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ABSTRACT

A study examined the power of communication apprehension, person perception, network connectedness, and course satisfaction to predict learning outcomes in a college communication course. Subjects, 81 students from a multisection course, completed a variety of self-report instruments measuring their communication apprehension levels; perceptions of teacher attraction, character, sociability, extroversion, competence, and composure; satisfaction with the course; and perceptions of class social structure. In addition, the students' final grades in the course were recorded. Canonical correlation analysis revealed that approximately 60% of the variance in learning outcomes was accounted for by the interaction of psychological and social structures. (FL)

THE RELATIONSHIPS AMONG ORGANIZATIONAL COMMUNICATION STRUCTURES AND BASIC COMMUNICATION COURSE LEARNING OUTCOMES

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by

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ABSTRACT

This study sought to examine the relative predictive power of communication apprehension, person perceptions, network connectedness, and course satisfaction in relationship to learning outcomes in a college communication course. Canonical correlation analysis revealed that 59.8% of the variance in learning outcomes is accounted for by the systemic interaction of psychological and social structures. The argument is made for a recognition of the classroom-as-a-human-system.

THE RELATIONSHIPS AMONG ORGANIZATIONAL COMMUNICATION STRUCTURES AND BASIC COMMUNICATION COURSE LEARNING OUTCOMES

London (1964) in his communication attitude survey of American colleges concluded among other things that:

(1) A first course in communication should be offered by all institutions of higher education in the United States, and

(2) A first course in communication should be required for all students seeking a bachelor's degree in all institutions of higher education in the United States.

Implicit in these excerpts from London's conclusions is the recognized value of communication as a vital part of higher education and as a viable part of any professional preparation. Further support for the belief in the value of communication courses is seen in the healthy enrollments noted by Gibson, et al (1980). Based on survey responses from 554 junior colleges, colleges and universities, Gibson and others reported that 53% of colleges of education, 50.3% of colleges of business, and 45% of colleges of arts and science required a basic speech communication course of their majors. Furthermore, the researchers said that 95% of respondents reported enrollments in communication courses growing at a rate equal to or greater than their institution enrollments, and 62% believed the course to be a heavy financial contributor to departmental and institutional support.

Given speech communication's recognized value and growth, one would expect concensus among the experts as to what the basic course should produce. Clearly, communication knowledge and skills would be a part of professional preparation. Nevertheless, there is some disagreement

as to how to predict what variables contribute to success in a basic communication course. Conville (1976) noted two problematic areas of concern regarding academic success in a basic communication course. Specifically, Conville noted that (1) substantial predictor variables of success have not been isolated and (2) theoretic explanations for results of predictive models have not been developed. These observations are well confirmed by professional research literature.

Previous Predictive Models

Judd and Smith (1969), in an attempt to predict success in the basic college communication course, correlated final grades with eighteen California Psychological Inventory (CPI) personality variables, Scholastic Aptitude Test (SAT) verbal scores, SAT math scores, and grades from high school quarterly grade reports. Of the CPI variables, only flexibility yielded a significant correlation ($r = -.42$, $p < .05$). For SAT verbal scores, the Pearson product moment correlation (r) was .07, for SAT math, r was .45. There were problems, however, in the data reported by Judd and Smith. First, the regression model only accounted for 25% of the cumulative variance, casting some doubt on the power of the model; and second, the sample was quite small ($n = 31$).

Hall (1970) used three performance variables and eight instructor-reported evaluation items to predict final exam and final course grade. The only significant effect obtained was the correlation between SAT verbal scores and final exam grades ($r = .35$, $n = 87$). The variance accounted for was negligible ($r^2 = .12$).

Burgoon (1971) studied the willingness to manipulate others (Machiavellianism) as related to final speech communication grade. Burgoon found that Machiavellianism was a significant single predictor in a course

in dyadic and small group communication ($r = .40$, $n = 207$), but was not related to success in a public speaking course ($r = .09$, $n = 134$).

Hayes and Morganstern (1977) generated a series of nine noncognitive variables including demographics such as age, sex, and year in school as well as speech anxiety and speech experience as predictors. These predictors were used in a forward stepwise regression with the final grade in the course as the criterion. The regression model accounted for an accumulated variance of only 12% in predicting final grade.

While each of the four models discussed above describes some aspect of communication achievement, little variance to date has been accounted for by academic and personality factors. Nor are high school grade point averages a signficant predictor (Judd & Smith, 1969). Interestingly, with the exception of Conville's (1976) unpublished homophily research, little or no emphasis has been accorded communication variables in predicting academic success in a communication course. The neglect is anomalistic in view of that which is being studied. Certainly the potential exists to engage the use of operative communication variables to analyze success in a communication course. For reasons discussed below, it is believed that the appropriate perspective was offered from the area of study known as organizational communication.

Organizational Communication

Under the broad areas of investigation studied in human communication, organizational communication is a highly eclectic discipline, Hurt (1978) defined organizational communication as the study of communication and the structural context in which it occurs. Traditionally the focus of organizational communication has been business and industry. In other words, most organizational communication research relates to employee-superior

relationships and other aspects of communicating in a business setting (c.f.,Fisher, 1981; Goldhaber, 1979; Rogers & Rogers, 1976). However, a much broader spectrum of study of communication in structural contexts is deemed appropriate by some organizational communication scholars. The broader view holds that organizational communication is the study of any human system, where a human system is any group of people associated for some purpose (c.f., Hurt & Cook, 1979; Rogers & Shoemaker, 1971). That purpose might be work, security, collective productivity, or learning.

The belief of communication scholars is that human systems tend to be self-organizing (Berlo, 1977). In other words, when humans form a group, formally and/or informally, a structure evolves. Further, as the group encounters problems or needs, the structure of the human system organizes a response unit (Clark, 1968; Zaltman, Duncan, & Holbeck, 1973); hence, new communication structures are continually evolving.

Organizational communication structures have been studied through differing levels of analysis, including the differences in individuals, communication links between/among individuals, and the subsequent formal and informal organizational structures which develop (Aiken & Hage, 1966; Aldrich & Herke, 1977; Goldhaber, Yates, Porter & Lesniak, 1978; Hage & Aiken, 1969; Hurt, Joseph & Cook, 1977; Richetto, 1977; Rogers & Rogers, 1976). Of course, for empirical grounds, any atomistic addition to existing knowledge is of some use, but a descriptive model containing a broad explication would be most useful.

Hurt (1978) offered such an encompassing perspective. His research suggested a triad of "structures" in the context of organizational communication. There is, of course, the physical structure: "the material components of and the spacial location of subunits within human organizations" (Hurt, 1978, p. 4). Secondly, there is a social structure:

"the formal composition of subgroups or units within an organization which govern horizontal and vertical communication flow" (Hurt, 1978, p. 4). Finally, there is a psychological structure to an organization: "consistent patterns of perception" among individuals and subunits of the human system which mediate individual responses to, and productivity within, the system (Hurt, 1978; Inkson, Hickson, & Pugh, 1967; Hurt & Tiegen, 1977; Hall, 1963). Figure 1 illustrates the dynamics of the posited structure. The concept is that members of an organization bring to the system a structure which then evolves in response to the behaviors which are a part of any system organized for some purpose. The result is that all the patterns of perception which mediate responses in combination and interaction with the subgroup composition and spacial location interdependently effect one another (see Figure 1).

While there is an impact from physical structure, this aspect is de-emphasized in light of other structures in the triad. Conceding direct effects of proximity on contact with others, it would seem the communication links and the perceived structure of the system (social and psychological structures, respectively) probably have a more powerful impact on communication behavior. In any event, this triadic structure offers a more broadly based perspective for organizational communication study as the study of a unified purposive group.

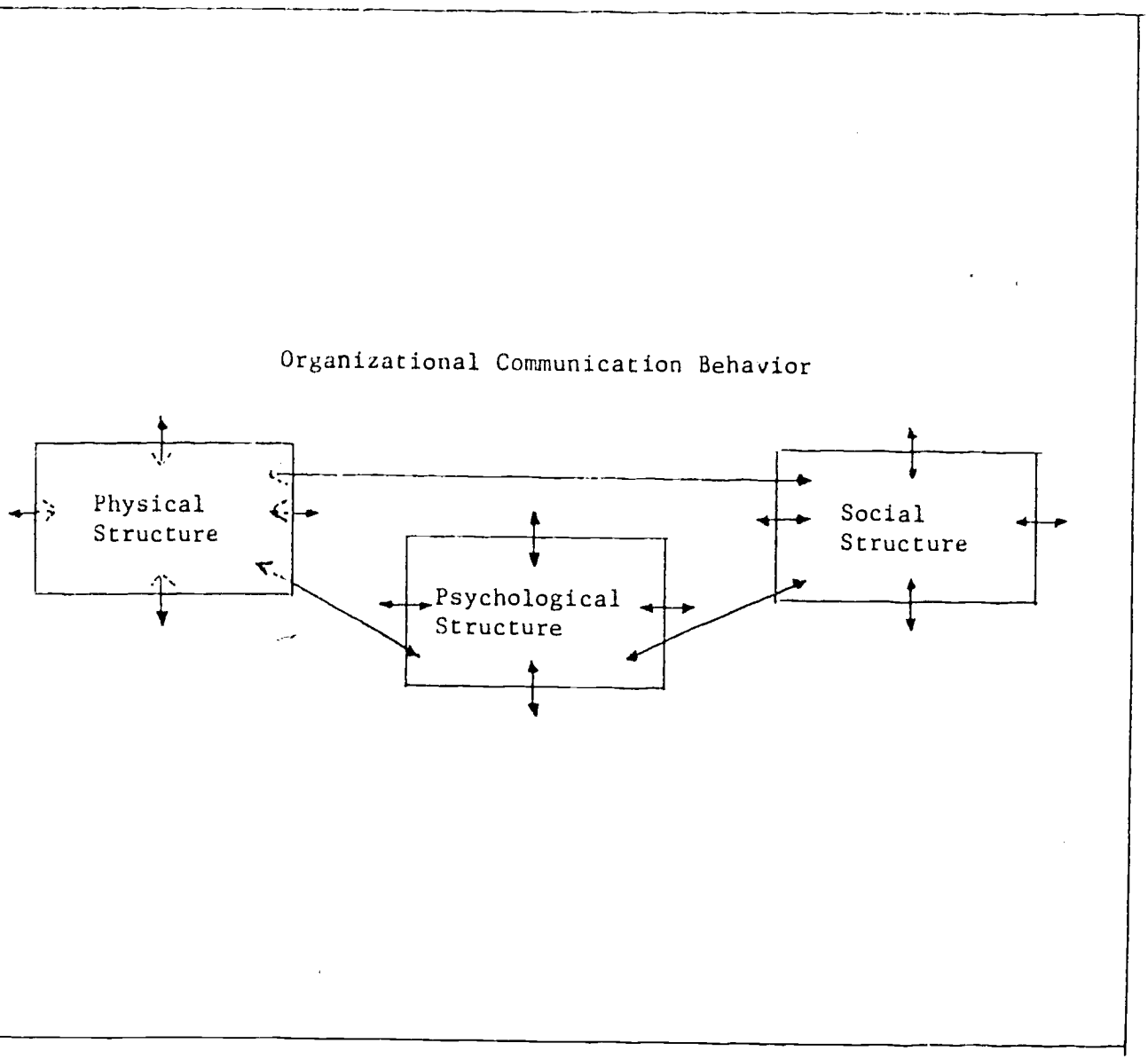

Fig. 1--Hurt's Structural Interaction Model of Organizational Communication. (Source: Hurt, 1978, p. 10)

Organizational and Instructional Communication: A Perspective

The study of communication in the classroom and the study of structured communication are intimately related. From the aforementioned broad perspective of organizational communication as a purposive human system, a classroom fits the definition. While the social structure is rarely complex in terms of formal subunits, a hierarchy exists. Furthermore, students and teachers bring with them and develop patterns of perception and orientations to communication demands which do in fact mediate responses to productivity requirements imposed by the system. It stands to reason that in a classroom which demands a great deal of interaction, communication structures would form; perceptions of the instructor as an information source would evolve, as would a social network, and resultant affect associated with this work environment would also develop. Hence, just as it is with any purposive system, so it is with a classroom. Communication elicits and is elicited by developing relationships and perceived relationships.

From this theoretic perspective one can see the appropriateness of the application of an organizational communication model. This model is most applicable in a high communication demand setting. In other words, the greater quantum amount of communication required in a class, the more applicable the model would logically be. Each of these applicable structures and variables described in the model will be amplified below.

Specific Elements of the Organizational Communication Model

Based on the work of Hurt and Tiegen (1977; 1978) and observations as to which variables seem operative in the classroom (Hurt, Scott, & McCroskey, 1978), certain variables were chosen to describe the psychological structure

of the classroom organization. Using the methodology developed by Bernard and Killworth (1973), a network analytic technique was selected to define classroom social structures. The broad research question is thus phrased:

R: Do the psychological and social structures of a speech communication classroom combined with the interactive effects of those structures and perceptions of course satisfaction predict learning outcomes in a college course in communication fundamentals?

Psychological Structure

Orientation to communication. One of the single most significant types of orientation to communication in instructional communication research has been found to be communication apprehension. Oral communication apprehension is a learned, generalized fear or anxiety associated with real or anticipated communication events (McCroskey, 1977). Oral communication apprehension has been shown to substantially affect success in organizations (Scott, McCroskey, & Sheahan, 1976), but the classroom effects are also well known. McCroskey (1975) found, based on data collected from nearly twenty thousand college students, that 20% of the people in university student populations suffer from high degrees of oral communication apprehension. This high oral communication apprehension can interfere with functioning in an academic environment.

McCroskey and Andersen (1976) found high communication apprehensives scored significantly lower than low communication apprehensives on the composite, social science subscore, science subscore, mathematics subscore, and English subscore of the American College Test (ACT). In the same study high communication apprehensives averaged one-half a grade point lower on a four point scale than low apprehensives. Furthermore, McCroskey and Andersen (1976) noted that low and moderate communication apprehensives preferred small classes while high communication apprehensives preferred mass lecture classes.

High communication apprehensives also sought help from available tutors less often (Scott, Yates, & Wheeless, 1975). McCroskey and Sheahan (1976) found that college students had a more negative attitude toward school if they were highly apprehensive about communication. The same pattern was found for junior high students (Hurt & Preiss, 1978).

The negative learning effect has been well documented as it relates to communication apprehension (Scott & Wheeless, 1978) and thus oral communication apprehension is an eminently appropriate variable. If communication apprehension is low, learning outcomes should logically be high.

Orientation to communication is but one aspect of the psychological structure. Since teachers serve as information sources in classrooms, the way in which that information source is perceived by students has a significant impact upon information flow.

Perceptions of teachers as an information source. Certain person perception variables, when operative, tend to increase the likelihood that the sending and receiving of messages will be successful. These perceptions of credibility and interpersonal attraction, were therefore incorporated into the study of the psychological structure of communication classrooms.

Organizational researchers have found that the credibility of information sources is extremely important to human interaction, particularly in a superior-subordinate relationship. Perceived credibility of supervisor has been found to increase satisfaction in human systems (Falcione, 1973, 1974, 1974a, 1975). Credibility is a perception which elicits trust, belief, and confidence, and thus people tend to rely more on information from a credible source. Analogous to this organizational communication perspective, a teacher as an information source, if credibly perceived, would evoke more information seeking by students (Hurt, Scott, & McCroskey, 1978). There are five dimensions of credibility used in contemporary communication

research: competence; composure, or emotional stability; sociability, a friendliness dimension; character, or perceived reliability of the message source; and extroversion, a dynamism dimension (McCroskey, Holdridge, & Toomb, 1974; McCroskey, Jenson, & Valencia, 1973). The amount of credibility of a supervisor is a multidimensional expression of trust. The greater the generic credibility, the greater the receptivity to communication (Scott & Powers, 1978). There may be, however, qualifications to this general effect of credibility and receptivity. Each of the five dimensions of credibility may be considered a continuum. At the extreme end of each continuum, receptivity to teacher interaction may decline, subsequently input and output will decrease (Hurt, Scott, & McCroskey, in press). This proposed inverted parabolic function works as follows. In the case of competence, an extremely incompetent information source will not be well received; yet, if a teacher were perceived as too competent, students might also tend to avoid interaction. The same might be said of composure. A teacher who is lacking in composure may reduce students' receptivity, but an extremely composed teacher would be seen as cold or impersonal and thus negatively impact receptivity. A teacher who is not perceived as sociable would be poorly received, but if too sociable, students may look on the teacher as a peer and thus reduce interaction effectiveness in the classroom. The case could also be made for the extroversion dimension. A teacher without dynamism would not be well received, but it is also believed that one can be too dynamic (Wheeless, 1982). It is presumed that the character dimension of credibility is linearly related to positive outcomes since it seems unlikely that one could be too reliable.

Members of a human system also often develop interpersonal bonds with a supervisor. This attraction develops as a result of communication exchange

(Falcione, McCroskey, & Daly, 1977) and, conversely, the amount of communication exchanges are strongly related to attraction (Bercheid & Walster, 1969). Since interaction with classroom teachers is predictive of success in class (McCauley, Bruiniks, & Kennedy, 1976; Hurt & Cook, 1979a), the "functional and entity relations" (Locke, 1976) between students and teachers become a mediating factor. Therefore, interpersonal attraction to teachers facilitates the communication climate. The most common conceptualization of attraction is a triad of attraction constructs: physical attraction, or the perceived physical characteristics which enhance bonding; social attraction, or an affective response to a person in a variety of social settings; and task attraction, or desire to perform required work with a person.

Both the five dimensions of credibility and the three dimensions of attraction have been deemed appropriate predictor variables defining the psychological structures of classrooms because of their positive impact on interaction. These perceptions and the orientation to communication also affect students' tendencies to interact with one another as well as with the teacher.

Social structure. The social structure of an organization has been defined as "the arrangement of the differentiated individuals that can be recognized in the patterned communication flows in a system" (Rogers & Kincaid, 1981, p. 346). Herein, one examines the degree of association or perceived communication "distances" among members of a human system. This social structure is defined by communication roles and developing relationships which indicate how much a part of the system an individual may be. In a high communication demand setting an individual would have to be well integrated into the communication patterns to maximize rewards from the system (in the case of a classroom, learning). Network analysis is most

commonly used to study such social structures (Rogers & Kincaid, 1981).

Given that psychological and social structures mediate communication flow in classrooms, organizational communication behaviors and consequences of these behaviors result from the psychological-social structural interaction. One such organizational communication behavior variable shall be called "adjusted orientation to communication" (AOC); the other is a consequence of organizational communication behaviors called "course satisfaction."

Resultant Structure Interaction Variables

AOC. Oral communication apprehension frequently results in an avoidance of interaction. However, when persons become a part of social structures, and they are integrated to some degree or another in such structures, communication is affected by this degree of their integration. Thus, the raw PRCA score must be reduced to adjust for the impact of social integration. A detailed explanation of this mathematical model will be seen in this paper under the operationalization of the model.

Course satisfaction. Positive patterns of perception of the teacher as an information source, combined with low anxiety about communicating, high integration into the social system, and the resultant AOC should all logically lead to positive affect associated with being a part of a class. The analog to satisfaction with the class in the organizational communication literature is a perception en toto of the task demands of the work environment. This element of organizational satisfaction reflects the feelings toward required work of a purposive human system (Hurt & Tiegen, 1977; McCroskey, Daly, & Falcione, 1977; Smith, Kendall, & Hulin, 1969). Given this similarity between organizational communication and instructional communication, adapting job satisfaction to a course satisfaction construct is a simple way to incorporate this variable as a viable factor in predicting performance.

To predict performance, it was also necessary to operationalize performance criteria. Hence, the criterion variables were defined as follows.

Criterion Variables

Learning outcomes. In previous studies the most often used yardstick for learning outcomes in a communication course was, quite obviously, final grade in the course. This seems appropriate in light of the fact that final grades were the only traditional outcome measure available to these researchers. Although Hall (1970) included final exam grades as well as final grades, he could find no significant correlations with these indexes. In a study by Hurt and Muse (1982) a second possible outcome measure was used. The particular scale to which the above refers was a simple Likert type scale of items which represent anticipated utility of knowledge of, or positive affect associated with, learning the material taught in the course. This learning utility scale was designed for foreign language learning. It was proven reliable (internal reliability measures ranged from .83 to .93 in the study for this three dimensional scale) and has been shown to have criterion related validity (Hurt & Muse, 1982). The scale was easily adapted to communication learning utility by replacing key phrases (e.g., "foreign language basic course" becomes "basic communication course").

The adaptation of foreign language learning to communication learning outcomes was appropriate because Hurt and Muse (1982) noted the link between communication variables and foreign language and because frequently foreign language classes have oral demands, just as communication classes do.

The use of this adapted learning utility measure and final grades were chosen as the dual index of learning outcomes.

Descriptive model. From the explication above, a clear delineation of the predictive organizational communication model has been developed. The psychological and social structures of college communication classrooms leads to certain interaction effects, all of which in turn are predictive of learning outcomes measured by the learning utility scale and final grade (see Figure 2).

Method

To test the model illustrated in Figure 2, data were collected and subjected to a canonical correlation analysis. The data were collected by various means; questionnaire, card sort, and final grade sheets, and were incorporated into the model.

Questionnaire Data

All self report instruments were prepared and administered to students. Subsequently, odd-even correlations were performed on all scales to obtain reliability estimates. The self-report instruments and obtained internal reliability estimates for these data were PRCA College, .91; perceived teacher physical attractive, .87; perceived teacher task attraction, .83; perceived teacher competence, .86; perceived teacher composure, .81; perceived teacher character, .83; perceived teacher sociability, .83; perceived teacher extroversion, .83; perceived satisfaction with course task demands, .89; and perceived speech learning utility, .80. Each scale has been validated in previous research. McCroskey (1970) has demonstrated the validity of the PRCA. Credibility dimensions have been validated by McCroskey, Holdridge, and Toomb (1974). The attraction scales have been examined and validated in the work of McCroskey and McCain (1979). Course satisfaction was operationalized as subjects' scores on a scale adapted from the job

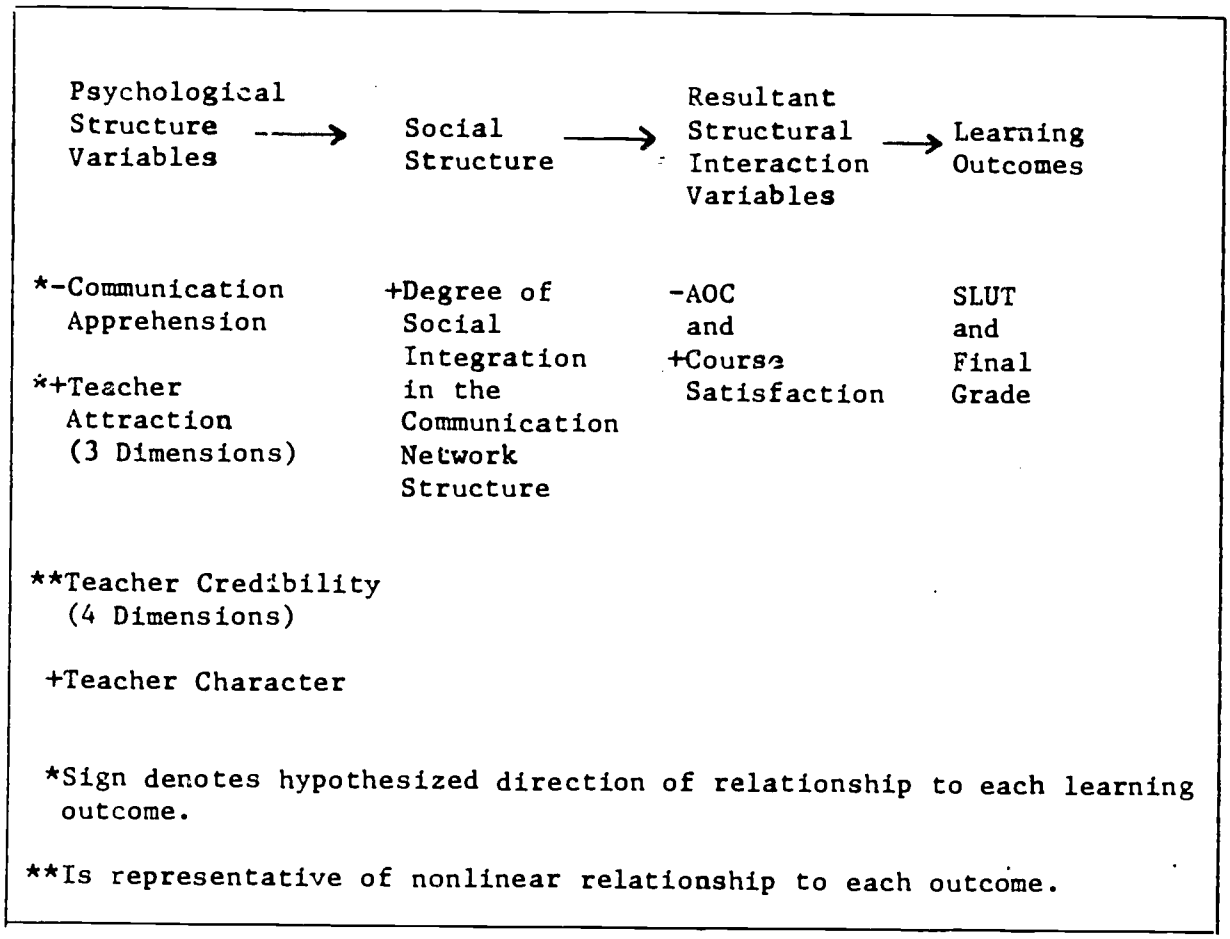

Fig. 2--Summary Statement of Hypothesized Relationships in Order of Occurrence.

satisfaction scale developed by Smith, Kendall, and Hulin (1979). The original scale included five dimensions of job satisfaction: satisfaction with own work, supervisor, pay, promotion, and coworkers. The one dimension of satisfaction with own work (adapted to communication course work) was engaged. This scale was comprised of four 5 interval Likert type items. Student perceptions of learning utility for the course were operationalized based upon an adaptation of the foreign language learning outcome scale. The thirteen items employed were 5 interval Likert type items which were adapted to refer to communication learning. This speech learning utility test (SLUT) was found to be one dimensional in factor analytic procedures.

Network Analytic Procedures

The social structure of the classrooms tested were operationalized based on the network analysis procedure CATIJ (Bernard & Killworth, 1977).

A class roll was obtained from each teacher. Then a network card set was prepared for each subject and the class instructor. The subjects were each assigned a three digit number. Thus, for each card set the subjects found one card representing each member of the class and the instructor. The three digit number sequence began with the teacher, coded as number 001, and then the class roll was alphabetized and numbered from 002 through nnn. All subjects received a stack of cards representing the members of that class. Each card contained a subject's three digit number, subject name, and student number. The teacher card for each set had only the instructor's name and the number 001. Both students and instructors reported this data.

Subjects were asked to sort the cards into four stacks. Each stack represented a different amount of communication interaction about the task aspects of the basic course in which they were enrolled. Stack I represented those people to whom the subjects talked "a lot" about the course. Stack II represented those people to whom the subject spoke "some" about the course. Stack III represented those people to whom the subject talked

"hardly any" about the course. Stack IV represented those people to whom the subject talked "very little or not at all" about the course. The labels of the four stacks were taken from Bernard and Killworth (1973). Subjects then rank ordered the cards in each stack from most to least. The result was a rank ordering of the amount of interaction each subject had with every other student and/or instructor in the class. Although these four individual stacks have no value in terms of the CATIJ network analytic procedure, they make it easier for each subject to discriminate among all other members of the class when generating the totally ranked system (Bernard & Killworth, 1977). Following completion of the ranking procedure, subjects then recorded their rankings of the three digit numbers on their own name cards. These records were then transferred to IBM computer cards for analysis by the CATIJ network analysis program. Each class was analyzed separately. The critical numerical values being sought provided a degree of social integration (DSI) score. This score is an index of an individual's connectedness within his class network.

The formula for indexing individual connectedness is a ratio measure.

$$\text{Individual Connectedness} = \frac{\text{Number of 1st and 2nd Choices}}{N-1}$$

First and second order choices are defined below and were obtained through the network program CATIJ. The denominator of the ratio was used to reduce the artificial effects of network size (Rogers & Kincaid, 1981).

In order to generate the number of first and second row choices made by each individual subject used in the social integration ratio, the CATIJ network analysis program initially generates a minimal distance matrix (MINIJ). MINIJ defines the shortest information routes between any two unique pairs of elements in a system under analysis. The "length" of an information distance between two such elements is defined in terms of the number of intermediaries which separate the two elements, and the number of

these intermediaries is also used to define what is referred to as a "row choice." Thus a first row choice exists between elements A and B when A interacts with B with no intermediaries. A second row choice exists between elements A and B when A interacts with B through one intermediary, and so forth. Thus, a row choice is defined by M-1 where M equals the number of elements in the interactive group under investigation.

Second row choices were included in the numerator following a recommendation by Rogers and Kincaid (1981) who argued that total element connectedness must include links with other elements which contain no more than a single intermediary (Rogers & Kincaid, 1981). These first and second row choices and the n-1 denominator were recorded for each student by his/her student number and punched on IBM computer cards for processing.

Photocopies of final grades listed by student number were obtained by each instructor and letter grades were assigned a numerical value based on a five point scale such that A = 5, B = 4, C = 3, D = 2, and F = 1. Grade values and student numbers comprised the third data set and these were punched onto the IBM computer cards used to record first and second row choices of the network data set.

Derived Score: Adjusted Orientation to Communication

The adjusted communication apprehension score (AOC) was defined as PRCA X (1-DSI). This variable was designed to take into account the impact of social integration on subjects' communication apprehension. This unique approach to effects of social integration on communication apprehension was based upon research reported by Hurt, Scott, and McCroskey (1978) and Hurt and Preiss (1978). Results of these researches have indicated that although communication apprehensives experienced anxieties about interacting, they nonetheless had the same desires to interact as did non-apprehensive

persons. Hurt and Preiss also reported that although the communication apprehensive subjects had a lesser degree of desired social integration than did communication non-apprehensive subjects, none of the communication apprehensive subjects were completely non-integrated into the system as McCroskey (1977) had suggested that they would be. Thus this formula was designed to account for the effects of desired social integration on subjects' PRCA score. For example, two students might have the same PRCA score of 50 yet one's apprehension leads to less integration. If student A has a PRCA score of 50 and an individual connectedness ratio of .70, his/her AOC would be adjusted thus: 50 x (1-.70) = 15. Student B might be much less integrated with an individual connectedness ratio of .30. His/her AOC would be higher: 50 x (1-.30) = 35. This derived score was calculated through SPSS computer procedures for entry into the model.

The questionnaire data set and the DSI and grade data set were merged based on student numbers and the final data set contained 81 subjects.

Subjects

The sample of 81 subjects was derived from a multi-section basic communication course at a southwestern state university with a total enrollment of approximately thirty-four thousand. The selected sample was based on location in one particular classroom in order to control for the physical environment. The assignment of five sections to the chosen classroom was based on scheduling logistics, and is considered a random element. Students were largely freshmen and sophomores. A disproportionate number of students were female (64%, n = 52). Since there were more females and since all five instructors were male, a series of one way analyses of variance were performed with sex as the independent variable, and each of the other variables discussed as a dependent variable. No significant sex effects were obtained (see Table 1).

TABLE 7

ONE-WAY ANALYSES OF
VARIANCE FOR INDEPENDENT
VARIABLE SEX

Dependent Variable	F	Probability
PRCA	3.49	.07
Physical Attraction	3.55	.06
Social Attraction	.54	.46
Task Attraction	.59	.48
Competence	.006	.94
Sociability	1.41	.24
Composure	.15	.70
Extroversion	.67	.41
Character	.96	.33
DSI	.06	.81
Course Satisfaction	.65	.42
AOC	.62	.43
SLUT	1.02	.32
Grade	1.49	.23

An examination of the one way analyses of variance shows no sex differences based on the .05 level of significance.

Course Difficulty

Because some variance in grades may be due to the relative difficulty of a communication skills course as compared to other courses, the possibility of the ease of the course having an effect was considered. By accounting for the ease of the course through the $(1-r^2)$ x criterion variable formula, that factor was controlled for. Since this study was designed to examine learning outcomes, the control of the difficulty variable became critical prior to hypothesis testing.

Parabolic Functions Adjustment

As suggested above, the credibility dimensions competence, composure, extroversion, and sociability are theoretically nonlinearly related to learning outcomes. To test this hypothesized set of relationships, a set of 8 simple regressions with each of the four credibility dimensions was performed. There were two for each criterion related to each predictor squared. The squared predictors yielded no significant regression models. To determine exactly how to enter these four credibility dimensions into the linear canonical correlation model, the same eight simple regressions were performed assuming linearity. While all models approached significance, three predictor variables were found to be positively associated with SLUT. The decision was made, therefore to enter the simple credibility variables rather than entering them in polynomial form.

Lack of Normal Distribution

While most variables in the equation were normally distributed, three were not. The grade variable was the worst offender. Ninety-one percent of the subjects (n = 74) received an "A" or a "B." Thus grades were far from normally distributed (skewness = -.518, kurtosis = .876). The SLUT

scale had a relatively narrow range (expected range = 52, actual range = 37) and a high mean (theoretical midpoint = 39, mean = 48.9). This score also was not normally distributed (skewness = -.702, kurtosis = 1.407). Finally, physical attraction was not normally distributed (theoretical midpoint 17, mean = 19; skewness = -.813; kurtosis = 1.681).

These restricted ranges were expected to have some impact on prediction particularly grades. Attempts were made to "normalize" the relationships posited for grades by converting to z-scores, converting to logarithms, and converting to trigonometric functions, but no increase in predictability of grade resulted. The grades were also weighted by instructors (section numbers). The instructors were regressed on to final grades as dummy variables, and resultant Beta weights were utilized to weight grades by instructors, again no greater prediction was achieved.[1]

Data Analysis

The predictor variables; PRCA, three dimensions of attraction, five dimensions of credibility, DSI, course satisfaction, and AOC were employed as a linear combination of predictors correlated with SLUT and grade (each adjusted by the correlation with course difficulty) in linear combination as criterion variables. The canonical correlation was performed using the SPSS subprogram CANCORR.

RESULTS

The canonical correlation model to test the research question was significant. The results, shown in Table II, revealed that there was a relationship between the criterion variables and the predictor variables when treated as linear systems. The canonical correlation coefficient between the two variable sets was .768 (R^2 = .59).

An examination of the canonical coefficients for the variables in each canonical variate set indicates that SLUT maximizes the variance

accounted for in the first set of criterion variables (coefficient = .991), while AOC, DSI, course satisfaction, perceived teacher competence, perceived teacher character, and perceived sociability are the predictors which have the highest coefficients for the second variable set. It is believed that this CANCORR model provides substantiation for the concept of a classroom-as-a-human-system.

DISCUSSION

In the case of the nonlinear relationships expected for the credibility dimensions (extroversion, competence, composure, and credibility), there was no confirmation for the inverse parabolic functions posited, although a post hoc analysis using linear regression models did result in a significant model for dimensions of credibility predicting SLUT. However, given the moderate skewness and leptokurtosis of the SLUT variable, interpretation of these three significant models is difficult. Nevertheless the three credibility dimensions (competence, sociability, and extroversion) make some logical sense when used to predict the perceived affective utility of a course. Given the distribution of the criterion variables, this logical consistency is encouraging to note. First, if a course is to be useful to a student in some meaningful way, it is apparent that the instructor of a course ought to be perceived as reasonably competent. Second, since the items of the unidimensional SLUT measure reflect affect associated with this utility, then the relationship of the sociability and extroversion dimensions of credibility to SLUT becomes more obvious. Both of these dimensions are designed to tap perceptions based upon interpersonal style and verbal behavior respectively. As Hurt, Scott, and McCroskey (1978) have alluded to, these dimensions of teacher credibility are important predictors of affective learning.

The failure to confirm the hypothesis dealing with the nonlinear relationship of four of the teacher credibility dimensions with the criterion variables is disappointing. However the failure to confirm these subhypotheses should not be taken to indicate that the original hypothesis is false. Not only can the restricted range of the criterion variables result in an artifactually reduced correlation coefficient, they can also make it extremely difficult to fit an inverted parabolic line to a limited number of data points. Thus, given the unsuccessful attempts to adjust the distribution of the criterion variable final grade, it is entirely possible that the decisions to not reject these implicit null hypotheses were actually Type II errors. Because the argument supporting the nonlinearity of the relationships between these dimensions of teacher credibility and final grades is so thoroughly consistent with previous instructional communication research, there remains an obvious and compelling need to retest the subhypotheses with final grade distributions which are accurate and reliable indicators of students' achievement in communication courses.

The result of the canonical correlation analysis also performed to investigate the research hypothesis was substantially supportive of the overall conceptual model.

The Systematic model tested by the canonical correlation viably demonstrated the conceptual and empirical utility of using organizational communication variables as a basis to describe communication classroom learning outcomes.

As has been argued in this study, a better understanding of the relationship between organizational communication variables and learning outcomes can be achieved if those variables are treated as interconnected elements of a larger system. This is exactly what the canonical correlation procedure investigates.

Clearly the contribution of the adjusted PRCA score, the AOC variable, demonstrates the worth of taking into account communication links despite anxieties. Satisfaction with task demands of the course greatly affected outcomes, but this is seen as a resultant interaction of structures. In terms of prescribing, few hard and fast precepts can be "set in concrete" at this juncture. It is logical that social integration into the task network would affect learning outcomes in a course which includes group work, as this course does. The strength of prediction of reliability (character) and competence are self evident as far as instructional communication is concerned.

The high coefficients for physical and social attraction are taken to be an index of the importance of affect in communication learning. Obviously the bonds developed between instructor and student matter, hence a teacher must be liked. On the other hand the more logical dimension of task attraction is not highly predictive of the learning outcome canonical variate. It may be that, since SLUT is the maximal criterion, that social aspects of teacher attractiveness are more important predictors in relation to the affect measured in the learning utility scale. Given that most students received an "A" or a "B," task attraction may have reduced importance here. This should not be construed to mean that the task attraction variable is not important to learning outcomes. Nor can one discount the importance of the credibility dimensions with relatively small coefficients. In a systemic model, such factors may vary, as can be seen below in some final observations.

Final Observations

It seems imperative, given the references above to the problem of the distribution of final grades and informal comments made to the researcher by course instructors, students, and the department chairperson, that a

substantial problem exists in terms of reliably evaluating the skills achievements of students in basic communication courses. Over a period of several years of teaching and doing research in instructional communication, the author has discussed this problem with colleagues in communication departments at a variety of institutions of higher education. Apparently the restricted range of final grades obtained in this study is not an unusual occurrence. This is particularly true when final grades are based at least 50% upon the evaluation of communication skills activities. Part of the difficulty stems from the large number of variables to be evaluated in a short period of time over a relatively transitory speech event. As Wilson and Arnold (1974) pointed out:

> A critic who assesses live speaking, speaking as it is delivered, deals with a distinctive critical object. What he examines, appreciates, and judges consists of a combination of sounds and actions symbolizing ideas, existing in time, air, and sight. This object is in constant flight, not static, not arrested. It is unlike some other critical objects. It is not a statue which can be placed on a pedestal and viewed on all sides. It is not a musical score not a play script which can be consulted. It is not a painting which can be gazed at for hours. It is not print which can be pored over. Speech cannot be taken in fully with either the eye or the ear alone. Ideally, it must be seen and heard--all in the moments of its creation. Like dance, it will not "freeze" for examination, and yet its verbal nature makes it seem analogous to the more stable objects of literary criticism. The contrasts go further. While it is true that a critic viewing a painting takes in first one part, then another, and the critic of music hears sounds in sequence in time, a critic of live speeches faces a more exacting assignment. He must see and hear sequences that have never before occurred in just that way. Usually he will not even have a drama critic's advantage of consulting a script before or after seeing and hearing the object he is to criticize, although occasionally this is possible with very formal speeches.
>
> A speech critic deals with a critical object which usually exists once and only once. Normally there will be no public preview of it, and there may even be no subsequent records. Speeches may be on identical subjects and in identical words, but still, exact duplication is impossible. The components of the speech situation also constantly shift. In public interviews the interviewee cannot foresee what he must next talk about until he receives the interviewer's question. The bits of talk, which may be regarded as

> small speeches, and which are a part of rap sessions, class discussions, political interchanges on television, and arbitration sessions--all of these are flexible, fluid, and in constant flux. They can never be exactly reproduced in any future place or time. But despite all of this anyone who would evaluate public speech must try to note and account for the ongoing adjustments speakers are or should be making (pp. 284-285).

Clearly communication skills evaluation is an incredibly complex and abstract task. As a result, what tends to be evaluated is not the complex or the abstract but rather the simple and concrete, such as the physical attractiveness of students, their apparent "glibness," and sometimes the instructor's prior familiarity with students who are engaged in the communication event. All of these variables play an important role in the evaluation of communication sources (Hurt, Scott, & McCroskey, 1978). Thus in many cases communication skills courses are perceived by students as "blow-off" or "lay down" courses. As several students commented, "It's impossible to flunk speech." Happily, there is a solution to the problem of communication skills evaluation. Many university and college level communication departments have begun to utilize specific behavioral objectives which are related to each critical aspect of the communication event to be evaluated. Hurt and Sawyer (cf 1982a, 1982b) reported that the use of behavioral objectives for communication evaluation purposes significantly improved the reliability of those evaluations and controlled for the undesired effects of those simple and concrete aspects of the communication skills evaluation process. Given the data obtained in this study, it should be obvious that more systematic instructional research efforts should be devoted to the development and utilization of such behavioral objectives.

Finally, it must be pointed out that in spite of the success of the canonical correlation analysis, it should not be assumed that this model is generalizable to other communication courses or noncommunication classes. This is not the fault of the sample selected for use in this study nor of

the analytic procedures employed. Rather, it is a function the artificially static nature of the correlation matrices and the dynamic characteristics of human systems. All other things being equal, it would be highly unlikely to exactly reproduce the matrices upon which canonical analysis was based. Unless the reproduced matrices are identical with the original, the magnitude of contribution of individual variables to the total system will vary. In addition, classrooms, as do all human systems, change and alter their structure over time (cf., Rogers & Kincaid, 1981). The results of the canonical correlation provide only a single static glimpse into the dynamic characteristics of classroom structures. Thus, although the overall model investigated in this study was confirmed, its utility can only be determined by examining the stability of its generic subsets across time in classroom environments.

Nevertheless, the implications for more rigor in assigning grades and more attention directed to the importance of person perceptions, social integration, course satisfaction, and orientation to communication are an essential part of a communication teacher's perspective in facilitating learning outcomes.

NOTES

[1]The converted grade variables were employed using a complex regression model and compared with the raw grade score model. No significant models were generated, hence grade was not a transformed score in the final canonical analysis.

TABLE II

CANONICAL CORRELATION
ANALYSIS SUMMARY

Canonical Correlation	R^2	Chi-Square	df	Significance
.768	.589	73.154	24	.000

Canonical Coefficients for Criterion Set

SLUT	GRADE
.991	.041

Canonical Coefficients for Predictor Set

PRCA	Physical Attraction	Social Attraction	Task Attraction
-.060	.454	.301	.123

Competence	Sociability	Character	Composure
.473	.017	.397	.034

Extroversion	DSI	Course Satisfaction	AOC
.147	.726	.566	-.801

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