

MODE EFFECTS ON COMMUNICATION

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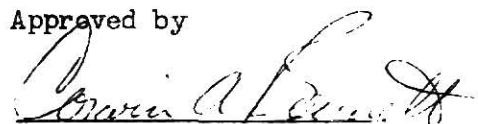
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INTRODUCTION

The avoidance or resolution of conflict is of primary concern to the decision maker. In addition to making the best quality decision, he is also interested in having that decision accepted by those who are involved or affected by it. The effectiveness of a decision is a measure of both quality and acceptance (Maier and Hayes, 1962). The great advances being made in the development of methods for arriving at high quality decisions have far exceeded those used to insure acceptance. Managers still rely in large measure upon the traditional means of gaining acceptance such as hierarchial coercion and money rewards. It is increasingly evident these are not sufficient to induce the positive acceptance and commitment desired and required by management. The problems of the future will be concerned with the means of attaining a desired goal and not, as it once was, of deciding what the desired goal should be. As stated by Hammond (1965): "My principal guess about the future is this: the prime source of conflict in the future is likely to be in cognitive differences concerning the means as how common ends may best be achieved. First priority should therefore be assigned to the necessity for learning how cognitive differences can be resolved". This will require effective communication.

In discussions of problems among people one often hears the statement: "They can't communicate with each other", or there was a "breakdown in communication". Actually the individuals in question probably are communicating; the problem more likely is that they misunderstand or misinterpret each others message. Another possibility is that the message sent by one

seemed incomplete to the other, consequently it lacked the total message the sender intended. This is a common occurrence when there is no opportunity for feedback.

In every instance of interpersonal communication it is generally accepted that three messages are involved: the one the speaker thought he said, the one he actually said and the one the listener thought he said. These three are hardly ever the same. The differences are due primarily to the differences in the reference frames of the people involved and the inherent limitations of the medium used. The amount by which the intended message sent and the actual message received differ can be considered a measure of the misunderstanding that results..

Kinesics

No small amount of work has been done involving the study of the various means of accomplishing interpersonal communication. There have been studies concerning the proximity of two speakers and the cultural norms proscribing the allowable distance limits between them. Hall (1959) determined that if the distance is less than or exceeds these limits negative attitudes are elicited or inferred, while Little (1965) found that a smaller distance between communicator and addressee is associated with more positive attitudes. Mehrabian (1968) determined that greater relaxation, a forward lean of trunk towards one's addressee, and a smaller distance to the addressee communicate a more positive attitude to the addressee than a backward lean and a larger distance do.

Not only actual distance but also distance implied by affiliation is important in determining the level and type of communication that occurs (affiliation is the degree of interest and understanding a person feels

towards another). Studies of interpersonal behavior by Exline (1960) showed that in high affiliation groups the speaker would be likely to sweep the group with a glance or focus ... "on individuals in turn until he had spoken to all. Low affiliation persons would either content themselves with glancing at one or two others, fix their gaze on a spot over the heads of coworkers or focus on their work materials while speaking." Another finding by Exline (1962) suggests that affiliation is inversely related to one's desire to exert control over the other. He suggests that "competitive situations may result in the production of cues of rejection and antagonism, that such cues are often communicated via facial expression". In parallel studies (Exline, 1963; Exline, Gray and Schuette, 1965) it was shown that there is more eye contact with an addressee when there is preference for, or more positive attitude toward, the addressee. However, Argyle and Dean (1965) showed there is less eye contact and glances are shorter, the closer two subjects are placed together. This effect was greatest for opposite sex pairs. In the same study they found that for a given degree of communicator attitude toward his addressee, directness of orientation of communicators' bodies decreases as closeness increases.

The relative status of communicators also seems to have an effect on the physical conditions for communication. In a study designed to explore the connections between location of communicators and their status, Lott and Sommer (1967) had results showing that people sat further from both high and low status individuals than they did from their peers.

As more and more of the factors of communication have been explored various studies have approached the conclusion that the many factors

involved in interpersonal communication cannot be totally understood except as parts of a greater whole, in interaction with each other. However, it is impossible to conduct research studies which would include measurement of every factor at the same time. As a consequence such work has generally been done in small parts. A major step in placing the results of these studies into an organized whole was made by Birdwhistell (1952; 1959; 1969) in his extensive studies of human body motion. He has termed the field the study of "kinesics". The theory underlying the study of kinesics is that interpersonal communication requires the use of all the senses, that the information conveyed thereby is coded and patterned differently in various cultures (Jones, 1970). It follows then, that "many of the differences in the way in which people communicate or respond to our communication reveal the differences between their roles, their social position and activity and ours" (Birdwhistell, 1959).

While these theories have been stated and studied by specialists in the fields of psychology, linguistics and kinesics, it seems little effort has been made to apply them. It has not yet been generally recognized that all aspects of an individual's presence have an effect on his communications with others. However, it should be readily apparent that "we get an entirely different picture of communication if we recognize that communication is not just what happens in one channel" (Birdwhistell, 1959). Some of the channels involved are the audio-acoustic, kinesthetic-visual, odor producing-olfactory, tactile, etc.¹ Each of these contributes to the total communication. It is the object of this study to explore the relationship between two of these, the aural and the visual, and also how these two compare with written communication.

Background Studies

Studies of one or more of the different modes of communication have been made using composite likenesses of the face in still photographs. These studies were generally not of great value due to their lack of motion but they did prompt further study. In one such study by Dusenbury (1938) of facial expression, and in making early use of movies, he noted moving pictures were "much more realistic in the pattern they present for judgment, in that they make possible a time sequence in expression". The formal results of his study confirmed that interpretation of the facial expression of emotional tendencies and attitudes can be made with a high degree of accuracy. However, there are significant differences in ability to correctly interpret facial expressions of the emotions, and that women are more accurate in the interpretation of facial expressions of emotions than men. The following year Fairbanks and Provonost (1939) determined that emotions expressed by the voice (aural) are readily identifiable.

Since then it has been found that in two channel facial-vocal (audio-visual) communication of emotion the facial channel contributes more to the decoding of the total message than the vocal (aural) channel (Levitt, 1964). Also, that the dominant component in a two channel communication determines the meaning of an inconsistent communication (Mehrabian and Weiner, 1967), and that attitudes inferred from two channel facial-vocal attitude communications are a linear function of the attitude communicated in each component with the facial (visual) component receiving $3/2$ the weight received by the vocal (aural) component. It was suggested that the combined effect of simultaneous verbal, vocal (aural) and facial

(visual) attitude communications is a weighted sum of their independent effects following the relation: .07 verbal, .38 vocal, .55 facial (Mehrabian and Ferris, 1967).

In a study of the relations between encoding and decoding abilities in the facial and vocal channels by persons differing in approval-seeking tendencies, Mehrabian (1969) found the facial channel generally more effective than the vocal for communicating attitudes, that negative attitudes are more effectively communicated than positive attitudes, that females were better than males at communicating variations in negative attitude though males are better communicators of positive attitudes. In a later study Mehrabian (1970) also determined that the verbal portion of inconsistent messages conveys attitudes towards the actions of the addressee, whereas the nonverbal portion conveys attitudes towards his person.

The research which has been conducted in attempts to determine differences between the sexes has proved little. The findings have generally been contradictory both with regard to expression and reception of emotional cues. Coleman (1949) found no differences between male and female judges in his study, and Gates (1927) found boys and girls to have the same level of accuracy. Weisberger (1956) found females to be superior to males in judging emotional content of pictures. Exline (1957) found women to be more accurate in the perception of interpersonal relations than men but later (1960) determined the sexes did not differ significantly. He did determine that women were more concerned with person-oriented information (1960). Also, women both send and desire more personal information than do men (Exline, 1962). Rosenfeld (1966) wrote: "women, in contrast to men, attempt to indicate lack of approval to others by reducing

the intensity of behavior, but not by changing its direction". There have been some findings which suggest that the sex of the person expressing feelings has an influence on the ability of another to judge those feelings (Levy and Schlosberg, 1960).

The relationship of communication itself to the speaker, regardless of the receiver involved, also has been investigated. Dittman (1962) and Boomer (1963) have indicated that frequency and pattern of movement is positively correlated with anxiety level. Ekman and Freisen (1967) determined that "facial expressions tend to indicate the direction of a person's motives, while lower body gestures tend to be manifestations of intensity of motivation". In addition, Mehrabian (1967), in an investigation of communication of attitude via head and body orientation cues determined that "postural and kinesic behaviors can be used to infer communicator feelings".

Williams and Sundene (1965) conducted studies similar to those of Osgood, Suci and Tannenbaum (1957). Results indicated that for facial (visual), vocal (aural), and combined facial-vocal(visual-aural) communications the major factors referred to by addressee for meaning were: general evaluation, social control and activity of the addressor. The speaker involvement in a verbalization is a direct correlate of positive attitude towards the content of that verbalization. Some measures of communicator relaxation and their order of importance are: arm asymmetry, sideways lean, leg asymmetry, hand relaxation, neck relaxation, and reclining angle. Relating these cues to status indicate that the greater a communicator status relative to his addressee, the greater his relaxation.

Another list of cues offered by Mehrabian (1969) for determining

positive attitudes includes: "higher speech rate, lengthier communications in terms of total word output, more frequent verbal reinforcers from the communicator, higher rates of positive head nodding and gestualtion, fewer self references and higher rates of speech disturbance.

In the study by Levitt (1964), *The Relationship Between Abilities to Express Emotional Meanings Vocally and Facially*, he tested the relationship between vocal (aural) and facial (visual) expressions. Also, he compared the relative accuracy with which vocal and facial expressions communicate emotional meanings and the differences in the accuracy of communication by simultaneous vocal-facial (aural-visual) expressions versus each mode treated independently.

The technique used involved sound motion pictures of simultaneous vocal and facial expressions of 50 subjects. Three sets of judges then attempted to identify the emotional meanings expressed by each subject. The three sets of judges each witnessed one of the three modes: vocal (aural), facial (visual), and the combination and the accuracy of their judgments was recorded.

The results of Levitt's study indicated that persons who are able to express emotional meanings vocally (aural) also tend to be able to express them facially (visual), that emotional meanings were communicated much more accurately in the facial (visual) mode, and emotional meanings were communicated more accutately in simultaneous vocal-facial (aural-visual) than in the vocal mode alone, however this difference between the simultaneous mode and the facial (visual) mode alone was not significant. Levitt's conclusion here was that any apparent superiority of the simultaneous mode over the aural alone was due primarily to the information

provided by the facial (visual) portion of the combination.

A similar pilot-study by Brown (1971), performed without knowledge of Levitt's work, achieved strikingly similar findings with all male subjects. There were two primary differences between this work and Levitt's.

First, the experiment utilized a role-playing design for both the person acting as the source of the attitude expression and the subjects as receivers of the expression. The role-playing format was intended to induce more realism and involve the subjects emotionally with the personality presented. Secondly, this work utilized one message by one communicator. This single message, related to the role-playing situation, was then witnessed by the 54 subjects.

The technique involved a video tape recording of an individual in the role of a shop supervisor talking to a subordinate. The subjects assumed the role of the subordinate. Subjects were divided into three matched groups on the basis of their expressions of the kind of supervisor they would prefer to have in real life. As in Levitt's study, groups each witnessed one of the three modes: aural, visual and their combination. The subjects then indicated their attitudes towards the supervisor on the basis of his statement to them.

The results of this study indicated that the supervisor's message and attitude were communicated more strongly by the combination than by either of the single modes. Also, the visual mode produced reactions significantly different from the aural mode and more like that of the combination. This supports Levitt's conclusion that what was seen had a significantly greater effect on the receiver's response than what he heard.

While the pilot-study by Brown (1971) used untested material and

techniques, in light of Levitt's work it suggests the importance of the visual aspect in interpersonal communication.

Research Design

To simulate the supervisor-subordinate, organization-individual relation a technique similar to multiple role-playing (Maier and Zerfoss, 1952) was employed. This technique and its supporting theory have been used before by Brown (1971) and others to accomplish similar studies. Lieberman (1956) in a study of workers moving into foreman and steward roles at Rockwell Manufacturing Company supported his hypothesis that people who are placed in a role will tend to take on or develop attitudes that are congruent with the expectations associated with that role. Brown (1962) wrote: "The role-playing design does seem to permit the testing of detailed implications in a model of attitude change without relying on elaborate techniques of deception. We believe that a role-playing subject will behave in a way that corresponds more closely to the life situation than a hoodwinked subject will". Mehrabian (1968) concurred: "Brown's comments seem appropriate for the selection of methodologies in the study of implicit attitude communication as well".

Despite limitations of using still photographs to record and measure expressions many studies have used this technique. Feleky (1914; 1922), Kanner (1931) and Goodenough and Tinker (1931) found high accuracy in communicating some emotions. These are limited further as only one model was used and the expressions were posed. Somewhat less artificial sets of photographs were used by Munn (1940) and Hanawalt (1944). These studies used photographs of unposed, spontaneous expression. The results were quite consistent with those obtained using the posed pictures.

The important limitation of still photographs is the loss of the time sequence in the expression. Little work has been accomplished using moving pictures, Dusenbury and Knower (1938) and Levitt (1964) are notable exceptions. While movies are distinctly superior to still photographs and can include more of a sequence of behavior they have limitations of their own. As common elements in our society, movies and television are not subject to the same apprehensions as other, less common, research tools might be.

Investigation of communication by vocal expression centers around three primary techniques. Recitation of letters or numerals to avoid verbal information interference while measuring emotional communication (Dusenbury and Knower, 1939; Knower, 1941; 1945; Davitz and Davitz, 1959). A second method involves emotionally neutral verbal statements as vehicles for varied emotional expressions. The intent was to express the various emotional meanings through vocal rather than verbal cues (Fairbanks and Provonost, 1939). A newer technique involves electronically masking the verbal content of passages without destroying the emotional (nonverbal) content (Soskin and Kaufman, 1954; Starkweather, 1956). The general agreement of all such studies has been that emotional meaning can be accurately communicated vocally (aurally). Recognizing the limitations of audio and visual recordings, they do retain the virtue of being consistent over many repetitions. This cannot be said for live performances and is the primary justification for their use.

PROBLEM

The present study will involve communication from a superior to a subordinate. To measure this communication some standard set of devices was needed. Since interpersonal communication is a behavioral aspect of human relations, behavioral measures were needed. This approach regards leadership as behavioral, situational and related to the specific group, leader and their interaction. No simple list of traits can identify every leader in every case. The behavioral approach indicates that leadership can best be observed in terms of what people do rather than trying to see them in terms of what they are. From the behavioral point of view, any two leaders who performed in every way in exactly the same manner under identical circumstances would achieve the same results. In his studies of leadership, Fleishman (1953) indicated that two primary and distinct patterns of supervisory behavior are apparent. These two categories were defined as "consideration" and "initiation of structure". "The consideration dimension represents the degree to which a supervisor is considerate of the feelings of those under him. It is analogous in many respects to the traditional notion of human relations in the work setting. The initiation of structure dimension refers to the degree to which the supervisor facilitates or defines group interaction toward goal attainment." Examples of items that are indicative of consideration are: "He makes those under him feel at ease when talking with him." (positive consideration), or "He acts without consulting his foremen first" (negative consideration). Examples of items that indicate "initiation of structure" are: "He emphasizes the meeting of deadlines" and "He emphasizes the quantity of work".

The research studies concluded that these two concepts are independent of each other; that any one person may behave in a manner to demonstrate either or both of these characteristics (Blum and Naylor, 1968).

As indicated in the introduction, by far the largest segment of the studies done in the fields of mode effects have been performed under laboratory conditions. More specifically, little reference to applications in business, industry or other fields has been indicated. It seems important then, to extend this work to those areas where people have a need for and can make use of this information to improve their skills and effectiveness in dealing with others.

Therefore, this study will focus on some of the mode effects on communication in the light of a supervisor-worker relationship. Specifically, the following hypotheses are to be tested:

1. The relative effectiveness of five selected communication modes with respect to communication of (a) attitude and (b) factual information is for
 - (a) visual/aural, visual/print, visual, aural, print and for
 - (b) visual/print, visual/aural, print, aural, visual.
2. (a) Female receivers are more sensitive than male to the visual mode while (b) males are more sensitive than females to the aural mode and (c) the sexes will not differ in sensitivity to the print mode.

METHOD

Supervisors

Video tape recordings were made of four males portraying the role of a supervisor in an office work situation (Appendix B). The supervisor, with his role as a reference point, made a statement to the subjects concerning a problem related to the work situation (Appendix C). These tapes were reviewed by a panel of twelve judges who were asked to determine whether the presentations reflected emphasis on consideration, structure or both equally. The responses indicated that no less than ten of the twelve correctly identified the intended character of each of the recordings (Appendix D). Five of the nine recordings reviewed were correctly identified by every judge. It was from among these five that the recordings eventually used were selected.

As originally designed, this study was to include two expressions emphasizing consideration and two emphasizing structure. Limitations on time and availability of subjects necessitated a reduction in scope. The resulting design incorporated only two presentations which emphasized structure.

The assistants who played the part of the supervisor were as follows: two graduate students in Theater; ages 21 and 23, one undergraduate in Electrical Engineering; age 21, and one civilian personnel officer from Fort Riley, Kansas, age 41. They were selected on the basis of their ability to give a realistic portrayal of the supervisor and an appearance of maturity in addition to other factors.

Measures

Selected items from the Supervisory Behavior Description developed at the Ohio State University (Fleishman, 1953) (Appendix E) were used to measure the communicative effect. This set of items gauged the subjects' feelings towards the two primary supervisory attitudes: consideration for people and initiation of structure within the work situation. There were 40 statements and questions. Statements one through 30 were items selected from the revised form of the Supervisory Behavior Description while questions 31 through 40 referred to the role-playing situation to measure the subjects' understanding of the supervisor's statement (Appendix F). Responses to statements one through 30 were recorded on a five point scale and scored from one to five. When a subject felt the supervisor exhibited a behavior more often it was recorded as a higher value, the highest being five. When a subject felt the supervisor exhibited a behavior less often it was recorded as a lower value, the lowest being one. The total of the responses for each subject under each of the consideration and structure measures could range from 15 to 75. Answers to questions 31 through 40 were scored as right or wrong and the number of correct answers was recorded.

Subjects

It was felt there might be some connection between the qualities of a supervisor or the techniques of supervision which a person expressed a preference for and his reactions to these qualities or techniques in the role-playing situation. If this was the case it would be useful to match subjects within groups on the basis of this preference before measuring their experimental responses. Therefore, some subjects were pretested to determine if such a condition might exist. The subjects were told to

respond to the statements by referring to the kind of supervisor each would prefer to have in a work situation. A total of 236 subjects responded.

A random sample of 26 subjects were presented the supervisor's statement through the aural/visual mode. Having witnessed the communication, the subjects again responded to the statements regarding the supervisor. This time they were told to refer to the supervisor witnessed on the tape. Responses of the subjects to the preferred and simulated supervisors were then scored and a correlation analysis (Table 1) showed there was little or no relation (maximum $r = .340$) between the kind of supervisor the subjects indicated they preferred and the way they responded to the supervisor they witnessed on the video tape. This result may be due to the fact that in describing their preferred supervisor the subjects were making a factual decision or choice but when describing the role-playing supervisor they were making an emotional response. Consequently, it was decided that it would not be useful to match subjects.

Volunteers were solicited from classes in Oral Communication, Speech and Psychology at Kansas State University. All were of working age (range 17 - 33) and reported no hearing, sight or reading deficiencies. All were given a description of the role-playing method and any questions were discussed before the actual experiment began. There were 65 male and 75 female students who participated in the second and primary portion of the study. Table 2 contains the results of the biographical information collected on the 152 subjects. Also included in the table are the means of the three total scores for each subject: item 7; the total of the statements measuring consideration, item 8; the total of the statements measuring structure, and item 9; the total number of correct answers to the

Pearson Product Moment Correlation Coefficients Matrix - Pretest Responses

	Consideration	1	2	3	4	5	6	7	8
Male	Preferred Supervisor	Structure	-0.104 11						
	Simulated Supervisor	Consideration	0.109 11	-0.328 11					
		Structure	0.028 11	0.207 11	-0.445 11				
	Preferred Supervisor	Consideration	0.279 11	0.343 11	0.088 11	0.416 11			
Female	Preferred Supervisor	Structure	0.452 11	0.526 11	-0.277 11	0.414 11	0.740* 15		
	Simulated Supervisor	Consideration	-0.011 11	0.210 11	0.296 11	-0.113 11	0.340 15	0.129 15	
		Structure	-0.163 11	-0.370 11	-0.106 11	0.036 11	-0.004 15	-0.058 15	0.081 15
			1	2	3	4	5	6	7

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TABLE 2

Subject Biographical Information

<u>Variable</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Mean</u>	<u>Standard Deviation</u>
Age	33.00	17.00	19.03	4.85
Consideration Total	70.00	26.00	52.60	9.76
Structure Total	69.00	28.00	52.70	8.38
Factual Test Score	9.00	1.00	5.55	1.49

Sex of Subject: 73 Male 79 Female

Major Ethnic Group:

Native American; European Origin:	147
Other European Origin:	1
Native American; African Origin:	2
Native American; South and East Asian Origin:	1
Other South and East Asian Origin:	1

Area of Geographic Origin; City:

Country (Farm or Other):	41
Rural (Town of 2500 or Less):	25
Suburban (Town of 2500 - 50000):	51
Urban (Town of 50000 - 500000):	31
Urban (Town of 500000 or More):	4

Area of Geographic Origin; National:

Pacific:	2
Mountain:	3
Southwest:	2
North Central:	136
Southeast:	7
Northeast:	2

Those who held a permanent job, including military service, six months or longer: 83. Those who did not: 69.

questions measuring factual information. A correlation analysis was made of all the nine factors listed in Table 1. The results of this correlation analysis are shown in Table 3.

The tests for the primary study were conducted in a classroom on two successive evenings. Subjects came at one of the six times scheduled. As a result of this procedure the number of subjects per cell was not equal. Indicated in Table 4 is the number of subjects in each between group cell for each mode/supervisor/sex combination.

Procedure

The statements of the supervisors were recorded with a Sony model 2100, black and white video tape recorder. Sound and light conditions were essentially identical for each of the supervisors. The subjects were given instructions concerning the format and requirements of the experiment (Appendix G). Identifying data and background information such as age, sex, area of geographic origin and major ethnic identity was also collected (Appendix H). Subjects were then given a description of the background and the specific role they were to assume, that of an office clerk. Next the subjects were presented the supervisor's statement using one of the four different recorded mode presentations or the print mode. All of the subjects within a group were presented the statement at the same time. Having witnessed the communication the subjects then responded to the questions and statements regarding the supervisor and what he said. Specifically, they indicated by their responses the degrees of consideration, structure and factual information which they perceived the supervisor to have communicated to them.

TABLE 3

Pearson Product Moment Correlation Coefficients Matrix - Biographical Information

Age	1									
Sex	2	-0.081								
Home Town Size	3	0.075	0.047							
Steady Job Held	4	-0.272*	0.162	-0.220*						
Consideration Total	5	0.113	-0.070	-0.083	-0.064					
Structure Total	6	-0.024	0.051	-0.016	0.054	-0.140				
Factual Test Score	7	-0.095	0.157	0.138	0.021	0.159	-0.081			
		1	2	3	4	5	6			

*p < .05

TABLE 4

Number of Subjects in Each Between Groups Cell

<u>Speaker</u>	<u>Sex</u>	<u>MODE</u>				
		<u>Aural</u>	<u>Visual</u>	<u>Print</u>	<u>Visual/Aural</u>	<u>Visual/Print</u>
1	male	7	6	15	7	5
1	female	6	9	8	9	8
2	male	6	4	14	5	4
2	female	7	5	10	10	7

RESULTS

Each subject's responses to the statements and questions were scored and tabulated in optical scoring machines by the Kansas State University Computing Center. Each of the statements measuring consideration or structure were answered on a scale graduated from one to five. Possible scores then, could range from 15 to 75 for each subject. A score closer to 15 indicates low consideration or structure, a score closer to 75 indicates high consideration or structure. The questions measuring factual communication were scored as the number of correct answers.

An analysis of variance was performed using the total score for each subject on the consideration, structure and factual measures. The results of these analyses indicate the effect and content of the communication between supervisor and subject. In this and subsequent analyses only the specific modes, speakers and sexes are of interest, and no attempt is made to consider them representative of classes of modes or speakers or, obviously, of sexes. That is, a fixed-effect model is used to conduct the analysis of variance.

Table 5 contains a listing of the means and variances for all main effects and interactions of the scores measuring the degree of consideration perceived by the subjects.

The results of the analysis in Table 6 indicate there are significant differences among the responses produced by the various modes. Also significant are the differences in response to the two supervisor presentations. Further analysis by Fisher's LSD test indicates which means are significantly different. The LSD test indicates there is not a difference

TABLE 5

Means and Variances for Main Effects and Interactions

Consideration Scores		Means	XX,X		
		Variances	YY,Y		
Mode	Aural	Visual	Print	Visual/Aural	Visual/Print
	56.160	51.081	56.915	45.644	52.729
	62.533	117.123	36.662	95.288	124.457
Speaker	1	2			
	50.695	54.236			
	101.884	80.443			
Sex	Male	Female			
	52.859	52.073			
	84.298	103.643			
Mode Speaker	Aural	Visual	Print	Visual/Aural	Visual/Print
1	52.536	49.611	57.679	43.889	49.763
	48.095	101.973	43.558	100.063	122.071
2	59.583	52.750	55.750	47.400	55.696
	53.006	136.914	29.123	76.329	107.273
Mode Sex	Aural	Visual	Print	Visual/Aural	Visual/Print
Male	56.869	52.083	55.617	43.900	55.825
	53.479	111.040	41.201	67.576	106.914
Female	55.250	50.278	57.813	47.389	49.634
	71.006	120.495	26.904	107.917	120.773

TABLE 5 (cont)

Means and Variances for Main Effects and Interactions

Consideration Scores

Speaker		1	2			
Sex						
Male		51.074	54.643			
		77.969	86.788			
Female		50.317	53.829			
		123.848	74.615			
Mode		Aural	Visual	Print	Visual/Aural	Visual/Print
Sex Speaker						
Male	1	51.571	49.667	55.733	45.000	53.400
		39.388	69.889	54.462	72.286	101.040
Male	2	62.167	54.500	55.500	42.800	58.250
		9.472	158.750	26.964	58.160	101.188
Female	1	53.500	49.556	59.625	42.778	46.125
		56.250	123.358	13.234	119.506	114.859
Female	2	57.000	51.000	56.000	52.000	53.143
		78.000	114.000	32.000	57.200	101.265

TABLE 6

Analysis of Variance of Consideration Scores

<u>Source of Variance</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Mode (MO)	4	531.362	6.646*
Speaker (SP)	1	420.390	5.258*
Sex (SX)	1	20.729	0.259
MO x SP	4	80.671	1.009
MO x SX	4	97.450	1.219
SP x SX	1	0.027	0.000
MO x SP x SX	4	87.399	1.093
Subjects	<u>132</u>	79.947	
Total	151		

* $p < .05$

Mode	Visual/Aural	Visual	Visual/Print	Aural	Print
Mean	45.644	<u>51.081</u>	<u>52.729</u>	<u>56.160</u>	<u>56.915</u>

Underlines connect means that are not significantly different.

between the following pairs of mode responses: visual and visual/print, visual/print and aural, and aural and print.

Table 7 contains a listing of the means and variances for all main effects and interactions of the scores measuring degree of structure perceived by the subjects.

The analysis of variance contained in Table 8 indicates there are significant differences among the responses produced by the various modes. Further analysis by Fisher's LSD test indicates the order of response and establishes the locations of significant differences among the means. However, there is an interaction among the modes, supervisors and sexes. Further analysis by Fisher's LSD test indicates under supervisor 1 and the visual mode, males perceived a higher degree of structure than in any other mode. Under supervisor 2 males perceived the highest degree of structure in the aural and aural/visual modes and the lowest degree of structure in the visual and print modes. Under supervisor 1, females perceived the highest degree of structure in the aural mode and the lowest degree of structure in the printed mode. Finally, under supervisor 2, females perceived the lowest degree of structure in the visual/print mode.

Table 9 contains a listing of the means and variances for all main effects and interactions of the scores measuring the number of correct responses to the questions testing the subject's knowledge of the message presented by the supervisor.

The analysis of variance contained in Table 10 indicates there is a significant difference in the retention rate between the video mode and all others, there is a significant difference in the responses by the sexes; the females giving more correct answers than the males, and the

interaction effect of the sexes with the various modes: while the males had their fewest correct answers in the visual and print modes, the females in the visual mode had the poorest scores of either sex in any mode, while having a higher number of correct answers than the males in every other mode but the visual.

TABLE 7

Means and Variances for Main Effects and Interactions

Structure Scores		Means	XX.X		
		Variances	YY.Y		
Mode	Aural	Visual	Print	Visual/Aural	Visual/Print
	55.792 24.936	54.794 98.526	49.141 72.563	55.802 43.469	50.463 63.250
Speaker	1	2			
	53.749 70.185	52.648 69.018			
Sex	Male	Female			
	53.200 62.877	53.197 76.050			
Mode Speaker	Aural	Visual	Print	Visual/Aural	Visual/Print
1	56.464 19.562	57.889 102.782	48.425 79.648	53.754 32.277	52.213 53.385
2	55.119 29.456	51.700 77.951	49.857 65.576	57.850 48.516	48.714 58.793
Mode Sex	Aural	Visual	Print	Visual/Aural	Visual/Print
Male	55.548 17.621	55.000 94.640	48.407 60.247	56.143 39.389	50.900 32.889
Female	56.036 32.178	54.589 98.638	49.875 90.583	55.461 46.039	50.027 81.440

TABLE 7 (cont)

Means and Variances for Main Effects and Interactions

Structure Scores

Speaker	1	2
Sex		
Male	53.623 55.844	52.776 70.547
Female	53.875 84.244	52.520 67.204

Mode		Aural	Visual	Print	Visual/Aural	Visual/Print
Sex Speaker						
Male	1	53.429 13.959	63.000 27.667	49.600 46.640	53.286 29.061	48.800 40.960
Male	2	57.667 12.222	47.000 41.500	47.214 71.883	59.000 34.800	53.000 13.000
Female	1	59.500 6.250	52.778 111.062	47.250 137.938	54.222 34.395	55.625 43.234
Female	2	52.571 32.245	56.400 67.840	52.500 40.450	56.700 53.610	44.429 58.245

TABLE 8

Analysis of Variance of Structure Scores

<u>Source of Variance</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Mode (MO)	4	268.254	4.688*
Speaker (SP)	1	40.642	0.710
Sex (SX)	1	0.000	0.000
MO x SP	4	109.196	1.909
MO x SX	4	6.354	0.111
SP x SX	1	2.167	0.038
MO x SP x SX	4	341.353	5.966*
Subjects	<u>132</u>	57.216	
Total	151		

* $p < .05$

Mode	Print	Visual/Print	Visual	Aural	Visual/Aural
Means	<u>49.141</u>	<u>50.463</u>	<u>54.794</u>	55.792	55.802

Underlines connect means that are not significantly different.

TABLE 9

Means and Variances for Main Effects and Interactions

Factual Test Scores		Means	XX,X		YY,Y
		Variances			
Mode	Aural	Visual	Print	Visual/Aural	Visual/Print
	6.042	4.290	5.920	5.696	5.483
	1.191	2.389	1.900	1.640	2.234
Speaker	1	2			
	5.433	5.540			
	2.498	1.912			
Sex	Male	Female			
	5.234	5.739			
	1.997	2.346			
Mode	Aural	Visual	Print	Visual/Aural	Visual/Print
Speaker					
1	6.095	4.056	6.083	5.643	5.288
	0.840	2.400	2.302	1.715	2.213
2	5.988	4.525	5.757	5.750	5.679
	1.538	2.247	1.472	1.529	2.000
Mode	Aural	Visual	Print	Visual/Aural	Visual/Print
Sex					
Male	5.845	4.792	5.440	5.243	4.850
	1.515	2.610	1.971	1.688	1.432
Female	6.238	3.789	6.400	6.150	6.116
	0.793	1.883	1.238	1.291	2.196

TABLE 9 (cont)

Means and Variances for Main Effects and Interactions

Factual Test Scores

Speaker	1	2
Sex		
Male	5.269 2.334	5.200 1.578
Female	5.597 2.649	5.880 1.895

Mode		Aural	Visual	Print	Visual/Aural	Visual/Print
Sex	Speaker					
Male	1	5.857 0.980	4.333 1.889	5.667 2.489	5.286 2.490	5.200 2.160
Male	2	5.833 2.139	5.250 3.188	5.214 1.311	5.200 0.560	4.500 0.250
Female	1	6.333 0.556	3.778 2.617	6.500 1.500	6.000 0.889	5.375 2.234
Female	2	6.143 0.980	3.800 0.560	6.300 1.010	6.300 1.610	6.857 0.980

TABLE 10

Analysis of Variance of Factual Test Scores

<u>Source of Variance</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Mode (MO)	4	13.223	7.304*
Speaker (SP)	1	0.383	0.212
Sex (SX)	1	8.538	4.716*
MO x SP	4	0.747	0.413
MO x SX	4	5.422	2.995*
SP x SX	1	1.038	0.573
MO x SP x SX	4	2.173	1.200
Subjects	<u>132</u>	1.810	
Total	151		

*p < .05

Mode	Visual	Visual/Print	Visual/Aural	Print	Aural
Mean	4.290	<u>5.483</u>	<u>5.696</u>	<u>5.920</u>	<u>6.042</u>

Underlines connect means that are not significantly different.

DISCUSSION

As established by Fleishman (1953), consideration of people and initiation of structure are independent measures of supervisory behavior. The present study attempted to measure the communication of these two behaviors through five chosen communication modes. Levitt (1964) demonstrated that emotional meanings can be communicated via the facial (visual) mode with a high degree of specificity. The present findings indicate that behavioral meanings can be communicated well via the visual mode but that, in the case of females at least, factual information cannot.

Consideration Measures

The results contained in Table 6 show the visual mode producing a striking effect on the communication of consideration. When the subjects witnessed the aural or print modes they perceived a higher level of consideration than they did under the visual mode alone. Apparently the speakers kinesic appearance communicated factors which the aural and print modes did not. When the subjects witnessed a combined mode presentation; visual/aural or visual/print, they perceived a degree of consideration equal to (visual/print) or much less than (visual/aural) that communicated by the visual mode alone. Significant here is the fact that the combination of the visual mode and the aural or print mode does not have an "averaging" effect. The result of the combination does not fall between them, on the contrary, the visual mode dominates and appears to change the perceived meaning of the aural or print messages. As noted earlier by Birdwhistell (1959): "We get an entirely different picture of communication if we recognize that communication is not just what happens in one channel." Of

interest also is the fact that while the consideration levels perceived in the aural and the visual modes were different, the aural, when combined with the visual, resulted in an effect which was different from either alone. This would indicate that the vocal portion of an aural communication contributes factors to the total meaning of a message which the verbal portion alone cannot produce. Mehrabian and Weiner (1967) put it this way: "The dominant component in a two channel communication determines the meaning of an inconsistent communication". The present findings indicate this may also be true in the case of three channel communication.

Also of interest in Table 6 are the results concerning the sex of the subject. As earlier described, previous findings have not firmly established if sex plays a role in reception of cues. Exline (1957) found women to be more accurate in the perception of interpersonal relations but later (1960) determined the sexes did not differ significantly in this respect. The present study supports this later finding. No significant differences in the perception of consideration existed between the sexes. This finding suggests that one does not need to fear that male and female addressees will perceive different messages from the same communication only because of sex difference. On the contrary, such an effect is not important in the case of consideration here.

Structure Measures

The results contained in Table 8, the communication of structure initiation by the speaker, are very different from those in Table 6. While the print mode communicated the highest degree of consideration (Table 6), it also produced the lowest degree of structure initiation. However, when these words were spoken the subjects perceived a significantly higher level

of structure initiation.

In contrast to the results in Table 6 the visual mode did not dominate the print mode but the reverse was true. The speaker presentations were chosen to be high in structure. It is notable that when the visual mode was added to the print there was not a significant change in the subjects' responses. The change was enough that the difference between the visual mode alone and the visual/print mode was no longer significant. Also, no significant differences in the effects of the visual, aural and visual/aural were present.

A study of the mode x speaker x sex interaction indicates that males in the visual mode perceived speaker 1 as more highly structure oriented and that females in the visual/print mode perceived speaker 2 as much less structure oriented than all other combinations of mode, speaker and sex. At present it is unclear what caused these effects. It appears then, that while consideration can be communicated equally well by the print mode and by the aural mode this is not the case with communication of structure, at least with this message. Structure was communicated significantly better in the aural, visual and visual/aural modes than by the print mode, indicating that a written message may be perceived by it's addressee to communicate a different meaning from that communicated in the aural, visual or visual/aural modes.

The results concerning the sex of the subject is again of interest. In this case there was absolutely no measured effect, caused by subject sex, in the communication of structure and subject sex contributed nothing to the total variance in the results. As before, the message perceived by the subjects was in no way affected by the sex of the receiver. Also, as

the speaker presentations were chosen to present a high degree of structure initiation the subjects evaluated the speakers as presenting statements of equal effect in this regard.

Factual Measures

Consideration and structure initiation are basically attitude or opinion measures. There were no right or wrong responses to the items in the questionnaire used to measure these attitudes. In order to determine the relative efficiency of the various modes in communicating specific information the subjects answered ten questions based on the material presented by the speakers in the role-playing situation. The results of this test are shown in Table 9 and an analysis in Table 10. The analysis shows the obvious and expected inferiority of the visual mode compared to all the others in its ability to communicate information of a factual nature.

Also in contrast to the previous findings is the effect the sex of the receiver has on factual communication. Females had a significantly higher number of correct responses than did the males in every mode but the visual. In the visual mode this was reversed, the males having a significantly higher number of correct responses. This reversal is indicated by the significance of the mode x sex interaction in Table 10.

The main effect of sex of receiver on communication shows females giving more correct answers. As this test immediately followed the statement of the supervisor in the role-playing situation, long range retention was not a factor. The attention span required was less than ten minutes. A possible conclusion then, is that the females simply paid stricter attention to what was occurring. This might be a general characteristic of females in an experimental situation (Roethlisberger and Dickson, 1939).

More likely is the fact that the females were simply more interested in what was happening than the males, and so paid more attention. In this regard it may be significant that of the subjects who were originally solicited for the experiment and participated in the first phase, 42.1% of the females returned on their own time to participate in the second phase while only 26.1% of the males returned. Also, a general observation by the experimenter was that during the conduct of the experiment females asked many more questions about the background and reason for the study than did the males. They seemed more interested and attentive.

Conflicting with the primary trend is the peculiar occurrence in the visual mode. In this case the females performed less well than did the males. One might be inclined to suggest that the males were better at guessing the right answer. A more plausible explanation might be the following: females are more attentive than males and recall more of what information they are given, thus their higher rate of correct responses in the other four modes. However, when the subjects were presented only the visual mode and so had very little of a factual nature to base their answers on the females were lost. They could not conceptualize the information they did have into possible solutions as well as the males could.

Noticing in Table 9, the males achieved a score in the visual mode which was almost equal that which they made in the visual/print mode and was not significantly different from that made in the print or visual/aural modes. These scores indicate that it is the females that caused the visual mode to rank significantly lower than the other modes. Clearly, when the verbal content of a message is absent females were not able to receive factual communication as well as males or to guess at what the information

was. In all other modes tested the females were superior to males in receipt of the factual communication.

Hypotheses

From the preceeding discussions it may be concluded that the first hypothesis concerning the relative effectiveness of the five selected communication modes with respect to communication of (a) attitude and (b) factual information was largely supported. The results do indicate significant differences among the various modes with only the aural mode not conforming to the predicted order of effectiveness for both attitude and factual communication. In the case of attitude communication one can assume for discussion purposes that the visual/aural mode, being the most complete of these tested, is the most accurate in ability to communicate attitudinal information. This assumption is supported by the findings of Levitt (1964) in his study of the relationship between abilities to identify vocal and facial expressions.

The results then, indicate that the relative effectiveness of the five tested modes of communication with respect to communication of consideration for people is: visual/aural, visual, visual/print, aural, print and the relative effectiveness of the five tested modes with respect to communication of structure initiation in the organization is: visual/aural, aural, visual, visual/print, print. (Those underlined together are of equal value.) The only mode which changes position in these sequences is the aural. The others maintain their sequence position, considering only significant differences. It appears that the vocalization of attitude is more important to the communication of structure initiation than it is to the communication of consideration.

In the case of factual communication it can be argued that the directional hypothesis was supported since the visual mode did produce significantly poorer test results than the other modes. On the other hand an ordered array of the means as found in Table 10 does not imply relative effectiveness as hypothesized. All that can definitely be stated is that all modes are equally good at communicating factual information excepting the visual which is not as good as the rest. A more sensitive test or procedure is probably required to detect the differences, if any, among the other modes.

The second hypothesis also was largely supported. With respect to attitude communication, no significant differences occurred between the sexes in either the communication of consideration or structure initiation in either the visual or the aural modes. This finding is also in complete agreement with the study by Levitt (1964) cited earlier. Also, Coleman (1949) found no differences between male and female judges in his study. Confusing the determination of the results here is the interaction effect among the modes, speakers and sexes in the structure scores. The prediction that there would be no difference between the sexes in sensitivity to the print modes was supported.

With respect to the communication of factual information, however, the results are strikingly different. In this case females were much less sensitive than males to the visual mode. So much so that it is only due to the effect of the female scores that the visual mode proved significantly different from all others. This was an unexpected result as this hypothesis was primarily directed towards attitude communication and formulated in the opposite direction from that which resulted. It was

expected that females would be better able to use the information communicated visually than males. The opposite was the case here and females fared far worse than males in the retention of factual information. There seems to be no mention in the literature of this type of finding either supportive or otherwise.

Of the remaining hypotheses concerning relative sensitivity of the sexes to the aural and print modes the first was not supported but the second was. It was expected that males would be better able to recognize information communicated aurally. This did not occur as no difference in the responses by the sexes occurred here. It was also expected that there would be no difference between the sexes in their response to the print mode. This was the case.

General

The results concerning the relative effectiveness of the various modes are in disagreement with those suggested by Mehrabian and Ferris (1967). In their study of mode effects they suggested a constant linear relation among the various modes. The results of the present study suggest that not only is the relation not linear, but that the relation itself is different for the separate parts of an interpersonal communication. That is, the relation needed to describe various emotional communications may be different for each of them and will also be different from that needed to describe a purely factual communication.

It was anticipated that simultaneous visual + aural communication would be more effective in the communication of attitude than any of the other modes tested. This prediction was only partially supported in the case of structure initiation. The visual + aural mode was not superior

to either the visual or aural alone. The visual/aural mode was superior to the printed and visual/printed modes. In view of these results, the communication of structure initiation is restricted only by the printed mode. Clearly then, written material can have its entire content and intent changed by the limitations, emphasis, or prejudices of structurally oriented readers or speakers presenting the material. The intent information is not communicated by the grammatical arrangement of words or the words used but rather by the way they are presented to the addressee.

The failure to distinguish the visual/aural from the visual or aural alone did not occur with regard to communication of consideration for people. In this case the predicted superiority of the visual/aural mode was demonstrated. This mode was better at communicating consideration than the visual and the visual was better than the aural. In this case, apparently, the aural cues were supportive of the visual cues and not, as suggested by Levitt (1964), that the aural cues in the simultaneous mode contributed "more noise than information". While such may have been the case in the communication of the emotions Levitt studied it is clearly not the case in the communications of consideration here.

Finally, the visual/aural mode was superior to only the visual in the communication of contextual information. All other mode combinations performed as well as the visual/aural. This indicates that the verbal segment, the choice of words, is of primary importance in communicating this kind of information. As no significant differences were evident between the aural and the print modes it is not clear what role is played by the sound portion of the message as separate from the verbal portion. A number of previous studies have attempted to investigate communication of

emotional meaning by vocal expression by attempting to eliminate the verbal content of speech without destroying the emotional content (Soskin and Kaufman, 1954; Starkweather, 1956). Most such studies agree that emotional meaning can be communicated vocally. This would seem to have little bearing, however, on the communication of contextual information in this study. Also, the communication of consideration or structure initiation is not affected by the presence or absence of the vocal mode. The results in Table 6 and Table 8 indicate the print and visual modes communicate these cues equally as well as other modes which contain the vocal. It would seem that further study of the part played by the vocal mode in the communication of various intents is necessary to determine if a general effect is present.

While in the preparation stage the present study was scheduled to include a replication of all conditions studied here. However, instead of emphasizing structure the speaker making the supervisor statement would emphasize consideration. Firmer conclusions concerning the results of consideration communication could then have been made. Also, while the structure and consideration constructs have been shown to be useful in leadership situations they may not be useful in other interpersonal relations. Therefore, other attitude sets which might be more appropriate in different circumstances need to be studied if general conclusions about mode effects are to be made. The use of female speakers for each of the above supervisor presentations was also considered. Such a design might indicate if the sex of a superior has any effect on the reactions of subordinates, also of either sex. For example, would the female subjects achieve the same poor results in the case of factual communication when

the speaker is female? Might the males be affected in some way by the visual cues of a female which were not involved in the case of a male speaker?

Though the results of the present study were mixed they do suggest some applications. First, they suggest the requirement for an awareness by all who engage in interpersonal contact that much more than just the choice of words is important in determining the message perceived by another. All factors of the human presence play a part in communication between people. This does not reduce the importance of the other factors such as the frame of reference, role sets, value systems and so on. It does indicate that the factors studied here are of importance along with these others. This study suggests that when one wishes to communicate a certain message to others he would be aware that the modes he chooses to communicate through can have important effects on the message that is ultimately communicated. He should realize his own characteristics which affect his communications and recognize that some of these are communicated better through some modes than others. Also, various kinds of messages are communicated better through some modes than others. With the knowledge of his own communicative abilities and the message he desires to communicate, the correct choice or omission of modes can be of great benefit in achieving the desired result.

CONCLUSIONS

A number of important conclusions can be drawn from the results of this study. The visual mode is singly, the most important of the modes tested in the communication of consideration. Also important is the contribution of the vocal portion of an aural communication. The vocal contributes factors which greatly alter the message communicated by the verbal alone. Regarding the communication of structure, the print mode dominated the visual and there was no difference between the visual, aural and visual/aural modes. The visual mode was inferior to all others in it's ability to communicate factual information.

No difference in the perception of consideration or structure existed between the sexes. There was a mode x speaker x sex interaction in the case of structure communication, however. Also, there was a difference between the sexes with regard to factual communication, females generally having a higher level of accuracy than the males. In the specific case of the visual mode, however, the males were more accurate.

The results suggest a varying relation between the modes in their ability to communicate various kinds of messages, such as attitudinal or factual. Also, all factors of the human presence are important in interpersonal communication, not just the words used.

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FOOTNOTES

1 In the discussion of the work done in this area the various authors have used terminology which at times seemed incomplete or misleading. Where this is the case, this author has added the term or phrase he has been using to describe a particular item. In so doing his intention is not to change the meaning of the original but only to maintain consistency within this piece. See Appendix A

APPENDIX A
DEFINITIONS OF TERMS

MODE	Manner of transmission of interpersonal communication.
AURAL	That mode which utilizes sound to communicate.
VISUAL	That mode which utilizes sight to communicate.
PRINT	That mode which utilizes the written word to communicate. Words arranged according to prescribed grammatical rules.
VERBAL	That portion of the aural mode composed of words arranged according to prescribed grammatical rules.
NON-VERBAL	Those portions of the aural excepting the verbal. For example: accent, inflection, cadence, acoustics, phonetics.
KINESIC	Body motions which affect and are part of visual communication.

APPENDIX B
ROLE PLAYING SITUATION

General Instructions*

Jim Telfer is the supervisor for one office unit in a large insurance organization. His unit serves to make available various kinds of information kept there in large files. Other units in the company call his office for information and data and the office clerks must refer to their records in order to answer these requests. This means that the office has a good many phone contacts with several other units of the company. There are ten clerks who report to Telfer. Each is in charge of a particular class of information. All clerks have phones on their desks, but all of the phones are on the same line. This means that only one person can use the phone at any one time. There is a buzzer system that is used to call any of the clerks in the group when the call is for them. Usually the person who answers the phone first is the one with the least service. At the present time it happened to be Stella.

The peak work load is between 9:00 and 11:00 in the morning and between 2:00 and 4:00 in the afternoon. All are allowed a 15 minute relief period both morning and afternoon. However, these are not scheduled since the demands of the work change from day to day.

*Adapted from Maier and Zerfoss (1952)

Role for Jim Telfer

You are the supervisor in a general office of an insurance company. The group you supervise is made up of ten clerks who work at desks. A good deal of the work requires telephone contacts with other people within the company who require information which your group has in their files. Since all of the phones are on one line the person who answers uses a buzzer signal and in this way the person requested or who has the needed information can take over the call. You yourself never answer the phone unless one of the clerks informs you by buzzer the call is for you. Ordinarily the clerks with the least service answers the phone and then buzzes the clerk who can handle the call.

A relief period of fifteen minutes both morning and afternoon is given the clerks and this is regarded as adequate for the usual personal needs. You have asked them to take their relief no more than two at a time so as to keep coverage in the office. When the work is heavy the relief is frequently skipped.

Your boss complained to you that you are hard to reach by phone because the line is always busy. He says he can reach other units which do the same type of work as your unit and he thinks your group is making too many personal phone calls. You know that the clerks do call out freely and that they receive quite a number of personal calls, because on several occasions you have picked up your phone and found the conversation had nothing to do with business. For example, twice during the past week you found Irene talking with her boyfriend. You told your boss you would do something about it and have decided to talk it over with the group first. Since the work load is light from 4:00 to 5:00 you have decided to meet with them then.

Role for Office Clerk

You are new in the company and like your job. You like to deal with people and especially enjoy working with the phone. You hope that soon your work will be more interesting. At present you do routine filing, answer the phone just to buzz for one of the other clerks and help out when the others are on relief or busy. The others seem to have a good deal of fun with the fellows and girls in the other units. You are gradually getting acquainted with them so now you can kid with some of the people who call you before buzzing one of the others when a call comes into the unit. You never make personal calls, however. You have a relief period mornings and afternoons and make all your personal calls from the lounge. Your immediate supervisor is Jim Telfer. He has called a meeting of all the clerks in the unit today in his office. Everyone has finally arrived and Telfer looks like he has something important to say.

APPENDIX C
SUPERVISOR'S STATEMENT

Good afternoon, I asked you in today to discuss some of our office procedures, determine if any problems exist and, if possible, discuss some solutions. While you consider what problems you may have encountered I'd like to bring up one that has come to my attention. My boss has recently told me that he found, in trying to contact me by phone, that our unit's telephone is often tied up. I understand that we are hindered by only having the one phone line for all of us to use. However, the other units that do work similar to ours do not seem to present the problem of busy signals to the extent we do.

The company has not seen fit to provide us with more telephones so far. Hopefully that will change soon. On the other hand there are strict rules concerning the use of office phones for personal calls. We also have an obligation to do our best to serve the needs of the other departments who require our service.

I want to make working here as pleasant as possible for all of you. To accomplish this the needs of everyone must be considered. This includes all of you here, myself and those above us whom we work for.

Now, as far as the telephone situation is concerned, do any of you see ways in which to reduce the likelihood of an incoming caller receiving a busy signal while maintaining or improving our service in our primary function?

APPENDIX D
EVALUATIONS OF SUPERVISOR TAPES

Responses by twelve judges to Supervisor tapes.

<u>Recording Number</u>	<u>Role Player</u>	<u>Attitude Set</u>	<u>Identified Correctly</u>	<u>Identified Incorrectly</u>	<u>Not Sure</u>
1	John	Consideration	10	1	1
2	John	Structure	12	0	0
3	Ray	Consideration	12	0	0
4	Ray	Structure	12	0	0
5	Ray	Structure	12	0	0
6	Joe	Consideration	10	2	0
7	Joe	Structure	10	1	1
8	Peter	Consideration	10	1	1
9	Peter	Structure	12	0	0

APPENDIX E
STATEMENTS FOR DETERMINING SUBJECTS' ATTITUDES
TOWARDS SUPERVISORY BEHAVIOR

Directions

When responding to each statement use the scale on your answer sheet as follows:

Always A B C D E Never

Record your responses by filling in the appropriate box which indicates the degree to which the statement describes the supervisor.

Your Supervisor:

1. does personal favors for those under him.
2. encourages overtime work.
3. expresses appreciation when one does a good job.
4. tries out his new ideas.
5. is easy to understand.
6. rules with an iron hand.
7. stands up for his workers even though it makes him unpopular.
8. criticizes poor work.
9. sees that one is rewarded for a job well done.
10. talks about how much should be done.
11. treats people under him with consideration for their feelings.
12. asks for sacrifices from his workers for the good of the entire department.
13. tries to keep those under him in good standing with those in higher authority.
14. insists that his people follow the standard way of doing things in every detail.
15. stresses the importance of morale to those under him.
16. sees to it that people under him are working up to their limits.

17. treats his workers as his equal.
18. offers new approaches to problems.
19. criticizes a specific act rather than a particular individual.
20. insists that he be informed on decisions made by those under him.
21. is willing to make changes.
22. stresses being ahead of other work groups.
23. makes those under him feel at ease when talking with him.
24. "needles" those under him for greater effort.
25. is friendly and can be easily approached.
26. decides in detail what shall be done and how it shall be done.
27. puts suggestions made by those under him into operation.
28. emphasizes meeting of deadlines.
29. gets approval of his foreman on important matters before going ahead.
30. asks those in slow groups to get more done.

APPENDIX F

QUESTIONS FOR DETERMINING SUBJECTS' UNDERSTANDING
OF SUPERVISORS STATEMENT

31. Telfer asked you to his office today to discuss a) promotions
b) office party c)*office procedures d) his bosses troubles.
32. Did Telfer ever give you a chance to tell him some of your problems?
a) Yes b) No
33. The problem with the telephone was brought up because a) the unit
wasn't doing it's job b) his boss told him to c) the girls in the
unit use the phone too much d) he wants relations with the rest of
the company to be strictly business.
34. Every unit like yours has a single line and a) they are tied up too
b) they are never tied up c) they don't have the line tied up as
much as yours d) They do different work than you do.
35. The company a) will soon provide more lines b) expects never to have
a busy signal c) requires outstanding performance d) has provided
no more lines.
36. There a) are b) are not strict rules concerning the use of office
phones.
37. Jim Telfer said he tries to make work a) eaiser b) more efficient
c) more pleasant d) available for everyone.
38. Telfer wants to consider the needs of a) workers b) himself c) his
boss d) all of these.
39. Telfer's boss said a) he could never get through by telephone b) they
had to get more work done c) the company decided to provide more tele-
phones d) everyone would share answering the telephone.
40. Jim Telfer held the meeting in his office a) between 8:00 and 9:00
b) during relief periods c) between 4:00 and 5:00 d) after hours.

* Underline indicates correct answer.

APPENDIX G
INSTRUCTIONS

For supervisors when recording statements:

In the role of Jim Telfer you are to approach the problem involving the telephones with a high degree of emphasis on goal attainment and structure. This does not mean that you cannot consider the feelings and attitudes of the clerks involved but only that the attainment of the goal of better use of the telephones and fewer tieups is paramount.

For subjects in Pretest:

When responding to the statements refer to the kind of supervisor you would prefer to have in a work situation. There are no right or wrong answers as you are asked to indicate the way you feel about the topics. Try to indicate the first impression you have about each statement. Try to answer each one as you feel and not as you think others would like you to feel.

For subjects in final meeting:

The general instructions will tell you information anyone would know from working on the job. You are one of the clerks in Jim Telfers Unit. The role you receive will describe how you individually feel about your job situation. Please do not discuss your roles with those near you. Your feelings and comments are to be guided by your role as a clerk and your attitude toward the general situation. Do not feel you must act or fabricate an opinion. Simply indicate your feelings with the information about your role as a starting point.

You will now hear (be shown) a comment by your supervisor, Jim Telfer.

You should not be surprised by not being able to see (hear) the picture (the sound) as that portion has been deleted.

PRESENTATION OF SUPERVISOR'S STATEMENT HERE

For subjects after presentation of supervisor's statement:

In responding to this series of statements and questions do so from the perspective of your role as a clerk in Jim.Telfer's office. Do not refer to your ideal as you previously did but now refer to Jim Telfer and his impression on you in the actual situation just encountered. Again, there are no right or wrong answers. We are interested only in your reactions to the supervisor. Remember to respond to all the statements and be sure all erasures are complete.

APPENDIX H
SUBJECT BIOGRAPHICAL INFORMATION

Items for subjects to indicate on answer sheet in identification box:

Identification number

Age

Sex (M = 1, F = 2)

Major Ethnic Group

1. American Indian
2. Native American; European origin
3. Other European origin
4. Native American; African origin
5. Other African origin
6. Native American; South and East Asian origin
7. Other South and East Asian origin
8. Native American; Latin American origin
9. Other Latin American origin
10. Other origins

Area of Geographic Origin; City

1. Country (Farm or other)
2. Rural (Town of 2500 or less)
3. Suburban (Town of 2500 - 50000)
4. Urban (Town of 50000 - 500000)
5. Urban (Town of 500000 or more)

Area of Geographic Origin; National

1. Pacific; Ca, Or, Wa, Al, Ha
2. Mountain; Ne, Ut, Co, Wy, Id, Mt
3. Southwest; Az, NM, Tx, Ok
4. North Central; ND, SD, Nb, Ks, Mn, Ia, Mo, Wi, Il, In, Mi, Oh
5. Southeast; Ak, La, Ms, Al, Ga, Fl, Tn, Ky, NC, Sc, Vi
6. Northeast; WV, Md, De, Pa, NY, NJ, Ct, RI, Ma, Vt, NH, Me
7. Latin America
8. Europe
9. Asia - Africa
0. Canada, Australia and other

Have you ever had a permanent job, including military service, six months or longer? (Yes = 1, No = 2)

APPENDIX I
LEAST SIGNIFICANT DIFFERENCE LEVELS

TABLE 6

<u>Modes Compared</u>	<u>Least Significant Difference</u>
Visual/Aural vs Visual	4.8094
Visual/Print vs Aural	5.0074
Visual/Print vs Visual	4.8094

TABLE 8

Visual vs Print	3.7541
Visual/Print vs Visual	4.3203
MO x SP x SX 11 vs 22	10.6524
MO x SP x SX 21 vs 22	11.1909

TABLE 10

Visual/Print vs Visual	.7684
Visual/Print vs Aural	.7534
Visual/Print vs Print	.6657

APPENDIX J
EXPERIMENTAL DATA BY
MODE, SPEAKER AND SEX OF SUBJECT:
TEST SUMMARY FOR EACH SUBJECT

Mode: Aural, Speaker: John, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
101	44	56	4
102	44	52	7
103	49	53	6
104	55	59	6
105	51	46	6
106	63	55	5
107	55	53	7

Sex: Female

108	46	60	5
109	55	62	6
110	57	57	7
111	54	59	7
112	43	56	6
113	66	63	7

Mode: Visual, Speaker: John, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
201	45	64	2
202	48	65	6
203	48	57	4
204	37	69	4
205	57	55	4
206	63	68	6

Sex: Female

207	45	55	1
208	47	55	3
209	56	48	5
210	60	64	7
211	62	63	5
212	36	68	3
213	66	47	4
214	39	36	3
215	35	39	3

Mode: Print, Speaker: John, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
301	53	60	6
302	57	50	5
303	52	49	7
304	46	57	4
305	56	46	8
306	59	50	6
307	68	56	2
308	52	39	7
309	59	43	5
310	64	53	5
311	52	42	7
312	48	56	6
313	65	53	4
314	41	36	5

Mode: Print, Speaker: John, Sex: Female

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
314	41	36	5
315	66	41	6
316	64	54	8
317	57	57	8
318	63	50	6
319	59	35	7
320	57	68	4
321	57	28	6
322	55	50	8
323	63	49	7

Mode: Aural/Visual, Speaker: John, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
401	63	55	3
402	39	56	5
403	42	44	6
404	47	56	7
405	36	54	3
406	49	61	6
407	39	47	7

Sex: Female

408	49	47	4
409	56	49	6
410	42	58	6
411	39	56	7
412	35	65	7
413	42	56	5
414	26	57	6
415	63	55	7
416	33	45	6

Mode: Visual/Print, Speaker: John, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
501	48	49	6
502	55	45	7
503	37	61	3
504	64	43	6
505	63	46	4

Sex: Female

506	39	61	7
507	54	55	5
508	42	64	3
509	28	48	5
510	53	44	5
511	57	62	8
512	60	58	6
513	36	53	4

Mode: Aural, Speaker: Ray, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
151	67	62	6
152	60	57	8
153	59	54	4
154	65	53	6
155	63	58	7
156	59	62	4

Sex: Female

157	61	49	7
158	66	51	4
159	55	56	7
160	51	61	6
161	63	43	6
162	39	58	7
163	64	50	6

Mode: Visual, Speaker: Ray, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
251	68	49	8
252	56	36	5
253	60	52	3
254	34	51	5

Sex: Female

255	39	65	5
256	67	43	3
257	58	51	4
258	51	63	4
259	40	60	3

Mode: Print, Speaker: Ray, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
351	69	38	8
352	57	52	6
353	57	52	5
354	57	57	4
355	53	49	4
356	52	38	6
357	50	37	5
358	54	56	5
359	61	43	5
360	56	45	3
361	54	43	5
362	59	34	5
363	51	54	6
364	47	63	6

Mode: Print, Speaker: Ray, Sex: Female

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
365	57	53	7
366	61	53	5
367	47	62	5
368	65	46	5
369	51	50	7
370	51	48	7
371	57	46	7
372	52	45	8
373	55	62	6
374	64	60	6

Mode: Visual/Aural, Speaker: Ray, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
451	45	56	6
452	49	61	5
453	36	49	4
454	32	65	5
455	52	64	6

Sex: Female

456	53	64	8
457	53	66	7
458	54	56	6
459	49	54	7
460	52	66	6
461	38	56	6
462	53	53	3
463	42	40	6
464	60	58	7
465	66	54	7

Mode: Visual/Print, Speaker: Ray, Sex: Male

<u>Subject Number</u>	<u>Consideration Total</u>	<u>Structure Total</u>	<u>Factual Total</u>
551	70	54	4
552	54	48	5
553	65	52	5
554	44	58	4

Sex: Female

555	35	33	7
556	41	55	7
557	57	54	6
558	56	45	9
559	63	45	6
560	57	36	6
561	63	43	7

MODE EFFECTS ON COMMUNICATION

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ABSTRACT

The effectiveness of a decision is a measure of both quality and acceptance, however the great advances being made in the development of methods for arriving at high quality decisions have far exceeded those used to insure acceptance. The inducement of the positive acceptance and commitment desired by managers requires a knowledge and application of effective communication. The present study was designed to investigate one of the aspects of the communication process: the effect of communication mode on interpersonal communication.

Each of 152 subjects received a communication through one of five communication modes and combinations of modes: aural, visual, print, visual/aural or visual/print. The subject then responded to a series of statements and questions. The responses to the statements and questions were then analyzed to determine if differences in communicative effect occurred between the various modes.

The results indicate there are significant differences among the modes and, in addition, that these differences are a function of the kind of communication involved. That is, beliefs of the communicator are affected differently from a factual communication. Also, the sexes respond differently under certain mode conditions. The study indicates that the manner and presentation of an interpersonal communication is at least as important as the words chosen in the expression.