An instructor's behavior may be perceived as more important or more effective by students whose cognitive style is compatible with the instructor's teaching style.

Students' Cognitive Style and Their Ratings of Their Teacher's Effectiveness

by Dona M. Kagan
and Yvonne Tixier y Vigil

What cognitive or affective variables can cause students in the same class to rate their teacher differently in terms of effectiveness? Even a tentative answer to this question might provide useful information about the ways in which students' perception of their teacher can delimit the effectiveness of instruction. In this context, students' evaluation of classroom instruction, as a topic for research, can be seen as a subcategory of a larger area of inquiry: variables that affect one's perception of others (Fox, Peck, Blattstein and Blattstein, 1983). To date, researchers have found a variety of psychosocial student characteristics that were significantly related to the way they perceived and evaluated their teacher's classroom behavior: e.g., students' self-esteem, psychological needs, educational values, styles of coping behavior, motivation (Crittenden and Norr, 1973; McKeachie, Lin and Mann, 1971; Rezler, 1965; Trent and Johnson, 1977).

What is the relationship between students' cognitive style and their ratings of a teacher's professional competency? Cognitive style, the characteristic way in which an individual perceives, organizes and interprets information, should logically affect the way students perceive and evaluate a teacher's classroom behavior. One dimension of students' cognitive style that had been examined in relation to their perception of a teacher was students' tendency to think concretely vs. abstractly. The definition of cognitive style as concrete vs. abstract thinking was derived from Harvey, Hunt and Schroder's (1961) comprehensive model of cognitive development. In the one study that attempted to relate concrete vs. abstract thinking to students' perception of their teacher, Ingersoll and Strigari (1983) focused on sixth graders and used an open-ended questionnaire. They found that students who tended to think concretely looked to their teacher for structure and authority. Those who tended to think abstractly saw effective teaching more in terms of encouraging individuality and independence.

Dona M. Kagan and Yvonne Tixier y Vigil are assistant professors of teacher education at the University of Nebraska at Omaha.

The definition of cognitive style as simply a tendency to be concrete or abstract in thinking seemed too broad to distinguish the many ways in which individuals can differ in their perceptions and judgments. Therefore, we chose to assess students with instruments representing a variety of definitions of cognitive style: the Myers-Briggs Type Indicator (Myers, 1962), the Inquiry Mode Questionnaire (Harrison and Bramson, 1977, 1982), and the Conflict Mode Questionnaire (Thomas and Kilmann, 1974). Each has been described briefly below.

The Myers-Briggs inventory includes four pairs of subscales that assess fundamental dimensions derived from Jungian personality theory: (a) **Sensing vs. Intuition**: Those who tend to sense prefer to work with known facts rather than look for new possibilities and relationships. They also prefer standard ways of solving problems, tend to be patient and good at precise kinds of work. Intuitive types rely more upon inspiration than on direct experience. They tend to pass over details quickly, see in flashes of insight and work on hunches. They also enjoy looking for new ways to solve problems. (b) **Thinking vs. Feeling**: Thinking types make decisions by logical analysis. They may not show emotion readily and are often uncomfortable dealing with others' feelings. In contrast, Feeling types tend to base judgments on subjective values, are aware of others' feelings, are sympathetic, and enjoy pleasing people. (c) **Perceiving vs. Judging**: Judging types prefer a planned, orderly way of life. They like to come to closure quickly, to arrive at decisions, and to work according to a schedule. In contrast, Perceiving types are more interested in obtaining and weighing data rather than rendering decisions. They tend to be uncomfortable with fixed patterns or structures, aim for pluralism and value the freedom to respond to impulse. (d) **Introvert vs. Extrovert**: Introverts relate more easily to the inner world of ideas than to people. They prefer quiet for concentration, are careful in detailed work, and tend to dislike sweeping statements. Extroverts relate more easily to the outer world of people, prefer variety and action, and may be impatient or act quickly without thinking (Jung, 1923/1971; Myers, 1962).

Students' scores on the Myers-Briggs inventory have been related to their preferences for various instructional formats at the college level (Smith, 1973). Results suggested that students who obtained relatively high scores on the Intuition or Perceiving scales preferred self-paced rather than group instruction. High scores on the Thinking subscale were associated with a preference for letting the instructor set course goals and for traditional methods of instruction. High scores on the Feeling scale were related to students' attendance at help sessions. Based on these results, it was logical to infer that students' scores on the Myers-Briggs scales would also relate significantly to preferences and assumptions regarding effective teaching.

"Inquiry Mode," as defined by Harrison and Bramson (1977), describes distinctly different ways in which individuals assess problems and arrive at decisions: the **Synthesist** tends to focus on underlying assumptions and abstract concepts; the **Idealist** focuses on process, values, and aspirations; the **Analyst** concentrates on method and plan, seeks predictability through ordering data and concrete detail; the **Realist** evaluates available resources and immediately apprehendable facts; the **Pragmatist** looks for the immediate payoff and uses incremental step-by-step thinking. These general approaches to decision making were based on the work of Churchman (1971) who identified five traditions of inquiry characteristic of Western philosophy. Mitroff and Pondy (1974) later labelled these "inquiry

modes" and suggested that they are used preferentially by individuals when making decisions. To date, the Inquiry Mode Questionnaire had not been used in relation to either students' or teachers' attitudes or behaviors.

The third definition of cognitive style was operationalized with the Conflict Mode Questionnaire (Thomas and Kilmann, 1974). It includes five subscales, each assessing characteristic ways in which an individual may react in situations where the concerns of two people appear to be incompatible: **Competing (forcing)**: an individual pursues his/her own concerns at the other person's expense; **Accommodating (smoothing)**: unassertive and cooperative style in which an individual neglects his/her own concerns to satisfy the concerns of the other person; **Avoiding (withdrawal)**: the individual does not immediately pursue his/her own concerns OR that of the other person, but prefers not to address the conflict at all; **Collaborating (problem-solving)**: an attempt to work with the other person to find some solution which satisfies the concerns of both parties; **Compromising (sharing)**: the individual's objective is to find some expedient, mutually acceptable solution that partially satisfies both parties. No attempt is made to explore the issue in depth. Each of these styles represent varying degrees of **Assertiveness** vs. **Cooperativeness**. In operationalizing the concept of conflict mode, Thomas and Kilmann extended the theoretical work of Blake, Shepard and Mouton (1964) on intergroup conflict. This instrument also had never been examined in the context of students' or teachers' attitudes or behaviors.

Research Questions

Because the theme of perception and evaluation is so central to each of these measures of cognitive style, we anticipated that students' scores on them would be significantly related to the way they judged their teacher's classroom behavior. What proportion of the variance in teacher ratings could be accounted for by the entire set of subscales? A secondary purpose of this study was to examine interrelationships among subscales on the three inventories, since the instruments had never been compared. To what degree did they evaluate common perceptual, cognitive or affective dimensions? Did they really represent three distinctly different definitions of cognitive style?

Method

Subjects

Subjects were 107 college students enrolled in one of two sections of a course taught by an instructor in the Department of Teacher Education at the University of Nebraska at Omaha. The content of the course was the teaching of reading at the secondary level; it could be taken for undergraduate or graduate credit. Demographics of the subjects were as follows: males = 30%, females = 70%, 100% = juniors.

Instruments

Cognitive style. Students' cognitive style was measured with each of the following inventories:

1. **Myers-Briggs Type Indicator** (Myers, 1962): As described earlier, this contains eight separate subscales.

2. **Inquiry Mode Questionnaire (Harrison and Bramson, 1977)**: Each of the five types of thinking were assessed with separate subscales. The inventory consists of 18 hypothetical situations followed by five possible responses, each characteristic of one mode of inquiry. Subjects are asked to rank the responses from 1 to 5, indicating how accurately each response describes their own style of thinking. Ratings assigned to all responses belonging to the same inquiry mode are then summed across the 18 situations. Since a forced-choice ranking is used, the maximum score obtainable on any one subscale is 90, and the minimum is 18. Test-retest reliability was reported at .61 to .75 for the set of subscales (Bruvold, Parlette, Bramson and Bramson, 1983). Sample item: When there is a conflict between people over ideas, I tend to favor the side that (a) identifies and tries to bring out the conflict (Synthesist); (b) best expresses the values and ideals involved (Idealist); (c) best reflects my personal opinions and experience (Pragmatist); (d) approaches the situation with the most logic and consistency (Analyst); (e) expresses the argument most forcefully and concisely (Realist).

3. **Thomas-Kilmann Conflict Mode Instrument (Thomas and Kilmann, 1974)**: As described earlier, this inventory yields five separate subscales, indicating a respondent's tendency to use different methods for resolving interpersonal conflict. The items consist of a pair of statements describing possible behavioral responses in conflict situations. For each pair the respondent indicates which is not characteristic of his/her own behavior. Sample item: (a) I am usually firm in pursuing my goals. (b) I might try to soothe the other's feelings and preserve our relationship. Results reported by Yarnold (1981) suggested that the five conflict modes could be described generally in terms of instrumental (task-oriented) vs. expressive (process-oriented) behavior—a dichotomy similar to Thomas and Kilmann's distinction of Assertive vs. Cooperative styles.

Ratings of teacher effectiveness. Subjects' evaluation of the teacher's classroom competency was measured with 25 items taken from the Teaching Analysis of Students (TABS) questionnaire, routinely used by the Office for the Improvement of Instruction at the University of Nebraska at Omaha. Students rated the teacher on 25 specific skills (e.g., ability to use a variety of teaching techniques, to inspire excitement in the course, to ask easily understood questions, etc.) by selecting one of five alternative responses: excellent, generally good, mediocre, poor.

Procedure

Subjects completed all instruments during class hours. Participation was voluntary and totally anonymous to ensure honesty, particularly in regard to teacher ratings.

Data Analysis

Scores for subjects were computed on each subscale of cognitive style. In each case, higher scores indicated a greater preference for a particular style of thinking or behavior. Bivariate correlation matrices were computed separately for students in each of the two sections of the course, and the matrices were statistically compared via Box's **M**. Since the test was N.S., data from all subjects were pooled in all subsequent statistical tests. Twenty-six separate multiple regression analyses were conducted, predicting each item on the TABS questionnaire, as well as the summative score. Predictors in each equation consisted of scores obtained on the cognitive style scales.

Results and Discussion

Ratings on 14 TABS items could be predicted from measures of cognitive style (Table 1). For six of these items, students' scores on the Myers-Briggs Extrovert scale were positively correlated with the ratings assigned to the instructor: teacher's ability to explain course objectives,

arouse interest, answer questions clearly, generate or conduct class discussions, and promote mutually respectful relationships. Extroversion is defined in part as sensitivity to nuances of personality and social interaction, so it was logical that relatively extroverted students would have been particularly sensitive to the common theme underlying these particular TABS items: the effectiveness of communication and interpersonal relationships.

Two other Myers-Briggs scales emerged as significant predictors: Perceiving and Feeling. Each was positively correlated with ratings assigned to the instructor's ability to arouse interest and to inspire excitement in the course. It was logical that both these skills would be important to students whose cognitive style could be described as more affective than analytic (i.e., Perceiving being the opposite of Judging; Feeling the opposite of Thinking). Students who scored high on these two scales may have equated effective teaching with the ability to generate positive affective response among students.

Scores obtained by students on the Pragmatist or the Synthesist scales of the Inquiry Mode Questionnaire were associated with lower teacher ratings, as were scores on the Competing or Compromising scales of the Conflict Mode inventory. In contrast, scores on the Collaborating scale and on the Idealist scale were each positively related to one or more TABS items. Viewed together, one could infer that the least analytic and the most social dimensions of cognitive style tended to be positively related to teacher ratings. Synthesists, preferring to impose their own organization upon information, may have viewed structured, organized teaching behaviors as negative characteristics. Similarly students who approached interpersonal conflict with a Competing style of interaction, may have disliked more assertive teacher behavior. The Collaborative ap-

Table 1
Multiple Regression Analyses
(N = 107)

Dependent variable	R	Predictor	cum. R^2	Beta weight
How would you rate your instructor's:				
Ability to explain course objectives.	.36	Extrovert (Myers-Briggs)	.13	.357
Ability to arouse interest when introducing an instructional activity.		Feeling	.09	.393
		Perceiving	.16	.369
		Extrovert	.22	.299
	.53	Sensing (all Myers-Briggs)	.27	.281
Skill in making clear the distinction between major and minor topics.	.28	Collaborative (Conflict Mode)	.07	.281
Ability to answer questions clearly and concisely.	.29	Extrovert	.09	.293
Overall effectiveness as a discussion leader.	.29	Extrovert	.09	.289
Ability to get students to participate in class discussions.	.29	Extrovert	.09	.293
Ability to wrap things up before moving on to a new topic.	.28	Synthesist (Inquiry Mode)	.08	-.283
Explanation of precisely how your performance is to be evaluated.	.28	Sensing (Myers-Briggs)	.08	.278
Selection of materials and activities which are varied and thought-provoking.	.34	Intuition	.11	-.334
Management of day-to-day administrative details.		Collaborating (Conflict Mode)	.14	.393
	.48	Perceiving (Myers-Briggs)	.23	.296
Flexibility in offering options to individual students.		Pragmatist (Inquiry Mode)	.17	-.491
	.49	Judging (Myers-Briggs)	.24	.267
Availability for personal consultation.		Idealist (Inquiry Mode)	.10	.315
	.43	Compromising (Conflict Mode)	.19	-.290
Ability to relate to people in ways that promote mutual respect.	.35	Extrovert	.12	.351
Ability to inspire excitement or interest in the content of the course.		Perceiving (Myers-Briggs)	.08	.333
		Competing (Conflict Mode)	.17	-.322
	.51	Collaborating (Conflict Mode)	.26	.304

Note. Significant regression equations could not be derived for each of the following TABS items: Explanation of the objectives for each class session and learning activity; explanation of the work expected from each student; ability to maintain a clear relationship between the course content and the course objectives; skill in clarifying the relationships among the various topics treated in the course; skill in adjusting the rate at which new ideas are covered so that the material can be followed and understood; ability to clarify material which needs elaboration; speaking skill; ability to ask easily understood questions; performance in periodically informing you of your progress; ability to use a variety of teaching techniques; ability to relate the subject matter to other academic disciplines and to real world situations.

proach to conflict resolution, the most social interactive style, and the Idealist approach to evaluating information, the most affective cognitive style, were each associated with higher teacher ratings. Thus, as with the results concerning the Myers-Briggs scales, students who seemed the most sensitive to social interaction, inclined to evaluate information in affective rather than analytic or judgmental manners, tended to assign higher ratings to their teacher on a number of TABS items.

We could think of several explanations for this pattern of correlations. These primarily affectively oriented students could have used low standards to evaluate their instructor, thereby accounting for higher ratings. Students sensitive to social interaction might also have inflated ratings in an effort to spare their instructor hard feelings. What seemed most logical, however, was that the aspects of teacher behavior assessed by the predictable TABS items (Table 1) were of special importance to extroverted, affectively oriented students. They may not only have noticed these behaviors to a greater degree than other kinds of students, but, because they valued them, may have "rewarded" their instructor with higher ratings.

Factors Underlying All Three Inventories of Cognitive Style

After 16 iterations, seven factors emerged with eigenvalues over 1.00, together accounting for 70 percent of the variance among all the cognitive style subscales. Varimax factor loadings have been listed in Table 2.

Factor 1 was characterized by a positive correlation with the Sensing scale of the Myers-Briggs, a negative correlation with the Intuition scale, and by a negative correlation with the Idealist scale of the Inquiry Mode Questionnaire. This suggested a dimension of cognitive style consisting of an affinity for apprehendable, concrete data, and a non-intuitive, non-idealistic attitude. Factor 2 was characterized only by the bipolar Myers-Briggs dimension of Perceiving rather than Judging—the tendency to analyze and weigh information rather than to rush to closure. Factor 3 combined the Myers-Briggs bipolar dimension of Thinking rather than Feeling, the Synthesist scale (Inquiry Mode), and the Compromising scale (Conflict Mode). This cluster suggested an intellectual rather than an affective approach to evaluating information and resolving conflicts. More than any of the other factors extracted, the third was successful in relating scales across inventories, extracting a common theme of a synthetic and reasoned cognitive style. The tendency toward synthesis was apparent even in the Compromising scale, a manner of resolving conflicts that most completely merges two opposing sides.

Two scales from the Inquiry Mode loaded on the fifth factor: Analyst (positive weight) and Pragmatist (negative), suggesting a tendency to weigh a situation without considering the immediate costs or benefits to oneself. Three scales from the Conflict Mode instrument loaded on the sixth factor: Collaborating (positive weight), Accommodating (negative), and Avoiding (negative). This seemed to suggest a style of resolving conflicts through a true give-and-take process, neither acceding to the other party's demands nor avoiding the conflict entirely. The last factor included the Realist scale (positive weight) from the Inquiry Mode and the Competing scale (negative) from the Conflict Mode. Apparently Realists preferred to resolve conflicts in a noncompetitive manner—perhaps because they regarded it as more likely to be successful.

With the exception of Factor 4, on which only the Myers-Briggs Introvert/Extrovert dimension loaded, all the factors appeared to represent different aspects of an essentially realistic cognitive style. None could be described as affective or non-intellectual. Instead, scales from the respective inventories fell into clusters that described various non-idealistic, affective-free approaches to perceiving and evaluating information. One could conclude that, in part, all three inventories measured a few common variations of a primarily analytic cognitive style. This was best reflected in the composition of Factor 3, which combined scales from all three inventories in a highly synthetic mode of evaluating data and resolving personal conflicts.

Table 2
Varimax Factor Loadings
(N = 107)

Factor 1: Sensing rather than knowing by intuition. (18% of variance)	
Sensing (Myers-Briggs)	.885
Intuition (Myers-Briggs)	-.868
Idealist (Inquiry Mode)	-.506
Factor 2: Perceiving rather than judging. (14% of variance)	
Judging (Myers-Briggs)	-.988
Perceiving (Myers-Briggs)	.923
Factor 3: Thinking rather than feeling, and resolving conflicts by compromising. (13% of variance)	
Thinking (Myers-Briggs)	.867
Feeling (Myers-Briggs)	-.862
Compromising (Conflict Mode)	.444
Synthesist (Inquiry Mode)	.350
Factor 4: Introvertion. (8% of variance)	
Introvert (Myers-Briggs)	.983
Extrovert (Myers-Briggs)	-.938
Factor 5: Analytic rather than pragmatic in examining and judging information. (7% of variance)	
Analyst (Inquiry Mode)	.970
Pragmatist (Inquiry Mode)	-.522
Factor 6: Resolving conflicts through collaboration. (6% of variance)	
Collaborating (Conflict Mode)	.685
Accommodating (Conflict Mode)	-.629
Avoiding (Conflict Mode)	-.473
Factor 7: Realist in evaluating information; noncompetitive in situations of personal conflict. (5% of variance)	
Competing (Conflict Mode)	-.706
Realist (Inquiry Mode)	.634

Summary

Cognitive style is a broadly defined variable than can include intellectual and personality traits which affect the way an individual perceives and evaluates information and the behaviors of others. Students in the same class appeared to rate their instructor's performance, in part, according to their own cognitive style. Some of the instructor's behaviors and skills may have been perceived as more important or more effective by students, depending upon

ate School Renewal Teams (SRT) at schools of each level. This format would provide key school personnel such as principals, assistant principals, guidance counselors, department heads and teachers with opportunities to plan and promote the essentials of articulation. The salient features of the SRT concept are:

1. Each SRT meeting would have a planned, printed agenda.
2. Minutes of each meeting would be taken and distributed to all SRT members.
3. Each SRT meeting would have a discussion leader. This individual would come from the central office staff. The presence of key central office figures is crucial, since their attendance would lend authority and credence to a school district's intent to implement articulation.
4. SRT members would meet formally once a month. Guidance counselors, department chairpersons, representative subject matter teachers and principals would meet initially in separate teams. At periodic intervals all SRT members would meet collectively.
5. Agenda building for the SRT meetings is crucial. Prior to the meeting of each group, a brief questionnaire (see sample) would be mailed to all participants and returned before the group met. The purpose of the questionnaire is to solicit topics of interest that would be addressed.

Purposes

The purposes of the SRT Format are as follows:

1. To contribute to improved dialogue between levels of schools.
2. To assist a school district to plan more effectively by encouraging participants to meet on a regularly scheduled basis.
3. To encourage planning between levels of schooling with a view towards initiating communication among other district personnel i.e., district supervisors-principals, principals-school community representatives, superintendent-building levels, etc.

Implications

The SRT Format could be extended to many areas of a school district. For example, bringing new teachers together from different school levels could be a significant aspect of orientation activities at the start of the school year. The concept of School Renewal Teams fosters a team approach to school planning and addresses the problem of dialogue across faculties and staffs of different school levels. SRTs promote the idea that staffs from different schools can be interactive and proactive collaborators. An effective articulation format, however, must do more than help participants react to problems. Such a format should be based on the premise that junior and senior high school personnel should be better connected. Mutual support is the imperative. The SRT Format is designed with the principles of articulation as revealed in the literature in mind. An SRT can help erase barriers and build bridges because the process engages participants in focused discussions about practices and issues that have a direct bearing on the problems of articulation.

School Renewal Team Questionnaire

Date: _____ Name: _____
Position: _____ School: _____

I am very much interested in seeing that we as a school district implement plans and programs effectively. One of our efforts is to bring together personnel from the junior and senior high schools. You will be an important part of this endeavor. Meetings are planned with your counterparts. In order for this process to become a meaningful one, I am requesting that you complete this form. Your comments will comprise agenda items that will be discussed in future meetings.

Superintendent's Statement

I. List at least three questions about how the articulation process will work that you would like answered:

1. _____
2. _____
3. _____

II. List at least three areas of interest that you would like to discuss with a colleague from the junior/senior high school:

1. _____
2. _____
3. _____

III. List at least three ways you would like to cooperate with a colleague from the junior/senior high school:

1. _____
2. _____
3. _____

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