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NONVERBAL BEHAVIOR DURING CONSTRAINED
VERBAL COMMUNICATION

BY

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B.A., Florida Technological University, 1970

THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master of Communication
in the Graduate Studies Program of
Florida Technological University

Orlando, Florida
1975

162158

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INTRODUCTION

A review of literature concerning nonverbal behavior indicates that such behavior is often considered communicative and that it is often studied during or in relation to instances of verbal communication. In reference to the basic communication concept - code/encoder/channel/decoder -¹ it is not clear which or how nonverbal behavior can be considered systematically communicative. As a result, a variety of meanings are assigned to nonverbal behavior in an attempt to account for verbal/nonverbal relationships, whether the focus is on classification, cultural factors, social factors, conscious two-way communication, non-purposive behavior which has message value for some receiver, or psychopathological conditions. While literature on nonverbal behavior has ample heuristic value it lacks a focus on nonverbal behavior which can be studied within the perspective of a code/encoder/channel/decoder system. Such a focus is unwarranted if the investigative concern is with understanding an individual's behavior since, ". . . toward this end all sources of information are equally relevant."² However, such a focus becomes necessary, ". . . if the primary concern is with communicative processes which occur extra verbally, for without it there is no basis for deciding which events from the on-going stream of extra-verbal behavior are relevant to and appropriate for a study of communication."³ The concern, then, is not with the discovery of which nonverbal behavior is or is not communicative, but with the discovery of a nonverbal language comparable to verbal language with reference to the basic concept of communication.

Consensual discovery of such a language is not evident in current literature.

Current volumes follow from the established works of Birdwhistell⁴ and Hall.⁵ Birdwhistell, with his notation system, defined and specified the various human movements which have discriminational meaning, including both minute and general movements.

Birdwhistell also offered this analogy:

The isolation of gestures and the attempt to understand them led to the most important findings of kinesic research. This original study of gestures gave the first indication that kinesic structure is parallel to language structure. By the study of gestures in context, it became clear that the kinesic system has forms which are astonishingly like words in language.⁶

Hall, on the other hand, originally developed a proxemic notation system which is used extensively to construct recording devices for nonverbal behavior.⁷ He later proposed that, "Culture is communication and communication is culture."⁸ While current volumes are not based on the observations of Birdwhistell and Hall, they rely on them for support of their kinesic, cultural, and social factors approach.

Recent books by Fast⁹ and Schefflen¹⁰ emphasize the social manifestations of nonverbal movement under the heading of "body language." These books cover a large range of topics including the evolution of kinesic behavior, proxemics, courting behavior, and unconscious expressions. Numerous details are given in describing how a nonverbal language may be used but there is no systematic discovery of a consensual language.

Other current volumes emphasizing the social manifestations of nonverbal behavior include Mehrabian¹¹ and Hinde.¹² Mehrabian's book

emphasizes social factors, although he attempts to distinguish between nonverbal behavior and language:

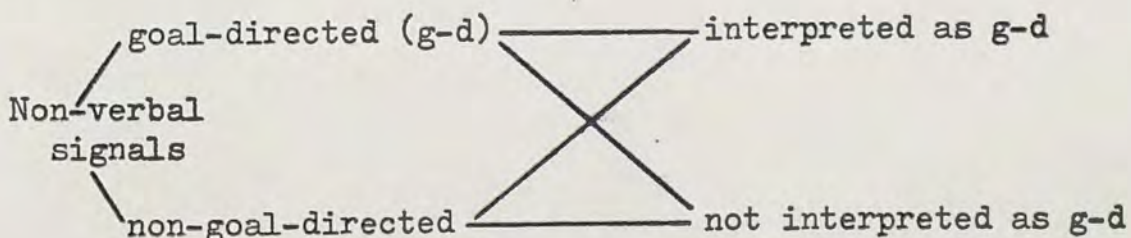
Anyone who has played charades knows that language is by far the most effective medium for expressing complex and abstract ideas. The ideas contained in this or any other book cannot be communicated with actions. This would be possible only if we were to develop a special code such as that used by deaf persons, and this would amount to learning a new language with all the accompanying arbitrary conventions.

One important difference between actions and speech, then, is that actions only permit the expression of a limited set of things, primary feelings and attitudes. This is in part an explanation for the second important difference: The conventions that underlie nonverbal communication are fewer in number and are more intuitively obvious than those of a language. We referred to these conventions as the metaphors that allow one to convey varying degrees of like-dislike, dominance or status, and responsiveness.¹³

Important here is Mehrabian's observation that nonverbal behavior, in order to be as effective as language, requires the development of a new language along with a special code and arbitrary conventions.

Hinde's book contains a series of articles concerned with evolutionary, social, and cultural factors. More importantly, some articles, for example MacKay's "Formal Analysis of Communicative Processes," are concerned with conscious two-way communication:

When we add to this the distinction between signals perceived by their recipient as communicatively goal-directed, and those not so perceived, this presents us at the outset with four basically different categories of situation covered by our title, which may be summarized in the following diagram.



Situations of these four types may be expected to differ radically both in their dynamics and in the categories of scientific explanation that they will demand in order to be fully understood. It seems important that experiments on non-verbal 'communication' should be designed as far as possible to distinguish between them.¹⁴

The distinction between goal-directed and non-goal directed is analogous with the distinction between consciously encoded nonverbal behavior and other nonverbal behavior to which observers assign meaning.

The more recent works of Mehrabian¹⁵ and Knapp¹⁶ review research conducted in various areas of nonverbal behavior. Mehrabian's text contains a review of his research that focuses on abilities to encode and decode positive and negative feelings. In summary of his findings Mehrabian states:

These findings supported the view expressed by Wiener and Mehrabian (1968) that our culture discourages the explicit verbalization of negative feelings, and consequently the implicit communication channels have assumed the function of expressing such attitudes. The finding that females are better encoders of negative attitude than are males is in line with this cultural explanation, since males seem to have greater latitude to express negative feelings explicitly.¹⁷

The importance of Mehrabian's work is evidenced by his systematic approach to an encoding process of nonverbal behavior, an approach lacking in the current publications. Mehrabian's summary suggests that nonverbal behavior can substitute for verbal behavior.

In addition to his review of nonverbal research, Knapp offers some basic perspectives for defining nonverbal communication in the total communication process:

The term nonverbal is commonly used to describe all human communication events which transcend spoken or written words. At the same time we should realize that many of these nonverbal

events and behaviors are interpreted through verbal symbols. In this sense, then, they are not truly nonverbal...Nonverbal communication should not be studied as an isolated unit, but as an inseparable part of the total communication process. Nonverbal communication may serve to repeat, contradict, substitute, complement, accent, or regulate verbal communication.¹⁸

Knapp's definition is in line with Miller's discussion of his "model emphasizing nonverbal communication."¹⁹ Basically, the model depicts communication as moving from referent-to-source/encoder-to-verbal stimuli + physical stimuli + vocal stimuli-to-receiver/decoder, then feedback. Verbal communication is treated as a process in which a source employs language to elicit certain meanings from his receivers. The language interacts with physical and vocal stimuli to create what Miller calls a potential problem faced by the source/encoder. The problem consists in potential disparities in the meanings assigned by the receiver/decoder to the three sets of message stimuli. Miller explains that the receiver-decoder's responses to both source-encoder and referent will interact to determine the meaning he assigns to the situation. However, he warns:

Whereas it would be psychologically difficult to respond to the referent without also responding to the source-encoder, the converse does not necessarily hold; i.e., the receiver-decoder might focus his entire attention on the physical and vocal stimuli encoded by the source and largely ignore the verbal stimuli relating to the referent.²⁰

Ignoring verbal stimuli would temporarily eliminate interaction between verbal and nonverbal stimuli and would open the physical and vocal channels in order to complete the communication. By this logic, it is possible to explain how these physical and vocal channels would also open for the source/encoder when he fails to use verbal stimuli. Miller makes no such assumptions nor is it known whether previous

research has considered his model, yet the recurrent assumption in literature is that these channels are open and are employed to communicate. Mehrabian reports evidence to support such an assumption when considering the expression of liking and feeling:

$$\begin{aligned} \text{Total liking (feeling)} &= 7\% \text{ Verbal liking (feeling)} + 38\% \\ &\text{Vocal liking (feeling)} + 55\% \text{ Facial liking (feeling)}^{21} \end{aligned}$$

Mehrabian's experimental results show that the impact of facial expression is greatest, then the impact of vocal expression, and finally that of words.

In addition to its cultural and social implications, current literature partially alludes to nonverbal language, considers verbal/nonverbal interaction and suggests nonverbal behavior as a substitute for verbal behavior. More recently Wiener, et al.,²² and Rubinow²³ proposed a reevaluation of nonverbal behavior as a communicative event. For them a communicative event would be:

An act of representing one's experience, or of making that experience overt, via a set of learned, socially shared signals, most of which bear little perceptual similarity to the referent (that is, most signals can be considered symbolic).²⁴

Or, communication would imply, "(a) a socially shared signal system, that is, a code, (b) an encoder who makes something public via that code, and (c) a decoder who responds systematically to that code."²⁵

Here code would consist of a set of arbitrary components which have referents other than themselves such as words or Morse code. This definition clearly reflects verbal behavior but tends to exclude certain nonverbal behavior that otherwise is considered communicative.

Furthermore, nonverbal behavior, to be communicative, must be perceived by the decoder. Mehrabian has considered this rationale in his

studies concerning the encoding of attitudes.^{26 10} Mackay's proposal for experimental design implies the same rationale.^{27 11} However, volumes which allude to a nonverbal language often lack such a rationale. A "socially shared signal system" concept of communication enables Rubinow and Wiener to distinguish between studies which treat nonverbal behavior as signs or inferences.

Rubinow explains that recent studies, which focus on the information conveyed by movements about underlying affects, derive from the thinking of Darwin.^{28 12} Darwin proposed that certain emotional states are manifested nonverbally and involuntarily.^{29 13} Studies which accept the proposal conclude that a trained observer can make inferences about individuals based on nonverbal manifestations along with other concurring affects, traits or conditions. However, Rubinow cautions:

However, in the above conceptualization, what an observer infers from an individual's behavior is often taken to be the same as what the individual communicates. But since any behavior can be the basis of an inference, then all behaviors must be considered to be communications.^{30 14}

Within this conceptualization, all behavior could be considered communication but there is no evidence to show that a socially shared signal system has been used.

As an example Rubinow cites those experiments of Ekman^{31 15} and Ekman and Friesen^{32 16} whereby subjects made inferences about the affect being expressed by people in photographs. The results, using this method, were inconsistent from study to study. Rubinow explains that since no explicit criteria were used to select stimuli (Stimuli were selected by time sampling.), it may be that the stimuli were not all functionally equivalent, containing both communicative and extra-

communicative behavior, or the stimuli were all communicative events, but not all communicated affect.³³ Again, there is no evidence to show that a decoder responded systematically to a code which an encoder had made public. The overall problem is that, without specified criteria, inferences made by an observer cannot always be used to verify what an actor intended to communicate.

While some studies focus on an observer making inferences, others focus on an actor who uses movements to express or reveal unacceptable information. According to Rubinow, this line of thought follows Freud.³⁴ Freud's concept consists of an actor subconsciously, symbolically, and covertly making manifest information which is unacceptable to him.³⁵ Rubinow gives as example Mahl's study of gestures and body movement in interviews. Mahl attempted to distinguish between communicative gestures and autistic actions. Communicative gestures were those which were taken to be substitutes for verbal utterances. Rubinow writes:

This approach appears to consider all movements as "betrayals," since Mahl does not respond differentially to "communicative" and "autistic" movements (i.e. both kinds of movements are interpreted psychoanalytically). To the extent that both kinds of movement give rise to identical kinds of statements by the observer, it is not clear in what sense the communicative-autistic distinction is a useful one.³⁶

Besides knowing a special code, in this approach, the decoder would also need special knowledge such as psychoanalytic theory in order to communicate with the encoder.

Does the sender communicate what he intended to communicate? This is the obvious problem question in any sign or inference inter-

pretation of nonverbal communication. Is nonverbal behavior conscious or unconscious? The answers to these and similar questions are secondary to determining which nonverbal behavior is communicative within the basic concept of communication. By comparison, verbal behavior is considered communicative; yet, verbal behavior often gives rise to the same questions of intention and consciousness. However, in order to show that nonverbal behavior is communicative, in reference to the basic concept of communication and in reference to Wiener, et al., there must be a discovery and use of a nonverbal code.

Wiener, et al., has introduced a new rationale for observing nonverbal communication by comparing verbal communication with nonverbal communication.^{37 21} Thus, if nonverbal communication is communicative, it must contain a code. Having a code, the nonverbal communication ~~must~~ involve encoding. For Wiener communication is a socially shared system (a code) used by an encoder to make something public to a decoder who responds systematically to that code. Using this definition, he proposes five steps to be considered in observing nonverbal encoding: (1) Establish an instance of code usage in the form of verbal communication. In other words, there will be verbal communication during the use of this method. (2) Identify a set of behaviors associated with verbal language behaviors. The occurrence of this set of behaviors is taken to be independent evidence for, and consistent with, the assumption that encoding is taking place in verbal behaviors. (3) Demonstrate that in the same way that predictable introductions take place within verbal language (variations in words), predictable nonverbal behaviors will be introduced when the verbal

possibilities are constrained. (4) Show that the introduction of these nonverbal behaviors does not result in changes in those decoder behaviors which are indicators of decoding or understanding in verbal exchanges. (5) If the nonverbal behaviors are introduced predictably, and if their introduction does not result in significant change in decoding indicators, then the nonverbal forms can be considered to be substituted for verbal forms, and thus can themselves be considered as components of nonverbal code ~~whose emission~~^{which} involves code usage. ^{38 22}

Wiener also suggests that the methodology of such an experiment is justified in terms of Hofstadter's "objective teleology". ^{39 23} Objective teleology suggests that predictions can be made on the basis of interrelationships between a set of operational events when one of the relationships among the designated events is changed.

While Wiener, et al., provides a framework and rationale for studying nonverbal behavior as an encoding/decoding process, Rubinow provides a channel for nonverbal communication. (Rubinow's work is based upon the conceptual framework presented by Wiener, Devoe, and Geller. ^{40 24}) The framework proposes that while any movement may serve as a basis for inferences about an individual, only some movements, for example gestures, are communications. Communicative gestures in this sense are gestures which judges can reliably discriminate from each other and from other kinds of movement. Rubinow also derives his definitions of channel and gestural channels from the proposed framework.

Channel, in relation to hand and arm movements, is defined as, "any set of behaviors in a communication which has been systematically

denoted by an observer and which is considered by that observer to be a representation which can be studied (in principle at least) independently of any other co-occurring behaviors."⁴¹ 25

Rubinow defines gestural channel in terms of two general classes of movements: pantomimes and semantic modifying gestures. Pantomimes are movements which have a culturally consensual meaning and function as nouns do in the verbal channel. Examples include such movements as placing the forefinger to the lips to signify "silence" or making two wavy lines with the hands to indicate a well-proportioned female. "Semantic modifying gestures are movements of the hands and arms which usually accompany speech and which have a function analogous to that of adjectives and adverbs in speech."⁴² 26 These movements have a low probability of occurring in a non-interpersonal situation and are considered relatively invariant with different performers, context, or addressee.

~~A third class~~ ^{Another} of nonverbal behavior is extra communicative movements which are not gestural but may be the basis for inferences by an observer. These movements include: direct responses to external or internal stimulation, for example scratching and foot jiggling; and culturally stereotyped movements like leg crossing; and individual stylistic variations in size, speed, and smoothness of movements. "These movements, unlike pantomimes and semantic modifying gestures, are assumed to be independent of co-occurring communication in other channels; thus, their occurrence is equally probable in non-interpersonal and interpersonal situations."⁴³ In other words, an encoder may equally use these movements in communicative or in non communi-

cative events.

Rubinow investigated the following assumptions about semantic modifying gestures: Semantic modifying gestures serve the function of modifying, clarifying, or reducing the ambiguity of some message occurring simultaneously in another channel, usually verbal; They may communicate information relevant to the interpersonal situation in which communication occurs; The kinds of information communicated by these semantic modifying gestures could equally well be communicated in the verbal channel.⁴⁴ Rubinow's investigation used the following gestures:

Palm up: Primarily a gesture of the hand(s)* rather than the arm. The wrist is rotated outward from the body midline and the palm of the hand is turned upward so that it is at least in part visible to the addressee. The arms may sometimes be moved out from the body midline.

Palm down: The hand is extended so that the palm is roughly parallel to the floor, but the speaker typically bends the wrist back somewhat so that the fingertips are facing outward and somewhat upward; some of the palm is usually visible to the addressee.

Point to self: Usually performed with the hand and forearm together: 1) the fingers are curled into the palm, and the extended thumb points toward the speaker, or 2) with the fingers held straight the palm is bent so that the four fingers point to the speaker.

Point to addressee: Typically, the index finger is extended toward the addressee, while the other fingers and thumb curl in towards the palm. However, two or more fingers may be used to point.

Point "out there": Either the thumb or one or more fingers are extended off to the speaker's side, sometimes with forearm movement.

*No distinction is made here between gestures performed using only one hand and those using both hands.

Circling: The hand is rotated in a fluid, free, soft, loose fashion with the wrist relaxed. Or the forearm and hand, functioning as a unit, perform the circling, with the wrist held relatively inflexible.

Oscillation: Usually performed with both hands, the wrists being held relatively immobile. The forearm and hand move back and forth slowly, and the speaker is apt to look as though his hands were going back and forth over the surface of a small ball held between them. As one hand moves clockwise, the other moves counterclockwise.

Rhythmic Chop: A linear movement primarily involving the forearm. The same plane is generally maintained throughout the movement, the hand and arm function as a unit, and the thumb stays relatively close to the other fingers. This gesture is rather like a "karate chop," and is typically repeated several times in fairly quick succession.⁴⁵

Rubinow hypothesized that the following gestures communicate ambiguity or uncertainty about some aspect of the verbal message:

The following gestures communicate uncertainty about some aspect of the message

1) palm up communicates the speaker's uncertainty about the truth-value of his message and uncertainty about the purpose of pursuing the matter further, 2) oscillation indicates alternatives and may communicate uncertainty about choice between the, 3) circling communicates that the message is expressed in general terms and is to be interpreted as an approximation rather than taken literally; it may also include the speaker's awareness that he has not said precisely what he means.⁴⁶

In addition, the palm down and chop gestures were hypothesized to communicate kinds of certainty in the verbal message. The three pointing gestures were hypothesized to denote the referent of the verbal message, the speaker himself, the addressee, or someone or thing either apart from the speaker and addressee or distant from them in time.⁴⁷

Rubinow tested his hypotheses by the following procedure:

Basic "neutral" sentences were each modified eight different ways. Each of the eight modifications added to a basic sentence the information hypothesized to be communicated by one of the semantic modifying gestures. For each gesture studied, subjects saw the gesture performed on a silent video tape recording and read one of the basic sentences, allegedly

spoken by the person at the same time as he was making the gesture. Subjects then indicated which modification of the sentence best expressed what the person was communicating when he made that particular statement and that particular gesture together. It was predicted that, for each gesture, subjects would predominantly choose the modification of the basic sentence associated with that gesture.⁴⁸ 31

The results confirmed that the semantic modifying gestures have consensual meanings. Data from control subjects indicated that the content and form of the basic sentences did not bias subjects in favor of particular modifications of them. The hypothesized results were as follows:

Responses from experimental subjects were predominantly made as predicted by the hypotheses. For each gesture, the pattern of responses was both significantly different from chance and, with one exception, significantly different from the pattern of responses to each other gesture. Sixty-two of the 64 subjects made more predicted responses than expected by chance.⁴⁹ 32

The present study follows Rubinow's findings, using the eight semantic modifying gestures, but is primarily concerned with uncertainty gestures as channels. The present study also adopts Wiener's, et al., proposed strategy for observing nonverbal encoding along with Wiener's, et al., outline for manipulations.⁵⁰ 3B The third step of the previously discussed strategy states:

(3) Demonstrate that in the same way that predictable introductions take place within verbal language (variations in words), predictable nonverbal behaviors will be introduced when the verbal possibilities are constrained.⁵¹ 3C

Familiar and unfamiliar topics were introduced as verbal constraints as suggested by Wiener's, et al., outline for manipulations:

1. A subject is required to talk about a subject matter he knows well and about a subject matter he knows less well (e.g., a psychologist is required to talk about some subject in physics). We would predict an increase in the

number of uncertainty gestures (i.e., palms up) and of vagueness or generality gestures (i.e., circling) when the subject talks about less familiar subject matter.⁵²

The variables, status and sex, were incorporated with the topic variable. Support for considering status as a constraint is discussed by Mehrabian, who states in sum:

...Relaxation seems to exhibit a linear relationship with status, as follows: There is a high degree of relaxation with a low-status addressee, a moderate degree of relaxation with a high-status addressee, and an intermediate degree of relaxation with peers.⁵³

The purpose of this study is to examine the effects of verbal constraints on nonverbal behavior during an interaction situation. Nonverbal studies seldom use actual verbal interaction, however, positive results from an interaction study would lend further support to Rubinow's findings that uncertainty gestures are used as channels during verbal communication. Furthermore, Wiener's, et al., strategy can be tested, while positive results would support the theory that nonverbal behavior can substitute for verbal behavior as discussed by Wiener, et al.,⁵⁴ Mehrabian,⁵⁵ Miller,⁵⁶ Knapp⁵⁷ and others.

Hypotheses

- I. Communicators will use more uncertainty gestures when speaking on unfamiliar topics than when speaking on familiar topics.
- II. Communicators will use more uncertainty gestures during verbal communication with high status addressees than with low status addressees.
- III. Communicators will use more uncertainty gestures when speaking to a high status addressee on an unfamiliar topic than when speaking: (1)

to a high status addressee on a familiar topic, or (2) a low status addressee on a familiar topic, or (3) a low status addressee on an unfamiliar topic.

METHOD

Subjects

Sixty Florida Technological University (FTU) undergraduates, male and female, were selected primarily from the Fundamentals of Oral Communication courses during the summer quarter. These undergraduates served in a pilot study, while another sixty-two were selected from the same courses during the fall quarter to serve in the actual experiment.

Design

Status was manipulated at two levels, high and low, by having the subjects speak to an addressee (confederate) who had identified himself as either "Professor Thompson" or as another student. Confederates were trained using the instructions found in Appendix A. The male addressee served in both high and low status manipulations. The independent variable, familiarity with topic, was varied as familiar or unfamiliar. Familiar topics came from the list of topics compiled by each subject in his or her instruction booklet (See Appendix B). Unfamiliar topics were selected from those that each subject checked as unfamiliar on the printed list of topics found in the instruction booklet. During the actual experiment, the confederate (addressee), who had the subject's list of topics in hand, dictated the discussion topic according to the rank assigned each topic by the subject. Subjects were randomly assigned to either the high or low status condition. To rule out order effects, the conditions were induced according

to the scheme shown in Figure 1. The scheme was used separately on both male and female subjects.

Figure 1

Scheme for Inducing Experimental Conditions

Subject	Status	Topic Order
1.	H	F ----- UF
2.	H	UF ----- F
3.	L	F ----- UF
4.	L	UF ----- F
5.	H	F ----- UF
6.	H	UF ----- F
7.	L	F ----- UF
8.	L	UF ----- F

H = High L = Low F = Familiar

UF = Unfamiliar

Since both male and female subjects were used, a 2x2x2 design was formed as shown in Figure 2. Repeated measures were used across topics. That is, each subject spoke on both his familiar topics and his unfamiliar topics.

Materials

An 18' x 18' room with a one-way curtain was used, concealing a video-tape recorder in the adjacent room, as shown in Figure 3.

Figure 2

Diagram for Experimental Design

		STATUS			
		High Status		Low Status	
SEX		Male	Female	Male	Female
T O P I C	Familiar				
	Unfamiliar				

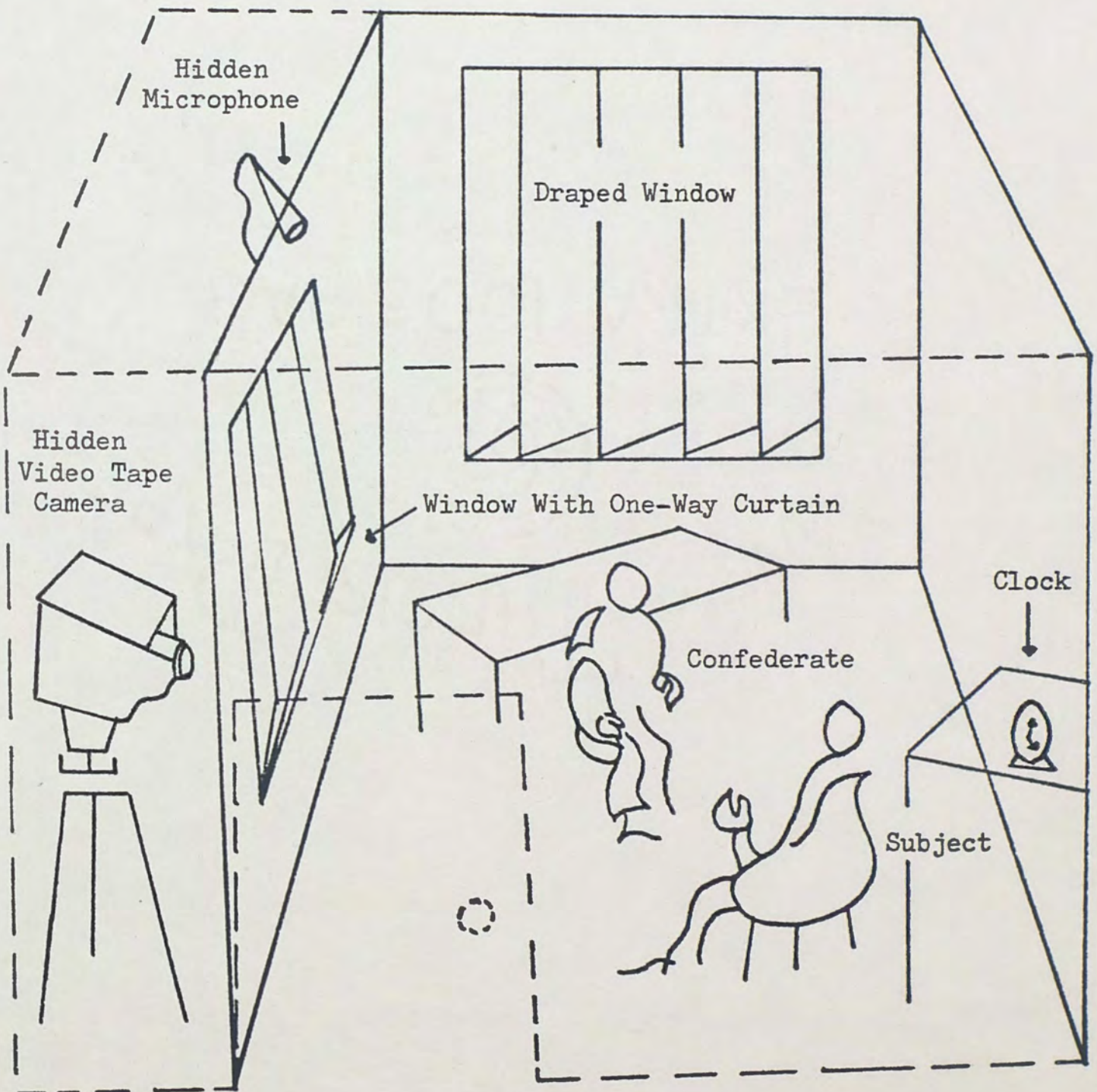
A booklet containing instruction and identifying data such as sex, date, and number was given to each student (See Appendix B). Each student also received a Post-Experiment Questionnaire (See Appendix C).

A recording sheet was used for each subject in recording the occurrence of each type of gesture. The sheets were used by judges who viewed the experiment tapes following the completion of the experiment. The sheets included all of the described gestures of the study (See Appendix D).

Pilot Study

Studying nonverbal behavior as proposed by Wiener's, et al., constrained conditions is new.⁵⁸ Using topic familiarity and status as the constraining variables posed several problems in experimental control of the dyad situation during verbal communication. A previous pilot study had indicated that subjects become nonverbally handicapped whenever they are placed in a small room containing visual or audio

Figure 3
Experiment Room



equipment and while standing. Thus, a pilot study was conducted in a room using a concealed audio-video tape machine, a microphone and camera.

The purpose of the pilot study was to iron out any problems in the following areas: (1) The role of the instructor (aid). (2) The role of the confederate. (3) The production of audio-video tapes suitable for transformation into judging units. (4) Subject reaction to topics.

Since the instruction booklet was, on the whole, self-explanatory, the instructor's role was easily defined. Two important factors were established for the instructor's role: He or she had to see that all items were completed in the booklet and that only the booklet was carried into the experimental room.

The first five subjects were used as trials to enable the confederate to adjust his role with direction from the experimenter. It became obvious that in addition to instruction, future confederates would require several rehearsals.

Because of the large window, with a one-way curtain, the cameraman was able to maneuver in such a way as to take clear close-up shots of the arm gestures. Too, the microphone which was easily concealed, clearly picked up the voices of the dyads. Later it was possible to compile units for judging by utilizing the pause, stop, and meter capabilities of the video-tape machine.

The limitations of the summer quarter, time and limited enrollment, made it virtually impractical to produce enough units for judging or, consequently, for data analysis. A review of all tapes revealed

an apparent trend toward more gestures during the unfamiliar topic condition. Two judges were secured to view twelve subjects in each condition, familiar and unfamiliar, including both males, females, and high and low status. Each subject represented 24 units. Collapsing the variables status and sex to show the percentage of total gestures in each topic condition, the percentages are shown in Table 1.

Table 1
Percentage of Total Gestures
in Each Topic Condition

Gesture	Familiar Topic N = 80 % of Total	Unfamiliar Topic N = 127 % of Total
Palms Up	20.0	24.4
Palms Down	7.5	4.7
Point To Self	1.2	5.5
Point To Addressee	60.0	19.6
Point "Out There"	5.0	22.9
Circling	5.0	8.6
Oscillation	1.2	9.4
Rhythmic Chop	0.0	6.2

EXPERIMENT

Procedure

Subjects were signed up to appear at five minute intervals to

allow for a continuous flow of treatments. Upon their arrival, subjects were given the instruction booklet by the experimenter's aid. Having completed the booklet, which required giving a list of familiar topics and a list of unfamiliar topics, the subjects handed the booklet back to the aid. The aid then made sure the booklet had been completed correctly. Next the aid marked the cover of the booklet with the appropriate treatment. For example, if the cover were marked H-UF, it meant that the confederate, upon seeing it, would introduce himself as "Professor Thompson" (high status) and would ask the subject to speak on unfamiliar topics first and familiar ones second. This scheme facilitated the rotation of treatment levels as to rule out order effects. The aid then led the subject into the experiment room and handed the confederate the instruction booklet.

To minimize the possibility of confederate bias on the results, two confederates were used in the actual experiment. Two males--same age group, general appearance, and dress--were used as male confederate I (MCI) and male confederate II (MCII). Each confederate had been trained through several rehearsals of his role. After introducing himself, and while taking a seat himself, the confederate asked the subject to be seated as shown in Figure 3. The confederate then gave a brief summary of the instructions and asked the subject to begin speaking on either a familiar or unfamiliar topic.

Typically, students listed their hobbies, favorite sports, jobs, careers or special interests as their familiar topics. Students showed no apparent pattern in checking unfamiliar topics from the list given in the instruction booklet (See Appendix B). Any number of

topics from the list were checked as most unfamiliar by different subjects.

Part of the confederate's task, especially during the unfamiliar condition, was to keep the subject talking by asking questions, when necessary, such as: "What do you think System Design means?" or "What do you think Organic Evolution is about?" The confederate also kept track of the time by an occasional glance at a clock placed on top of a cabinet behind the subject. He allowed two minutes each for both conditions.

The confederate dismissed the subject by thanking him and asking him not to discuss the experiment. Subjects were told that the explanation and results of the experiment would be sent to their speech teachers. This procedure was used in an attempt to minimize discussion of the experiment. Meanwhile, the next subject had been readied and was led to the confederate as soon as the previous subject left the room.

As a validity check on the status of the confederate, subjects were asked to fill out a post-experiment questionnaire. Each subject was asked to identify the person they talked with by placing a check next to one of the following positions: Staff member, Administrator, Undergraduate student, Clerk, Professor, Graduate student. After reading a definition of status, subjects then checked on a scale (Strongly Agree to Strongly Disagree) their reaction to the statement: "In my opinion, the person that I talked with has high status in relation to staff members, administrators, undergraduate students, clerks, professors and graduate students at FTU." (See Appendix C)

DATA COLLECTION

All the tapes were reviewed and coded. The video-tape machine was equipped with a meter. It was, therefore, possible to compile a log using digits to mark the beginning and end of each condition for each subject. The beginning was marked where the subject actually began talking about his topic. To keep treatments uniform for analysis, only the first 90 seconds -following the beginning- were considered for all data collection. This resulted in a minimum of $1\frac{1}{2}$ minutes of tape for each treatment. The $1\frac{1}{2}$ minutes were divided into 18 five second judging units. Several trial judgments helped to establish the 5 second unit since longer units made it difficult for the judges to recall the increased number and types of gestures.

Four graduate students were chosen to judge the units. Judges were given a list and demonstration of all gestures exactly as described in the present study. In general, the judges' instructions prepared them with techniques for viewing the tapes and stated the length of pauses between treatment units (Judges were not aware of different treatments). Also included in these instructions were procedures in asking for playbacks and procedures for recording the occurrence of different gestures (See Appendix E). Due to time and the individual judges' schedules, the judging had to take place over several sessions. Recording sheets such as shown in Appendix D were used in recording the occurrence of gestures. Although each judge recorded 124 sheets, the four judges' sheets were added together to yield one sum for each subject and gesture in each treatment cell.

ANALYSIS OF DATA

An analysis of variance with repeated measures topic (ANOVR) was used (See Linquist⁵⁹ and Hays⁶⁰) to allow for dependency among observations due to the same individual subjects in two different treatments. T-tests were used to probe the interaction effects, while a one-way analysis of variance was used to test differences between judges. A t-test was used to test differences in data produced between the two confederates.

RESULTS

Using the tabulations from the uncertainty gestures (Palm Up, Circling, Oscillation), a one-way analysis of variance, as shown in Table 2, indicated that differences between judges were non-significant. Thus, the total number of occurrences were tabulated for each gesture in all 16 treatment cells by adding all judges' recordings together.

Table 2

Analysis of Variance between the Judges' Ratings
of Uncertainty Gestures

Source	SS	df	MS	F	P
Between Judges	616.67	4-1 = 3	205.55	0.89	NSD
Within Judges	13803.31	64-4 = 60	230.05		
Totals	14419.98	64-1 = 63			

A t-test between the mean number of uncertainty gestures occurring for MCI and MCII produced non-significant results ($t = 0.94$ Two-tailed). Thus, the data of conditions using MCI and MCII were combined.

Since little research effort has previously been devoted to the encoding of nonverbal behavior, trends as well as significant findings could be of importance. That is, strong trends might lead to the formulation of subsequent hypotheses. For this reason the probability levels are included in the summary tables.

Table 3

Analysis of Variance for the Gesture Palm Up
With Sex, Status and Familiarity with Topic

Source	SS	df	MS	F	P
Between Subjects					
Sex	24.954	1	24.954	0.143	0.707
Status	172.811	1	172.811	0.988	0.324
Sex x Status	113.507	1	113.507	0.649	0.424
Error	10139.830	58	174.825		
Within Subjects					
Topic Familiarity	83.903	1	83.903	1.839	0.180
Sex x Topic	172.044	1	172.044	3.770	0.057
Status x Topic	15.050	1	15.050	0.330	0.568
Sex x Status x Topic Familiarity	77.244	1	77.244	1.693	0.198
Error	2646.758	58	45.634		

All three hypotheses can be tested, separately, on each of the three dependent measures. Table 3 summarizes the results of a 2x2x2 ANOVR including Sex, Status, and Topic Familiarity with Palm Up as the dependent measure.

As shown, there is no evidence to support any of the three hypotheses. However, Sex with Topic Familiarity approaches significance. The mean number of Palm Up gestures (10.19) was higher for females in the unfamiliar condition than in the familiar condition (9.15). While males had a higher mean number of the same gesture (12.43) in the familiar condition than in the unfamiliar condition (8.71).

The results of ANOVR for the Circling gesture with the variables Sex, Status and Familiarity with Topic are shown in Table 4. Topic Familiarity approached significance ($p = .052$). As predicted, subjects in the familiar condition tended to exhibit fewer circling gestures than in the unfamiliar condition. The mean number of gestures for the familiar condition was 1.15 and 1.79 for the unfamiliar condition. Hypothesis II and III were not supported. Sex with Topic familiarity again tended toward significance according to the mean number of circling gestures. Males had 1.03 gestures in the familiar condition and 1.20 gestures in the unfamiliar condition. Females had 1.30 gestures in the familiar condition and 2.55 gestures in the unfamiliar condition.

The analysis of variance for the Oscillation gesture resulted in a trend similar to the Circling gesture (See Table 5). There were fewer gestures in the familiar condition (1.66) than in the unfamiliar

Table 4

Analysis of Variance for the Gesture Circling
With Sex, Status and Familiarity with Topic

Source	SS	df	MS	F	P
Between Subjects					
Sex	20.082	1	20.082	2.628	0.116
Status	1.491	1	1.491	0.195	0.660
Sex x Status	1.032	1	1.032	0.135	0.715
Error	443.267	58	7.643		
Within Subjects					
Topic Familiarity	12.903	1	12.903	3.937	0.052
Sex x Topic	9.018	1	9.018	2.752	0.103
Status x Topic	0.111	1	0.111	0.003	0.954
Sex x Status x Topic Familiarity	3.001	1	3.001	0.916	0.343
Error	190.067	58	3.277		

condition (2.45). Again there is no significant finding for the second and third hypotheses.

As a final check on hypothesis three, a 2x2 analysis of variance was conducted involving status and topic familiarity. The three uncertainty gestures Palm Up, Circling and Oscillation were combined to include total uncertainty gestures. The results are shown in Table 6.

As can be seen, results obtained by combining the three

dependent measures does not provide support for the interaction Hypothesis III.

Table 5

Analysis of Variance for the Gesture Oscillation
With Sex, Status and Familiarity with Topic

Source	SS	df	MS	F	P
Between Subjects					
Sex	0.286	1	0.286	0.032	0.858
Status	13.185	1	13.185	1.492	0.227
Sex x Status	0.167	1	0.167	0.019	0.891
Error	512.467	58	8.836		
Within Subjects					
Topic Familiarity	19.363	1	19.363	3.823	0.055
Sex x Topic	3.729	1	3.729	0.736	0.394
Status x Topic	3.506	1	3.506	0.692	0.409
Sex x Status x Topic Familiarity	0.169	1	0.169	0.033	0.856
Error	293.733	58	5.064		

Table 6

Analysis of Variance for Uncertainty Gestures
With Status and Familiarity with Topic

Source	SS	df	MS	F	P
Between Subjects					
Status	483.750	1	483.750	1.961	0.167
Error	14799.740	60			
Within Subjects					
Topic Familiarity	47.815	1	47.815	0.670	0.416
Status x Topic Familiarity	28.610	1	28.610	0.401	0.529
Error	4283.075	60	71.385		

DISCUSSION

Although the data for the present study failed to reach the designated significance, several findings provided strong directional support for Hypothesis I.

Support for the first hypothesis (Topic Familiarity) approached significance concerning the Circling and Oscillation gestures. In each case the unfamiliarity treatment produced an appreciably greater number of gestures than the familiarity treatment. Thus, tentative evidence - that communicators display uncertainty via increased circling and oscillation gestures - was obtained.

During the demonstration of gestures and training of judges, it became apparent that, physically and technically, the Palm Up

gesture was hardest to detect on video tape. Physically, the Palm Up gesture requires the least effort to perform; while, the Circling gesture requires the movement of the wrist and forearm, the Oscillation gesture requires the movement of the wrist and fingers. Judges were told that the Palm Up gesture consisted of the subject exposing a palm, regardless of the duration of such an exposure. Technically, judges were instructed to ask for replays of any 5 second unit they were uncertain about; however, replayed units were always played back at the same speed as the first play. Therefore, it is possible that some Palm Up gestures were too brief for detection, even with the availability of replays.

While the present study does not analyze the alternative gestures chosen by the judges, Rubinow did and concluded, "Where alternatives were imperfectly discriminated, the confusions were always between alternatives which were related to each other."⁶¹ For example, a gesture such as Palm Up can be taken for Point out There when, ". . . a gesture on the tape may have been performed too quickly or without sufficient clarity to be decoded accurately."⁶² In a study of this nature, more exact recordings of gestures might be obtained with a video-tape unit equipped with slow motion capabilities.

Support for the second prediction (Status) was nearly non-existent except when the three uncertainty gestures were collapsed for analysis. Tabulations from the post-experiment questionnaire indicate that the majority of subjects did perceive the status of the confederate as intended. This would mean, that under the high status condition, subjects did realize the position, rank and thus the status of the

confederate. Such recognition was achieved mainly on paper. It is not possible to know whether this recognition was a mere reaction to the questionnaire (Both Pre- and Post) or to the stimulus (Confederate introducing himself as "Dr. Thompson"). Too, the confederate might not have communicated status by his mere presence since the subjects did not meet him beforehand. The stimulus high status might be improved by the use of a high status confederate who already has high status as a result of his past achievement, his character, his reputation, or his prestige.

The third hypothesis, which involved the interaction between status and topic familiarity was not supported.

All verbal messages were recorded in order to verify the familiar and unfamiliar conditions. However, no tabulations were made of those verbal statements which coincide with verbal substitutes suggested by Wiener, et al.⁶³ For example, Wiener suggests, "Palm up is equivalent to uncertainty or to 'I think' or 'I believe' or 'It seems to me' in a verbal statement, . . ."⁶⁴ The tabulation and analysis of verbal statements could lend further support to any hypotheses concerning uncertainty gestures as substitutes for verbal behavior.

Until now experiments, in an attempt to assess the role of nonverbal behavior in the two-way verbal communication process, have limited behavior for observation to an encoding stage or to a decoding stage. Furthermore, some studies have limited observations to nonverbal processes alone. The present experiment is unique in its attempt to observe both verbal and nonverbal behavior simultaneously

during actual two-way verbal communication. This at once provides the study with assets and liabilities.

Positively, the study shows that feasible units of nonverbal behavior can be abstracted from the total on-going two-way communication, regardless of focus. The focus here was with the gesture channel, but other channels were open for observation such as: facial expression, tone of voice, immediacy, posture, eye contact, and possibly the entire spectrum of nonverbal behavior. The method also leaves the experiment open to other manipulations such as those proposed by Wiener, et al., for constraining the communicator.⁶⁵ The conditions of communication could be manipulated by requiring the subjects to speak in a foreign language they have begun to learn in addition to speaking in their first language.⁶⁶ Variations of the manipulations used in the present experiment could also be induced within the same framework. Subjects could be required to speak on topics they disagree with instead of speaking on unfamiliar topics; then, they could be required to speak on topics they agree with instead of speaking on familiar topics. Subjects could also speak to a foreigner instead of speaking to a high status person, and could also speak to a native person instead of speaking to a low status person.⁶⁷ In general terms then, as long as the manipulations require two-way verbal communication, they can be readily induced and observed via the method of this study since each channel of nonverbal behavior occurring, during the verbal communication, can be isolated with the use of video-tape recorders.

Negatively, the methodology can be criticized for its openness. It may be too general, bringing into play too many factors to control

scientifically. Factors such as place, subject being discussed, setting, and even the experiment situation must eventually be considered.

In sum, the present study attempted to show how semantic modifying gestures are substituted for verbal behavior when the verbal language of the communicator is constrained, and the results show some direction towards this substitution. Other studies have discussed the nonverbal substitution; but further investigations, with the use of the observations made here, must demonstrate a more accurate parallel between verbal language and nonverbal behavior in order to discover a consensual language.

SUMMARY

Previous research supports the concept that nonverbal behavior is communicative. The general concept that all nonverbal behavior is communicative does not follow the basic communication concept of -code/encoder/channel/decoder. Rarely has research dealt with the problem of how nonverbal behavior fits into the basic concept of communication, in spite of repeated implications that it does. Some research explains the verbal/nonverbal relationship as a substitution process. Still, there remains little consensus among studies concerning the role of nonverbal behavior, particularly during two-way verbal communication. Recently, Rubinow⁶⁸ and Wiener, et al.,⁶⁹ provided a conceptual framework for studying nonverbal behavior.

Rubinow studied semantic modifying gestures, including the Palm Up, Circling and Oscillation gestures. These gestures were

hypothesized to communicate various kinds of ambiguity and uncertainty. Using video tapings of the gestures along with modifications of basic sentences, subjects were required to match the sentence with the gesture. The sentence modifications included information hypothesized to be communicated by each specific gesture. Rubinow found support for his hypotheses, thus confirming that the semantic modifying gestures have consensual meanings. This provided the three uncertainty gestures used as observation channels of nonverbal behavior in the present study.

Wiener, et al., proposed a rationale for studying nonverbal behavior as an encoding/decoding process. Nonverbal behavior, to be communicative, must conform to code usage as does verbal language. To show this usage, nonverbal behavior has to be observed during actual verbal communication. Then, when the verbal communication is constrained, the semantic modifying gestures will be encoded to substitute in the absence of verbal behavior. Wiener also suggests the manipulations and explains validity for the rationale in terms of Hofstader's "Objective Teleology".⁷⁰

The three semantic modifying (uncertainty) gestures -Palm Up, Circling, Oscillation- were studied during constrained verbal communication. Constraints were induced by requiring subjects to speak on unfamiliar topics and by requiring subjects to speak to high status addressees.

The present study hypothesized that communicators would: Use more uncertainty gestures when speaking on unfamiliar topics than when speaking on familiar topics; Use more uncertainty gestures when speaking

to high status addressees than with low status addressees; Use more uncertainty gestures when speaking to high status addressees on unfamiliar topics than when speaking in any of the other conditions.

Results did not significantly support the hypotheses. Evidence for the first hypothesis approached significance concerning the Circling and Oscillation gestures with Topic Familiarity. This significance is reported in terms of mean number of gestures occurring during the unfamiliar topic condition. The Palm Up gesture nears significance only when interacted with the variable Sex.

Of significance in this work is the attempt to draw a parallel between verbal and nonverbal behavior. Both kinds of behavior were observed and recorded simultaneously on video tape. The recordings provided feasible units for analysis, exposing the entire spectrum of nonverbal behavior for further analysis.

A fundamental basis has been set for studying nonverbal behavior in reference to the basic verbal concept of communication. Future research can now consider this basis in its assessment of verbal/nonverbal relationships. The positive results reported here give some direction to the presumption that nonverbal behavior is communicative and that it is a substitute for verbal behavior.

APPENDIX A

CONFEDERATE INSTRUCTIONS

- I. When the instructor hands you the subject's instruction booklet, take immediate notice of your role indications found on the booklet cover.
- II. Introduce yourself according to the indications: L indicates that you must introduce yourself as another FTU student. H indicates that you must introduce yourself as "Professor Thompson".
- III. You will notice FU or UF next to the L or H. For example, H-FU would mean that you introduce yourself as "Professor Thompson" and ask the subject to speak on his or her familiar topics first and to speak on his or her unfamiliar topics second. For H-UF you would still be "Professor Thompson" but you would ask for unfamiliar topics first. Abbreviated then, your four possible instructions are:
 - H-FU "I'm Professor Thompson . . . speak on familiar and then on unfamiliar topics."
 - H-UF "I'm Professor Thompson . . . speak on unfamiliar and then on familiar topics."
 - L-FU "I'm (your name) a FTU student . . . speak on familiar and then on unfamiliar topics."
 - L-UF "I'm (your name) a FTU student . . . speak on unfamiliar and then on familiar topics."
- IV. Be seated and ask the subject to take his seat.
- V. Convey neither a positive or negative attitude. You must remain neutral as possible. In other words, do not lean forward or backward

nor sit in a rigid position. Simply fit the contour of the chair, allowing one arm and hand to rest on your lap, using the other hand to hold the booklet. When the subject speaks look at him but avoid prolonged eye contact or head nods.

VI. Review briefly with the subject the purpose of your meeting: "As you know you are here to speak on some topics. I'll ask you to speak about two minutes on familiar topics and two minutes on unfamiliar topics."

VII. Check the cover again to make sure of the familiarity sequence.

VIII. Begin: "Let's take familiar topics first (according to FU). . .

I see you've put down Surfing. What do you have to say about Surfing?"

IX. Give neither positive or negative verbal reinforcement. Your comments should acknowledge reception: "I see. Well now, let's talk about Sculpture." Or, your comments should generate more conversation: "What would a course in Art and Technology be like?" "How would you describe it?" "Can you tell me anything more?" In short, you should ask questions or ask for comparisons between topics.

X. Keep track of the time, one minute for explanation and review, two minutes each for familiar and unfamiliar conditions. There is a clock behind the subject.

XI. To debrief: "Thank you for your time. We would appreciate it very much if you wouldn't discuss this experiment with anyone until two weeks from now when it is over. We will be sending a letter to your speech teachers, explaining the entire experiment and results. Thank you."

APPENDIX B

INSTRUCTION BOOKLET

When a sociologist says that a man has high status in an organization, he may mean any or all of the following: (a) the man is close to the center of the web of communication in the organization; (b) he is carrying on a particular kind of activity or maintaining a certain level of activity; and (c) by reason of his position in the web of communication and the kind of job he does, he is highly ranked or valued.⁷¹

Using these aspects of status, assign a rank to each of the following positions. The highest rank is 1, the lowest is 6. Use a rank only once, but rank every position.

- _____ Staff member
- _____ Administrator
- _____ Undergraduate student
- _____ Clerk
- _____ Professor
- _____ Graduate student

The recent trend in some speech courses is to emphasize communication rather than "formal speaking". In other words, the emphasis is on a combination of social, intrapersonal, and psychological factors rather than on the mere art of using language effectively. This trend has created new interest in all areas of speech communication. Some researchers are asking new questions about what helps students get the message across. One question concerns topics. Students have often indicated that they prefer choosing their own topics. Furthermore, some students have suggested that if speeches were more like conversation, they would communicate better with the audience. It is these two areas, topics and conversational speech, that we are interested in.

We have asked you to come here to help us begin a closer look at topics. First, list some topics that you are familiar with. List them in order of familiarity, with your most familiar topic listed first.

Now indicate as many topics as you feel you are unfamiliar with and would probably not use in a speech. Indicate those topics you are unfamiliar with by ranking them according to unfamiliarity. In other words, place an 1 by your most unfamiliar topic, a 2 by your next unfamiliar topic and so on.

- Accounting Concepts
- Three Dimensional Design
- Sculpture
- Art and Technology
- Biology and Environment
- Genetics
- Organic Evolution
- Field Botany
- Designated Pinch Hitter
- Urban Planning
- System Design
- Interpersonal Communication
- Economics of Public Utilities
- English Instructional Analysis
- Counseling Psychology

Once you have considered your topics and all of your choices, hand them to the instructor. He (she) will lead you into a room where Professor Thompson* will ask you to talk on different topics. You may be asked to talk about unfamiliar topics. However, you will talk only about what you think the subject is about or means. This is to help us understand how these topics are defined by those who are relatively unfamiliar with them. The idea is to talk in a conversational manner and to contribute as much information as possible to keep a conversational flow going until the professor dismisses you.

* Under the low status condition "student" was substituted for "Professor Thompson" on this page of the instruction booklet.

APPENDIX C

POST-EXPERIMENT QUESTIONNAIRE

I. The person that I talked with was a . . . (check one)

- Staff member
- Administrator
- Undergraduate student
- Clerk
- Professor
- Graduate student

II. When a sociologist says that a man has high status in an organization, he may mean any or all of the following: (a) the man is close to the center of the web of communication in the organization; (b) he is carrying on a particular kind of activity or maintaining a certain level of activity; and (c) by reason of his position in the web of communication and the kind of job he does, he is highly ranked or valued.⁷²

Using these aspects of status, please respond to the following:

"In my opinion, the person that I talked with has high status in relation to staff members, administrators, undergraduate students, clerks, professors and graduate students at FTU."

Indicate with a check your opinion on the following scale:

Strongly Agree

Strongly Disagree

_____ / _____ / _____ / _____ / _____ / _____ / _____

- V. If the unit ends in the middle of a gesture and continues in the next unit, record the gesture in both units. For example, if the subject has his palm up at the end of Unit 1. and Unit 2. begins with a palm up, you would record a Palm Up gesture in both Unit 1. and Unit 2.
- VI. If the subject makes a gesture other than those described on your list and demonstrated to you, record it in the Other Gestures column. Likewise, if no gesture is made, record a mark in the No Gesture column.
- VII. The instructor will tell you when to change recording sheets. You will be doing 124 sheets in sets and on different days.
- VIII. Remember that there are no right or wrong answers. This is especially important when there is another judge in the room with you. His recordings should not influence yours.
- IX. Refrain from talking to other judges during recordings.
- X. Use ink only.
- XI. You will be given an explanation of the entire experiment after all the judges have completed their observations and recordings. Thank you.

FOOTNOTES

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- ¹⁸Knapp, op. cit., pp. 20-21.
- ¹⁹Gerald Miller, An Introduction to Speech Communication (New York: Bobbs Merrill Company, Inc., 1972), p. 76.
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- ²³Rubinow, "Hand and Arm Gestures as Communications," p. 1.
- ²⁴Ibid., p. 6
- ²⁵Wiener, et al., op. cit., p. 25.
- ²⁶Mehrabian, Nonverbal Communication, p. 145.
- ²⁷MacKay, "Formal Analysis of Communicative Processes," pp. 3-27.
- ²⁸Charles Darwin, The Expression of the Emotions in Man and Animals (New York: Philosophical Library, 1955).
- ²⁹Rubinow, op. cit., p. 3.
- ³⁰Ibid.
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- ³⁵Rubinow, op. cit., p. 5.
- ³⁶Ibid.

³⁷Wiener, et al., "Nonverbal Behavior and Nonverbal Communication," pp. 185-214.

³⁸Ibid., p. 206.

³⁹Albert Hofstadter, "Objective Teleology," Journal of Philosophy, XXXVII (1941), pp. 32-33.

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⁴²Ibid., p. 7.

⁴³Ibid., p. 8.

⁴⁴Ibid.

⁴⁵Ibid., p. 9.

⁴⁶Ibid., p. 10.

⁴⁷Ibid.

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⁴⁹Ibid., p. 35.

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⁵¹Ibid., p. 206.

⁵²Loc. cit.

⁵³Albert Mehrabian, "Significance of Posture and Position in the Communication of Attitude and Status Relationships," Psychological Bulletin, LXXI (1969), p. 370.

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⁶³Wiener, et al., "Nonverbal Behavior and Nonverbal Communication," p. 211.

⁶⁴Ibid.

⁶⁵Ibid., p. 212.

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⁶⁷Ibid.

⁶⁸Rubinow, "Hand and Arm Gestures as Communications," p. 10.

⁶⁹Wiener, et al., "Nonverbal Behavior and Nonverbal Communication," p. 206.

⁷⁰Hofstadter, "Objective Teleology," p. 32.

⁷¹G. C. Homans, The Human Group (New York: Harcourt, Brace, 1950), p. 179.

⁷²Ibid.

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