educational productivity must rely heavily on the ability of the supervisor, in the school situation, to identify and assess teaching behaviors that will produce more effective and productive learning on the part of students.

While the need for teacher evaluation is well-documented: Goldhammer (25), Popham (49), Cogan (12), Manatt (40), Manatt, Palmer and Hidlebaugh (41), and Stow (64); and reviews of empirical research on effective teaching behaviors has been conducted: Medley (45), Rosenshine (53), Borich (6), and Peterson and Walberg (48); the current professional literature does little to investigate the variable of a predisposition by supervisors or evaluators in the clinical or performance evaluation cycle.

Even though school administrators now have at their disposal a wide variety of empirically tested productive teaching behaviors with which to mark the effectiveness of teachers, the possibility remains that some existing bias may still be actively clouding the individual assessment and thereby causing the evaluation process to "miss the mark".

Morris Cogan succinctly conceptualizes this problem in teacher evaluation by stating:

Most teachers have consciously and unconsciously constructed a personal model of the good teacher. Such conceptions generally grow by accretion rather than by critical examination and careful testing. The result is that, too often, the operating model of the teacher-turned-supervisor is pretty much what he himself does well. When teachers become supervisors, these personal preferences generally operate in full vigor furnishing many of the criteria for viewing the teaching of others.
(12:54)

While Cogan's concept of an "operating model", acting as a bias in evaluation, has not been empirically validated, recent research has been conducted with regard to classroom management, Geosits; educational philosophy, Chan (10); and Frudden's (21) work in lesson analysis. Also, several initial investigations have been conducted in an attempt to categorize and identify basic learning and teaching styles: Gregorc and Ward (27), Dunn and Dunn (17), Joyce and Weil (35), and Weil and Joyce (72).

Even though professional educators profess to utilize an objective and unbiased system of assessment and evaluation, it is not unreasonable to speculate that a void still exists. If this void can be identified and eliminated, the process of instructional assessment will be enhanced.

The Study

Because all administrators in the state of Iowa must have teaching experience to obtain certification, it is logical to assume, as did Cogan (12), that these individuals have, over time, developed a personal model of the attributes that constitute the good or exceptional teacher. Further, these attributes, methods, or strategies are generally referred to as a teacher's style or teaching style.

While it would be difficult to ascertain exactly where or how preferences for teaching style were developed by educators in general, professionals, having observed the teaching process, may offer a number of clues. Cogan (12), for example, speculates that this development may actually be some unconscious process. Gregorc and Ward (27) would suggest that the manifested style displayed by the teacher would be a reflection of the individual's personal learning style. Echoing these sentiments, Engel (20) views teaching style as a possible extension of personality. Additionally, he suggests that a well-developed concept of style may actually be a reaction to the things that have been successful or unsuccessful in actual classroom situations (i.e., coping devices). Another perspective is offered by Sweeney (65). From his point of view, style is developed through a complex combination of factors. Included in this combination are the elements of observation and theoretical deduction, background and training, adoption of techniques employed by a respected mentor or peer, and the factor of teaching in a manner similar to the way the individual has been taught. Finally, McNally-Jarchow (42) submits that the basis of teaching style is a factor of early learning

experiences coupled with training and early teaching experiences.

Regardless, however, of how the particular style or combination of styles is developed, there exists, as Cogan (12) suggested, the possibility that the personal preferences of the teacher-turned-supervisor for a particular style (i.e., methods or strategies) may in some way bias the observations and assessment of teachers by the particular supervisor.

The problem for this study, therefore, will be to determine if there is a tendency for teachers to receive higher evaluative ratings when the teaching style of the teacher is congruent with the teaching style of the supervisor (principal).¹

Definition of Terms

Words often have different meanings depending on their context. In the interest of clarity, this investigation used the tentative definition of teaching style to be a set of behavior patterns and theoretical constructs, sometimes called method or strategy, employed by the teacher in approaching the classroom situation.

Other terms were defined as:

Administrator--The individual who assumes direct responsibility for the maintenance and development of the educational program, and supervision and evaluation of instruction at the building level. In the state of Iowa, this administrative supervisory function is delegated to the

¹The Iowa State University Committee on the Use of Human Subjects in Research reviewed this project and concluded that the rights and welfare of the human subjects were adequately protected, that risks were outweighed by the potential benefits and expected value of the knowledge sought, that confidentiality of data was assured and that informed consent was obtained by appropriate measures.

building principal. The administrator (principal) may be categorized as either elementary (K-2, K-3, K-4, K-5, K-6, K-8 or secondary (7-12, 9-12, 10-12).

Bias--Some mental set or predisposition toward a teaching style that would cause the administrator to deviate from an objective assessment of the teaching act.

Evaluation--The process of observing, analyzing, and assessing the critical activities of the teacher which produce effective and productive learning behaviors on the part of students.

Satisfactory Performance--A set of teaching behaviors that are judged to meet the basic and ongoing expectations of a particular school district.

Superior Performance--A set of teaching behaviors that are judged to exceed the basic and ongoing expectations of a particular school district.

Teacher--The individual charged with the direct responsibility for the implementation of the districts' curricular plan within a specific classroom and with a specific group of learners.

Delimitations

The following delimitations were established for the purposes of this study.

1. The study was delimited to elementary and secondary administrators in the state of Iowa based on a random sample of all administrators.
2. The study was delimited to elementary and secondary teachers who were selected by the administrators who chose to participate in the study.
3. The study was delimited to the identification of teaching style

on the part of teachers and administrators, and the relationships that style may have with evaluative ratings and other demographic data.

4. The study was delimited to a point in time contained within the months of October and November, 1980.

Sources of Data

The data were obtained through the administration of a written survey instrument used by permission of Michael W. Heikkinen, the author (see Appendix B). Using a Q-Sort technique, this instrument reported preferences for one or more of four teaching style families as defined by Joyce and Weil (35).

Participants consisted of administrators identified through a random selection of all Iowa administrators as of the 1979-1980 school year. In addition, teacher participants were identified by the previously selected administrators. To make this identification, the administrator was asked to select teachers who, in the administrator's assessment, conformed to the stated definitions of superior performance and satisfactory performance.

As a provision of consent to participate, it was agreed that all individuals would remain anonymous.

Hypotheses

Drawing upon the conceptualizations of Cogan (12), and Popham (49), and the research of Chan (10), Tuckman (70), Tuckman, Steber and Hyman (71), and Latham, Wexley and Pursell (39), it is reasonable to suspect

that predispositions regarding teaching style, on the part of principals, in some manner influences the evaluation process. Therefore, it is postulated that when there is congruence in style between the principal and teacher, that teacher will tend to receive higher evaluative ratings. Operationally, if principals identify superior and satisfactory teachers, and a measure of teaching style is obtained from principals, superior teachers, and satisfactory teachers, there will be no significant difference between measures of principal's teaching style and measures of superior teacher's teaching style. Conversely, there will be a significant difference in the measures of style when principal's styles are compared with the teacher's styles of those teachers that they evaluated as satisfactory in performance.

To direct statistical analysis of the operational hypothesis, twelve hypotheses were developed and are here stated in the null form.

- HO: ₁ There will be no significant difference between the mean scores for teaching family 1 (personal) when principals are compared with superior and satisfactory teachers.
- HO: ₂ There will be no significant difference between the mean scores for teaching family 1 (personal) when elementary principals are compared with superior and satisfactory elementary teachers.
- HO: ₃ There will be no significant difference between the mean scores for teaching family 1 (personal) when secondary principals are compared with superior and satisfactory secondary teachers.
- HO: ₄ There will be no significant difference between the mean scores for teaching family 2 (information processing) when principals are compared with superior and satisfactory teachers.
- HO: ₅ There will be no significant difference between the mean scores for teaching family 2 (information processing)

when elementary principals are compared with superior and satisfactory elementary teachers.

- HO:6 There will be no significant difference between the mean scores for teaching family 2 (information processing) when secondary principals are compared with superior and satisfactory secondary teachers.
- HO:7 There will be no significant difference between the mean scores for teaching family 3 (social interaction) when principals are compared with superior and satisfactory teachers.
- HO:8 There will be no significant difference between the mean scores for teaching family 3 (social interaction) when elementary principals are compared with superior and satisfactory elementary teachers.
- HO:9 There will be no significant difference between the mean score for teaching family 3 (social interaction) when secondary principals are compared with superior and satisfactory secondary teachers.
- HO:10 There will be no significant difference between the mean scores for teaching family 4 (behavior modification) when principals are compared with superior and satisfactory teachers.
- HO:11 There will be no significant difference between the mean scores for teaching family 4 (behavior modification) when elementary principals as compared with superior and satisfactory elementary teachers.
- HO:12 There will be no significant difference between the mean scores for teaching family 4 (behavior modification) when secondary principals are compared with superior and satisfactory secondary teachers.

In addition to the examination of congruence between style measures and evaluation ratings, a second major question is confronted. According to Tuckman et al. (71), supervisors tend to have specific preferences for the type of teaching that they feel is best. In addition, these preferences are related to the educational level being taught.

As a corollary to these research findings, it is therefore

postulated that teachers and principals will show marked differences in their preference for a particular teaching style when those at the elementary level are compared with those at the secondary level. Further, since Tuckman et al. (71) found that elementary principals indicated a preference for warmth and acceptance, it is postulated that elementary principals and teachers would show preferences for the teaching styles of personal and social interaction as defined by Joyce and Weil (35). Likewise, preference for dynamism on the part of secondary principals would lead to the postulate that secondary principals and teachers would show a preference for the teaching style families of information processing and behavior modification as defined by Joyce and Weil (35).

Operationally, given a measure of style for both elementary and secondary educators, there will be a significant difference in preference for teaching style. Further, this difference will be that the style families of personal and social interaction will be most preferred by elementary principals and teachers while secondary principals and teachers will prefer the style types of information processing and behavior modification.

To direct the statistical analysis of the operational hypothesis and related components, eighteen hypotheses were developed and are here stated in the null form.

- HO: ₁₃ There will be no significant difference in elementary principals' mean scores when four measures of teaching style are compared.
- HO: ₁₄ There will be no significant difference in elementary superior teachers' mean scores when four measures of teaching style are compared.

- HO:15 There will be no significant difference in elementary satisfactory teachers' mean scores when four measures of teaching style are compared.
- HO:16 There will be no significant difference in secondary principals' mean scores when four measures of teaching style are compared.
- HO:17 There will be no significant difference in secondary superior teachers' mean scores when four measures of teaching style are compared.
- HO:18 There will be no significant difference in secondary satisfactory teachers' mean scores when four measures of teaching style are compared.
- HO:19 There will be no significant difference in the mean scores on teaching style family 1 when elementary principals are compared with secondary principals.
- HO:20 There will be no significant difference in the mean scores on teaching style family 2 when elementary principals are compared with secondary principals.
- HO:21 There will be no significant difference in the mean scores on teaching style family 3 when elementary principals are compared with secondary principals.
- HO:22 There will be no significant difference in the mean scores on teaching style family 4 when elementary principals are compared with secondary principals.
- HO:23 There will be no significant difference in the mean scores on teaching style family 1 when elementary superior teachers are compared with secondary superior teachers.
- HO:24 There will be no significant difference in the mean scores on teaching style family 2 when elementary superior teachers are compared with secondary superior teachers.
- HO:25 There will be no significant difference in the mean scores for teaching style family 3 when elementary superior teachers are compared with secondary superior teachers.
- HO:26 There will be no significant difference in the mean scores for teaching style family 4 when elementary

superior teachers are compared with secondary superior teachers.

- HO: 27 There will be no significant difference in the mean score on teaching style family 1 when elementary satisfactory teachers are compared with secondary satisfactory teachers.
- HO: 28 There will be no significant difference in the mean scores on teaching style family 2 when elementary satisfactory teachers are compared with secondary satisfactory teachers.
- HO: 29 There will be no significant difference in the mean scores on teaching style family 3 when elementary satisfactory teachers are compared with secondary satisfactory teachers.
- HO: 30 There will be no significant difference in the mean scores on teaching style family 4 when elementary satisfactory teachers are compared with secondary satisfactory teachers.

In addition to questions raised by Tuckman et al. (71), and related to the overall speculation as to the development of teaching style, Cogan (12), Engel (20), Sweeney (65), and McNally-Jarchow (42), demographic data were collected which would allow the investigator to examine other elements that may be related to teaching style. Specifically, it was postulated that preference for teaching style will differ when background demographics such as experience, areas of preparation, educational level attained, and coaching background are examined.

Due to the lack of empirical evidence concerning possible relationships, no specific directional hypothesis is offered. Rather, this area of investigation is governed by the global postulate that differences in teaching style preference will be found when background demographics are examined.

To direct the statistical analysis of this area of the investigation, thirty-four hypotheses were developed and are here stated in the null form.

- HO: 31 There will be no significant difference in the mean scores of superior teachers who have taught one to five years when four measures of teaching style are compared.
- HO: 32 There will be no significant difference in the mean scores of satisfactory teachers who have taught one to five years when four measures of teaching style are compared.
- HO: 33 There will be no significant difference in the mean scores of superior teachers who have taught six to ten years when four measures of teaching style are compared.
- HO: 34 There will be no significant difference in the mean scores of satisfactory teachers who have taught six to ten years when four measures of teaching style are compared.
- HO: 35 There will be no significant difference in the mean scores of superior teachers who have taught more than ten years when four measures of teaching style are compared.
- HO: 36 There will be no significant difference in the mean scores of satisfactory teachers who have taught more than ten years when four measures of teaching style are compared.
- HO: 37 There will be no significant difference in the mean scores of principals who have been a principal for one to five years when four measures of teaching style are compared.
- HO: 38 There will be no significant difference in the mean scores for principals who have been a principal for six to ten years when four measures of teaching style are compared.
- HO: 39 There will be no significant difference in the mean scores of principals who have been a principal for more than ten years when four measures of teaching style are compared.

- HO:40 There will be no significant difference in the mean scores of superior teachers holding a B.A. degree when four measures of teaching style are compared.
- HO:41 There will be no significant difference in the mean scores of satisfactory teachers holding a B.A. degree when four measures of teaching style are compared.
- HO:42 There will be no significant difference in the mean scores of superior teachers holding a a B.A. degree plus additional hours when four measures of teaching style are compared.
- HO:43 There will be no significant difference in the mean scores of satisfactory teachers holding a B.A. degree plus additional hours when four measures of teaching style are compared.
- HO:44 There will be no significant difference in the mean scores of superior teachers holding an M.A. degree when four measures of teaching style are compared.
- HO:45 There will be no significant difference in the mean scores of satisfactory teachers holding an M.A. degree when four measures of teaching style are compared.
- HO:46 There will be no significant difference in the mean scores of superior teachers who hold an M.A. degree plus additional hours when four measures of teaching style are compared.
- HO:47 There will be no significant difference in the mean scores of satisfactory teachers who hold an M.A. degree plus additional hours when four measures of teaching style are compared.
- HO:48 There will be no significant difference in the mean scores of principals who hold an M.A. degree when four measures of teaching style are compared.
- HO:49 There will be no significant difference in the mean scores of principals who hold an M.A. degree plus additional hours when four measures of teaching style are compared.
- HO:50 There will be no significant difference in the mean scores of superior teachers who hold an undergraduate degree in social studies or language arts when four measures of teaching style are compared.

- HO: 51 There will be no significant difference in the mean scores of satisfactory teachers who hold an undergraduate degree in social studies or language arts when four measures of teaching style are compared.
- HO: 52 There will be no significant difference in the mean scores of superior teachers who hold an undergraduate degree in math or science when four measures of teaching style are compared.
- HO: 53 There will be no significant difference in the mean scores of satisfactory teachers who hold an undergraduate degree in math or science when four measures of teaching style are compared.
- HO: 54 There will be no significant difference in the mean scores of superior teachers who hold an undergraduate degree in elementary education when four measures of teaching style are compared.
- HO: 55 There will be no significant difference in the mean scores of satisfactory teachers who hold an undergraduate degree in elementary education when four measures of teaching style are compared.
- HO: 56 There will be no significant difference in the mean scores of superior teachers who hold undergraduate degrees in physical education, vocational education, or fine arts when four measures of teaching style are compared.
- HO: 57 There will be no significant difference in the mean scores of satisfactory teachers who hold undergraduate degrees in physical education, vocational education, or fine arts when four measures of teaching style are compared.
- HO: 58 There will be no significant difference in the mean scores of principals who hold undergraduate degrees in math or science when four measures of teaching style are compared.
- HO: 59 There will be no significant difference in the mean scores of principals who hold undergraduate degrees in language or social studies when four measures of teaching style are compared.
- HO: 60 There will be no significant difference in the mean scores of principals who hold undergraduate degrees

in physical education, vocational education, or fine arts when four measures of teaching style are compared.

- HO: 61 There will be no significant difference in the mean scores of principals who hold undergraduate degrees in elementary education when four measures of teaching style are compared.
- HO: 62 There will be no significant difference in the mean scores of principals who have coached when four measures of teaching style are compared.
- HO: 63 There will be no significant difference in the mean scores of principals who have never coached when four measures of teaching style are compared.
- HO: 64 There will be no significant difference in the mean scores of superior teachers who have coached when four measures of teaching style are compared.
- HO: 65 There will be no significant difference in the mean scores of superior teachers who have never coached when four measures of teaching style are compared.
- HO: 66 There will be no significant difference in the mean scores of satisfactory teachers who have coached when four measures of teaching style are compared.
- HO: 67 There will be no significant difference in the mean scores of satisfactory teachers who have never coached when four measures of teaching style are compared.

CHAPTER II. REVIEW OF LITERATURE

The review of literature is intended to provide insight into and establish a theoretical framework for research in the area of teacher appraisal bias. To accomplish this objective, review and summarization of current literature was conducted and is presented here. Essential components of this review include the teacher evaluation process, sources of observer bias, and the definition and measurement of teaching style.

Teacher Evaluation

Currently, two views of teacher evaluation exist. Taking a pessimistic orientation, Schofield and Start state:

With over 15 years of continuous research effort there appear no unequivocal answers to the two questions - what is effective teaching and what are the characteristics and behaviors of the effective teacher? (56)

Similarly, Hodel (30), after a study of formal and informal teacher evaluation practices, suggests that there remains very little agreement on what constitutes good teaching. Further, much of the "stuff" of evaluation tends to be comprised of subjective judgments formulated by principals in their supervisory roles.

While teacher performance evaluation may still exist as a highly complex, and at times, elusive concept, a growing number of researchers have recently developed a more optimistic perspective on the state of the art. So great is the potential impact of this new research on teaching effectiveness that it has caused Mary Ann Gatheral (22) to refer to it as "Super Research".

Critical to the growing optimism of this new wave is the fact that the concept of teacher performance appraisal as a process is being married with current research on teacher effectiveness in terms of product.

As Donald Medley (45) observed, the history of research on teacher effectiveness has undergone an evolution. Beginning with efforts to identify desirable personality traits of teachers, this evolution has now passed through the study of teaching methods and is now centering on the identification of competencies that will produce increased student gains as a product.

Put another way, Schofield and Start (56) identify these stages as presage, process, and product. Finally, Rosenshine (53) speaks of the same concept in terms of teacher personality, teacher-student interaction, and student attention and mastery.

Interest in teacher evaluation has been apparent for a number of years. However, the most fruitful contributions in performance evaluation, effectiveness/product research, and assimilation of the two concepts has been most evident in the decade of the 1970s.

Notable in the effort to develop articulated performance assessment procedures has been the work of the Iowa State University research team headed by Richard Manatt (40), and his counterpart at U.C.L.A. (and principal of the laboratory school), Madeline Hunter (32). While both models emphasize the improvement of instruction and rely heavily on supervisory observations, post conferences, and improvement targets, the Manatt T.P.E. system additionally stresses the preobservation conference, the establishment of identified critical work activities, and the comparisons

of teachers across departments, buildings, and the school district.

Any attempt at the development of an appraisal system, however, will remain without substance if that system does not address the crucial issue of effective/productive teaching. As alluded to earlier, it is the marriage of empirical research and philosophical conceptualization that now offers the opportunity for meaningful movement in the effort of teacher evaluation.

Seminal to the efforts to identify effective/productive teachers are the investigations of Rutter et al. (54), Medley (44, 45), Rosenshine (53), Soar and Soar (60), Coker, Medley, and Soar (13), and Berliner (2, 3), and are here summarized.

Berliner, 1978

In this discussion of effective teaching, Berliner (2) draws heavily upon the work of the research team at the Far West Laboratory for Educational Research and Development. Through intensive observations and teacher-recorded activities logs, it was revealed that certain behaviors on the part of teachers lead to higher achievement on the part of students. Further, these behaviors dealt primarily with the structuring of the curriculum and the use of time.

First, the research team compared the stated curriculum with the actual amount of time allocated for specific instruction within a curricular area. The amount of time actually allocated by teachers was found to vary greatly. The second area of investigation concerned how the allocated time was actually used. As with allocated time, the actual amounts of time that students were engaged in instruction in a particular

area also varied greatly. For example, the school curriculum might call for extended amounts of effort in the area of reading. Translated into allocated time, one teacher might plan for thirty minutes of instruction while another might provide for sixty minutes. Even with this time being allocated, due to poor organization, transfers, or disruptive behavior, the amount of actual engaged time could be far different from the planned allocation of thirty or sixty minutes. Finally, given an amount of engaged student time, the researchers examined the content of study being conducted during that period of time. Concerning the use of engaged time, it was found that students in some classrooms worked on materials that provided a high success rate while others experienced a very low success rate. To identify and separate these varying classroom experiences, the term academic learning time (ALT) was utilized. ALT was defined as a function of the amount of engaged time and the success rate.

After a period of observation and analysis using elementary school children, Berliner (2) found that an increase in ALT was associated with student achievement. That is, increased amounts of engaged time coupled with higher success rates result in higher achievement scores.

In total, these research findings caused Berliner to state:

Students who spent more time than the average in high success activities had higher achievement scores in the spring, better retention over the summer, and more positive attitudes toward school. (2:8)

Medley, 1978

Seeking to discover elements of effective teaching, Medley (45) reviewed 289 empirical studies of teacher effectiveness. Before data were included in the findings, each research effort was subjected to four criteria. First, the research had to indicate evidence of long-term change in students. Second, the study must have been reported in terms of observations recorded. Third, only research that revealed a positive relationship between the process of teaching (behavior) and the product (student learning) was included. Finally, evidence of a relationship between process and product was included only if the Pearson product-moment correlation coefficient was equal to or greater than $\pm .387$.

After subjecting the 289 empirical studies to the four stated criteria, Medley (45) found that only fourteen studies met all of the four. However, from these fourteen studies, over 600 relationships were discovered.

Briefly summarized, the results of this review indicate the following characteristics regarding effective teacher behavior:

1. The effective learning environment is one that tends to be orderly, psychologically supportive, and easily maintained. (45:22)
2. The effective teacher devotes more class time to academic activities, with the class organized in one large group, and devotes less class time to small group activities and independent seatwork than the ineffective one. (45:22)
2. Concerning the method of instruction, ". . . teachers who use more low-level questions and fewer high level ones, whose pupils initiate fewer questions and get less feedback, who tend not to amplify or discuss what pupils say - these are the most effective teachers." (45:22)

Soar and Soar, 1979

During the early 1970s, Robert S. and Ruth M. Soar (60) directed research in the attempt to discover how pupil learning might be related to the variables of classroom environment and management. This study conducted in the southeastern United States was comprised of 159 elementary classrooms and included a broad spectrum of socioeconomic and ethnic groups. In all classroom settings, observations and records of teacher behaviors were made. In addition, all classroom units were administered a student achievement test in the fall and spring of the given year.

Results of this study indicated, rather surprisingly, that gain scores of pupils were not highly correlated with the emotional climate that would be considered as warm and positive. The results did suggest, however, that a negative climate was associated with lower achievement scores. From this, it appears that the relationship between improved performance and climate is one that centers on the absence of negativism rather than the presence of positive support.

With respect to the management of classroom behavior, Soar and Soar (60) found that increased amounts of freedom of behavior were associated with a decrease in the amount of learning. These findings caused the authors to state:

These results raise serious questions about the soundness of the popular belief that considerable freedom of activity is important for pupil growth in complex outcomes. (60:109)

Finally, considering the areas of managing learning tasks and thinking, the results indicated that some pupils experienced gains when freedom in selection of materials and study was allowed. However, this tendency

was associated with teachers who maintained an overall focus and direction for all activities.

Rosenshine, 1979

Another perspective on effectiveness has been presented by Barak Rosenshine (53). Focusing on the basic skills (reading/math), this research review sought to identify relationships between student engaged time and the mastery of academic skills. Drawing upon the data collected in the research efforts of Stallings and Kaskowitz (62), Bloom (4), Brophy and Everston (7), Tikunoff, Berliner and Rist (69), Solomon and Kendall (61), Soar (59), and Medley (44), Rosenshine came to the conclusion that this current research suggests that the instructional variables of academically engaged time and achievement gains are usually associated with, ". . . teachers who maintain a strong focus with encouragement and concern for the academic progress of each student; grouping of students into small and large groups for instruction; and use factual questions and controlled practice in teacher-led groups" (53:52).

In addition, Rosenshine (53) discovered that while nonacademic activities may constitute motivational techniques, the emphasis on what he called "direct instruction" (i.e., student contact with the curriculum and curriculum materials) will garner the greatest gains as measured by student achievement.

Rutter et al., 1979

Using surveys, test-retest materials, and inclass observations, Rutter et al. (54) conducted an extensive longitudinal study of English school children within the city of London. While this investigation attempted to describe a number of variables in the process of schooling, several significant conclusions were drawn concerning academic growth and specific teaching behaviors.

First, there was found to be a positive association between academic outcome measured by exam scores, and increased amounts of homework administered to students. Second, there was a tendency for children to make better progress, both behaviorally and academically, when an emphasis on academic matters was stressed. A third finding was that attendance, behavior, and academic attainment were more closely associated with teachers who used a formal, whole group approach with students. Fourth, the observation of teachers indicated a strong tendency for greater academic outcomes to be realized when those teachers exhibited lesson planning in advance and started lessons promptly. Finally, the results of the study suggest that teachers who keep students actively engaged and make smooth transitions in presenting subject matter realize greater results.

Coker, Medley, and Soar, 1980

Perhaps the most current research relating to teacher effectiveness is that currently being conducted in the state of Georgia and headed by Coker, Medley, and Soar (13).

Somewhat apart from other effectiveness research, this particular study centers on attempts to define effective teaching competencies and

application of these competencies to a competency-based teacher evaluation (CBTE) system. If successful, these competencies would form an evaluative core for the assessment of new teachers attempting to secure certification.

Critical to this investigation was the establishment of basic teacher behaviors that would form the assessment core. To define these behaviors, the investigators relied heavily on a committee of teachers whose purpose was to generate a list of behaviors that could be used to identify the effective teacher.

Upon completion of the competency list, the researchers attempted to compare observations of actual teaching with student achievement to ascertain if, in fact, these competencies did lead to greater achievement.

While it was assumed that the possession of each of the competencies would lead to greater achievement, the initial results of the study were contradictory. That is, of thirteen significant relationships, five proved to be negative. Specifically, Coker, Medley, and Soar state:

Among the teacher behaviors found to be related to decreased achievement gain are the following: using non-verbal communication skills; using praise and/or rewards; making contact with a pupil who is off task; pausing, eliciting, and responding to student questions; and giving pupils a voice in decision making. (13:149)

Conversely, the authors further state:

Behaviors that are related in the expected direction included listening to students; respecting the pupil's right to speak; selecting goals and objectives appropriate to students; involving students in organizing and planning; giving clear, explicit directions and maintaining self control. (13:149)

While these findings tend to confound the effort to establish a

clearly defined CBTE system, they are not necessarily inconsistent with the overall thrust of effectiveness research. For example, one might note the congruence of the concept of giving explicit directions and concept of "preorganization" and direction presented by Rutter et al. (54). Therefore, even though this research may cast further doubt on some "gut level" feelings on the part of the teacher committee regarding what effective teaching is, it does not, in and of itself, nullify other effectiveness research. Further, it should be noted that this initial research consisted of a sample of classrooms drawn from only one school district. Finally, the results of this study may indicate a need for a more refined method of identifying and measuring the actual competency being studied.

Rater Bias

While a review of literature identified only a small number of investigations concerned with rater bias, and even fewer directly related to teacher evaluation, data collected do point to a potential flaw in the performance evaluation cycle.

Operating in the private sector, Latham et al. defined rater error as: ". . . errors in judgment that can occur when one individual observes another" (39:550). Further, four types of error were identified. The first error type was one that exaggerates the homogeneity of an individual's characteristics or traits and was referred to as the halo effect. In this case, one positive trait may be so strong that it carries over to another and causes a masking effect in observation. For example, a person observed to be very organized may in addition be seen as punctual when

in fact this is not the case.

A second error type is one that deals with contrast effects. In this type, the observer may have some predetermined anchor based on one individual with which to view another person. In contrasting one individual to another, the power of the first observation may be so strong that certain positive traits in the second individual may not be recognized.

The third error type relates to first impressions. This type of error may be committed when an observer evaluates someone on the basis of judgments made primarily after an initial meeting.

The final type of rater error was termed the "similar-to-me" effect. Very simply, this error relates to a tendency on the part of the rater to judge more favorably those individuals that (s)he perceives as similar to themselves.

Subsequent to Latham's et al. conceptualization of rater error, Wexley and Rand (73) conducted research on the "similar-to-me" effect in employment interviews. Through the use of simulated employment interviews, it was found that interviewers were more attracted to potential candidates when information was supplied that caused the interviewer to conclude that the candidate had personal attributes similar to those of the interviewer. From this simulated activity, Wexley and Rand (73) concluded that the "similar-to-me" effect was a source of judgmental error in hiring recommendations.

The idea that the "similar-to-me" effect potentially impacts on educational assessment and evaluation has been alluded to by several authors in the current educational literature. Contributing to E. M. W. Travers

(Ed.) Second Handbook of Research on Teaching, McNeil and Popham state:

information about teacher competencies is now overlooked in favor of subjective impressions of the teacher. (43:240)

Continuing with this theme, Popham elaborates saying:

Each of us probably has a personal picture of how a teacher should behave. It is the way we would teach if we could. But these conceptions of the good teacher differ dramatically and such diversity often yields not richness but confusion. (49:287)

Rather than attending to the results achieved by a teacher (as reflected in pupil attainments and attitudes), some administrators try to lay their own conception of good instruction on all teachers. Principals sometimes look in on teachers and only if those teachers appear to be mirror images of those principals in their "stellar" days in the classroom do such teachers pick up positive ratings. (49:228)

Morris Cogan, noted researcher and father of the clinical evaluation process, echoes the same concern:

Most teachers have consciously and unconsciously constructed a personal model of the good teacher. Such conceptions generally grow by accretion rather than by critical examination and careful testing. The result is that too often the operating model of the teacher-turned-supervisor is pretty much what he himself does well. When teachers become supervisors, these personal preferences generally operate in full vigor, furnishing many of the criteria for viewing the teaching of others. (12:54)

Tuckman et al. (71), concerned with preferences on the part of principals when viewing the teaching act, employed the Tuckman Teacher Feedback Form (70) to measure perceptions. Results of this study indicated that principals at different educational levels do tend to assess effective teaching using different criteria. These criteria included creativity, dynamism or dominance with energy, organized demeanor or organization with control, and warmth and acceptance. Despite what current

empirical research might suggest with regard to teaching effectiveness, the results of this study indicate that elementary principals view warmth and acceptance as essential criteria for effective teaching with dynamism being undesirable. In addition, intermediate principals seem to prefer creativity and high school principals favor dynamism.

In concluding remarks, Tuckman et al. calls to the attention of principals charged with the responsibility of assessing teacher competency, the fact that predispositions do in fact impact on the objectiveness of evaluative observations by stating: "The message would seem to be clear. Principals have their preferences, and these are largely consistent with the educational level at which they administrate" (71:114).

In 1978, Geosits (23) conducted an investigation to determine if principals and other supervisors expressed a tendency to bias evaluation in favor of teachers in a traditional classroom setting as compared with those utilizing an open approach to instruction. While the hypothesis postulated was that those teachers utilizing a more open approach would receive lower ratings on the school district rating form, data collected and given statistical analysis proved the hypothesis tenable. However, analysis did indicate that a bias did exist in favor of the open approach.

While Geosits' (23) research does substantiate the existence of bias in teacher evaluation, it did not address the concept of "similar-to-me" as a biasing factor.

Employing the "similar-to-me" construct, Chan (10) sought to determine if a relationship existed between principals' and teachers'

philosophy and the evaluation ratings that the teachers received. In this investigation, a measure of philosophical beliefs between principals and teachers, whom they had evaluated as high and teachers evaluated as low, were compared.

Utilizing Brown's Personal Belief and Teacher Practices Inventory, two groups of twenty principals were selected on the basis of the twenty highest and twenty lowest composite scores on the philosophical concept of Experimentalism. Upon completion of the initial procedure, each principal was asked to identify three teachers that they had given high evaluative ratings and three that they gave low evaluative ratings. Of the teachers identified, four groups of forty each were selected on a random basis to complete the same inventory. The four groups consisted of:

(1) teachers rated high by high agreement (experimentalism) principals, (2) teachers rated low by high agreement principals, (3) teachers rated high by low agreement principals, and (4) teachers rated low by low agreement principals.

Statistical analysis of composite scores revealed that a significant difference existed between the philosophy of principals and those teachers that had received low rankings. Further, this finding was consistent for both high and low agreement principals.

Based on these results, Chan (10) came to the conclusion that principals' opinions (ratings) tend to be biased by similarities in philosophical preference.

Teaching Style

A review of educational literature with regard to teaching reveals a strong consensus that the teaching act and composite behaviors constitute a highly complex process: Geosits (23), Start (63), Hyman (33), and Howell and Erickson (31). Further, elements of this complex process taken either separately or in some combination are generally referred to as the teaching style.

Taylor, using the term "technique", describes style as ". . . what the teacher does to help students learn" (66:1). In addition, she suggests thirty-two different techniques of which a total of seventeen fall broadly within the realm of student-teacher discussion. Dunkin and Biddle (16) refer to the teaching act as lesson formats and enumerate the formats of discovery, discussion, and lecture. Discussing style, Blount and Klausmeier state, "It is not possible to champion any existent instructional method as clearly superior to any other" (5:260). However, they proceed to categorize teaching methods into examples that constitute the whole class, small groups, and individualized treatments. Finally, Herbert (29) views instructional activities in terms of whether teachers, students, or a combination of teacher-student interaction modifies subject matter.

While as indicated, there are differing opinions on the definition of the teaching act, the current literature does reveal several major efforts to theoretically and empirically define this elusive concept.

For Gregorc and Ward (27), teaching style should be closely related to the specific learning style of the students. That is, for the most

productive learner behaviors to occur, these authors suggest that teachers must identify learner style and then select the teaching approach that is most congruent with the style of the learner.

In observing hundreds of students in a variety of educational settings, Gregorc and Ward (27) found that these learners tended to exhibit four basic learning preferences, patterns, or modes. These preferences for information acquisition were labeled abstract-sequential, abstract-random, concrete-sequential, and concrete-random.

In the first learner mode, abstract-sequential, the typical learner has a preference for learning through written, verbal, and image symbols. Further, this typology is characterized by a preference for a presentation that is rational and sequential in nature. The abstract-sequential learner would be well-matched with a teacher who emphasizes a well-organized, structured approach that would rely on reading and lecture.

The second mode, abstract-random, like the abstract-sequential, identifies learners who desire information that comes in symbolic or verbal form. However, the abstract-random learner seems to respond to the manner of delivery as well as the message. The abstract-random learner tends to relate to a busy stimulating classroom with ample opportunity for interaction.

The concrete-sequential learner, or those showing a preference for the third mode, tend to acquire knowledge from direct hands-on experiences. However, due to the sequential nature of their thinking processes, the concrete-sequential learner would prefer this hands-on experience to be well-ordered and in a logical step-by-step pattern.

Finally, the fourth mode includes those who may be considered as concrete-random learners. As with the concrete-sequential learner, a desire for hands-on experiences is fundamental. However, unlike the third typology, the desire for randomness enters in. For this individual, an unstructured experimental and trial and error approach would work well.

While Gregorc and Ward (27) do not directly attempt to identify teaching style, they imply that teachers' selected methods and materials relate to one or more of the identified learner styles. Therefore, teaching style tends to be either a conscious or unconscious reflection of learning style.

Teaching style as a reflection of learning style has also been discussed by Dunn and Dunn (17). In this publication, the authors discuss their perception of the critical need to match student learning style to a method of instruction most suited to the student. The first step in accomplishing this goal is for teachers to examine current educational programs from the perspective of which one best meets the needs of the student. Far too often, suggest Dunn and Dunn (17), teachers attempt to choose an educational philosophy or approach that they see as "good" and appropriate for every student.

Contrasting traditional, individualized, open, and alternative classroom orientations, Dunn and Dunn point to the fact that each basic orientation is based on differing concepts of how children learn and state, ". . . while each program serves strong needs of certain children; no single program is appropriate for all (or even most) children" (17:44).

With this concept clearly established, the authors present a catalog of the elements that have been shown to affect the way individuals learn. These elements are broadly categorized into four basic stimuli groups and are labeled environmental, emotional, sociological, and physical. In addition, each of the four are subdivided into four to six specific elements and are listed in Figure 1.

Stimuli	Elements
Environmental	Sound, Light, Temperature, Design
Emotional	Motivation, Persistence, Responsibility, Structure
Sociological	Peers, Self, Pairs, Teams, Adult, Varied
Physical	Perceptual, Intake, Time, Mobility

Figure 1. Elements in the diagnosis of learning style
(Dunn and Dunn 17:45)

Since individuals vary in their reaction to each of these elements, it becomes a crucial task for teachers to prepare a composite analysis for students based on these needs and then offer the student an approach which compliments the learning style.¹

Employing a more philosophical frame of reference, Broudy (8) has

¹To aid teachers in this identification and diagnosis, Rita and Kenneth Dunn have prepared an inventory instrument based on the identified elements. To examine this systematic instrument, see Rita Dunn and Kenneth Dunn (18).

categorized teaching or teaching style into three basic components. The first, didactics, deals with the dissemination of factual knowledge. The second, hueristics, is teaching to encourage thought and problem solving on the part of the student. Finally, philetics, calls for a personal relationship between the instructor and the students. As with the previously cited authors, Broudy (8) also suggests that through identification of the student and instructor style a matching may be accomplished.

Finally, Joyce and Weil (35) approached the study of style from the perspective of the teacher. While they would agree with the concepts of student style and the desirability of creating a match, their conceptualization stemmed from a study of prevailing educational philosophy and pedagogy.

After an exhaustive review of the various theoretical premises concerning education, Joyce and Weil (35) extracted sixteen basic strands of educational thought. Of the sixteen theories, further examination revealed commonalities that allowed the authors to create four models or approaches to teaching that they referred to as families.

Broadly defined, Joyce and Weil refer to a teaching model family as:

a pattern or plan, which can be used to shape a curriculum or course, to select instructional materials, and to guide a teacher's actions. (35:3)

Drawing from an initial list of eighty theorists, schools of thought, and actual projects, the four basic family models are as follows:

1. Personal Sources

The emphasis of this family keys on the personal psychology and emotional life of the individual. Distinctive to this family is the orientation on personal development. Further, this model does not stand in

isolation. Rather, as understanding and development of personal sources takes place, the aspects of interpersonal relations and information processing will be enhanced.

2. Information Processing Sources

This second family has as a central theme an orientation toward students' abilities to receive and process information. This process refers to how the student handles stimuli from the environment, organizes data, and the ability to solve problems through manipulation of verbal and nonverbal symbols.

3. Social Interaction Sources

The emphasis on the third family keys on the relationship between man and society and between individuals. Within this model, the major emphasis is a concern for the development of mind, self, and the learning of academic subjects. A teacher with a predisposition toward the social interaction model typically would attempt to relate subject matter to the student's personal values and reactions.

4. Behavior Modification

The behavior modification family is essentially an outgrowth of Skinnerian reinforcement theory. The central thrust of this family is the attempt to create efficient systems for sequential learning activities and shaping of behavior.

Accepting the philosophical premise offered by Joyce and Weil (35), Heikkinen (28) sought to develop a method that could be used by teachers to assess their preference for one or more of the basic teaching style families.

To accomplish this identification, Heikkinen (28) first developed a series of statements regarding education. Each of these statements related to the style families. To obtain an assessment of preference for each of the families, a Q-Sort technique was selected.

Utilizing this procedure, an individual would sort a total of sixteen statements according to the criteria of most like or most unlike that

person's teaching. Of the sixteen statements, four each related to the four teaching style families. As the sorting process progresses, the individual places two statements (most like) and two statements (most unlike) at polar positions on a continuum. The two statements selected as most like are given a rank score of five. The two statements selected as most unlike receive a rank score of one. At this point, the individual repeats the sorting process on the remain twelve statements. During the second sort, three statements are selected that are most like and three that are most unlike. Placed on the continuum, the three statements most like are assigned a score of four with the unlike statements being ranked as two. The remaining six statements receive a rank score of three.

When the sorting process is complete, the four statements relating to a given family are totaled resulting in a raw score for that family. In a like fashion, total raw scores for the remaining three families are derived. At the completion of the scoring process, the individual, through inspection of the raw scores, may ascertain preference patterns for each of the four families.

Due to the nature of the Q-Sort, all families will receive some raw score total. Preference for a particular family or combination of families would be revealed by the magnitude of the total raw scores along with the amount of deviation from a predetermined norm group. Therefore, the family receiving the highest raw score total would indicate that the family most closely resembles the teaching of that individual. Conversely, the family with the lowest total score would be the teaching

style family that least resembles the individual.

Summary

Writing on behalf of the Iowa Association of School Boards, Richard Manatt stated:

now it is time for boards and administrators of Iowa districts to develop, redevelop, or refine performance evaluation systems that are valid, reliable and now discriminatory under the provisions of the law. (40:1)

The critical need for such a discriminatory evaluation system is most in evidence when orientations such as legal status, professionalism, accountability, or ethics are considered.

What then is the status of teacher performance appraisal? A review of current literature points to a wealth of empirical findings regarding effective/productive teaching behaviors. Rutter et al. (54), for example, found that teachers who stressed academics, who used formal group approaches, who exhibited preorganization, and who kept students actively engaged realized greater outcomes. Adding to these concepts, Medley (45) found that greater attention to academic activities, an orderly learning environment, and the use of more low-level questions by teachers led to greater academic gains. Similarly, Rosenshine (53) discovered that controlled practice and strong academic focus enhanced student achievement while Soar and Soar (60) found relationships between achievement and limited student freedom of behavior. Finally, Berliner (2) discovered wide discrepancies between engaged time and academic learning time. Further, increases in academic learning time (ALT) led to increased student achievement.

With regard to the findings related to achievement, Manatt et al. (41) and Hunter (32) have shown that model evaluation systems can and are being based upon these empirical findings.

However, even with the current emphasis on performance appraisal systems based on empirically validated effective behaviors, concern must be expressed for possible sources of bias which may, in the final analysis, render these systems hollow at best.

Concerning this issue, Latham et al. (39) cogently discussed the "similar-to-me" effect and other sources of observer bias. Additionally, Tuckman et al. (71) discovered that observations of teachers by school principals seem to be biased by predispositions which are related to the instructional level. Finally, Chan (10) demonstrated that basic philosophical orientations act as a source of bias in the process of teacher evaluation.

In light of the findings of Tuckman et al. (71), Latham et al. (39), and Chan (10), a logical question arises. Do orientations to teaching style also act as a source of bias in evaluation of teachers? While Gregorc and Ward (27) discovered relationships between teaching style and four predispositions by students for learning, Dunn and Dunn (17) identified elements that impact on learning style, and Joyce and Weil (35) philosophically defined four basic families of teaching style, the review of literature did not reveal research that would relate teaching style as a source of bias to the evaluation process.

Therefore, since a void exists, this study has been designed to

investigate possible sources of bias in teacher appraisal that has been brought about by orientations to teaching style on the part of teachers and principals.

CHAPTER III. METHODS AND PROCEDURES

Description of the Instrument

Joyce and Weil (35) described four basic orientations to teaching that they referred to as teaching style families. Drawing from this concept, Heikkinen (28) developed a twenty-eight statement instrument, subsequently refined to sixteen statements, designed to identify the preferences of teachers for each of the four basic families. In the development of this instrument, the author employed a modified Q-Sort technique. That is, given a series of sixteen statements, each respondent is asked to sort the statements according to the criteria of most like or most unlike their teaching. Of the sixteen statements, the respondent may choose two statements that are most like and two statements which are most unlike their teaching. After this initial sorting, a second sorting process is requested. During the second sort, three statements are selected that are most like and three are selected that are most unlike the respondent's teaching. The final six statements are those with which the respondent cannot make a judgment or has little or no feeling about.

When the sorting process is complete, the selections are placed on a numerical continuum which gives a rank score of five for the two statements most like the respondent. This continuum descends to a point where the two statements most unlike the respondent receive a ranking of one.

Of the original sixteen statements, four each are direct expressions of each of the four teaching style families. Thus, the researcher may derive numerical scores for each of the four families. The family

receiving the highest total score would be the family or teaching style most like the respondent. Conversely, the family type with the lowest score would be considered as the teaching style family least preferred by the respondent.

As part of the T.S.Q.S. development, Haikkinen (28) applied several tests of validity and reliability. First, content validity was tested by having college students, who used Joyce and Weil (35) as a text, match the T.S.Q.S. statements with the family type. Overall, 90 percent of the statements were matched with the correct family type. A second measure of validity was acquired by administering the T.S.Q.S. to a group of students having completed a training session on behavior modification. Analysis of the results indicated that the behavior modification group had a mean score that was significantly higher than the norm group on the behavior modification section of the instrument. A third procedure involved the use of the T.S.Q.S. as a pretest-posttest for seven groups of educators involved in workshops designed to promote the personal style of teaching. In all seven cases, the posttest scores for the personal family were significantly higher than the pretest scores. Finally, the T.S.Q.S. statements were subjected to a factor analysis which indicated that the statements were selected in groups that can be identified with the four families of teaching style.

To test the reliability of the instrument, Pearson product moment correlations between items and family totals were generated and used as an indicator of internal consistency. In all cases, the correlations were both statistically significant (.01), positive in nature, and

ranged from 0.31 to 0.56. A second test of reliability was conducted by using Kendall's tau correlation coefficients between the rank order of families in a test-retest situation. Once again, all correlations were both significant (.01), positive, and ranged from 0.44 to 0.65.

Since the identification of preference for teaching style is critical to this study, and since the author has presented validation studies, the instrument described herein was selected and used with the written permission of the author, Michael W. Heikkinen (see Appendices B and C).

Selection of the Sample

Since the study was delimited to include only the state of Iowa, a random sample of Iowa elementary and secondary public school principals was drawn (N = 100). Using the 1979-1980 Department of Public Instruction listing of all elementary and secondary principals, a sequential series of numbers were used to identify each school administrator. Elementary and secondary principals were numbered separately. As of this current listing, a total of 849 elementary and 457 secondary principals were identified. Using the table of random numbers presented by Glass and Stanley (24:510), elementary principals were selected until a total sample of fifty had been reached. Using the same technique, a sample of fifty secondary principals was generated.

Since the study was designed to investigate relationships between principals and teachers, a selection process to identify a representative teacher sample was next considered. Due to the fact that (1) evaluative judgments, on the part of principals, was necessary, (2) a matching

technique was mandatory, and (3) to avoid violation of privacy rights, it was found that the random sample technique would not be usable.

To complete the teacher portion of the sample, therefore, each principal randomly identified, was requested to distribute survey instruments to four teachers, within the attendance center, that the principal periodically evaluates. Further, two teachers would be of the superior category; i.e., ones that exceed the basic expectations of the school district, and two teachers would be of the satisfactory category; i.e., ones that meet but do not exceed the basic expectations of the school district.

Using this combined method, a total sample of teachers and principals was generated ($N = 500$).

Collection of Data

The first stage of data collection consisted of a modified field test. Since the basic instrument had been previously tested, a class of graduate students at Iowa State University was asked to review the instructions and letter of explanation that was written to accompany the instrument. This modified test resulted in the restructuring of instructions and explanation to gain additional clarity.

Upon completion of the modified field test, a package of survey instruments was mailed to each of the one hundred randomly identified principals. Each package contained one instrument for the principal and four instruments for the selected teachers. Each instrument printed in booklet form contained a cover letter, explanation, and instructions. In addition, each booklet was printed with a return address and postage for

direct mailing by the respondent.

To allow for follow-up and matching of principals and teachers, a numerical code was affixed to each booklet. While the coding device identified principals, it was not designed to provide for the individual identity of any teacher.

Two weeks after the initial mailing, a follow-up request and package of survey instruments was sent to each attendance center from which one or more responses were lacking. Ten days after the follow-up procedure, a final follow-up contact was made with each principal to encourage participation.

Data from the sample of identified principals and selected teachers were collected during a six-week period from mid-October, 1980 to late November, 1980.

Number of Respondents

Type	Elementary	Secondary	Total
Principals	28	37	65
Superior Teachers	37	56	93
Satisfactory Teachers	35	54	89

To provide for statistical comparative analysis, all respondents were subgrouped using the identification code. This subdivision provided a triad consisting of a principal, a superior teacher, and a satisfactory teacher. When the overall subdivision was complete, a second subdivision was performed to create a sample of triads at both the elementary and secondary levels.

Of the original one hundred possible triads, 62 remained in the final data set which was used to test the stated hypotheses.

<u>Triads Formed</u>	
Elementary	28
Secondary	34
Total	62

Treatment of the Data

The data obtained from the survey instrument were analyzed to determine statistical significance through the services of the Iowa State University Computation Center. The basic statistical program used for this purpose was the Statistical Package for the Social Sciences (SPSS). Also, the subprogram for reliability was employed to allow for the statistical technique of blocking to be included with the basic Analysis of Variance procedure.

The Analysis of Variance (ANOVA) technique with blocking, which produces an F statistic, was employed to test the basic hypotheses concerning congruence of style type and evaluation rating, preferences for style type, and preferences by demographic categories. In the data analysis, the procedure of blocking on the variable "school" was deemed necessary. The necessity for blocking was due to the fact that the triads used in the analysis were formed on the basis of schools. Following the discussion of Edwards, it was assumed that ". . . the units (individuals) within each block (school) will be more homogeneous in their response on some

dependent variable of interest, in the absence of treatment effects, than units selected completely at random" (19:231).

Statistical analysis to determine style preference by various groups utilized the same analysis technique. When only two groups were being compared, the t-test was performed to determine if significant differences existed. In addition to the ANOVA technique, multiple comparisons using the t-test were calculated. This procedure would allow the researcher to examine where differences exist should any null hypothesis be rejected.

In all analysis, the level for significance was established at .05.

CHAPTER IV. FINDINGS

Introduction

The basic problem for this investigation was to examine predispositions for teaching style as a source of bias in teacher evaluation. To accomplish this goal, the researcher collected data from sample groups of elementary and secondary principals and selected elementary and secondary superior and satisfactory teachers. Since the data set contained measures of teaching style on the part of principals and teachers, and since teachers were categorized as superior or satisfactory, statistical analysis could be conducted to ascertain relationships, if any, between the different groups with regard to teaching style.

The findings of the data analysis are reported in three basic areas. First, findings related to congruence of style and evaluative ratings are presented. The second area of findings relates to preferences for a style type when position and evaluative ratings are considered. Finally, preferences for style types are analyzed in relation to the position and selected demographic variables.

Style Congruence Between Principals and Teachers

Drawing upon the conceptualization of the "similar-to-me" effect, as defined by Latham et al. (39), and the linkage to teacher evaluation suggested by Popham (49), and Cogan (12), it was postulated that teachers who were similar to their principal on measures of teaching style would garner higher evaluative ratings than teachers who were dissimilar.

Thus, when four measures of teaching style were compared across matched triads of principals, superior teachers, and satisfactory teachers, it was expected that a significant difference would exist between principals and satisfactory teachers and that no significant differences would exist between the principals and superior teachers.

For this portion of the data analysis, matched triads were formed by grouping principals with teachers that they had evaluated as either superior or satisfactory. This matching produced a total of sixty-two triads. Since each participant had completed the Teaching Style Q-Sort instrument (28), mean scores and standard deviations for principals, superior teachers, and satisfactory teachers could be calculated for each of the four measures of teaching style. These statistics are presented in Table 1.

To analyze more fully the statistical data found in Table 1, four null hypotheses relating to congruence between style and evaluative rating were tested. Examination of Table 2 reveals that when data for sixty-two matched triads were subjected to an analysis of variance no significant differences were found. Therefore, the four null hypotheses stating that there would be no significant difference between mean scores of principals and teachers on four measures of teaching style ($H_0:1$, $H_0:4$, $H_0:7$, $H_0:10$) could not be rejected and thus remain tenable.

Upon completion of the analysis of the total sample, the sixty-two triads were subdivided into two groups consisting of twenty-eight elementary triads and thirty-four secondary triads. Once again the data sets were subjected to analysis of variance. Results of this analysis, also

Table 1. Means and standard deviations of scores obtained on the T.S.Q.S.^a by category and triad

Category	(N)	T.S.Q.S. teaching style families							
		Personal		Social Interaction		Information Processing		Behavior Modification	
		Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Elementary	28								
Principals		10.75	2.76	12.14	2.12	12.86	2.43	12.21	2.22
Superior teachers		10.00	2.54	12.21	1.99	12.61	2.38	13.18	2.04
Satisfactory teachers		10.68	2.28	12.14	2.17	12.57	2.01	12.60	2.44
Secondary	34								
Principals		9.56	2.36	11.85	2.02	14.06	1.89	12.53	1.96
Superior teachers		10.71	2.92	12.24	2.55	13.52	2.39	11.56	1.97
Satisfactory teachers		10.06	1.56	12.21	2.48	13.61	1.83	12.12	2.06
Total triads	62								
Principals		10.10	2.60	11.98	2.05	13.52	2.22	12.39	2.07
Superior teachers		10.39	2.75	12.23	2.29	13.11	2.40	12.29	2.15
Satisfactory teachers		10.34	1.92	12.18	2.33	13.15	1.97	12.34	2.23

^aTeaching Style Q-Sort used by the permission of the author, Michael W. Heikkinen (28). This instrument produces scores for each style family that range from a low of six (most unlike the individual) to a high of eighteen (most like the individual).

Table 2. ANOVA summary: F values and probabilities resulting from analysis of variance within triads by teaching style family

Teaching style	Total triads (N=62)		Elementary triads (N=28)		Secondary triads (N=34)	
	F	Prob.	F	Prob.	F	Prob.
Personal	.24	.79	.73	.49	1.89	.16
Social Interaction	.21	.81	.01	.99	.26	.77
Information Processing	.65	.52	.13	.88	.61	.55
Behavior Modification	.03	.97	1.24	.30	2.38	.10

displayed in Table 2, again revealed no significant differences. Therefore, the eight null hypotheses indicating that there would be no significant difference between mean scores on four measures of teaching style when elementary and secondary principals were compared with their respective superior and satisfactory teachers (HO:₂, HO:₃, HO:₅, HO:₆, HO:₈, HO:₉, HO:₁₁, HO:₁₂) could not be rejected and thus remain tenable.

Preference for Teaching Style

Educational level

In addition to the examination of congruence, this study also sought to identify basic preferences for teaching style by various groups of educators. This analysis was divided into two parts. First, preferences were examined according to position and evaluative rating. Second, preferences were analyzed by position and other selected demographic variables.

As demonstrated by Tuckman et al. (71), principals at different educational levels (i.e., grades) tend to have predispositions regarding what a good teacher is. Linking this concept to the examination of teaching style, it was postulated that elementary principals and teachers, and secondary principals and teachers would exhibit different preferences for teaching style. Further, there would be a tendency for elementary educators to exhibit a preference for the personal and social interaction families while the secondary educators would tend to prefer the style types of information processing and behavior modification. Finally, it was expected that a comparison of mean scores on the four measures of teaching style would produce significant differences when the elementary groups were compared with their counterparts at the secondary level.

Unlike the analysis of congruence, the examination of preference was not limited to matched triads. Data analyzed in this section included all respondents and consisted of sixty-five principals and 182 teachers. The number of respondents, mean scores, and standard deviations for each category on each style family are exhibited in Table 3.

Proceeding with statistical analysis, the four measures of teaching style (means) for a given category were subjected to an analysis of variance to determine if significant differences existed. This procedure was conducted a total of six times, once for each category. The resulting F values and probabilities for each analysis of variance are summarized and presented in Table 4.

Perusal of Table 4 indicates that all F values are significant and allows for the rejection of the hypotheses suggesting that there would be

Table 3. Means and standard deviations of scores obtained on T.S.Q.S. for all respondents by educational level

Category	(N)	T.S.Q.S. teaching style families							
		Personal		Social Interaction		Information Processing		Behavior Modification	
		Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Elementary									
Principals	28	10.75	2.76	12.14	2.12	12.86	2.43	12.21	2.22
Superior teachers	37	10.00	2.30	12.38	1.99	12.38	2.22	13.24	2.07
Satisfactory teachers	35	10.57	1.18	11.09	1.21	11.60	1.91	12.74	1.47
Secondary									
Principals	37	9.81	2.70	11.95	2.32	13.87	2.02	12.38	1.95
Superior teachers	56	10.63	2.85	12.50	2.29	13.20	2.67	11.70	2.05
Satisfactory teachers	54	10.35	2.12	12.37	2.28	13.31	2.05	11.96	2.04

Table 4. ANOVA summary: Significant differences between teaching style families by educational level

Category	F value
Elementary principals	2.88*
Elementary superior teachers	11.79**
Elementary satisfactory teachers	5.12**
Secondary principals	15.18**
Secondary superior teachers	8.31**
Secondary satisfactory teachers	13.72**

*Probability < .05.

**Probability < .01.

no significant difference between measures of teaching style (HO:13, HO:14, HO:15, HO:16, HO:17, HO:18) when responses were categorized by position held and or evaluative rating.

With the acceptance of the alternative hypotheses, the next step in the analysis would be to determine where the differences lie. Since the S.P.S.S. subprogram reliability used in this analysis does not allow for the Scheffé procedure, multiple t-tests were calculated comparing each style family to every other family. This procedure was repeated six times to include all categories. Table 5 is a composite summary of all t-values and reports those found to be significant.

Since the t-values displayed in Table 5 point to significant differences, an examination of the mean scores (from Table 3) would determine which style family was rated as high (most preferred) or low (least

Table 5. Comparisons of teaching style families by educational level using multiple t-tests

Category	(N)	Teaching style comparisons (t-values)					
		PER/SI ^a	PER/IP ^b	PER/BM ^c	SI/IP ^d	SI/BM ^e	IP/BM ^f
Elementary principals	28	1.88	2.86 [*]	1.98	.97	.09	.88
Elementary superior teachers	37	4.13 ^{**}	4.13 ^{**}	5.61 ^{**}	.00	1.49	1.49
Elementary satisfactory teachers	35	2.45 [*]	3.27 ^{**}	3.49 ^{**}	.82	1.05	.23
Secondary principals	37	3.52 ^{**}	6.68 ^{**}	4.23 ^{**}	3.16 ^{**}	.71	2.45 [*]
Secondary superior teachers	56	3.45 ^{**}	4.74 ^{**}	1.97	1.29	1.48	2.47 ^{**}
Secondary satisfactory teachers	54	4.28 ^{**}	6.27 ^{**}	3.41 ^{**}	1.99 [*]	.86	2.86 ^{**}

^a Personal vs. Social Interaction.

^b Personal vs. Information Processing.

^c Personal vs. Behavior Modification.

^d Social Interaction vs. Information Processing.

^e Social Interaction vs. Behavior Modification.

^f Information Processing vs. Behavior Modification.

* Probability - .05.

** Probability - .01.

preferred). These relationships are disclosed in summary Table 6.

In some cases, as Tables 5 and 6 indicate, two or more style families were not found to be significantly different. When such cases occurred, multiple family types were reported as a group and as either most or least preferred.

As postulated, principals and teachers at the secondary level tended to prefer the information processing teaching style family. That is, the secondary respondents tended to prefer a style type that emphasizes and develops student's abilities to receive and organize data and to enhance problem solving. However, at the elementary level, principals and teachers did not, as postulated, prefer the personal style family. In fact, in all cases, the personal style family which keys on the personal

Table 6. Summary of multiple comparisons of style families by educational level indicating most preferred and/or least preferred teaching style

Category	Most preferred	Least preferred
Elementary principals	IP	PER
Elementary superior teachers	SI/IP/BM	PER
Elementary satisfactory teachers	SI/IP/BM	PER
Secondary principals	IP	PER
Secondary superior teachers	IP	PER
Secondary satisfactory teachers	IP	PER
PER/Personal	IP/Information Processing	
SI/Social Interaction	BM/Behavior Modification	

psychology and emotional life of the student tended to be the least preferred.

The final question addressed in this section dealt with differences that may exist when educators working at different educational levels are compared. To examine this concept, a series of twelve null hypotheses were established. The basis for each of these hypotheses was that no significant difference would be found when measures of teaching style for elementary educators were compared with the corresponding style measure for the parallel secondary educator ($H_0:_{19} - H_0:_{30}$).

To test these hypotheses, a series of t-tests was calculated which compared the various elementary subgroups with the corresponding secondary subgroups. Further, these comparisons were made for each of the four measures of teaching style.

As shown in Table 7, a significant difference was established for the comparison of elementary and secondary superior teachers on the style family of behavior modification. Therefore, $H_0:_{26}$ was rejected while the remaining null hypotheses in this section were held tenable. With the rejection of $H_0:_{26}$, that there would be no difference in the mean scores of elementary superior teachers and secondary superior teachers on the measure of behavior modification, examination of the means suggests that elementary superior teachers exhibit a significantly stronger preference for the behavior modification style than do the secondary superior teachers.

Continuing with the examination of teaching style preference, analysis of data collected was conducted categorizing respondents by selected

Table 7. Summary of multiple comparisons of teaching style families by educational level utilizing t-tests

Comparison by level	Style family (t-value)			
	PER ^a	SI ^b	IP ^c	BM ^d
Elementary principals vs. secondary principals	1.38	.34	1.83	.33
Elementary superior teachers vs. secondary superior teachers	1.12	.26	1.51	3.53 ^{**}
Elementary satisfactory teachers vs. secondary satisfactory teachers	.46	.56	1.64	1.62

^a Personal.

^b Social Interaction.

^c Information Processing.

^d Behavior Modification.

^{**} Probability < .01.

demographic variables. This final area of investigation considered possible preferences of teachers and principals when their level of experience, undergraduate major, educational attainment, and background in coaching were isolated.

Experience

To compare preference for teaching style by experience level, superior and satisfactory teachers and all principals were grouped by the number of years that they had taught or the number of years as an administrator. Thus, experience level one consisted of individuals with five

or less years of experience. Level two contained respondents having six to ten years of experience. Finally, experience level three held those persons recording in excess of ten years in their respective position. Table 8 reveals mean scores and standard deviations for each of the categories constructed around experience level on each of the four measures of teaching style.

To determine if the mean scores of teachers and principals on a particular teaching style family were significantly different when experience level was considered, the mean scores (from Table 8) were subjected to an analysis of variance. Results of the procedure indicated that differences did exist for principals and teachers at experience levels two and three. These findings, summarized in Table 9, provide for the rejection of the hypotheses suggesting that there would be no significant difference between measures of teaching style when respondents were categorized by experience ($H_{0:33}$, $H_{0:34}$, $H_{0:35}$, $H_{0:36}$, $H_{0:38}$, $H_{0:39}$). Due to the fact that the computed statistics for principals and all teachers at experience level one did not reach the established level of significance, the hypotheses $H_{0:31}$, $H_{0:32}$, and $H_{0:37}$ could not be rejected and thus remain tenable.

Since the alternative hypothesis was accepted in six of nine cases, additional analysis was conducted to determine where the differences lie. To reveal differences, multiple comparisons were calculated using the t-test comparing each style family with every other style family. This procedure was repeated six times to include all categories indicating a significant difference. Table 10 is a composite of all t-values and

Table 8. Means and standard deviation of scores obtained on the T.S.Q.S. of respondents by experience level

Category	(N)	T.S.Q.S. teaching style families								
		Personal		Social Interaction		Information Processing		Behavior Modification		
		Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	
Principals										
Exp. Lev. 1	12	11.17	2.92	11.17	1.80	12.75	2.05	12.92	1.68	
Exp. Lev. 2	16	9.81	2.69	12.25	2.52	13.82	1.94	12.13	2.22	
Exp. Lev. 3	32	9.94	2.53	12.38	2.11	13.41	2.47	12.25	2.06	
Superior teachers										
Exp. Lev. 1	19	11.37	2.50	11.95	1.87	13.16	2.19	11.58	1.87	
Exp. Lev. 2	19	10.00	2.60	12.74	1.94	12.79	2.18	12.47	2.32	
Exp. Lev. 3	51	9.88	2.53	12.47	2.25	12.94	2.77	12.71	2.17	
Satisfactory teachers										
Exp. Lev. 1	24	10.79	2.30	12.29	2.48	12.50	2.00	12.42	2.32	
Exp. Lev. 2	24	10.54	2.32	12.88	2.15	12.79	2.06	11.79	1.99	
Exp. Lev. 3	35	10.20	2.10	11.69	2.22	13.60	2.03	12.51	2.31	
Exp. Lev. 1 = One to five years experience.										
Exp. Lev. 2 = Six to ten years experience.										
Exp. Lev. 3 = Eleven or more years of experience.										

Table 9. ANOVA summary: Significant differences between teaching style families by experience level

Category	F value
Principals	
Exp. Lev. 1	1.78
Exp. Lev. 2	5.86**
Exp. Lev. 3	9.71**
Superior teachers	
Exp. Lev. 1	2.02
Exp. Lev. 2	4.96**
Exp. Lev. 3	13.03**
Satisfactory teachers	
Exp. Lev. 1	2.26
Exp. Lev. 2	4.67**
Exp. Lev. 3	11.49**

Exp. Lev. 1 = One to five years experience.
 Exp. Lev. 2 = Six to ten years experience.
 Exp. Lev. 3 = Eleven or more years experience.

** Probability < .01.

reports those found to be significant.

Since the t-values, displayed in Table 10, point to significant differences between respondents' mean scores when style families were compared, an examination of the mean scores (from Table 8) would indicate which style family or combination of families was rated as high (most preferred) or low (least preferred). These relationships are shown in summary Table 11.

Table 10. Comparisons of teaching style families by experience level using t-tests

Category	(N)	Teaching style comparisons (t-values)					
		PER/SI ^a	PER/IP ^b	PER/BM ^c	SI/IP ^d	SI/BM ^e	IP/BM ^f
Principals							
Exp. Lev. 2	16	2.53**	4.16**	2.41*	1.63	.13	1.75
Exp. Lev. 3	32	3.67**	5.22**	3.47**	1.55	.20	1.74
Superior teachers							
Exp. Lev. 2	19	3.22**	3.28**	2.90**	.06	.32	.38
Exp. Lev. 3	51	4.64**	5.48**	5.07**	.84	.36	.41
Satisfactory teachers							
Exp. Lev. 2	24	3.28**	3.15**	1.75**	.13**	1.53	1.40
Exp. Lev. 3	35	2.49**	5.68**	3.86**	3.20**	1.37	1.82
Exp. Lev. 2 = Six to ten years experience.				Exp. Lev. 3 = Eleven or more years experience.			

^a Personal vs. Social Interaction.

^b Personal vs. Information Processing.

^c Personal vs. Behavior Modification.

^d Social Interaction vs. Information Processing.

^e Social Interaction vs. Behavior Modification.

^f Information Processing vs. Behavior Modification.

* Probability < .05.

** Probability < .01.

Table 11. Summary of multiple comparisons of style families by experience level indicating most preferred and/or least preferred teaching style

Category	Most preferred	Least preferred
Principals		
Exp. Lev. 2	SI/IP/BM	PER
Exp. Lev. 3	SI/IP/BM	PER
Superior teachers		
Exp. Lev. 2	SI/IP/BM	PER
Exp. Lev. 3	SI/IP/BM	PER
Satisfactory teachers		
Exp. Lev. 2	SI/IP	PER
Exp. Lev. 3	IP/BM	PER
PER/Personal	Exp. Lev. 2 = Six to ten years experience.	
SI/ Social Interaction		
IP/ Information Processing	Exp. Lev. 3 = Eleven or more years experience.	
BM/ Behavior Modification		

Thus, when preference for a teaching style is examined using experience level as a classification, none of the style families emerge as the single most preferred style. On the other hand, however, the personal teaching style is clearly the least preferred.

Educational attainment

A second demographic variable considered in this section of the data analysis concerned possible teaching style preferences when respondents were classified according to their level of educational attainment. To provide the appropriate comparisons, all categories of respondents were

subgrouped according to the last university degree attained. In this analysis, principals and teachers were grouped into four categories of educational attainment (B.A., B.A.+, M.A., M.A.+). A small number of respondents indicated the completion of even higher degrees. However, due to the small sample size, this category was not included in the analysis. Mean scores and standard deviations for each of the degree categories on each of the four measures of teaching style are presented in Table 12.

Utilizing the same procedure employed in the analysis regarding experience level, the categories of educational attainment were subjected to an analysis of variance to determine if significant differences existed between the respondents' mean scores for each teaching style family. Results of the analysis of variance are summarized and reported in Table 13.

As indicated by Table 13, significant differences existed in every category except the superior teachers holding a master's degree. When considering educational attainment, therefore, the series of hypotheses stating that no significant difference would exist between respondents' mean scores on four measures of teaching style were rejected in nine of ten cases ($H_{0:40}$, $H_{0:41}$, $H_{0:42}$, $H_{0:43}$, $H_{0:45}$, $H_{0:46}$, $H_{0:47}$, $H_{0:48}$, $H_{0:49}$). Since the computed F value for the comparison of superior teachers holding a master's degree did not reach the established level of significance, $H_{0:44}$ could not be rejected and thus remains tenable.

To further examine where differences actually lie, multiple t-tests were calculated for each category comparing each teaching style family

Table 12. Means and standard deviations of scores obtained on the T.S.Q.S. of respondents by educational attainment

Category	(N)	T.S.Q.S. teaching style families							
		Personal		Social Interaction		Information Processing		Behavior Modification	
		Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Principals									
M.A.	10	9.70	1.95	12.70	1.49	13.10	1.97	12.50	1.27
M.A.+	42	10.52	2.80	11.88	2.24	13.36	2.34	12.21	2.15
Superior teachers									
B.A.	19	10.05	2.61	12.79	2.01	13.05	1.75	12.11	1.70
B.A.+	42	10.40	2.32	12.48	1.95	12.95	2.58	12.17	2.20
M.A.	11	10.00	2.53	12.64	2.46	12.82	2.36	12.64	2.16
M.A.+	17	10.12	3.33	11.71	2.34	12.94	3.27	13.24	2.49
Satisfactory teachers									
B.A.	26	10.27	2.38	12.38	2.30	13.04	1.84	12.31	2.41
B.A.+	32	10.52	2.17	12.66	2.09	12.81	2.43	12.00	2.40
M.A.	7	9.71	1.50	11.14	3.29	13.14	1.35	14.00	2.00
M.A.+	17	10.82	2.32	11.76	2.05	13.35	2.00	12.06	1.43

Table 13. ANOVA summary: Significant differences between teaching style families by educational attainment

Category	F value
Principals	
M.A.	6.29**
M.A.+	7.47**
Superior teachers	
B.A.	6.25**
B.A.+	7.52**
M.A.	2.66*
M.A.+	3.07*
Satisfactory teachers	
B.A.	5.57**
B.A.+	5.02**
M.A.	4.18*
M.A.+	3.56*

*Probability < .05.

**Probability < .01.

with every other family. The t-values for these comparisons are printed in Table 14.

Since the t-values, displayed in Table 14, indicate significant differences between respondents' mean scores when style families were compared, an examination of the mean scores (from Table 12) would indicate which style family or combination of families was rated as high (most preferred) or low (least preferred). These findings are summarized and reported in Table 15.

Table 14. Comparisons of teaching style families by educational attainment using t-tests

Category	(N)	Teaching style comparisons (t-values)					
		PER/SI ^a	PER/IP ^b	PER/BM ^c	SI/IP ^d	SI/BM ^e	IP/BM ^f
Principals							
M.A.	10	3.42**	3.88**	3.20**	.46	.23	.68
M.A.+	42	2.25**	4.70**	2.80**	2.45	.55	1.91
Superior teachers							
B.A.	19	3.57**	3.90**	2.68**	.34	.89	1.22
B.A.+	42	3.63**	4.45**	3.09**	.82	.54	1.36
M.A.+	17	1.39	2.46**	2.72**	1.07	1.34	.26
Satisfactory teachers							
B.A.	26	2.94**	3.85**	2.85**	.92	.10	1.02
B.A.+	32	3.24**	3.47**	2.29*	.23	1.00	1.23
M.A.	7	1.07	2.56*	3.20**	1.49	2.13	.64
M.A.+	17	1.20	3.23**	1.58	2.03	.38	1.65

^aPersonal vs. Social Interaction.

^bPersonal vs. Information Processing.

^cPersonal vs. Behavior Modification.

^dSocial Interaction vs. Information Processing.

^eSocial Interaction vs. Behavior Modification.

^fInformation Processing vs. Behavior Modification.

*Probability < .05.

**probability < .01.

Table 15. Summary of multiple comparisons of style families by educational attainment indicating most preferred and/or least preferred teaching style

Category	Most preferred	Least preferred
Principals		
M.A.	SI/IP/BM	PER
M.A.+	IP/BM	PER
Superior teachers		
B.A.	SI/IP/BM	PER
B.A.+	SI/IP/BM	PER
M.A.+	IP/BM	PER
Satisfactory teachers		
B.A.	SI/IP/BM	PER
B.A.+	SI/IP/BM	PER
M.A.	IP/BM	PER
M.A.+	IP	PER
PER/Personal	IP/Information Processing	
SI/ Social Interaction	BM/Behavior Modification	

As with the examination of preference considering experience level, analysis with regard to educational attainment reveals that the personal teaching style is least preferred. Also, with only one exception, no teaching style is clearly preferred above all others.

Undergraduate preparation

Another demographic variable to be considered in this analysis was the undergraduate area of preparation. That is, do educators who have trained in different subject matter areas tend to exhibit specific preferences for a particular teaching style.

To complete this section of the data analysis, respondents were classified according to their undergraduate teaching major. Due to the fact that some sample groups were very small, only four major classifications were used for statistical analysis. These classifications included principals and teachers hold undergraduate degrees in the combined areas of: (1) math/science, (2) social studies/language arts, (3) physical education/vocations/fine arts, and (4) elementary education. Table 16 identifies the mean scores and standard deviations for each group of respondents on each of the four measures of teaching style.

The analysis of variance procedure employed in the previous analysis was again used to test for significant differences in mean scores of respondents on the four measures of teaching style.

A summary of F values, reported in Table 17, indicates that significant differences existed in nine of twelve cases. Specifically, when considering the categories of undergraduate preparation, the nine hypotheses indicating that no significant difference would exist between respondents' mean scores on the four measures of teaching style were rejected ($H_0:_{50}$, $H_0:_{51}$, $H_0:_{52}$, $H_0:_{54}$, $H_0:_{55}$, $H_0:_{57}$, $H_0:_{58}$, $H_0:_{59}$, $H_0:_{60}$).

Three hypotheses stating that no significant differences would exist when principals were categorized by elementary education degree, when superior teachers were classified by the undergraduate degrees of physical education/vocations/fine arts, and when satisfactory teachers were grouped under the category of math/science could not be rejected and thus remain tenable ($H_0:_{53}$, $H_0:_{56}$, $H_0:_{61}$).

To continue the analysis of preference for teaching style when

Table 16. Means and standard deviations of scores obtained on the T.S.Q.S. of respondents by undergraduate preparation

Category	(N)	T.S.Q.S. teaching style families							
		Personal		Social Interaction		Information Processing		Behavior Modification	
		Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Principals									
Math/science	11	9.00	2.00	11.55	1.69	14.36	1.36	13.09	1.97
Language/social stud.	26	10.42	2.91	12.12	2.53	13.42	2.34	12.00	1.96
P.E./voc./fine arts	13	9.54	1.90	12.15	2.19	14.00	2.23	12.31	1.80
Elementary educ.	9	11.89	2.89	12.67	1.87	11.22	1.86	12.22	2.54
Superior teachers									
Math/science	18	10.33	2.66	11.39	2.28	10.67	2.62	12.78	2.21
Language/social stud.	26	10.62	2.99	13.23	2.10	12.88	2.50	11.27	2.15
P.E./voc./fine arts	15	10.67	2.53	12.00	1.77	13.27	2.79	12.07	1.83
Elementary educ.	28	9.61	2.20	12.46	1.93	12.57	2.38	13.36	1.89
Satisfactory teachers									
Math/science	14	11.00	2.48	12.21	2.04	13.00	2.29	11.79	1.93
Language/social stud.	24	9.96	1.97	11.92	2.50	13.54	2.25	12.58	2.19
P.E./voc./fine arts	20	10.50	1.50	11.90	2.61	13.85	1.53	11.75	2.31
Elementary educ.	23	10.52	2.66	12.74	2.05	12.04	1.69	12.70	2.42

Table 17. ANOVA summary: Significant difference between teaching style families by undergraduate preparation

Category	F value
Principals	
Math/science	13.93 ^{**}
Language/social studies	4.86 ^{**}
P.E./vocations/fine arts	7.95 ^{**}
Elementary education	.46
Superior teachers	
Math/science	4.63 ^{**}
Language/social studies	5.08 ^{**}
P.E./vocations/fine arts	2.45 ^{**}
Elementary education	12.74 ^{**}
Satisfactory teachers	
Math/science	1.51 ^{**}
Language/social studies	8.29 ^{**}
P.E./vocations/fine arts	6.84 ^{**}
Elementary education	3.70 [*]

*Probability < .05.

**Probability < .01.

teachers and principals were categorized by undergraduate degree, classifications found to have significant differences were subjected to a series of t-tests comparing each teaching style family with every other style family. The results of this analysis are exhibited in Table 18.

Since the t-values presented in Table 18 reveal significant differences between respondents' mean scores when style families were compared, an examination of the mean scores (from Table 16) would indicate which

Table 18. Comparisons of teaching style families by undergraduate preparation using t-tests

Category	(N)	Teaching style comparisons (t-values)					
		PER/SI ^a	PER/IP ^b	PER/BM ^c	SI/IP ^d	SI/BM ^e	IP/BM ^f
Principals							
Math/science	11	2.92**	6.13**	4.68**	3.21**	1.76	1.45
Language/social stud.	26	2.16**	3.81**	2.01**	1.15	.15	1.80
P.E./voc./fine arts	13	2.83**	4.83**	3.00**	2.00	.17	1.83
Superior teachers							
Math/science	18	1.12	3.43**	2.60**	2.30*	1.48**	.82*
Language/social stud.	26	3.31**	2.87**	.82**	.44	2.49**	2.04*
Elementary education	28	4.38	4.55**	5.76**	.17	1.38	1.21
Satisfactory teachers							
Language/social stud.	24	2.63**	4.81**	3.52**	2.18*	.87	1.29**
P.E./voc./fine arts	20	1.87**	4.47**	1.67**	2.61**	.20	2.81**
Elementary education	23	2.92**	1.99	2.86	.92	.05	.87

^a Personal vs. Social Interaction.

^b Personal vs. Information Processing.

^c Personal vs. Behavior Modification.

^d Social Interaction vs. Information Processing.

^e Social Interaction vs. Behavior Modification.

^f Information Processing vs. Behavior Modification.

* Probability < .05.

** Probability < .01.

style family or combination of families was rated as high (most preferred) or low (least preferred). These findings are summarized and reported in Table 19.

As with the previous examination of teaching style preference, classification by undergraduate degree again indicates that in most cases some combination of teaching styles tend to be the most preferred. One exception does exist. When satisfactory teachers were categorized by the combination of undergraduate degrees P.E./vocations/fine arts, the

Table 19. Summary of multiple comparisons of style families by undergraduate preparation indicating most preferred and/or least preferred teaching style

Category	Most preferred	Least preferred
Principals		
Math/science	BM/IP	PER
Language/social studies	SI/IP	PER/BM
P.E./vocations/fine arts	SI/BM/PER	PER
Superior teachers		
Math/science	BM/IP	PER
Language/social studies	IP/SI	PER/BM
Elementary education	SI/IP/BM	PER
Satisfactory teachers		
Language/social studies	BM/IP	PER
P.E./vocations/fine arts	IP	PER/BM
Elementary education	IP/BM/SI	PER
PER/Personal	IP/Information Processing	
SI/ Social Interaction	BM/Behavior Modification	

teaching style family of information processing tended to be the most preferred.

Finally, examination of the least preferred style, when undergraduate degree was the criteria for grouping, indicates that this personal teaching style again tends to be the least preferred. For the first time, however, the style family of behavior modification did emerge, in combination with personal, as the least preferred. This tendency occurred for principals and superior teachers with a background in language and social studies and for satisfactory teachers having undergraduate preparation in the areas of P.E., vocations, and fine arts.

Coaching background

To complete the examination of style preference, the demographic variable considering the respondent's background in coaching was considered. Classification for this variable consisted of generating groups according to whether the respondent was presently or had been a coach versus the indication that they had never coached. Using this criterion, coupled with position, means and standard deviations for respondents' scores on each style family were generated and are displayed in Table 20.

Examination of Table 20 reveals the interesting fact that while a majority of principals (68.3%) had been a coach, a majority of teachers (64.9%) had never coached. Also, there was a very nearly equal split between coaches and noncoaches when the criteria of superior or satisfactory is applied to the teachers.

Continuing with the analysis, data were subjected to analysis of variance to test for significant differences in mean scores of

Table 20. Means and standard deviations of scores obtained on the T.S.Q.S. of respondents by coaching background

Category	(N)	T.S.Q.S. teaching style families							
		Personal		Social Interaction		Information Processing		Behavior Modification	
		Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Principals									
Coaches	41	9.83	2.72	11.68	2.52	13.78	1.98	12.68	1.93
Noncoaches	19	10.84	2.43	12.00	1.76	12.53	2.61	11.63	2.09
Superior teachers									
Coaches	30	10.70	2.44	12.13	2.27	13.07	2.30	12.10	2.29
Noncoaches	58	9.91	2.61	12.57	2.04	12.93	2.64	12.60	2.10
Satisfactory teachers									
Coaches	30	10.80	2.12	12.53	2.21	12.80	2.19	11.87	1.63
Noncoaches	53	10.28	2.26	12.02	2.36	13.19	2.00	12.51	2.48

respondents on the four measures of teaching style. Inspection of Table 21 reveals that significant F values were produced in six of seven cases. Therefore, considering coaching background, six of the null hypotheses stating that there would be no significant difference between respondents' mean scores on the four measures of teaching style were rejected (HO:₆₂, HO:₆₄, HO:₆₅, HO:₆₆, HO:₆₇). The hypothesis that no significant difference in mean scores would exist for noncoaching principals could not be rejected and thus remains tenable (HO:₆₃).

To continue the analysis of preference for teaching style when teachers and principals were categorized by the variable of coaching, classifications found to have significant differences were subjected to a series

Table 21. ANOVA summary: Significant differences between teaching style families by coaching background

Category	F value
Principals	
Coaches	17.22**
Noncoaches	2.59
Superior teachers	
Coaches	3.59**
Noncoaches	15.33**
Satisfactory teachers	
Coaches	4.24**
Noncoaches	11.78**

** Probability < .01.

of t-tests comparing each teaching style family with every other style family. The results of this analysis are presented in Table 22.

Since the t-values, displayed in Table 22, indicate significant differences between respondents' mean scores when style families are compared, an examination of the actual scores (from Table 20) will indicate which style family or combination of families were rated as high (most preferred) or low (least preferred). These findings are summarized and reported in Table 23.

In concluding the analysis of style preference, the findings again indicate that the personal teaching style family is the least preferred when respondents were classified by the coaching criteria. Also, no single style family emerged as clearly the most preferred.

Table 22. Comparisons of teaching style families by coaching background using t-tests

Category	(N)	Teaching style comparisons (t-values)					
		PER/SI ^a	PER/IP ^b	PER/BM ^c	SI/IP ^d	SI/BM ^e	IP/BM ^f
Principals							
Coaches	41	3.23**	6.91**	4.98**	3.67**	1.75	1.92
Superior teachers							
Coaches	30	2.06*	3.42**	2.02**	1.36	.04	1.40
Noncoaches	58	5.25**	5.96**	5.31**	.71	.06	.65
Satisfactory teachers							
Coaches	30	2.83**	3.27**	1.75**	.44*	1.08	1.52
Noncoaches	53	3.40**	5.69**	4.36**	2.29*	.96	1.33

^a Personal vs. Social Interaction.

^b Personal vs. Information Processing.

^c Personal vs. Behavior Modification.

^d Social Interaction vs. Information Processing.

^e Social Interaction vs. Behavior Modification.

^f Information Processing vs. Behavior Modification.

* Probability < .05.

** Probability < .01.

Table 23. Summary of multiple comparisons of style families by coaching background indicating most preferred and/or least preferred teaching style

Category	Most preferred	Least preferred
Principals		
Coaches	BM/IP	PER
Superior teachers		
Coaches	SI/IP	PER
Noncoaches	SI/BM/IP	PER
Satisfactory teachers		
Coaches	SI/IP	PER
Noncoaches	BM/IP	PER

CHAPTER V. SUMMARY, LIMITATIONS, DISCUSSION, CONCLUSIONS,
RECOMMENDATIONS

Summary

The problem

The major problem for this study was to ascertain if some predisposition on the part of school principals toward a particular teaching style has any relationship to the evaluative ratings of teachers made by those principals. Put another way, would principals and teachers rated as superior share common preferences for teaching style? Conversely, would principals and teachers rated as satisfactory exhibit divergent preferences for teaching style?

The second area of investigation included the examination of a variety of classifications of educational personnel to determine if any one teaching style was more preferred by those individuals. For data analysis, this second area was divided into two parts. First, preference for style type was analyzed according to position held and, on the part of teachers, the evaluative rating received. In the second part of the analysis, preference for style was measured using position and rating combined with the demographic variables of experience, educational level (elementary or secondary) educational attainment (degree held), the undergraduate area of preparation, and the existence of a coaching background.

Methodology

To address the areas of interest, data were gathered from elementary and secondary principals and from elementary and secondary superior and satisfactory teachers in the state of Iowa. Further, all teachers were categorized by the basic evaluative ratings of superior or satisfactory given by their respective principal. In all cases, respondents completed a teaching style inventory designed to reveal individual preferences for four basic teaching style families. These families, as defined by Joyce and Weil (35), consisted of personal (emphasizing the student's psychological and emotional needs) social interaction (teaching geared to the interaction processes) information processing (problem solving) and the behavior modification family (structuring behavior patterns).

Upon the conclusion of the data capture, statistical analysis was conducted employing the analysis of variance technique. Additionally, multiple comparisons were made using the t-test. Results of these statistical procedures were examined to determine if, in fact, principals and superior teachers share preferences for a particular teaching style. Also, subgroups of principals and teachers determined by demographic variables were examined to determine if any relationships existed between the categories and the preferred style type.

Delimitations

Delimitations placed upon this study were fourfold. First, the study included only elementary and secondary principals in the state of Iowa who were selected on a random sampling basis. Second, the teacher portion of the overall sample contained those individuals who were

selected by the principals who chose to participate. The third delimitation was that the study sought only to identify teaching styles and the relationships that style may have with evaluative ratings and other demographic variables. Finally, this study was delimited to a point in time contained within the months of October and November of 1980.

Findings

Summarization of the major findings of this study are as follows:

1. No differences for any of the four teaching style families existed when principals' mean scores were compared with corresponding mean scores for either of the teacher groups. Further, this situation existed when the respondents were subgrouped by the instructional levels of elementary and secondary. Therefore, the findings did not support the postulate that principals would be similar in style preference to superior teachers and dissimilar to satisfactory teachers.

2. When respondents were classified by position held and educational level (elementary/secondary) certain preferences for teaching style emerged. Specifically, elementary principals and all categories of respondents on the secondary level tended to show a preference for the information processing teaching style family. Elementary teachers, on the other hand, did not exhibit a preference for any single style type. In addition, and contrary to the expected pattern, the personal teaching style family was selected as the least preferred by all respondents.

3. In a comparison of teaching style preference made between elementary and secondary educators, the data analysis revealed a difference only for the behavior modification family. Even though this style type

was not the most preferred, it did receive a higher ranking from the elementary superior teachers than from the secondary superior teachers.

Other suspected differences between elementary and secondary principals and teachers were not confirmed. In total, this finding tends to refute the postulate that marked differences would be found between the educational levels regarding preference for style.

4. Employing the demographic variables of experience, educational attainment (degree held), undergraduate preparation, and coaching background, significant differences in the mean scores of principals and teachers existed between the four measures of teaching style. These differences, however, did not reveal a clear-cut tendency for any of the teaching styles to be the most preferred. Rather, in most comparisons some combination of styles were indicated as most preferred with the personal teaching style clearly being chosen as the least preferred. Of twenty-nine comparisons found to have significant differences, only five cases deviated from the established pattern. These deviations were that (1) satisfactory teachers hold an M.A.+ preferred the information processing style, (2) satisfactory teachers who majored in P.E., vocations, or fine arts preferred the information processing family, and (3) principals and superior teachers with undergraduate majors in language arts or social studies and satisfactory teachers with a background in P.E., vocations, or fine arts tended to indicate the combination of behavior modification and personal styles as the least preferred.

Limitations

It must be noted that certain limitations were imposed due to the nature of the design of the study.

1. Since principals were asked to nominate teachers for participation, a contamination or internal bias may have been created. Thus, even though teachers were rated as superior or satisfactory, it is possible that the principals may have chosen superior and satisfactory teachers that share common preferences for a particular teaching style.

2. Since this study dealt with evaluative ratings, some principals may have chosen not to participate. This may have been due to the highly sensitive, emotional, and legalistic nature of current evaluation practices. Therefore, the final sample was limited to sixty-two of a possible one hundred matched triads.

3. The problem of sensitivity to research on evaluation may also have been enhanced as a result of certain media reports being published at the time of data capture. This may have caused some possible participants to be biased against research of this nature and at this time.

4. The study was limited to include only teachers that were evaluated as either satisfactory or superior. Because of legal constraints and rights of privacy, no attempt was made to capture data on the teacher judged to be unsatisfactory even though this inclusion may have altered the findings.

5. Considering instrumentation, two limitations are suggested. First, due to the nature of the instrument, a forced ranking across a narrow scale resulted in the compaction of scores. This compaction may

have resulted in the loss of statistical significance. Finally, there is always the possibility that for the purposes of this study the instrument may not have been valid.

Discussion

The first area of examination in this study sought to determine if there existed a congruence between teaching styles for principals and superior teachers who were matched with them. The global postulate guiding this area of the investigation, and drawn from Latham et al. (39), Popham (49), and Cogan (12), stated that teachers rated as superior would exhibit preferences for style type that would be similar to the preferences of the principals. Likewise, the teachers rated as satisfactory would indicate preferences markedly different than the principals.

Upon the analysis of data, it was found that the postulate could not be confirmed. While, as expected, no significant differences existed between principals and superior teachers, there was also found to be no significant difference between principals and satisfactory teachers. Thus, the "similar-to-me" concept suggested by Latham et al. (39) does not appear to hold when teaching style is considered as a variable in evaluative ratings.

While the statistical analysis did not show significant differences, a matter of practical significance did emerge. When raw scores were examined employing discrepancy scores, obtained from subtracting one mean from the other, it was found that a congruence pattern did exist. However, this pattern was opposite to the one expected. In fifteen of

sixteen comparisons, principals' scores on the four teaching style families fell closer to the satisfactory teachers than to the superior teachers.

Therefore, from both a statistical and practical analysis, the data do not lend support to the concept that teaching style tends to bias the evaluative ratings of principals.

The second area of investigation concerned the identification of style preference for any isolated group of educators. Following the lead of Tuckman et al. (71), expectations were that educational personnel would have different preferences for teaching style when educational levels were considered (i.e., elementary vs. secondary). Within these parameters, it was further expected that elementary principals and teachers would tend to prefer the teaching style families of personal or social interaction while the secondary educators would tend to prefer the families of information processing or behavior modification.

Following the pattern established by Tuckman et al. (71), that secondary principals desire dynamism or dominance with energy, it was not surprising to find secondary principals and teachers indicating a preference for the information processing teaching style which emphasizes structure, organization, and problem solving. The remainder of the findings, however, tend to run counter to those of Tuckman et al. Where the former research indicated that elementary principals tended to desire patterns of warmth and acceptance, the results of this study did not indicate a preference on the part of elementary personnel for a teaching style that would seem complimentary. By definition, the personal teaching style

which centers on the personal psychology and emotional life of the student would appear to closely parallel warmth and acceptance. However, in every case, elementary principals and teachers indicated that this particular teaching style was the least preferred.

In addition to suspected differences in preference for teaching style, it was further postulated that significant differences would exist when elementary personnel were compared with their counterparts at the secondary level. This, however, was not the case. Considering twelve comparisons, only one significant difference emerged. Specifically, elementary superior teachers showed a stronger preference for the behavior modification family than did the secondary superior teachers.

The final area of analysis dealt with possible preferences for teaching style that may be related to other demographic variables. Linking the discussions of Engel (20), McNally-Jarchow (42), and Sweeney (65), it was expected that when respondents were categorized by demographics, some pattern of preference would emerge. That is, persons who share common background and/or training might be expected to exhibit common preferences for teaching style.

While the results of the analysis did establish rather clear-cut patterns, they were not as expected. Using the demographic variables of experience, educational attainment (degree held), undergraduate preparation, and participation in coaching, thirty-seven comparisons were made. In twenty-nine of these cases, significant differences were found. The pattern of these differences do not, however, lead to the expected identification of common preferences. Instead, in virtually every case,

the differences pointed to the fact that educators when categorized by demographics, tended to identify the personal teaching style as the least preferred. Conversely, no individual teaching style was clearly identified as the most preferred by any group.

This study does not, therefore, support the contention that certain backgrounds tend to foster or lead to the development of any particular teaching style. Further, while commonalities may exist, they do not appear to be rooted within the demographic variables studied here. One might speculate that a reexamination of Gregorc and Ward's (27) discussion of learning style/teaching style might be fruitful in this context.

Finally, it has become most obvious throughout this discussion that the personal teaching style family has been ranked as the least preferred. This fact might lead to the conclusion that educators in this sample show no regard for the psychological and emotional needs of students. Before drawing this conclusion, the reader should remember that the instrument used for the purpose of this study constituted a forced ranking of four basic teaching styles and did not purport to identify all teaching styles. Therefore, while the personal teaching style family was consistently ranked as the least preferred, it should not be construed to mean that psychological and emotional needs of students are totally disregarded.

Conclusions

Considering the data collected and analysis made in this study, five basic conclusions are offered regarding preference for teaching style and the potential for bias in the evaluation process.

1. Since the expected congruence between principals and superior teachers and divergence between principals and satisfactory teachers was not realized in the study, it is concluded that the matter of similarities in teaching style do not, in fact, bias the evaluation process. Rather, principals' evaluations of teachers are based on other objective and subjective criteria.

2. On the basis of the data gathered and analyzed, it is concluded that the personal teaching style family is the least preferred of the four basic style families examined. In thirty-two of thirty-five comparative groups, the personal style was least preferred. On the remaining three comparisons, the personal style was found in combination with behavior modification as the least preferred.

3. While expectations held that certain divisions by demographic variables would produce clusters around some preferred style type, in actuality this was not the case. In twenty-seven of thirty-five comparisons, no single style type emerged as the most preferred. Therefore, it must be concluded that similar backgrounds as classified in this study do not necessarily relate to a preference for a particular teaching style. In other words, coaches do not cluster about a single style type nor are they significantly different than noncoaches. Similarly, more experienced teachers do not appear greatly different from the less experienced.

4. Data collected in this study do support the conclusion that elementary teachers have different preferences for style types than do their counterparts at the secondary level. On the other hand, the same conclusion does not hold for the comparison of elementary and secondary

principals.

5. As expected, secondary teachers tended to prefer information processing as a teaching style while rejecting the personal style family. When elementary teachers were considered, however, no teaching style emerged as clearly the most preferred.

6. In totality, this study tends to reject the notion that teaching style acts as a source of bias in teacher evaluation and finds that teachers tend to be more alike than different in preferences for a particular teaching style.

Recommendations for Further Research

As stated in the review of the literature, research on the potential sources of bias in teacher evaluation is extremely limited. Since this study is but one effort in that direction, many avenues remain for further investigations. Recommendations for further research are as follows:

1. Due to the fact that data collected for this study were drawn from only one survey instrument, replications of the same basic nature could be pursued employing a number of different teaching style inventories.

2. Since data and conclusions presented in this study relate only to the state of Iowa, further replication in other geographic regions could garner strikingly different results.

3. Due to the fact that principals chose teachers that would become part of the sample group, it is possible that some research bias or contamination may have existed which possibly altered the final outcome.

Therefore, it is suggested that replication may be possible using a random sample of teachers with evaluative ratings being applied by principals after completion of the survey instrument.

4. The question of bias cannot be narrowed to include only teaching style. Recommended, therefore, is continued research on the nature of bias in teacher evaluations. Areas for further study might include, but be not limited to, administrative style, personnel selection criteria, the organizational variables of style and climate, and the aspect of physical attractiveness.

5. In light of the rather surprising conclusion that teachers tend to be more alike than different in preference for teaching style, further research is warranted using other variables, techniques, and instruments, to determine if, in fact, this conclusion may be further verified. For example, further research might be conducted to investigate similarities and/or differences in educational personnel when learning style is considered as a possible source of bias in the evaluation process.

Recommendations for Practice

Throughout this study, it has become evident that identification of factors that may bias teacher evaluation is an elusive task at best. While a specific source of bias has not been clearly established, aspects of this study give rise to areas in need of thoughtful consideration by the present day principal.

Since the "similar-to-me" concept cannot be limited only to teaching style, the practicing administrator would be well-advised to critically

examine his or her personal beliefs, philosophies, and leadership style in relation to the most critical need for an objective teacher evaluation process. In addition, and in light of the findings reported here, administrators may wish to reexamine some of the traditional "gut level" preconceptions regarding teachers and groups of teachers. To reiterate, unintended results of this study pointed to the fact that teachers tended to be more alike than they were different. Therefore, one should be most careful not to categorize teachers by virtue of the fact that they were once a coach, that they are inexperienced versus highly experienced, that they teach a particular subject or at a particular level, or for that matter any other subjective category.

Finally, it is evident that extensive work has been completed within the last decade regarding more effective and objective teacher evaluation. While it is not necessary that every practitioner be a researcher, it is very clear that every practicing administrator must be a student of current trends and recent findings in this area.

BIBLIOGRAPHY

1. Barr, A. S., et al. Wisconsin studies of the measurement of teacher effectiveness: A summary of investigations. Madison, Wisconsin: Dembar Publications, 1961.
2. Berliner, David C. Tempus educare. In Research on teaching. Edited by Penelope L. Peterson and Herbert J. Walberg. Berkeley, California: McCutchan, 1979.
3. Berliner, David C. Successful teaching and learning. Paper presented at the Meeting of the Educational Forum, Washington, D.C., 6-7 November 1978.
4. Bloom, Benjamin S. Human characteristics and school learning. New York: McGraw-Hill, 1976.
5. Blount, Nathan S., and Herbert J. Klausmeier. Teaching in the secondary school. New York: Harper and Row, 1968.
6. Borich, Gary D., ed. The appraisal of teaching: Concepts and process. Reading, Mass.: Addison-Wesley, 1977.
7. Brophy, Jere E., and Carolyn M. Everston. Process-product correlations in the Texas teacher effectiveness study: Final report. Austin, Texas: University of Texas, 1974.
8. Broudy, H. S. Didactics, heuristics, and philectics. Education Theory 22 (1972): 251-261.
9. Cardellichio, Thomas L. Evaluating teacher's methods. NASSP Bulletin 58 (December 1974): 8-12.
10. Chan, Peter V. A study of the relationship between principal's philosophies and teacher's philosophies in educational practices and teacher evaluation. Unpublished dissertation. The University of Michigan, 1973.
11. Clark, Mary Jo, and Robert T. Blackburn. Assessing faculty performance: A test of a method. Paper presented at the 62nd Annual Meeting of the American Education Research Association, Toronto, Canada, 27-31 March 1977. ERIC ED 159 190.
12. Cogan, Morris L. Clinical supervision. Boston: Houghton Mifflin, 1972.

13. Coker, Homer, Donald M. Medley, and Robert Soar. How valid are expert opinions about effective teaching? *Phi Delta Kappan* 62 (October 1980): 131-134, 149.
14. Cottrell, Victor A. Evaluating your teaching staff. Paper presented at the 39th National School Boards Association Convention. Miami Beach, Florida, 21-24 April 1979. ERIC ED 173 927.
15. Cunningham, William G. The impact of student-teacher pairings on teacher effectiveness. *American Education Research Journal* 12 (1975): 169-189.
16. Dunkin, Michael J., and Bruce J. Biddle. The study of teaching. New York: Holt, Rinehart, and Winston, 1974.
17. Dunn, Rita, and Kenneth Dunn. Finding the best fit: Learning styles, teaching style. *NASSP Bulletin* 59 (October 1975): 37-49.
18. Dunn, Rita, and Kenneth Dunn. The educator's self-teaching guide to individualized instructional programs. New York: Parker, 1975.
19. Edwards, Allen L. Experimental design in psychological research. New York: Holt, Rinehart, and Winston, 1972.
20. Engel, Ross A. A personal interview conducted with Ross A. Engel, professor of educational administration. Iowa State University, Ames, Iowa, November 1980.
21. Frudden, Sarah Jane. A comparison of school administrators' ratings of teaching performance utilizing varied instructional materials in the assessment process. Unpublished dissertation. Iowa State University, 1980.
22. Gatheral, Mary Ann. Super research. *Learning Magazine* 8 (Aug.-Sept. 1979): 70, 76-78.
23. Geosits, Margaret S. An investigation of bias in appraising teachers using an open approach to instruction. Unpublished dissertation. Lehigh University, 1978.
24. Glass, Gene V., and Julian C. Stanley. Statistical methods in education and psychology. Englewood Cliffs, New Jersey: Prentice-Hall, 1970.
25. Goldhammer, Robert. Clinical supervision: Special methods for the supervision of teaching. New York: Holt, Rinehart, and Winston, 1969.

26. Good, Thomas L. Teacher effectiveness in the elementary school. *Journal of Teacher Education* 30 (March-April 1979): 52-64.
27. Gregorc, Anthony F., and Helen B. Ward. Implications for learning and teaching: A new definition for individual. *NASSP Bulletin* 61 (February 1977): 20-26.
28. Heikkinen, Michael W. The teaching style Q-sort: A description of its uses in assessing teacher style. University of Utah, 1978. ERIC ED 151 351.
29. Herbert, J. A. A system for analyzing lessons. New York: Teachers College Press, 1967.
30. Hodel, Gerald J. A study of formal and informal teacher evaluation practices of selected elementary principals. Unpublished dissertation. Northwestern University, 1979.
31. Howell, John F., and Marilyn R. Erickson. Matching teacher and learner styles. Paper presented to Annual Meeting of the American Educational Research Association, Toronto, Canada, 27-31 March 1978. ERIC ED 151 341.
32. Hunter, Madeline C. Appraising teacher performance: One approach. *National Elementary Principal* 52 (February 1973): 60-62.
33. Hyman, Ronald T. Observing teachers. *Journal of Secondary Education* 43 (1968): 313-319.
34. Hyman, Ronald T. Ways of teaching. New York: J. B. Lippincott, 1970.
35. Joyce, Bruce R., and Marsha Weil. Models of teaching. Englewood Cliffs, New Jersey: Prentice-Hall, 1972.
36. Kanaga, Kim. The evaluation of instruction. Paper presented at the International Communication Association Conference, Chicago, Illinois, 25-29 April 1978. ERIC ED 177 936.
37. Kempthorne, Oscar. The design and analysis of experiments. New York: John Wiley and Sons, 1952.
38. Kowalski, Joan P. Sullivan. Evaluating teacher performance. ERS Report. Arlington, Virginia: Education Research Service, 1978.
39. Latham, Gary P., Kenneth N. Wexley, and Elliot D. Pursell. Training managers to minimize rating errors in the observation of behavior. *Journal of Applied Psychology* 60 (May 1975): 550-555.

40. Manatt, Richard P. Developing a teacher performance evaluation system as mandated by senate file 205. Des Moines, Iowa: Iowa Association of School Boards, 1976.
41. Manatt, Richard P., Kenneth Palmer, and Everett Hidlebaugh. Evaluating teacher performance with improved rating scales. NASSP Bulletin 60 (September 1976): 21-24.
42. McNally-Jarchow, Elaine. A personal interview conducted with Elaine McNally-Jarchow, professor of secondary education. Iowa State University, 1980.
43. McNeil, J. D., and W. J. Popham. The assessment of teachers' competencies. In Second handbook of research on teaching. Edited by E. M. W. Travers. Chicago: Rand-McNally, 1973.
44. Medley, Donald. Teacher competence and teacher effectiveness. Washington, D.C.: American Association of Colleges for Teacher Education, 1977.
45. Medley, Donald. The effectiveness of teachers. In Research on teaching. Edited by Penelope Peterson and Herbert Walberg. Berkeley, California: McCutchan, 1979.
46. Morsch, Joseph E., et al. Student achievement as a measure of instructor effectiveness. Lackland AFB, Texas: Air Force Personnel and Training Center, 1955.
47. Parson, Lewellyn. Evaluation of teacher performance. Paper presented at the International Congress of Education, Vancouver, Canada, 17-20 June 1979. ERIC ED 175 125.
48. Peterson, Penelope, and Herbert Walberg, ed. Research on teaching: Concepts, findings, and implications. Berkeley, California: McCutchan, 1979.
49. Popham, W. James. Educational evaluation. Englewood Cliffs, New Jersey: Prentice-Hall, 1975.
50. Popp, Jerome A. Toward a product-free process analysis of teaching. ERIC ED 177 104.
51. Powell, Marjorie. Research on teaching. The Educational Form 43 (November 1978): 27-37.
52. Robinson, John J., and John H. Lee, Jr. Evaluation: Can we agree? NASSP Bulletin 62 (December 1978): 15-20.

53. Rosenshine, Barak V. Content, time, and direct instruction. In Research on teaching. Edited by Penelope Peterson and Herbert Walberg. Berkeley, California: McCutchan, 1979.
54. Rutter, Michael, et al. Fifteen thousand hours. Cambridge, Mass.: Harvard University Press, 1979.
55. Schalock, Del. Research on teacher selection. In Review of research in education 1979. Edited by David C. Berliner. Tempe, Arizona: University of Arizona, 1979.
56. Schofield, Hilary L., and K. B. Start. Product variables as criteria of teacher effectiveness. The Journal of Experimental Education 48 (Winter 1979-1980): 130-136.
57. Silvernail, David L. Teaching styles as related to student achievement: What research says to the teacher. Washington, D.C.: National Education Association, 1979. ERIC ED 177 156.
58. Smith, Douglas K. A study of contrasting styles of teacher behavior. Paper presented at the Annual Convention of the Southeastern Psychological Association, Atlanta, Georgia, 15-18 March 1978. ERIC ED 178 785.
59. Soar, Robert S. Follow through classroom process measurement and pupil growth (1970-71): Final report. Gainesville, Florida: College of Education, University of Florida, 1973.
60. Soar, Robert S., and Ruth M. Soar. Emotional climate and management. In Research on teaching. Edited by Penelope Peterson and Herbert Walberg. Berkeley, California: McCutchan, 1979.
61. Solomon, Daniel, and Arthur J. Kendall. Individual characteristics and childrens' performance in varied educational settings. Rockville, Maryland: Montgomery County Public Schools, 1976.
62. Stallings, Jane A., and David H. Kaskowitz. Follow through classroom observation evaluation (1972-73). Menlo Park, California: Stanford Research Institute, 1974.
63. Start, K. B. Teacher assessment as a problem of sampling within a complex composite criterion. International Review of Applied Psychology 21 (1972): 53-60.
64. Stow, Shirley B. A critical appraisal of indicators of quality and a survey of effective school processes. Unpublished dissertation. Iowa State University, 1976.

65. Sweeney, James. A personal interview conducted with James Sweeney, professor of educational administration. Iowa State University, November 1980.
66. Taylor, Hazel. Choosing techniques for teaching and learning. Washington, D.C.: Home Economics Education Association, 1970.
67. Thomas, M. Donald. Performance evaluation of educational personnel. Fastback 132. Bloomington, Indiana: Phi Delta Kappan, 1979.
68. Thornell, John G. Research on cognitive styles: Implications for teaching and learning. Educational Leadership 33 (April 1976): 502-504.
69. Tikunoff, William J., David C. Berliner, and Ray C. Rist. An ethnographic study of forty classrooms of the beginning teacher evaluation study known sample. Technical Report No. 75-10-5. San Francisco: Far West Laboratory for Educational Research and Development, 1975.
70. Tuckman, Bruce W. The Tuckman teacher feedback form (TTF). The Journal of Educational Measurement 13 (1976): 233-237.
71. Tuckman, Bruce W., James M. Steber, and Ronald T. Hyman. Judging the effectiveness of teaching styles: The perceptions of principals. Educational Administrative Quarterly 15 (Winter 1979): 104-115.
72. Weil, Marsha, and Bruce Joyce. Social models of teaching: Expanding your teaching repertoire. Englewood Cliffs, New Jersey: Prentice-Hall, 1978.
73. Wexley, Kenneth N., and Thomas M. Rand. Demonstration of the effect "similar-to-me", in simulated employment interviews. Psychological Reports 36 (April 1975): 535-544.

APPENDIX A: COVER LETTERS

IOWA STATE
UNIVERSITY

Telephone 515-294-5450

October 17, 1980

Dear Colleague:

Currently, the research team at Iowa State University is continuing investigations into critical aspects of performance evaluation of teachers. This concept is of a crucial nature to all of us associated with school administration.

At this time, Mr. Dennis Rucker is pursuing research in this area and is seeking your assistance. Please read carefully the enclosed information and thoughtfully consider participating in this research effort.

As with all research, a high rate of participation is very important. Your assistance would be most appreciated.

Sincerely,



Richard P. Manatt
Professor & Section Leader

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Enclosure

Dear Principal:

I am completing research as part of graduate studies at Iowa State University. I am interested in studying variables that affect teacher evaluation.

To direct this research, I will need your assistance. Please take 15 minutes of your time to complete and return the enclosed survey instrument. In addition, please give Teacher Survey Form A to two teachers that you evaluate as SUPERIOR in their performance; i.e., ones that exceed the basic expectations of your school. Form B should be given to two teachers that you would rate as COMPETENT; i.e., ones that meet the basic expectations of your school.

Confidentiality is assured. Because you will distribute the survey instrument to teachers, there will be no way for me to personally identify any teacher.

To assure confidentiality for you and other principals, a numerical code will be employed for follow-up procedures only and will be removed before any data analysis is conducted.

It is important that all survey instruments be completed and returned on or before November 1.

If you wish to receive a summary of this research, please complete the spaces for your name and address.

Sincerely,

Dennis W. Rucker
Graduate Assistant
Educational Administration

Please send summary to:

(Principal's Name)

(Address)

Dear Teacher:

I am completing research as part of graduate studies at Iowa State University. I am interested in studying variables that affect teacher evaluation.

To direct this research, I will need your assistance. Please take 15 minutes of your time to complete and return the enclosed survey instrument.

NO request will be made, to your principal, to identify you. Because of this, confidentiality is assured. A numerical code for follow-up procedures will be employed. This code, however, identifies districts only and not individuals. In addition, this code will be removed before data analysis is conducted. Because confidentiality is assured, all results will be reported in group form only.

It is important that all surveys be returned by November 1.

Sincerely,

Dennis W. Rucker
Graduate Assistant
Educational Administration

APPENDIX B: VARIABLES IN INSTRUCTIONAL ASSESSMENT

In this activity you will be asked to respond to a series of 16 statements. (Facing page) These statements pertain to various aspects of the education process . . . philosophy, methodology, goals, etc.

You are to sort these statements identifying those that are like and those that are unlike your teaching.

1. Read all statements.
2. Generally, sort statements according to the criteria of like or unlike your teaching.
3. Pick the two MOST LIKE your teaching and place the numbers of the two statements above column 5. (Most Like)
4. Pick the two MOST UNLIKE your teaching and place the numbers of the two statements above column 1. (Most Unlike)
5. Of the remaining statements in the LIKE group, pick the next three that are most like you and record in column 4.
6. Of the remaining statements in the UNLIKE group, pick the next three statements that are most unlike you and record in column 2.
7. The remaining six statements are those that you have the least feeling about or are unable to make judgments on and should be placed in column 3.

_____	_____	_____	_____	_____
5.	4.	3.	2.	1.
(Most Like)			(Most Unlike)	

1. Students should have control over the selection of activities so that he/she selects his/her own instructional outcomes.
2. Concepts are the basis of knowledge.
3. Instruction should emphasize the maximization of unique personal development.
4. The social involvement of group investigation is a route to academic inquiry.
5. The teacher should recognize that the individual is capable of handling his/her own learning in constructive ways.
6. The sequence of learning should be broken down into small units to assure success at each step.
7. The school has to be an active participant in the continuing development of culture.
8. Positive and negative reinforcement can both increase response probability.
9. In a complex, interdependent world, the individual's well-being is closely related to the larger social structure.
10. The task of the school is to identify clear, stable, and organized bodies of knowledge within the disciplines.
11. Teachers are able to define all goals and objectives in terms of observable behavior.
12. The student must take responsibility for initiating and maintaining learning activities.
13. Instruction should emphasize the relationships of the person to society.
14. Good lectures and demonstrations can lead to meaningful learning.
15. The role of the teacher is to retain control of the intellectual structure of the classroom.
16. Behavior modification can be used to extinguish objectionable behavior as well as to establish behavior responses in subject matter areas.

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(PLEASE TURN PAGE)

General Information

1. Years of Experience as a Principal? _____
2. Years of Experience as a Teacher? _____
3. Undergraduate Major? _____
4. Subject/Grade Taught when Teaching? _____
5. Have you ever Coached? Yes No
6. Last Degree Earned? M.A. M.A.+ Ed.S. Ph.D
B.A. B.A.+

Upon completion, please staple or tape and mail the entire booklet.

Thank you for your time and support!

APPENDIX C: LETTER OF PERMISSION

August 11, 1980

Mr. Dennis Rucker
 College of Education
 Educational Administration
 230 Curtiss Hall
 Ames, Iowa 50011

Dear Mr. Rucker:

Please accept my apologies for the apparent delay in responding to your letter. The University is between sessions now, so your letter was not received immediately. Feel free to use the Teaching Style Q-Sort in your research. I am assuming that in your literature review you came across the original version of the Q-Sort. Currently we are using a revised version which I am including with this letter. The major advantage in using the revised version is that it is shorter (16 items vs. 28 items). The shortening was accomplished by statistically examining the items, using a Factor Analysis procedure, and eliminating those items that contributed weakly to the identification of teaching styles. The validity of the revised version is greater than the original. The sample size involved in their revision was over 500.

Internal consistency for the items was calculated using Pearson Product - Moment correlation. Each item was correlated to the total score for all items from the family represented by that item. All correlation coefficients were significant at the .001 level of significance. The coefficient ranged from .42 to .77. The sample size for the validation and internal consistency calculations was 83; all were classroom teachers.

I have calculated a test-retest reliability on the revision, but the sample was small (32) and the subjects were preservice education majors. The test-retest reliability coefficients and levels of significance for each family were:

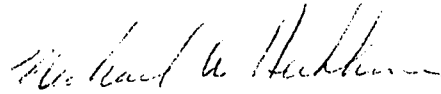
<u>family</u>	<u>r</u>	<u>p</u>
Personal	.67	.0001
Social Interaction	.13	.237
Information Processing	.59	.0001
Behavior Modification	.41	.078

Mean family scores and standard deviations for the revised Q-Sort based on the sample of 83 teachers were:

	<u>Mean Family Score</u>	<u>S.D.</u>
Personal	12.6	1.9
Social Interaction	11.8	2.2
Information Processing	12.1	2.8
Behavior Modification	11.5	2.1

If I can be of further assistance, please let me know. Best of luck on your research project.

Sincerely,



Michael W. Heikkinen
Assistant Professor

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APPENDIX D: Q-SORT SCORING KEY

<u>Family</u>	<u>Instrument Statements</u>
Personal	1 - 3 - 5 - 12
Social Interaction	4 - 7 - 9 - 13
Information Processing	2 - 10 - 14 - 15
Behavior Modification	6 - 8 - 11 - 16

Locate each statement number on the Q-Sort answer sheet. Assign ranked score for each statement. Total ranked scores for each statement for each family. The resulting four raw scores may be used to compare the teaching style families. The highest score indicates the style that is most like the individual while the lowest score reveals the teaching style least like the individual.