Toward a General Model of Instructional Communication

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A general model of instructional communication is advanced and the linkages of four components in the model are tested. Data were drawn from college teachers and college students through a split-class design which permitted collection of unique data from teachers and two sets of their students. Using by-class analyses of data it was determined that teacher self-reported temperament is significantly correlated with students' perceptions of the teachers' communication behaviors and the students' evaluation of teachers' source credibility and task attractiveness. All of these measures were also found to predict learning outcomes and teacher evaluations of another group of students. The results support the general model and provide a foundation for future research in instructional communication.

KEY CONCEPTS Instructional Communication Theory, temperament, communication traits, source credibility, task attraction, cognitive learning, affective learning, teacher evaluation, communibiology

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Ver the past thirty years, as a function of the establishment of divisions and interest groups devoted to instructional communication in most of the professional associations in the field of communication, research in instructional communication has increased substantially. While much of the early research (McCroskey & McCroskey, in press) focused on individual differences in students (such as levels of communication apprehension; McCroskey, 1972, 1977; McCroskey & Daly, 1976), in recent years much of the research has centered on teachers' orientations and behaviors related to communication in instruction (Mottet, Richmond, & McCroskey, in press). While no general theory of instructional communication has been advanced to guide this research, two general approaches (relational and rhetorical) have dominated much of the research.

The relational approach to instructional communication (Mottet & Beebe, in press) has been derived from scholarship relating to interpersonal communication,

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particularly the transactional model of interpersonal communication. This model of instructional communication assumes that teachers and students mutually exchange information and ideas which produces shared understandings and a positive relationship with each other. This approach sees both teachers and students as sources and receivers of information which results in the generation of shared meanings and simultaneous learning. A primary example of this approach is the "learning community culture" advocated by Book & Putnam (1992). This approach is most likely to be employed in humanistic disciplines where specific facts are not the primary focus of attention and where objectives for learning are quite general, such as "learning to appreciate" some area of endeavor.

The rhetorical approach to instructional communication (Mottet & Beebe, in press) is derived from classical rhetorical theory and contemporary scholarship relating to influence via person-to-group communication. This model assumes that in instruction teachers are the primary source of information (along with teacher-selected reading matter and other instructional aids) and that students are the receivers/learners. Instructional communication is seen as a teacher- controlled, linear process where the teacher is the person primarily responsible for creating messages which will stimulate teacher-selected meanings in students' minds (learning). Teachers employing this model typically work from carefully designed instructional objectives with specific expectations that the students will master the knowledge represented by those objectives. This approach is most likely to be employed in the scientific and socialscientific disciplines where specific facts and processes are being taught. This is considered to be the "traditional" approach to instruction and is widely employed throughout the world, not just within the U.S. Since much of the research on instructional communication has been drawn from the rhetorical approach, it was chosen to provide the basis for the general model of instructional communication which is presented in this paper.

A GENERAL MODEL OF INSTRUCTIONAL COMMUNICATION

There are six essential components of this model of instruction. This research involved four of these: teachers, students' perceptions of teachers' verbal and nonverbal communication behaviors, students' perceptions of the teachers' source credibility and task attractiveness, and instructional outcomes. Each of these components introduces substantial variability into the instructional communication process. The other two components are students (temperament, intelligence, experience, etc.) and the instructional environment.

Instructional Environment

No two instructional environments are exactly alike. The environment includes such elements as the nature of the institution hosting the instruction, the nature of the classroom, the culture of the institution (and the surrounding population), the level of instruction (elementary through graduate school), the physical and social climate in which the institution exists, transitory factors (e.g., political environment, presence of athletic programs, size of class), and many other elements not noted here. Since most of these environmental factors are beyond the control of the teacher or the students, most of the variance created by the environment will function as error variance in the testing of instructional communication theories. The current research accepted as error variance all elements of the environment.

Students

Students introduce many aspects of variance into the instructional system. Students vary greatly in terms of intelligence, prior learning, personality, and temperament. In most classrooms, students also vary widely in terms of gender, culture, ethnicity, religion, socio-economic status, etc. All of these elements impact the way students perceive teachers and teachers' communication behaviors. As was the case with the environment, this research accepted as error variance all variance attributable to individual students.

Teachers

The teacher introduces many aspects of variance into the instructional system. The teacher's level of intelligence, content knowledge, pedagogical knowledge, communication competence, and experience are important. So are the teacher's education, personality, and temperament. All of these elements influence the teacher's choices of verbal and nonverbal communication behaviors in instruction.

Teachers' Verbal and Nonverbal Behaviors

No teacher communicates in exactly the same way as any other teacher. Teacher communication behaviors introduce considerable variance into the instructional process. What teachers say and what they do nonverbally constitutes a continuous stream of messages which impact the meanings which are stimulated in students' minds. Typically, individual teachers tend to have consistent communication behavior patterns which are observable by students.

Student Perceptions of the Teacher

Sometimes students have perceptions of the teacher even before they take a given class with that teacher. This may be a function of having taken a class with them before, having met the teacher before, or they may have received information about the teacher from someone else. If the teacher is totally unknown, however, students will begin to develop perceptions of the teacher as soon as they begin to be exposed to her/him. These perceptions may be weak and stereotypical at first, but they become stronger as exposure continues. These perceptions will be generated primarily on the basis of the teacher's verbal and nonverbal communication behaviors--what the teacher says and how he/she says it.

Instructional Outcomes

The primary outcomes of instructional communication are concerned with learning: cognitive, affective, and in classes where appropriate, psychomotor. A secondary outcome of interest to teachers (and sometimes to those who evaluate teachers) is student evaluations of the teacher. Many other outcomes can also occur, but they usually are incidental and not of central concern to the instructional communication process.

This general linear model of instructional communication suggests a direct causal pattern: 1) orientations of teachers are associated with teachers' verbal and nonverbal behaviors; 2) teachers' verbal and nonverbal behaviors are observable by students; 3) the observation and interpretation of these behaviors are related to students' perceptions of the source credibility and task attractiveness of the teacher; and 4) students' perceptions of teacher communication behaviors, source credibility, and task

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attractiveness are associated with students' evaluation of the teacher, affective learning, and perceptions of their own cognitive learning.

RATIONALE AND HYPOTHESES

This general model permitted the generation of four testable hypotheses. Each hypothesis, and a rationale for it, is noted below.

Teacher temperament was the initial variable to be considered in this research. After a careful review of the temperament literature, Bates (1989) noted that ". . .there is general agreement that temperament is manifest largely in the context of social interaction [communication]." This conclusion suggests a strong link between teacher temperament and teacher communication behavior. Hence, hypothesis 1 was advanced:

H1: Teachers' self-reported temperament is related to students' reports of their of teachers' assertiveness, responsiveness, and nonverbal immediacy.

Specifically, it was expected that, since extraversion and talkativeness are generally seen as positive in the general U.S. culture (Daly, McCroskey, & Richmond, 1977) teacher extroversion would be positively associated with all three teacher communication behaviors. In contrast, since nervousness, anxiety, and rejection of cultural norms are generally seen as negative in the general U.S. culture, it was expected that teacher neuroticism and psychoticism would be negatively associated with all three teacher that teacher neuroticism and psychoticism would be negatively associated with all three teacher behaviors.

Since a primary student source of information about a teacher is the teacher's communication behavior, influenced by the teacher's temperament, hypotheses 2 and 3 were posed:

H2: Teacher's self-reported temperament is related to students' perceptions of teachers' source credibility and task attractiveness.

Specifically, it was expected, for the reasons noted previously, that teacher extraversion would be positively associated with all four credibility and attraction measures, and neuroticism and psychoticism would be negatively associated with those measures.

H3: Students' reports of their teachers' communication behaviors are related to their perceptions of teachers' source credibility and task attraction.

Specifically, it was expected that all three communication variables would be positively associated will all four of the credibility and attraction measures since they are both influenced by teacher temperament.

The general model suggests that effective communication on the part of the teacher should result in increased learning and positive evaluation. Since our research design (described in more detail later) involved dividing students participating in the study into two separate groups (Group A and Group B) which responded to different research measures, hypothesis 4 was proposed:

H4: Teachers' self-reports of their temperament, and students' reports

(Group A) of their teachers' communication behaviors, source credibility, and task attractiveness are related to other students' (Group B) self-perceived cognitive learning, affective learning, and teacher evaluations.

Specifically, it was expected that teachers' reports of their extraversion would be positively related to instructional outcomes (reported by Group B) and teachers' reports of their neuroticism and psychoticism would be negative related to those outcomes. In addition it was expected that all three measures of teachers' communication behaviors and all four measures of teachers' credibility and task attractiveness (reported by Group A) would be positively associated with the two learning measures and teacher evaluations (reported by Group B).

METHOD

Design

The design of this study required a "by-class" data analysis. This design has been considered the "gold standard" for instructional research in Education for decades. However, it rarely has been employed in communication research. Christophel (1990) introduced this design to instructional communication research in her landmark study of immediacy and learning. This type of design is necessary when data are collected from both teachers and their students. The analyses of data in this design requires computing means for measures across all students in each class and pairing those data with data from the teacher of the class. The drawback to this design is that it reduces the sample size for data analyses to the number of classes/teachers involved in the study, regardless of how many students actually participate. The advantage to the design is that it provides much more stable student data (means and standard deviations) and reduces any possible impact from outliers in the data.

A second feature employed for the first time in instructional communication research by Christophel was use of a split-class design. Half of the students in each class were assigned to Group A and the other to Group B. She conducted a second study which employed the more common design which had all students respond to all measures used in the research. This feature permitted her to test for possible halo effects between the split-class and the more traditional design. Her results demonstrated that no halo effects were present in the more common design, since there were no statistically significant differences in the relevant results of the two studies. However, some measures in the present study were being employed that had never been tested for possible halo effects, the split-class design was employed to avoid those considered to be the potentially most serious problem--halo effects between measures of perceptions of teachers' communication behaviors, perceptions of source credibility, and perceptions of task attraction with self-reports of perceived cognitive learning, affective learning, and teacher evaluation.

Procedure

As a result of the two design features noted above, three sets of participants were involved. All participants were teachers and students at a large Mid-Atlantic university. Data were collected over two semesters, with the data collected the first semester serving as a pilot (Valencic, 2001) for the larger study. The data from the pilot study and the second semester data were merged to provide the data for this report.

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Data were collected during the last three weeks of the course, with teachers and both groups of students responding to the research measures simultaneously. All classes employed in this research were considered "small" classes, meaning only classes enrolling less than 40 students were included. The average number of students in each participating class was 24. Large lecture classes were not included because the nature of instruction in such mass-lecture classes is sufficiently different from that in small classes that it could introduce substantial error in the research design.

Participants

The first set of participants were 93 teachers (each one teaching one class in the study) who volunteered to participate in this study, along with the students in their classes. Teachers completed three measures of the temperament variables: extraversion, neuroticism, and psychoticism (the BIG THREE).

Students who volunteered to participate (non-volunteers did not participate) in each of the classes taught by these teachers were divided randomly into two groups. Group A (N = 1123) responded to measures of teacher communication behaviors (assertiveness, responsiveness, and nonverbal immediacy) and measures of teacher source credibility and task attractiveness. Group B (N = 1138) responded to measures of self-perceived cognitive learning, affective learning, and teacher evaluation. An additional 27 students and two teachers failed to provide complete responses to the measures employed. These individuals were dropped from the study and are not reflected in the sample sizes noted above. Some students also misinterpreted the nature of our measure of self-perceived cognitive learning and reporting learning more from their teacher than they could have from an "ideal" teacher. These students (N = 23) also were dropped from the study, and are not represented in the sample sizes reported above.

Measures

Temperament. The short-form, self-report, measures for the BIG THREE temperament variables advanced by Eysenck (1947, 1990) were employed: extraversion, neuroticism (Eysenck & Eysenck, 1985), and psychoticism (Eysenck, Eysenck, & Barrett, 1985). Eysenck (1990) has argued that these three variables represent "super traits" which extend influence on virtually all personalities. His research indicates that these traits are genetically based. While some argue that they may be in part or wholly learned, both Eysenck and his critics agree that these are dominant trait variables which have been found to influence many human behaviors. Communication researchers have found them to be highly associated with numerous communication related variables (McCroskey, Heisel, & Richmond, 2001), many of which have been found to be important in the instructional environment. In previous research response options provided have included 2, 3, 5, or 7 choices. In the present research three choices were presented: 1) Agree, 2) Undecided, 3) Disagree. The alpha reliability estimates for the three dimensions of temperament in this research were extraversion, .76; neuroticism, .83; and psychoticism, .55. The relatively low reliability observed for the psychoticism measure was consistent with similar observations reported in previous research. Only the teachers completed this instrument. Given the low reliability of the measure of psychoticism, and the impact of low reliability on Type II error, it should be expected that the magnitude of relationships of psychoticism and other measures in this study are very conservative estimates of any "true" relationship.

Nonverbal Immediacy. The observer-report version of the revised teacher nonverbal immediacy measure recommended by McCroskey, Richmond, Sallinen, Fayer, & Barraclough (1995) was employed in this research. This measure included ten items with five-step response options. The alpha reliability estimate for this measure in the current research was .81. Only students in Group A completed this instrument.

Socio-Communicative Style. The socio-communicative style construct includes two primary components, assertiveness and responsiveness. The observer-report version of the assertiveness-responsiveness measure (Richmond & McCroskey, 1990) was employed in this research. Each dimension was measured by ten seven-step, bipolar scales. The alpha reliability estimates for two components of this instrument in this research were assertiveness, .84 and responsiveness, .93. Only the students in Group A completed this instrument.

Source Credibility. The source credibility measure advanced by McCroskey & Teven (1999) was selected for use in this research. This instrument provides measures for student perceptions of three dimensions of their teachers' source credibility: competence, caring/goodwill, and trustworthiness. Each dimension measure included six seven-step bipolar scales. The alpha reliability estimates for these three measures in this research, respectively, were .86, .92, and .88. Only the students in Group A completed these measures.

Task Attractiveness. McCroskey and McCain (1974) developed a frequently used instrument for measuring three dimensions of interpersonal attraction. Only the task dimension was employed in this research. A six-item, seven-step version of the measure was administered. The alpha reliability estimate for the measure in this research was .77. Only the students in Group A completed this measure.

Teacher Evaluation. The measure of teacher evaluation consisted of eight bipolar, seven-step scales. Four of these were directed toward general attitude toward teacher and four were directed toward the student's willingness to take another course with the teacher (McCroskey, 1994). The alpha reliability estimate for this measure in this research was .97. Only the students in Group B completed this measure.

Affective Learning. The measure of affective learning consisted of eight bipolar, seven-step scales. Four of these were directed toward the students affect for the content of the course and four were directed toward the student's willingness to take another course in same content area as the course in which the data were collected (McCroskey, 1994). The alpha reliability estimate for the measure in this research was .92. Only the students in Group B completed this measure.

Cognitive Learning Loss. Students' perceptions of their cognitive learning were measured by a self-report instrument which required students to respond to two items (Richmond, McCroskey, Kearney, & Plax, 1987). The first item asked students, "On a scale of zero to nine, how much did you learn in this class, with zero meaning you learned nothing and nine meaning you learned more than in any other class you've had?" The second item asked, "How much do you think you could have learned in this class had you had the ideal instructor?" By subtracting the score from the first item from the second item, a "learning loss" score was created. This instrument has been widely used in instructional communication research when employing classes in different subject matters, since creating comparable exams for courses across multiple disciplines would not be feasible (McCroskey & Richmond, 1992). Given the single-item nature of the measure, alpha reliability estimates can not be computed. However, the test-retest reliability of this approach has been found (Richmond, McCroskey, Kearney, & Plax,

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1987) to be satisfactory (.85). In addition, the validity of the instrument in predicting actual student learning in an experimental study has been established (Chesebro & McCroskey, 2000). Only the students in Group B completed this instrument. Because of the nature of the scoring of this instrument, more negative correlations indicate increased learning less. Hence, positive correlations of learning loss with other variables reflect negative associations and negative correlations reflect positive relationships.

Data Analyses

The hypotheses each involved relationships of one (or more) group of variables with one (or more) other group of variables. Canonical correlation analyses, therefore, were the most appropriate way for examination of our data (Hatcher & Stepanski, 1994, p. 523). As a result, except for generation of basic statistics (see Table 1 for the means and standard deviations for all variables), all of the results are interpreted through the results of canonical analyses.

	1	Laonney Estimates 101	wieasures
Measure	Mean	S.D.	Alpha
Temperament Variables			
Extraversion Neuroticism Psychoticism	22.4 15.3 16.1	3.87 4.23 2.60	.76 .83 .55
Communication Behavior Variables			
Nonverbal Immediacy Assertiveness Responsiveness	30.3 49.9 51.4	4.42 6.03 8.00	.81 .84 .93
Credibility/Attraction Variables			
Competence Goodwill/Caring Trustworthiness Task Attraction	36.3 32.6 34.9 36.0	3.19 4.36 2.71 2.73	.86 .92 .88 .77
Outcome Variables			
Affective Learning Learning Loss Teacher Evaluation	43.1 .99 46.4	6.50 .90 7.99	.92 NA 97

TABLE 1 Means, Standard Deviations, and Alpha Reliability Estimates for Measurements

RESULTS

The first hypothesis predicted that teachers' reports of their own temperament would be related to students' reports of the teachers' communication behavior. The canonical correlation analysis of these two sets of measures confirmed this hypothesis. One canonical correlation ($r_c = .44$) was statistically significant [F(9, 211.89) = 3.05, p<.002, Wilks' Lambda = .74]. As noted in Table 2, all three of the communication behavior measures were substantially correlated with their canonical variable. Extraversion was the dominant contributor to the temperament canonical, with psychoticism making some contribution. Neuroticism made no contribution. High extraversion and low psychoticism predicted higher scores on all three communication behavior variables.

The second hypothesis predicted that teachers' reports of their own temperament

Behavior Measures with Their C	anonical Variables	
Temperament Canor	nical 1	
Extraversion	.91	
Neuroticism	01	
Psychoticism	41	
Communication Behaviors	Canonical 1	
Immediacy	.69	
Assertiveness	.70	
Responsiveness	.65	

would be related to students' evaluations of their teachers' source credibility and task attractiveness. The canonical correlation analysis of these two sets of measures confirmed this hypothesis. One canonical correlation (r_c =.36) was statistically significant [F(12,227.83) = 1.81, p < .05, Wilks' Lambda = .79]. As noted in Table 3, extraversion was the dominant contributor to the temperament canonical, and psychoticism was moderately associated. Neuroticism made no meaningful contribution. All of the evaluation measures were associated with the credibility/ attraction canonical variable. Goodwill/caring was strongly associated, trustworthiness and task attractiveness were substantially associated, and competence somewhat less associated. High extroversion and low psychoticism predicted higher scores on all four of the credibility/attraction measures.

TABLE 2

TABLE 3 Correlations of Temperament and Credibility/Attraction Measures with Their Canonical Variables

Temperament Canonic	al 1	
Extraversion	.82	
Neuroticism	.03	
Psychoticism	57	
Credibility/Attraction Can	onical 1	
Competence	.37	
Goodwill/Caring	.91	
Trustworthiness	.51	
Task Attractiveness	.66	

The third hypothesis predicted that students' reports of teachers' communication behaviors would be related to their evaluations of the teacher's source credibility and task attractiveness. The canonical correlation analysis of these two sets of measures confirmed this hypothesis. Two canonical correlations were statistically significant. The first canonical correlation generated an r_c =.86 [F(12,227.83) = 20.64, p<.0001]. The second generated an r_c =.64 [F(6,174) = 10.19, p<.0001]. Wilks' Lambda for this analysis was .14.

Examination of the first canonical variable (see Table 4) indicates that students' perceptions of increased responsiveness and nonverbal immediacy were strong predictors of increased credibility and task attractiveness, particularly goodwill/caring

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and trustworthiness. Examination of the second canonical variable indicates that higher assertiveness was a strong predictor of both higher competence and higher task attractiveness. Nonverbally immediate and responsive teachers were seen as more competent, caring, trustworthy, and task attractive, while assertive teachers were seen as more competent and task attractive.

Communication Behavior	Canonical 1	Canonical 2	
Nonverbal Immediacy	.77	.25	
Assertiveness	.33	.94	
Responsiveness	.92	37	
Credibility/Attractiveness			
Competence	.61	.66	
Goodwill/Caring	.99	04	
Trustworthiness	.73	09	
Task Attractiveness	.63	.71	

TABLE 4
Correlations of Communication Behavior and
Credibility/Attraction Measures With Their Canonical Variables

The final hypothesis (H4) predicted that teachers' temperament (provided by the teachers self-reports), perceptions of teachers' communication behavior, teachers' credibility, and teachers' task attractiveness reported by students in Group A would predict the learning and teacher evaluation outcomes reported by the students in Group B.

The canonical correlation analysis of these two sets of measures confirmed this hypothesis. Two canonical correlations were statistically significant. The first canonical correlation generated an r_c =.79 [F(30/235.49) = 4.92, p<.0001]. The second generated an r_c =.54 (F(18,162) = 2.30, p<.01]. Wilks' Lambda for this analysis was .24.

Examination of the first canonical variable (see Table 5) indicates that higher teachers' extroversion, Group A students' reports of higher teacher nonverbal immediacy, task attractiveness, competence, goodwill/caring, and to a lesser extent responsiveness and trustworthiness, were predictive of reduced learning loss, higher teacher evaluation, and to a lesser extent, higher affective learning. Examination of the second canonical variable indicates that higher affective learning was predicted by teachers' lower neuroticism, and Group A students' reports of higher teacher responsiveness, and higher goodwill/caring.

DISCUSSION

A six-component general model of instructional communication was advanced. The research reported above tested linkages among four of these components: Teacher temperament, student perceptions of teacher communication behaviors, student evaluations of teachers' source credibility and task attractiveness, and instructional outcomes. Four hypotheses regarding relationships among these components were generated. All of the hypotheses were supported by the results of the research.

It is important to note that expectations for a negative relationship between neuroticism and student perceptions of teachers' communication behaviors, source credibility, and task attractiveness were not confirmed. However, the expectation that neuroticism was negatively associated with affective learning was confirmed. This relationship was observed on the second canonical variable related to instructional

Teach	er Temperament, Communication			
Behav	ior, and Credibility/Attractiveness	Canonical 1	Canonical 2	
	Extraversion	.31	06	
	Neuroticism	.12	40	
	Psychoticism	05	.24	
	Nonverbal Immediacy	.84	.09	
	Assertiveness	.68	.30	
	Responsiveness	.44	.56	
	Competence	.75	.14	
	Goodwill/Caring	.76	.43	
	Trustworthiness	.45	04	
	Task Attractiveness	.83	.02	
Outcom	mes			
	Learning Loss	99	.13	
	Affective Learning	.58	.66	
	Teacher Evaluation	.85	20	

TABLE 5
Correlations of Teacher Temperament, Teacher Communication Behavior,
and Credibility /Attractiveness with Learning Outcomes and Teacher Evaluation

outcomes (see Table 5). It did not appear on the first canonical which was dominated by student perceptions of teachers' communication behaviors, credibility, and task attractiveness. Instead it appeared on the second canonical (which was negatively valenced). That canonical indicated that high neuroticism, low responsiveness, and low goodwill/caring were associated negatively with affective learning. Neuroticism measures anxiety orientations, among other things. No anxiety variables were measured in this study. Neuroticism has been found to be associated with such variables as communication apprehension, and communication apprehension has been found to be related to reduced learning in other research. Thus, our expectation for a negative impact from neuroticism was confirmed. However, it does not appear that this neuroticism was reflected directly in the communication variables included in this study. Future research is needed to probe the process by which neuroticism had its negative impact on affective learning.

The results of this research indicate that teacher temperament is manifested in teacher communication behaviors which are observable by students. These behaviors also were found to be associated with students' perceptions of their teachers' source credibility and task attractiveness, as were teachers' self-reports of their temperaments. Student perceptions of teachers' communication behaviors and student evaluations of teachers' source credibility and task attractiveness) were found to be associated with a set of instructional outcome variables (learning loss, affective learning, teacher evaluation).

The results of this research were consistent with previous research relating to the impacts of nonverbal immediacy (Richmond, Lane, & McCroskey, in press), assertiveness, and responsiveness (Wanzer & McCroskey, 1998) on learning outcomes. That is, more nonverbally immediate, assertive, and responsive teachers produce more positive instructional outcomes. By eliminating the possibility of halo effects through the design of this research, the results confirm the effects of these teacher communication behaviors are real, not a function of halo effects.

The results of this research were also consistent with previous research relating to

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the impact of teacher source credibility and task attractiveness (Myers & Martin, in press). More credible and task attractive teachers produce more positive instructional outcomes. Again, by eliminating the possibility of halo effects through the research design, these results indicate that these perceived teacher characteristics produce positive instructional outcomes that are not a function of halo effects.

One part of this research, however, was open to possible halo effects. The data that produced a strong relationship between students perceptions of teachers' communication behavior and their evaluation of teachers' credibility and task attractiveness were provided by the same group of students. This would permit halo effects to be part of the observed relationship. However, since the by-class data analysis was based on mean student reactions to each of the sets of variables in each class, rather than direct correlation of responses of individual students, the likelihood of halo effects influencing the results was substantially lowered. Future research employing the split-class methodology, where different groups of students supply each data set (communication behaviors, credibility/attraction), is needed to confirm the accuracy of the present results.

The results of this research also support the importance of the Eysenck's BIG THREE temperament variables in the instructional environment. Teacher self-reported temperament was involved in the prediction of all of the student-supplied data. Students do perceive communication behaviors related to these temperament variables, they do make evaluations of teachers' based on these temperament manifestations, and they do learn more or less as a function of their teachers' temperaments. While there is substantial data to support the belief that these temperament variables are a function of genetically produced brain systems which also are influential in people's choices of communication behavior (Beatty & McCroskey w/Valencic, 2001; Eysenck, 1990), even if these temperaments are partially or wholly learned, they are an important component of the instructional process and deserve continued consideration by instructional communication researchers.

While the model advanced in this report is presumed to be causal, it is important to recognize that this research employed only correlational analyses. While our hypotheses were confirmed, this does not prove causality. However, it does demonstrate that our presumption is viable and worthy of testing for causality in future research.

Future research is needed which will test the general model advanced here more thoroughly. Other teacher characteristics need to be examined, such as the impact of their scores on the BIG FIVE temperament variables, (extraversion, neuroticism, agreeableness, openness to experience, and conscientiousness; Costa & McCrae, 1992), other specific personality variables, and aspects of their education/educational achievement. Other instructional communication variables also need to be examined, such as teacher clarity, teaching in a second language/culture, teacher adaptability, and teacher misbehaviors. Finally, other instructional outcomes need to be considered, such as student motivation, student attendance, and student willingness to engage in extraclass communication with teachers.

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