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ABSTRACT

A study investigated the relationship of communication style and cognitive style in the secondary school context. Eighty-seven secondary teachers from 4 high schools in suburban Denver (Colorado) and 86 of their students completed cognitive and communication style instruments as well as evaluations of one another. Results found: (1) an association between cognitive and communication style for the student sample; (2) a positive correlation between the cognitive style "concrete sequential" for teachers and student evaluation of teachers; (3) a main effect of students' communication style on teacher evaluation of students; and (4) a significant main effect of cognitive style match on student evaluation of teachers. Supplementary analyses revealed a relationship between student evaluation of teacher and teacher evaluation of student. (Contains 98 references.) (Author/SR)

The Relationship between Cognitive Style and Communication Style in the Secondary School Context

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ABSTRACT

The specific purpose of this study was to investigate the relationship of communication style and cognitive style in the secondary school context. The relationship between speech and thought, described by Dance as his "Speech Theory of Human Communication" served as the theoretical foundation of the study. Teachers and their students completed cognitive and communication style instruments as well as evaluations of one another. Hypotheses were as follows: 1) There is an association between an individual's cognitive and communication style; 2) There is a main effect of communication/cognitive style on teacher/student evaluation; 3) There is a main effect of matched teacher and student cognitive and/or communication style on teacher evaluation; and 4) There is a main effect of matched teacher and student cognitive and/or communication style on student evaluation. The sample consisted of eighty-seven secondary teachers and eighty-six of their students from four high schools in suburban Denver. The hypothesis testing yielded mixed results. An association between cognitive and communication style was found for the student sample. The cognitive style "concrete sequential" for teachers was positively correlated with student evaluation of teachers. A main effect of students' communication style on teacher evaluation of students was found. A significant main effect of cognitive style match on student evaluation of teachers was found. Supplementary analyses revealed a relationship between student evaluation of teacher and teacher evaluation of student.

The Relationship Between Communication Style and Cognitive Style in the Secondary School Context

Vygotsky (1934/1987) believed that to study speech or thought separately was like contemplating the properties of oxygen or hydrogen in an attempt to understand the nature of water. In a review of human communication theory, Dance (1978) explained that

> A human communication theorist spends his or her time and cognitive efforts in in consciously trying to answer the fundamental question... of 'What is human about human communication and how does human communication help us in becoming ever more humane individually and socially?' Such an overall question...carries with it innumerable subsidiary concerns guaranteed to keep numerous persons busy for a long time (p. 8).

One of the examples of such a subsidiary concern which Dance suggests is "...the effects of different styles of human messages on individuals and society" (1978, p. 8). If styles of thinking and communicating exist, what is the relationship between those styles? The specific focus and purpose of this study was the examination of the relationship between cognitive and communication style in the secondary school context. Beyond the initial associations of those styles within individuals, an exploration of teacher and student evaluations (as they relate to cognitive and communication styles) was undertaken.

Style

As early as 1965, "style" was recognized as a possible intervening variable in the process of education.

> In both education and psychology the possibility that the world might actually look, sound and feel differently to different persons,that they might form concepts and solve problems in different ways, and that the same stimulating situation might carry different meanings for them was something investigators did not generally take into account (Tyler, 1965, p. 211).

Researchers began to investigate this "style" possibility in the early seventies (Dunn & Dunn, 1975). According to Guild and Garger (1985) those exploring educational contexts are now "actively engaged in understanding and recognizing individual differences" (p. 14). In both in-service training and teacher preparation during the last ten years, teachers and potential teachers have been asked to identify their styles and then to employ strategies to insure that they teach to all styles represented in their classrooms, rather than just their own (Johnson, 1989). These "strategies" consistently amount to changes in communication patterns (Barbe & Swassing, 1979).

Speech & Thought Relationship

Recognition of the connection between speech and thought is central to the conceptual underpinnings of this investigation. At the heart of Dance's theoretical propositions (1967, 1972, 1975, 1978) is the assumption that a relationship exists between

uniquely human spoken language and mentation, or higher mental processes; mentation is a functional outcome of human communication. Others, including Langer and Vygotsky, support the contention of both an ontogenetic and phylogenetic relationship between speech and thought:

> Consciousness is reflected in the word like the sun is reflected in a droplet of water. The word is a microcosm of consciousness, related to consciousness like a living cell is related to an organism, like an atom is related to the cosmos. The meaningful word is a microcosm of human consciousness (Vygotsky, 1987, p. 285).

The rise of language in the Hominidae marked the completion of the 'Great Shift' from animal to man. The power of speech transformed the genus Homo and every aspect of its ambient; for with speech came thought and remembrance, intuition, conception and reason. With words-in dim, distant and very long ago ages-some strange, unimaginable ancestors of ours built up the human world (Langer, 1972, p. 316).

Mok (1989) and Gregorc (1982), leaders in the "style" assessment field, allude to this speech and thought relationship. Gregorc fluctuates between the terms "mind styles" and "mediation channels" for his description of cognitive style, demonstrating an assumed relationship between the receptive and expressive (1982). This relationship has emerged as a possibility in previous research conducted in secondary school settings. Andersen & Bell-Daquilante (1980) found communication behaviors and learning style tendencies to be related in high school students. Ekstrom (1974) hypothesized, that a match between teacher and student cognitive style would facilitate student learning. Abruzzese (1979) recommended to teachers that they assess their students' cognitive styles using the results to personalize

their communication with each student. Several other educators dispense advice to teachers regarding the communication-cognitive style connection (Butler, 1984; Dunn, 1982; Guild, 1982; Keefe, 1982: Kusler, 1982).

Brain research also supports a cognitive-communication style relationship (Blakeslee, 1982; Hart, 1982; Levy, 1982; Zenhausern, 1982). Style theory initially materialized from within the brain research field (Johnson, 1989; Restak, 1979). The trend of recognizing right or left brain tendencies (Partridge, 1982) as well as the counter-argument for holistic brain functioning (Brennan, 1982; Stackes & Andersen, 1987) and multiple intelligences (Gardner, 1983) all support the viability of a relationship between consistent patterns (styles) of thought and communication.

"Style" and Evaluations of Effectiveness

"Communication is the essence of teaching" (Lynn, 1977, p. 5). According to Roueche and Baker, in their 1986 book, Profiling Education in American Schools, effective teachers exhibit consistent characteristics. Others have also searched to describe the "excellent teacher" (Astin, 1985; Brannon, 1989; Gardner, Mason & Matyas, 1989; Kuehl, 1979; NEA, 1982). Does this elusive prototype exist-a particular "style" of teaching that is "best?" Both education and speech communication scholars have examined specific communicative behaviors as vital elements of determining teacher excellence (Csikszentmihalyi & McCormack, 1986; Kearney, Plax, Richmond & McCroskey, 1985; Lynn, 1977; McKinney, 1988; Owen, 1984; Richey & Richey, 1978; Rubin & Feezel, 1986). Norton and his colleagues completed several studies based on the premise that some "communicator styles" may be more effective than others in the classroom (Norton, 1977, 1986; Norton & Nussbaum, 1980; Nussbaum 1982; Nussbaum & Scott, 1979, 1980).

Stanford and Roark define teaching as "providing relationships and environmental conditions which facilitate increased differentiation of personal perceptions and accurate integration of new data into personal perceptions" (1974, p. 7,8). Decentering to students' cognitive perspectives is necessary for this kind of excellence in teaching to occur. Homogeneity of cognitive and/or communication style between a student and teacher could contribute to more effective teaching and learning, as the ease of decentering would be increased (Ekstrom, 1974).

Student perceptions of teacher excellence are frequently debated for their worth or lack thereof (Harris, 1986; Myers, 1978; Rosenshine, 1970; Wright & Saunders, 1976). In Successful Teacher Evaluation, McGreal explained that "(secondary) teachers generally lack faith in the students ability to accurately rate their performance" (1983, p. 134). In a large study of secondary students, Traugh and Duell found that 44% had never evaluated a teacher (1989). One of the major misgivings about adolescents evaluating teachers is that "personality" factors will obscure sound judgment (Simpson, 1966); Jones (1989) argued that "This is valid" since personal qualities of teachers and the relationship between teacher and pupil do affect the quality of learning (p. 158). Brown (1977) concluded that there is a positive significant relationship between learner perceptions of instruction and achievement. Hart, in his extensive 1934 study, also concluded that secondary students learn more from teachers they "like" or evaluate favorably. In addition, Boser and Poppin (1978) found a direct relationship between dropout rate and teacher liking. A "liked" teacher's ability to influence students is definitely stronger than the influence of teachers who are not rated favorably by students (Csikzentmihalyi & McCormack, 1986).

Although immaturity or personal vendetta could certainly influence a student's opinion of a teacher, the student's view of that teacher is still valid to that individual and hence, that assessment can affect the student's learning. In fact, Haukoos and Penick found that science achievement was influenced by teacher personality characteristics which provided dynamic classroom interaction (1987). Perceived personality types of teachers also were found to influence agricultural students' learning on the secondary level (1985). Psychology students felt they learned more from extroverted teachers in a study conducted by Hart and Driver (1978). In addition, gender was seen as an issue in student perception of teaching and learning (Basow & Distenfeld, 1983).

What can affect teacher evaluations of their students? Driscoll and Reynolds found that teachers use similar descriptions when talking about excellent students and when talking about themselves (1984). Teachers positively evaluate students whom they see as being like themselves. Paisey and Paisey discovered that high school students' grades were significantly related to their personality type (1982). In fact, students rated by teachers as "extroverted, affectively oriented individuals," generally rated their teachers higher than other students did (Kagan, Tixier & Vigil; 1987). Perhaps the similarity between teacher and students impacts evaluations of both. This study examines the possibility of shared cognitive and/or communication style as a factor which could influence perceptions of excellence both in student evaluation of teachers and teacher evaluations of students.

In summary, if speech and thought are related, then patterns of speech (communication styles) and patterns of thought (cognitive styles) in the same individual may also be related. The relationship of styles may impact evaluations of effectiveness in the secondary school context.

The following hypotheses were examined: 1) There is an association between an individual's cognitive style and his/her communication style; 2) There is a main effect of communication/cognitive style on teacher/student evaluation; 3) There is a main effect of matched teacher and student cognitive and/or communication style on teacher evaluation; 4) There is a main effect of matched teacher and student cognitive and/or communication style on student evaluation.

Method

Subjects

Four large suburban Denver schools participated in this study. Schools were selected based on administrator willingness to participate. 166 full time classroom teachers were randomly selected from these four schools for participation in the first phase of the study. 15 teachers had ceased employment with their districts and 28 refused to participate. 35 did not respond at all, producing a response rate of 80% and a sample of 87 teachers. Brief follow-up investigation of non-respondents indicated a high percentage of both males (77%) and of teachers who had already taken the Gregorc instrument (63%). The teacher sample was comprised of 34% males and 66% females. Subject areas represented by the randomly selected group included: English-21%, Math-18%, Science-10%, Social Studies-9%, Foreign Language-9%, Business-9%, Special Education-3% Home Economics-3% and Other 18%.

Following the first phase of data collection (teachers' communication and cognitive styles), teacher and student subjects were selected for the second phase. Five to seven teachers from each of the four schools (the maximum number allowed by each principal) were randomly selected from lists of teachers who had participated in the first phase of the

study. For each of those teachers, a class period of the day was randomly selected. Five students enrolled in each of those class periods were randomly selected. Students were identified in this way to assure that they were all being taught the same subject in the same way, since many secondary teachers teach a variety of subjects. Each of the selected students was assigned a number related to their teacher's number. If a student happened to be selected twice (once for two different teachers), his/her instruments were administered only once, and coded for only one teacher.

Of the 177 students selected in the manner described, four were no longer enrolled, three had parents who objected to signing the consent form and 14 refused to participate. The total student sample size was 86. Of the 26 teachers selected for phase two, 19 completed evaluations, two refused and five teachers' forms were inadvertently discarded by a school custodian. A total of 86 teacher evaluations of students were completed.

Measurement

The concept "cognitive style" was measured with the Gregorc Cognitive Style Delineator. The concept "communication style" was measured with Norton's Communicator Style Survey. Evaluations of students by teachers were made using the Student Evaluation Survey and student evaluations of teachers were made using Bentley and Starry's Purdue Teacher Evaluation Scale.

All of the data were collected via self-report instruments; the most common method of assessing style (Guild & Garger, 1985). The basic premise of this study encompasses the idea of differing realities-and the reality of an individual's own cognitive style is most efficiently ascertained by asking that individual. This study sought to validate the

assumption that cognitive styles correspond to verbal communicative behaviors. To have incorporated methodology into the study which determined cognitive style based on observable verbal behavior would have sabotaged the effort. To that end, self-report was determined to be the best method of investigating the problem. To access a person's perceptions of excellence (teacher or student), self-report data is a viable method. Some instruments ask the teacher to assess the student's style; then the teacher's style influences the perception (Dunn & Dunn, 1989). The individual's perception of reality is the most "objective" way of determining that individual's style of thinking.

Cognitive Style

Five self-report cognitive style inventories are suggested by style researchers (Guild & Garger, 1985). These five include Dunn, Dunn and Price's Learning Style Inventory (1975, 1978), the Myers-Briggs Type Indicator (1943, 1976), Mok's Communicating Styles Survey (1975, 1989), Kolb's Learning Style Inventory (1976) and the Gregorc Style Delineator (1978). Both the Dunn and Kolb instruments assess modality preference; Myers-Briggs and Mok examine personality type.

Gregorc's cognitive style instrument was selected based on the matching of its conceptual foundation with that of this study. "Each of the four scales of the Gregorc Style Delineator exhibits a strong degree of internal consistency..." ranging from 0.89 to 0.93" (1984, p. 18). "The test-retest correlation coefficients are all significant at the 0.001 level or less ranging from 0.85 to 0.88..." (1984, p. 18). All correlations for predictive validity were also significant at the $p<.001$ level.

An indirect, self-report instrument of non-situationally bound items, the Gregorc Style Delineator has a five minute time limit. Individuals are asked to quickly rank four

words, using "the real you" as the "reference point" (Gregorc, 1985, p. 3). A rank of "4" indicates the word which is the "best and most powerful descriptor of you" whereas "1" should be placed next to the word which is "the least descriptive of you"(Gregorc, 1985, p. 3). The directions encourage first impression reactions. The scoring of this instrument results in classification of each individual into one of five cognitive styles: abstract random, abstract sequential, concrete random, concrete sequential or square (a rare combination of the other four styles). Scores of 27 or more on any given style identify that style as dominant. For the few subjects who were dominant in two styles, the style with the highest score was selected as the person's dominant style for the categorical analyses.

Communication Style

Norton's Communicator Style (1983) instrument was selected as being representative of the communication focus sought in this study. Other communication style instruments whose definitions of communication style encompassed all observable behavior, stretched the limits of communication style outside the conceptual boundaries of this study.

Norton's instrument has 45 items, each with a five point scale ranging from "very strong disagreement" to "very strong agreement." Nine independent variables (friendly, open, relaxed, attentive, impression leaving, animated, contentious, dramatic and dominant) are each represented within the 45 item pool. All of the items have been randomly distributed throughout the test. The scoring process results in classification of each individual into one of Norton's five communicator style subconstruct clusters: Cluster I-impression leaving and communicator image; Cluster II-dramatic and animated; Cluster III-attentive, friendly and open; Cluster IV-dominant and contentious; Cluster V-relaxed

(1978). Norton's communicator style construct has previously been used for research in the field of education (Hurt & Scott, 1978; Norton, 1977; Norton, 1986; Norton & Nussbaum, 1980; Nussbaum, 1982; Nussbaum & Scott, 1979, 1980).

Student Evaluations of Teachers

Of the few instruments designed for high school students to assess their teachers, the Purdue Teacher Evaluation Scale emerged as the most comprehensive and useful (Bentley & Starry, 1975). Other instruments frequently cited or recommended [Learning Environment Inventory, (Anderson, 1973); My Class Inventory, (Anderson, 1975); and The Class Activities Questionnaire, (Walberg, House, & Steele, 1973)] focus on other-than-teacher classroom information.

The concept "student evaluation of teacher" includes the following dimensions as delineated in the Purdue Teacher Evaluation Scale: motivation, control, subject, communication, methods, fairness and total evaluation. The Purdue Teacher Evaluation Scale was tested for reliability using a split half technique (with 28 teachers with 20 students each) yielding correlations of 0.83 to 0.90 on each of the six dimensions. According to Bentley and Starry,

> There is not truly relevant criterion on which to judge the validity of an instrument of this nature...Peer ratings, evaluations by administrators, etc. obviously have very limited relevance as a criterion of the validity of student ratings. To the extent that students agree with one another, are self-consistent in their ratings, and content validity is exhibited, at least adequate validity may be assumed (1970, p. 4).

Although some other instruments address the evaluation by students of learning context, or classroom activities (Anderson, 1973; Walberg, House & Steele, 1973) no other published secondary "student evaluation of teacher" documents were available. This 60 item instrument asks students to respond to items with answers of "very much like my teacher" (four points) to "very much unlike my teacher" (one point) on a four point scale. Subcategories include ability to motivate students, subject matter orientation of the teacher, teaching methods and procedures, ability to control students, student-teacher communication and fairness of teacher.

Teacher Evaluation of Student

Instrument which allow teacher assessment of student have been developed primarily around specific handicapping conditions (Burks, 1968; Chess & Thomas, 1969; Elrod, Franklin & Sorgenfrei, 1988; Loutlit, 1957; Rimm, 1982; Palmer, 1970; Walker,1970). A more holistic evaluation (which was not designed with a specific "condition" in mind) is the Student Evaluation Scale, developed by professional in-house staff with Psychologists and Educators Press (1970). This evaluation tool includes academic and social/emotional components without specifically directing teachers toward a "handicapping condition." The Student Evaluation Scale was deemed appropriate for the current study which asked teachers to evaluate randomly selected students, presumably many of whom would not have "special needs." Although widely used, SES validity and reliability information was not available. Conceptually, teacher evaluations of students include both academic and social-emotional judgements. The Student Evaluation Scale allows assessment in both these areas, rather than limiting the evaluation to academics.

Procedure

Packets containing Norton and Gregorc's instruments and instructions were distributed to participating teachers in their faculty mailboxes, with the researcher's phone number provided for questions. Subjects were instructed to return instrument packets to a locked box in their faculty lounge within three weeks. Reminder notices were sent after two weeks and additional copies of the packets made available for those who has misplaced the originals. Teachers were assigned a number which appeared on each of the instruments (as well as each of the student evaluation forms in the second phase). After the instruments were scored, all participating teachers received a summary of their own results, with explanation sheets about each of the styles.

Student instruments were administered in a group setting at each school, with individual assistance and follow-up provided. Evaluation instruments were clearly marked with the name of the teacher whom the student should evaluate. Students were assigned numbers which corresponded with the appropriate teacher number. Following the study, students (and their parents, if under eighteen) were provided with results and explanation sheets.

Teachers in the second phase of the study evaluated the same five to seven students (selected from one of their classes) who had evaluated them. Teacher-subjects received the Student Evaluation Forms and explanation sheet in their faculty mailboxes, with a three week deadline for completion. Again, forms were returned to the locked box in the faculty lounge. Evaluation results were not given to subjects.

Results

Data were analyzed with the Statistical Package for Social Sciences - X release 4.0 (1991). Alpha for all analyses except correlations was set at .05. Correlations were tested at an alpha level of .01 to reduce type I error rate, since so many variables were correlated.

The first hypothesis was based on the theoretical relationship of speech and thought: "There is an association between cognitive style and communicator style." Were Gregorc cognitive styles of teachers and or students related to Norton communicator styles of teachers and/or students?

To test this first hypothesis, chi square statistical analyses (Likelihood Ratio, $p<.05$) were calculated for Norton by Gregorc-student and for Norton by Gregorc-teacher. Distributions of teachers and students within each style (both Gregorc and Norton) were normal. Gender and subject taught were also considered for each teacher. Results indicated no significant association between teacher Gregorc style and teacher Norton style. For students, Gregorc styles and Norton styles were significantly associated. A significant association between gender and Gregorc style was not found, but the association between teacher gender and Norton style was significant. Subject taught was not associated with either Gregorc or Norton styles.

To further examine the first hypothesis, and to begin investigation of the second hypothesis, Pearson Product Moment correlations were run using interval level raw scores for the following variables: teacher Gregorc style, student Gregorc style, teacher Norton style (not including teacher scores in Norton style four since only three teachers were dominant in that style), student Gregorc style, student Norton style, teacher evaluation of

student (academic, social-emotional and total) and student evaluation of teacher (motivation, control, subject, communication, methods, fairness and total). Distributions were fairly normal for all variables except 1) student evaluation of teacher communication (negatively skewed) 2) student evaluation of teacher subject matter knowledge (negatively skewed) and 3) teacher social-emotional evaluation of student. Transformations of those scores did not significantly affect the distributions. Data were still used, with acknowledged awareness of the non-normal distributions of these three variables. An alpha rate of .01 was set, to diminish experiment-wise type I error rate. A negative correlation was found between student evaluation of teachers and teachers' scores on the "concrete random" Gregorc style. Several dimensions of student evaluation of teachers were positively correlated with teacher evaluations of students, both academic and social-emotional. In addition, teachers' scores on the "concrete sequential" style were related to the teachers' "total evaluation of students" scores.

Hypothesis two states, "There is a main effect of style on evaluation." This hypothesis required four analyses of variance (Anovas). First, teacher style (Gregorc) was tested with teacher evaluation total. Second, teacher style (Norton) was tested with teacher evaluation total. Third, student style (Gregorc) was tested with student evaluation total and fourth, student style (Norton) was tested with student evaluation total. Non-normal distributions were present for three variables, as noted previously. Teacher Norton Style Four was not included in the analyses since only three of the 87 teachers were classified in that style. The only significant main effect found was for student Norton style on teacher evaluation of student. Tukey's multiple comparison analysis revealed the pair - student Norton cluster one and student Norton cluster three -

to be significantly different in terms of teacher evaluations. Alpha rate for all Anova analyses was set at the .05 level.

Hypotheses three and four were offered to investigate the possibility of a main effect of teacher and student matched styles on evaluation. To test these hypotheses, a nested design was used with a mixed-model multivariate analysis of variance statistic (Manova). Expectations were calculated to determine the appropriate F test. Students (1-86) were nested in teachers (1-19). Of 86 cases, 36 matched on Norton styles and 50 did not; 52 matched on Gregorc styles and 34 did not match. To determine if there was a need to nest teachers in districts, two one-way analyses of variance were calculated to investigate a possible main effect of district on teacher evaluation and on student evaluation. Results were nonsignificant at a liberal alpha of .20. Since there was no effect of district, nesting teachers in districts for the manova was not deemed necessary. The independent variables for the first test were 1) students nested in teachers and 2) matched or not matched on Gregorc styles. Total teacher evaluation of student and total student evaluation of teacher were the dependent variables.

In the second test, the dependent variables remained the same as did the independent variable of students nested in teachers but the second independent variable changed to matched or not matched on Norton styles.

Acknowledgement of the three variables with non-normal distributions has been noted above. Although manova is robust in regard to violation of normality, the non-normal distributions could have affected the homogeneity of dispersion measure. Box's M was 90.03 for Norton match and 83.84 for Gregorc match, so the Pillai's trace was utilized, rather than Wilk's lambda. Where multivariate significance was found, univariate tests were also

conducted. A significant main effect of Gregorc match/no match was found on teacher and student evaluation. Univariate analysis revealed significance specifically of Gregorc match/no match on student evaluation of teachers.

Discussion of Results

Hypothesis 1 predicted that "There is an association between an individual's cognitive style and his/her communication style." Results indicated no significant association between teacher cognitive style and teacher communication style; however, the association between student cognitive style and student communication style was significant ($p<.05$). An association between cognitive and spoken language styles was apparent in one sample (students) but not in the other (teachers). Consideration of this difference in results needs to begin with an examination of the differences in populations from which the two samples were drawn. An age difference between the two groups is apparent: the student sample all being adolescents and teachers all being twenty-two years of age or above, with an average of ten and a half years of teaching experience. The teachers were a more homogenous group; having made the same career choices as one another and having all been college-educated.

It was found that only three teachers' data placed them in the Norton style "dominant and contentious" whereas 14% of the students were categorized as "dominant and contentious". It is speculated that teachers may have had preconceived notions about what characteristics a good teacher is expected to have, causing them to avoid affirmative answers to dominant and contentious questions. It may be that there is not a significant relationship between secondary teachers' thought and spoken language, as operationalized in the Gregorc and Norton style instruments. Another explanation of these results is that

teachers either 1) modify their communication styles to facilitate learning, subjugating their own cognitive styles and the resulting "natural" verbal expression to students or 2) modify their reported perceptions of themselves to meet the pre-established conditions of their own views of effective teachers. The finding of a significant association between students' cognitive and communication styles allows rejection of the null hypothesis for that population. Consequently, it can be said that in secondary students, there is an association between spoken language and thought, as measured by dominant Gregorc cognitive and Norton communicator styles.

Categorical variables gender and subject taught were also analyzed for possible associations with Gregorc and Norton styles for students and teachers. No associations between subject taught and cognitive/communication style were found. An interesting supplementary finding was the significant relationship between communication style of secondary teachers and gender. The cell means show that no male teachers were classified as being dominant in cluster three: attentive, open and friendly. Since no significant association between gender and cognitive style was found for these secondary teachers, and distributions for both styles were normal, one might conclude that males and females have similar patterns of thinking, but not of speaking. Previous gender studies have shown mixed results in terms of communication variables (Bartol, 1976; Borden & Homleid, 1978; Buck, Miller & Caul, 1974; Cherulnik, 1979; Chusmir & Franks, 1988; Fierman, 1990; Frances, 1979; Gornick & Moran, 1971; Hall, 1978; Henley, 1980).

Hypothesis 2 stated that "There is main effect of communication/cognitive style on teacher/student evaluation." A negative relationship between student evaluation of teachers and teachers' scores on the cognitive style "Concrete Random" (CR) was found

($p<.001$). The "motivation," "fairness," and "methods" subdimensions of teacher evaluation as well as the total teacher evaluation score were negatively related to teachers with a CR cognitive style. Characteristics of the CR style include: intuitive, independent, random ordering preferences, practical proof needed, competitive and ego-centric (Gregorc, 1982). The CR style for teachers was consistently evaluated negatively, regardless of the cognitive style of the student completing the evaluation.

A positive correlation ($p<.001$) was found between total evaluation score of teachers and teachers' scores on the "Concrete Sequential" (CS) cognitive style. The characteristics of a CS cognitive style include: instinctive, methodical, deliberate, concrete, sequential ordering preferences, step-by-step linear progression, product oriented, practical, stable, conformist (Gregorc, 1982). The primary difference between the concrete sequential and concrete random styles is the difference alluded to in the terms "random" as opposed to "sequential." Random thinking secondary teachers were not seen positively by their students; whereas, sequentially thinking teachers were viewed positively. This evidence points to the possibility of particular cognitive styles affecting perceived teacher excellence, rather than a cognitive style match between teacher and student being the precursor to more favorable evaluations.

A significant main effect was found for student Morton style on teacher evaluation of student. To further examine that finding, a Tukey's multiple comparison test was calculated. Differences between teachers' evaluations of students in Morton clusters one and three were found, with cell means of 109.88 and 134.53 respectively. Teachers more positively evaluated students whose communication patterns were characterized as "friendly, open and attentive" as compared with students in the "impression leaving, communicator

image" cluster. Perhaps cooperativeness (or even compliance) is presumed from the attentive, open, friendly student communicator. Kagan, Tixier and Vigil (1982) concluded that teachers gave more favorable evaluations to outgoing (friendly), affectively oriented (open and attentive) students. In this study, secondary students who saw themselves as "impression leaving" left a less than positive impression on their teachers when compared to open, attentive and friendly students.

Supplementary correlations found relationships between several dimensions of teacher evaluation of students and student evaluation of teachers. The total evaluation of teacher score was correlated with the total evaluation of student score at $p<.001$. A style match was not necessarily responsible for this finding, as had been anticipated. Rather, students evaluated teachers highly who evaluated them highly, and vice versa. Driscoll and Reynold's research (1984) suggested the likelihood of this result. In a discussion of attraction, Devito states that "The most obvious statement we could make about interpersonal attraction is that we like those who like us and dislike those who dislike us (1983, p. 343). Reinforcement is a key force in attraction; regardless of context. In student-teacher relationships in the secondary school reinforcement appears to play a crucial role in teacher and student evaluations. Social exchange theorists (Foa & Foa, 1974; Roloff, 1981) characterize interpersonal communication as intentional and goal directed; giving something to get something in return. Affection and prestige are two of the commodities thought to be exchanged between individuals (Foa & Foa, 1974); conceivably, teachers and students make similar "exchanges." The student may give open, attentive, friendly classroom communication and a favorable evaluation of their teacher in exchange for positive evaluation from their teacher. Reinforcement of the positive exchange process

guarantees its continuance. Social exchange theory can imply a self-centered premeditation which may not be palatable to some interpersonal communication theorists (Infante, Rancer & Womack, 1990). Perhaps the case is more simply stated: good students and good teachers appreciate one another.

Hypotheses 3 and 4 stated: There is a main effect of matched teacher and student cognitive and/or communication style on H3) teacher evaluation and on H4) student evaluation. A significant main effect of cognitive style match was found specifically for student evaluation of teachers ($p=.002$). If a student shared patterns of thinking, or cognitive styles, with his/her teacher, evaluations were affected. There was a main effect of cognitive style on student evaluation of teachers. Matches between their own and their teacher's cognitive styles mattered to students. One might argue that teachers are trained to be objective, so that student characteristics do not affect evaluation. One misgiving about secondary students evaluating teachers has been their lack of "objectivity" (McGreal, 1983). A more functional explanation of these results might be that a match between patterns of thinking in teacher and student may actually affect learning; causing the student to believe that instruction which comes from his/her own perspective is more effective. Brown (1977) supported such a possibility. Teacher decentering becomes increasingly important in light of this evidence, if one accepts the supposition that a student's opinion of his/her teacher does indeed impact the quality of learning (Jones, 1989).

In summary, the research hypotheses in this study received mixed support. An association between cognitive and spoken language style was found in the student sample, but not in the teacher sample. A significant positive correlation coefficient was found

between one teacher cognitive style (concrete sequential) and student evaluation of teacher, suggesting that a particular cognitive style might have universal appeal among students. Analysis of variance revealed a relationship between student spoken language style and teacher evaluation of student. The idea of matched styles impacting evaluation was only supported for cognitive style match and student evaluation of teacher. Supplementary analyses revealed an effect of gender on spoken language style and a strong relationship between teacher evaluation of student and student evaluation of teacher.

Further research which investigates the impact of particular teacher styles on actual learning is needed. Other research has shown that favorable opinions about their teachers can influence student learning (Bosert & Poppin, 1978; Brown, 1977; Hart & Driver, 1978; Haukoos & Penick, 1987) and this study has shown that cognitive style can influence student opinion. Studies are needed which specifically address learning as a possible outcome of teacher cognitive or communication style.

The influence of gender on spoken language style was a supplemental finding.The teacher sample was 66% female, with a majority of non-respondents being male. Since gender was not a variable specifically targeted for investigation in any of this study's hypotheses, further research is needed to corroborate or contradict this finding.

Finally, other methods of operationalizing the concepts "spoken language" and "thought" are needed. Perhaps instrument development which specifically seeks to separate these processes would allow more precise assessment. Although self-report data is the most commonly used method of assessing style, the collection of other types of evidence (observation, interview, specific task ratings) and comparison among the types of style assessment data could aid the investigation process.

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