A comparative study of the reinforcing potential of verbal and nonverbal cues in a verbal conditioning paradigm.

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A COMPARATIVE STUDY OF THE REINFORCING POTENTIAL OF VERBAL AND NONVERBAL CUES IN A VERBAL CONDITIONING PARADIGM

A Dissertation Presented
By
DONALD L. BANKS

Submitted to the Graduate School of the University of Massachusetts in partial fulfillment of the requirements for the degree of

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A COMPARATIVE STUDY OF THE REINFORCING POTENTIAL
OF VERBAL AND NONVERBAL CUES IN A
VERBAL CONDITIONING PARADIGM

A Dissertation

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A Comparative Study of the Reinforcing Potential of Verbal and Nonverbal Cues in a Verbal Conditioning Paradigm (February 1974)

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Abstract

This study investigated the potential of specific verbal and nonverbal behaviors to serve as reinforcers of selected verbal speech production. The verbal utterance of "mmm-hmmm-good" and the nonverbal behavioral acts of eye contact, head nod, and a forward lean of the trunk were compared for their effectiveness in conditioning selected verbal responses.

An experimental procedure was devised around the principles of operant behavior and the verbal conditioning paradigm. Subjects were required to make up sentences from a stimulus card which contained six pronouns and a past tense verb. A predetermined class of sentence responses (those beginning with "I" and "we") were reinforced by the experimenter who was trained to emit only one of the reinforcement contingencies in each of the four experimental conditions. Forty female subjects were randomly and equally distributed
among the four stimulus conditions. Secondary areas of interest of this study were concerned with the issue of learning and awareness, and the measurement of the amount of anxiety engendered by each experimental condition.

The data from the study were analyzed by a $4 \times 3$ factorial analysis covariance with repeated measures on the operant, conditioning, and extinction task levels. The overall results of this investigation were not supportive of differential reinforcement potential between the contingent reinforcers investigated.

The results of the study are discussed from a naturalistic perspective that postulates that the obtained results are indicative of a fundamental principle of human behavior that is operative in dyadic social interaction. In effect, the argument is presented which suggests that behavioral cues, such as forward trunk lean, eye contact, and the head nod, summate in naturally occurring social interaction and in tandem provide a reinforcing effect. An alternative explanation of the results of this investigation was presented which linked the observed results to factors originating within the framework of the experimental design.
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CHAPTER I

INTRODUCTION

In recent years the principle of operant conditioning that originated from B. F. Skinner's (1938, 1959) laboratory studies of rats and pigeons has found its way into the research literature that concerns itself with the study of man and the environmental contingencies that shape his behavior. The principle of operant conditioning, stated in its simplest form, conveys the notion that when a response or operant is immediately followed by some meaningful reinforcement the frequency of the occurrence of that response is increased.

The differentiation between operant and respondent behavior (classical conditioning; Pavlov, 1928, 1941) explained by Skinner (1938), provided the foundation upon which new approaches to learning were launched. In contrast to the Pavlovian paradigm in which a stimulus elicits and precedes a given response, the operant paradigm postulates a reversal in the sequence of stimulus and response. Operant behavior implies that the organism acts on his environment, and that behavior is determined by its consequences.

Within the limits of the above operational definition of operant conditioning, man's verbal output can be considered operant behavior; that is, when an individual speaks, he is
acting upon his environment. The environmental consequences subsequent to the act of speaking become the stimuli for its continuation on suppression.

The operant conditioning paradigm has been of practical and heuristic significance in the study of man's verbal behavior. Greenspoon (1955) used a simple verbal response to influence the frequency of emission of a class of verbal nouns. This study was the pioneering investigation that provided the framework for subsequent studies which documents operant conditioning as a viable paradigm in investigating man's verbal behavior.

There are excellent reviews of the literature of verbal conditioning studies, such as those of Krasner (1958), Salzinger (1959), Strong (1964), Williams (1964), and Kanfer (1967). Perusal of these reviews will acquaint one with the methodological issues involved, the theoretical undergirdings of verbal conditioning studies, and the professional disciplines to which data from verbal conditioning studies have practical application. To understand the current state of verbal conditioning research, it is helpful to study the review by Kanfer (1967). In his discussion, Kanfer proposed that research on verbal conditioning has developed within the following four stages: (1) demonstration, (2) re-evaluation, (3) application, and (4) expansion. Kanfer elaborates these states:
The studies in the first stage demonstrated that verbal behavior could be brought under the control of environmental stimuli; verbal behavior followed the same principles of human motor behavior as that of animal behavior. The early verbal conditioning studies were similar to early operant conditioning studies, they demonstrated that reinforcement under certain conditions can systematically influence verbal behavior.

The second stage, that of re-evaluation, demonstrated that what was being dealt with was a far more complex phenomenon than at first was evidenced by a single operant explanation. Responsivity to verbal conditioning was affected by variables such as social setting, previous experience with examiner, expectance variations in the meaning of reinforcement stimuli, and other interpersonal variables.

In the third stage, that of application, operant conditioning was used to specifically change verbal behavior with a therapeutic intent. E.g. Williams & Blanton (1968) reports a study in which verbal conditioning was used as a deliberate "therapeutic" technique and found to be as effective as traditional psychotherapeutic procedures. There have been other reports of a similar nature. Goodkin (1969), Ince (1968), Gelzand & Singer (1968), report a study in which verbal conditioning was used to influence the positiveness of the evaluation of photographs.

The fourth expansion stage of development involves those studies investigating theoretical issues related to the capability of human beings for self-regulation. These include processes such as vicarious learning (Kanfer, 1969), the role of awareness in learning (Herzen, 1968; Krasner, 1967; Rosenfeld & Baer, 1969; Vogler & Ault, 1969), self-reinforcement and self-control (Krumbolz & Thoresen, 1969) and the associative relationship of words. (Kanfer, 1967 [quoting Krasner, 1967, p. 495])

In essence, the verbal operant conditioning studies referred to above are, in principle, the same since they all required subjects to emit verbal behavior as part of a given task and subsequently received reinforcement by the experimenter when the preselected class of verbal responses was emitted.

According to the operant conditioning paradigm, if the subjects' verbal response results in an increased probability of
future response occurrences, the response has been reinforced. It should be noted that "the only defining characteristic of a reinforcing stimulus is that it reinforces" (Skinner, 1938). To the extent that a stimulus, or event, reinforces a response, it possesses reinforcing value (Kennedy, 1967). The class of reinforcers used in this investigation is categorized as secondary positive reinforcement or generalized reinforcers. In contrast to primary positive reinforcers which are associated with events such as the presentation of food, water, and sexual contact, secondary or generalized reinforcers become symbolic representation of primary reinforcers and include such events as the presentation of money, praise, social approval, attention, or dominance (Kimble, 1961; Wike, 1966).

It can be concluded from a review of verbal conditioning studies that a functional knowledge of the parameters of this area of human behavior has application to psychotherapy, to teaching, to speech therapy, and to a broad range of interpersonal and intrapersonal situations in which communication of verbal content is linked to verbal and other behavioral outcomes.

Statement of the Problem

A number of reported investigations provide empirical evidence that a variety of verbal and nonverbal reinforcers are effective conditioners of man's verbal behavior. The "mmm-hmmm" sound has produced successful conditioning results
(Ball, 1952; Dailey, 1953), "fine" (Wickes, 1956), and "I see" (Salzinger, Pisoni, 1957).

The nonverbal cues that have been employed as reinforcers have consisted of two types—"behavioral" or "gestural" and mechanical. The mechanical cues have included a light flash (Ball, 1952; Greenspoon, 1955), a buzzer (Ball, 1952; Greenspoon, 1955), and a bell tone (McNair, 1957). Gestural or behavioral reinforcers that have produced the conditioning effect have been a forward trunk lean (Wickes, 1956) and the combination of a smile and forward trunk lean (Reece and Whitman, 1962).

From these studies it can be concluded that behavioral and mechanical cues have reinforcing properties. These data provide information pertinent to the selection of reinforcers but only in a limited sense. What has not been reported in the literature, as far as the writer has been able to determine, is the isolation of discrete behavioral cues from a total unit of behavior and investigated for its reinforcing potential. It has not been demonstrated whether a head nod is more reinforcing than a smile or whether a smile is more reinforcing than a forward trunk lean, etc. Nor has it been empirically validated whether verbal stimuli are more reinforcing than nonverbal stimuli and vice versa.

Contiguous to the problem of validating behavior cues as differentially reinforcing of verbal behavior is the need to determine the functional relationship between the verbal
and nonverbal channels of communication. A number of investigators have drawn attention to the need to study the communicative significance of nonverbal behavior. Charles Darwin (1872), David Efron (1941), Ray C. Birdwhistell (1970), Edward T. Hall (1959, 1966), Jurgen Ruesch (1971), Paul E. Konan (1972), Erving Goffman (1971), Albert Mehrabian (1971), and Morton Wiener (1972) are among the prominent researchers and social scientists who are collecting empirical data in this area of communication. Common observation reveals that the message conveyed among and between individuals in dyads and in groups is composed of paralinguistic, vocal, and non-lexical components. Such nonlexical behaviors as smiling, looking, nodding, making gestures, and assuming various postural configurations are observed to be interwoven with the verbal dialogue and appear to be significantly related to the verbal content.

It is not completely understood just how such nonverbal behavior functions independently and in concert with verbal behavior to communicate the total impact of a given message. At the superficial level of observation, these nonverbal cues seem to function either to insure the continuation and continuity of dyadic conversation along an established theme, to suppress the flow of communication altogether, or to signal boredom and the desire on the part of either member of the dyad to shift to a more mutually reinforcing topic.

At the investigative level, most research on nonverbal
behavior assumes that the nonverbal channel of communication is a rich source of information not available in the verbal channel. Preliminary conclusions drawn from the research data concerning the function of nonverbal behavior in the communicative process reveal that it provides information about interpersonal relationships, emotions, basic attitudes toward self and others, and that nonverbal behavior is interrelated with the concomitant verbal dialogue.

Purpose of the Study

The central purpose of the present study was to assess the reinforcing properties of selected nonverbal responses of an experimenter on a predefined verbal response class. This study was designed around the principles of operant conditioning and social reinforcement theory. Social reinforcement is defined as those common occurrences of secondary reinforcement such as social approval, praise, attention, etc. The design of the study was effectuated via the verbal conditioning paradigm. Three of the stimulus variables selected for investigation were nonverbal and the other consisted of a verbal response. Selected for comparative study were the following stimulus conditions: (1) "mmm-hmm-good," (2) eye contact, (3) forward trunk lean, and (4) head nod.

This study was also concerned with a number of secondary issues; namely, (1) the role of awareness in learning,
(2) the relationship between the stimulus conditions investigated and their potential for arousing anxiety in the subject, and (3) the subjects' perception of the experimenter as influenced by the individual experimental condition. Information gathered from this aspect of the study should be enlightening in determining if the selected nonverbal cues under investigation vary in communicational intent contingent upon the task to be performed and the reinforcing value of the experimenter.

The concept of subject awareness and learning, and the anxiety arousing potential of each of the stimulus conditions are important aspects of this study in that in naturalistic settings reinforcement contingencies are subtle and at times generally out of awareness. Since it is an array of complex and subtle environmental reinforcers that shape and maintain human behavior, the more data that are gathered concerning the nature of these contingencies and the methods of isolating these reinforcers, the better one will be able to manage his life. Additionally, the more knowledge that one has of behavioral reinforcers, the more efficient we can become as psychotherapist, as teacher, as manager of human behavior. Manager in its most efficacious sense of helping foster the optimal development of each individual. Until it has been clearly established which class of social reinforcers is differentially effective in shaping and modifying human behavior, the "helping" professions, particularly
counseling and psychotherapy remain removed from scientific credibility. It is the hope of the author that this investigation will in a qualitative way contribute to such an explanation.

Importance of the Study

An experimental investigation of the effectiveness of the reinforcing value of nonverbal behavioral cues has implications for workers in all fields in which interpersonal relationships are the primary facilitators of effective action. This type of relationship is especially evident in counseling, psychotherapy, in teaching—in all social service relationships and has implications for the communicative process in general.

In addition to understanding the relationship between nonverbal behaviors and their subsequent effects on the communication process, Duncan (1969) articulates several questions that are in need of empirical validation. He poses the following questions: Can patterns of nonverbal behavior be discovered which aid discrimination of significant personality types, or which suggest new bases for personality topologies? Similarly, can greater specificity regarding language and nonverbal behaviors lead to more effective formulation of significant variables in psychotherapy, to new classification of types or "schools" of therapy, and to new techniques of therapist-patient matching to maximize favorable outcome? Can
careful consideration of nonverbal behavior help illuminate the function of reinforcement in communication?

This study was too limited in scope to address the major questions suggested by Duncan and from its Skinnerian theoretical foundation was not concerned with personality variables. However, it has attempted to shed some light on the potential of nonverbal behaviors as reinforcers in interpersonal communication.

The ultimate importance of this investigation is related to man and his expressive nature. Since man is an expressive being, the more knowledge ascertained that elucidates the functional relationship between verbal behavior and the nonverbal modalities that elicit, shape, and maintain its occurrence, the more facilitative will become the interpersonal communicative process. The possibilities for a more facilitative, growth encouraging society are enhanced by the ease with which man can communicate and be understood by his fellowman.
CHAPTER II
REVIEW OF THE LITERATURE

A review of the literature important to the theoretical background of this investigation is presented in this chapter. The first section of this review is devoted to an overview of the Verbal Conditioning literature. Section two comprises a review of the field of Nonverbal Communication. The third section of this review contains pertinent empirical findings related to each of the experimental variables under investigation. A fourth and final section of this chapter attempts to build a bridge between verbal conditioning research and nonverbal communication.

Antecedent Research in Verbal Conditioning

The purpose of this section of the literature review is not to review the voluminous amount of research data that relate to verbal conditioning studies. Instead, the aim is to highlight the empirical findings from within the field that have a direct relationship to the present investigation. The aim is to provide a focus, to formulate a rationale, and to create a functional perspective from which the purpose of this study can be understood and its results and conclusions evaluated.
Why study man's verbal behavior? The answer to this question is multidirectional and is inextricably tied to the study of man's behavior in general, and is specifically linked to each individual discipline which attempts to isolate functional aspects of human behavior within a designated sociological and cultural context. Two closely allied and mutually supportive rationales for studying man's verbal behavior are provided by J. P. Das and Leonard Krasner.

The significance of studying man's verbalizations is well formulated in this paragraph by Das (1968):

The individual is constantly engaged in acquiring, assimilating, and manipulating words and symbols. Numerous, and often conflicting verbal stimuli impinge upon him, compelling him to develop unique patterns of verbal response. Since childhood, the verbal milieu to which he is exposed has become as important a force in shaping his personality as his inherited characteristics. Therefore, an analysis of the individual's verbal behavior provides us with clues for the understanding of his thoughts, enduring attitudes, and temperamental characteristics. The knowledge obtained from such analysis can be subsequently utilized in predicting his future course of action. Thus a proper study of man should begin with man's verbal output. (p. 1)

Confined to a specific discipline— that of psychotherapy— the importance of studying man's verbalizations from an empirically supported foundation is articulated by Shaffer and Lazarus (1952) as being inherent in the treatment process itself. These investigators conclude that in psychotherapy "the techniques of getting the patient to talk and to continue to talk must be the real core of treatment" (p. 63). Krasner (1955) points out that the therapist has the initial
task of facilitating his client's verbalizations and the additional responsibility of employing his skill "to guide the patient's verbalizations into certain areas which he feels will eventually be more beneficial to the patient." Krasner further concludes that the way the therapist aids the client is indicated by the variety of cues that he employs to reveal that he is interested in or paying particular attention to certain aspects of the patient's verbalizations. Krasner continues, "since verbalization is of such importance in therapy, and since it is a segment of general behavior which is measurable, it would seem to be the logical dependent variable with which to start an experimental approach to the problem of psychotherapy" (pp. 22-23).

With the general point of view expressed by Das—that of studying man's verbalizations to learn more about man in general—to the specifics of studying individual verbal behavior to facilitate behavior change delineated by Krasner, the research rationale for studying man's verbal output was firmly established. What was then needed was a vehicle upon which hypotheses related to the control and manipulation of human verbal output could be scientifically tested. This vehicle emerged from the animal laboratory in the form of the operant conditioning paradigm.

The abstractions from the literature on verbal conditioning presented here will touch briefly upon some general
considerations that apply to the historical beginnings of verbal conditioning research, procedural methodology as it relates to the experimental task, response class, and reinforcing stimuli. Finally, a more detailed discussion will be provided that discriminates between verbal and nonverbal stimuli as they are defined within the parameters of this investigation.

Historically, the antecedents of verbal conditioning research has its roots in the scientific investigation of learning by E. L. Thorndike. Writing in 1935, Thorndike articulated his finding that verbal behavior could be controlled or manipulated by the administration of verbal rewards and punishments. Building on the operant behaviorism articulated by Skinner (1938), an extensive body of literature in the area of learning was formulated during the ensuing two decades. However, it was not until the publication in 1955 of Greenspoon's article (based on his 1951 doctoral dissertation) that the area of verbal behavior came under scientific scrutiny vis-à-vis the principle of operant conditioning. Previous to Greenspoon's investigation, the operant conditioning principle had been confined to experimental investigations with animals. In verbal operant conditioning, the subject is required to emit verbal behavior as part of a given task, and the experimenter reinforces a preselected class of the subject's verbal behavior by carefully controlled
verbal and/or nonverbal behavioral cues. The Greenspoon (1955) study was designed to determine the effect of two operations on two different verbal responses. The operation performed was to present one of two stimuli, "mmm-hmm" or "huh-uh," after one of two responses, plural nouns or any word not a plural noun. The results of this study indicated that "mmm-hmm" increased the frequency of plural responses and "huh-uh" decreased the frequency of plural responses. Both stimuli increased the frequency of non-plural responses. The stimulus "mmm-hmm" had the same effect on both responses. The stimulus "huh-uh" had different effects on the two responses. It was this initial investigation by Greenspoon that successfully demonstrated that verbal behavior could be brought under the control of a social reinforcement contingency. Since this pioneering investigation, a substantial body of research has appeared in the literature that documents operant learning as a viable principle in verbal conditioning research (see, for example, Williams, 1964).

Subsequent research directed toward conditioning one person's verbalizations by the controlled emittance of social reinforcement by another person have shared common methodological implementation. As Strong (1964) has adequately summarized, the following common elements are characteristic of all verbal conditioning studies: (1) the subjects are given no instruction (or set) to learn, (2) a stimulus situation is
presented which requires the emission of verbal behavior, (3) the stimuli used as reinforcers are of the generalized conditioned variety.

The methods and procedures that have been utilized successfully to condition human verbalization can be summarized into five basic procedures: (1) Taffel's "make up a sentence" method, (2) the "say separate words or numbers" method originated by Greenspoon, (3) the "tell a story method," (4) the "interview and conversation" method, and (5) the "autokinetic" method.

Basically, the Taffel task requires subjects to make up sentences from a stimulus card that has printed on it a past-tense verb and six pronouns (I, we, you, he, she, they). Each card has a different past-tense verb and a randomly ordered sequence of the six pronouns. A predetermined class of responses is reinforced. In his original study, Taffel (1955) reinforced all subject responses that began with the pronouns "I" and "we." Various combinations of the listed pronouns have been incorporated into the research design of subsequent investigators.

The Taffel task has several characteristics that recommend it for verbal conditioning research. The general advantages of the Taffel task are: (1) clear identification of the response class selected for reinforcement, (2) the simplicity of the stimulus format, (3) and the ease with
which preconditioning operant responses can be determined.

The "say separate words" method was employed by Greenspoon (1955) in his original verbal conditioning study. In this procedure subjects are requested to say separate words within a given time frame. A preselected response class of subject behavior is reinforced. Greenspoon reinforced plural nouns and non-plural words. Other response classes reinforced have included verbs, animal references, and human references, such as mother and teacher.

The "tell a story" method requires that the subjects tell a story. This method has two major variations. In one variation, the subjects are provided with stimulus material such as inkblots, TAT-like cards, or photographic projections of scenes depicting interpersonal situations from which they are to build their story. Response classes chosen for reinforcement have been "emotional words" and the amount of verbalization. The second variation requires the subjects to tell a story without any external stimulus material being provided. Animal references, mother references, negative self-reference statements, and positive self-reference statements have constituted the reinforcement response classes.

The "interview and conversation" method has been the method of choice in verbal conditioning studies that have been designed to manipulate human verbalizations as they occur in naturalistic settings. The distinctive feature of
this method is that the subjects are usually unsure that they are participating in an experimental investigation and the experimenter is active in asking questions and making comments that encourage the flow of conversation. The response classes reinforced have varied. Salzinger and Pisoni (1960) reinforced patients' affective responses during hospital intake interviews. Verplanck (1955) and Azrin, Holz, Ulrich, and Goldiamond (1961) reinforced subjects that gave opinion responses during conversational exchange.

The advantage of the "interview and conversation" method is that it most closely approximates the type of verbal exchange that occurs in counseling and psychotherapy, as well as in other types of daily conversational interactions. This method encapsulates the greatest potential for identifying the components of verbal reinforcement contingencies as they occur in naturally evolving verbal interaction and, in so doing, enhances the possibility of discovering principles of effective manipulation of verbal behavior.

Finally, the "autokinetic" method has been used in a few verbal conditioning studies. This procedure requires the subjects to estimate the distance of movement of a point of light. The judgment of the light movement within a predeter- mined range constituted the reinforced response class in most of the studies employing this method. Kanfer (1954) reinforced estimates that were within a range of 20 percent of
the subjects' estimates during operant level trials.

In summary, the methods employed to isolate components of man's verbalizations via the operant conditioning paradigm have been variations and modifications of the principle methods outlined above. The method of choice in individual investigations has been determined by precedents established in previous research and by the nature of the research hypotheses under investigation.

Response Classes Reinforced

Several response class categories have been used in verbal conditioning research. Representative response classes are found within the research of the following investigators: Taffel (1955) and Grossberg (1956) reinforced sentences beginning with the pronouns "I" and "we." Sarason (1957) conditioned responses that were active verbs having to do with the vocal apparatus, such as "talked," "whispered," etc. "Mildly hostile" and "neutral" verbs constituted the response class reinforced in the research of Binder, McConnell, and Sjoholm (1957). Ball (1952) reinforced animal references. Krasner (1955) identified "mother" references as the selected response class. Finally, Verplanck (1955) used statements of opinion, such as "I think," "I believe," "It seems to me," and "I feel" as the class of reinforced responses.

The equivocality of the results of verbal conditioning
studies is reflected in the degree to which various classes of reinforced operants have been brought under the control of selected stimuli. All of the response classes listed above, as well as a wide variety of response classes not listed herein, have been employed effectively to demonstrate the occurrence of conditioning. Because of the ease with which the response class can be identified, "I" and "we" pronouns have constituted the class of behavior reinforced in a large percentage of verbal conditioning studies. A number of studies have reported failure to obtain the conditioning effect when using "I" and "we" pronouns as the response class reinforced. The same holds true for the other response classes listed in this discussion.

Salzinger (1959) suggests that the response class selected for reinforcement in verbal conditioning research can either be a "natural" response class, such as opinion statements, or arbitrary response classes, such as plural nouns, or "I" and "we" statements that are determined by the experimenter. Salzinger regards the employment of natural response classes as being superior to arbitrary selection of reinforced responses. Salzinger also establishes two important guidelines to aid in the determination of response class choice; first, the "response emission should be short and leave the organism in position to respond again." And secondly, low operant levels of natural response classes do
not constitute a practical class of responses to be conditioned in the usual experimental paradigm employed in verbal conditioning research.

In summary, a variety of response classes have been employed in verbal conditioning research. The criteria used to determine the response class to be reinforced have been arbitrary in most instances, but in some investigations the generalizability of the response class to naturally occurring speech patterns has governed its selection. A detailed consideration of factors influencing the selection of response classes can be found in a review by Salzinger (1959).

Reinforcing Stimuli

Related to the issue of response class is the component of conditioning termed reinforcement. A discussion of the types of reinforcement stimuli used in previous verbal conditioning research is herein outlined. The types of reinforcing stimuli are divided into three general categories: (1) verbal cues, (2) gestural behaviors, and (3) mechanical devices.

Verbal Cues

The most frequently used verbal reinforcer of verbal operant responses is the "mmm-hmmm" sound. Studies reported by Ball (1952), Daily (1953), B. Sarason (1957), and I.
Sarason (1957) discuss positive results using the "mum-hmm" sound as the contingent reinforcing behavior emitted by the experimenter. A detailed list of the verbal cues that have been exercised in verbal conditioning research can be found in a review of the literature compiled by Krasner (1958). Selections from this list include "good" (Cohen, Kalish, Thurston, and Cohen, E., 1954; Cushing, 1957; Daily, 1953; and Grossberg, 1952), "uhha" (Salzinger and Pisoni, 1957), "yeah" (Salzinger and Pisoni, 1957), "that's accurate" (Kanfer, 1954), "right" (Spivak and Papajohn, 1957), and "fine" (Wickes, 1956).

Investigations have reported positive and negative conditioning results using a variety of verbal cues as reinforcing stimuli. In addition to positive verbal reinforcers, a few studies investigated the effect of negative verbal reinforcement. Greenspoon (1954) and Ball (1952) both employed the negative verbal reinforcement "huh-uh." Greenspoon's results indicated that "huh-uh" was ineffective in decreasing non-plural words but was effective in decreasing plural nouns. Ball, however, was unable to obtain the conditioning effect with "huh-uh" as the reinforcement. In contrast to Ball's findings, Hartman (1955) found the negative reinforcer of a headshake to be effective in decreasing the frequency of occurrence of the verbal response it followed. The research reviewed does not support the notion that any
single positive verbal cue is more reinforcing than another. The trend in the research reviewed is more supportive of positive verbal reinforcers (disregarding the specificity of the positive response) as being more consistently linked to the conditioning effect than are negative verbal reinforcers. The verbal utterances of "mmm-hmm" and "good" have been used most frequently in verbal conditioning studies and both have yielded comparable results.

Nonverbal Reinforcers

A number of investigations appear in the literature that have demonstrated the efficacy of using nonverbal behaviors as reinforcing stimuli in verbal conditioning research. Such behaviors as "smiling, writing, looking at the patient's face, nodding of the head, picking up or putting down a pen" (Krasner, 1955) are examples of the class of nonverbal reinforcers that have received some research attention.

A second class of nonverbal reinforcers that have been successfully utilized to obtain the conditioning effect are of a mechanical nature. Represented in this category are such cues as a light flash (Ball, 1952; Greenspoon, 1954), a bell tone (McNair, 1957), and a buzzer (Ball, 1952; Greenspoon, 1954). In one study Greenspoon (1954) used a positive reinforcer of "mmm-hmm" and a negative verbal reinforcer of "huh-uh." He found that "mmm-hmm" resulted in an increase in
plural nouns and that the use of "huh-uh" resulted in a decrease in plural nouns. When these same stimuli were used to reinforce nonplural responses, both stimuli tended to increase the frequency of such responses. In the same investigation, Greenspoon was able to condition both plural and nonplural responses using a red light and a bell tone. Similarly, Ball (1954) found a trend toward conditioning using a light and tone as the reinforcer. In a comparative study in which the verbal stimulus "good" and a mechanical nonverbal stimulus of a light flash were used, Nuthman (1957) was able to obtain conditioning with the verbal stimulus but not with the light flash.

It is clear from the studies reported above that certain types of nonverbal mechanical modalities have reinforcing potential. The literature is less clear in providing plausible explanations as to why conditioning occurs in some studies using sensory stimulation and not in others.

Studies more pertinent to this investigation are those which have attempted to discern the differential effects of a combination of verbal and gestural reinforcers. Wickes (1956) investigated the effects of examiner influence in a testing situation. In this study he contrasted the effects of verbal reinforcement with nonverbal reinforcement. The verbal reinforcement consisted of the following repetitive sequence: "fine" for the first response, "good" for the next, "all
right" for the next. The nonverbal reinforcement consisted of the following repetitive sequence: for the first response the experimenter nodded his head three times, for the second he smiled, for the third he leaned forward in his chair after the response and then returned to his initial position. The nonverbal reinforcers were more effective than the verbal reinforcers in this particular situation. However, no differential determination was ascertained between the reinforcing potential existent among the cues employed.

Mock (1957) used a design in which he alternated blocks of reinforced and nonreinforced sessions. He was able to successfully increase the response class of "mother" responses in the first block of reinforcement sessions but not in the succeeding reinforcement sequence. The reinforcement in the positive group consisted of a head nod combined with the verbalization "mmm-hmm." In the "negative" group, he obtained a similar result whereby a significant decrease in the reinforced behavior occurred during negative reinforcement. The negative reinforcer consisted of a head shake plus "huh-uh." This result was observed during the first but not in the succeeding reinforcement sessions.

A comparative investigation of the reinforcing potential of five selected stimulus conditions was carried out by Kennedy and Zimmer (1958). In this study the five stimulus conditions were: (1) "mmm-hmm," (2) "mm-hmm" accompanied by
an affirming head nod and smile, (3) "good," (4) "I see," and (5) a short paraphrase. The results of this study demonstrated that the paraphrase and the "mm-hmm" vocalization were effective reinforcers of the selected operant responses. The stimulus conditions "I see" and the "mm-hmm" utterance emitted simultaneously with an affirming head nod and smile were ineffective in augmenting selected operant responses.

In a study by Reece and Whitman (1962), a combination of nonverbal cues effectuated in conjunction with a verbal reinforcer produced the conditioning of amount of verbalization. Their study was designed to determine if "warmth" has a reinforcing influence on verbal behavior. An experimental atmosphere of "warm" and "cold" was defined and operationalized in behavioral terms that were actuated by the experimenter. In the "warm" condition, the experimenter leaned toward the subject, looked directly at the subject, smiled, and kept his hands still. In the "cold" condition, the experimenter leaned away from the subject, looked around the room rather than at him, did not smile, and drummed his fingers. The authors concluded that the "climate," as defined by the expressive movements of the experimenter, was an effective variable. The expressive movement condition of "warmth" combined with verbal reinforcement produced the greatest amount of verbalization.

A study reported by Hartman (1955) revealed that he
was able to condition subjects to decrease the selected verbal response by using a head shake as the reinforcer. In a study designed to condition anti-capital punishment opinions, Ekman (1958) was successful in obtaining conditioning but did not obtain a difference between the verbal reinforcer "good" and the nonverbal reinforcer which consisted of a combined behavioral act (head nod, smile, and slight lean forward).

From the brief review of the literature that has been discussed, it seems plausible to conclude that verbal and nonverbal reinforcers (both gestural and mechanical) have reinforcing properties. What has not been reported in the literature, as far as the writer has been able to determine, is the isolation of discrete behavioral cues from a total unit of behavior and investigated for its reinforcing potential. For example, it has not been demonstrated whether a head nod is more reinforcing than a smile, or whether a smile is more reinforcing than a forward trunk lean, etc. It is the aim of this study to add to the literature in this area.

In addition to the parameters of verbal conditioning research already discussed, there remains the concept of subject awareness that has received attention in verbal conditioning studies. The concept is important to the present investigation from the perspective of knowing the significance of a particular reinforcer to the subjects and the attendant implication and generalizability of such knowledge.
Salzinger (1959) defines the concept of awareness in the following way: awareness of a reinforcing contingency consists of a subject's verbal response (usually subvocal) to the response-reinforcement contingency so that subsequently this verbal response becomes a discriminative stimulus (on occasion) for the emission of the response utilized in the experiment. A subject can be aware of what constitutes the reinforcement without knowing the response that is being conditioned; he may be aware of both the reinforcement and the response; and finally, he may be aware of neither the response nor the reinforcement; he may not even know that he is in an experimental situation such as in Verplanck's (1955) experiment.

There is evidence in the literature that supports the conditionability of subjects that are aware and unaware of the reinforcement contingency. Philbrick and Postman (1955) found that subjects who were aware of the reinforcement contingency showed a significant amount of learning of verbal response before verbalization of awareness. This study also showed that the unaware subjects increased their performance but not to the same magnitude as did the aware group. Salzinger (1959) concludes that, in general, in estimating the effect of reinforcement variables, it is advisable for the experimenter to arrange the experimental situation so the subject has difficulty in recognizing the response.
reinforcement contingency.

For a more detailed description and evaluation of the research into man's verbal behavior vis-à-vis the operant conditioning paradigm and verbal conditioning, the reader's attention is directed to a number of comprehensive reviews of the literature. Reviews by Greenspoon (1962), Krasner (1958, 1962, 1965, 1966, 1967), Salzinger (1959, 1967), Strong (1964), and Williams (1964) articulate procedural and theoretical issues pertinent to this important area of man's behavior.

From a general perspective, the literature pertaining to verbal operant conditioning substantiates the conceptualization that man's verbal behavior can be modified through controlled manipulation of verbal and nonverbal cues. Further, the literature corroborates the principle of operant conditioning as a heuristic and functional approach toward developing a qualitative understanding of an important aspect of man's behavior.

Nonverbal Communication

The purpose of this section of the literature review is to provide a background of nonverbal communication research that is relevant to the present study. The intent is to develop a conceptual definition of nonverbal communication; to comment in brief upon the three major areas of nonverbal
communication (i.e., paralanguage, kinesics, proxemics), and

to provide research data that directly relate to the proxemic
variables of eye contact, head nod, and trunk lean that are
central to this investigation.

Review of the literature of nonverbal communication
highlights the broad scope of the field and also reflects the
confusion that exists as to what constitutes the content of
this component of communication. Part of the equivocality
over definitional consistency in the area of nonverbal com-
munication is a consequence of the approaches that have been
adopted to study the phenomena. The approaches have been
from independent disciplines and reflect the interest and
bias of individual investigators. To date, the most flour-
ishing results have emanated from the anthropological and
psychological perspectives.

A concise, historical review, outlined by Harrison
and Knapp (1972), encapsulates the major investigators of
each perspective. The anthropological perspective is best
represented by the prewar investigations of David Efron (1941).
The approaches reflecting a linguistic methodology are fea-
tured in the work of Ray C. Birdwhistell (1970) on "kinesics,
and in the work of Edward T. Hall (1959, 1966) on "Proxemics."

The psychological perspective is mirrored in the clin-
ical concerns of Jurgen Ruesch (1971) and in the experimental
investigations of Paul Ekman (1972) and his colleagues.
Sociologists, such as Erving Goffman (1971), have written about facets of nonverbal communication in groups. In the field of social psychology, the communication implications of nonverbal behavior have drawn steadily increasing interest from Albert Mehrabian (1971) and Morton Wiener (1972). Robert Hinde (1972) and Thomas Sebeok (1968) have systematized the observations of ethnologists that have implications for human communication.

Consistent with the variety of disciplines that have approached the study of nonverbal communication, an equal number of diverse systems for categorizing nonverbal behavior appear in the research literature. Ruesch (1955) organizes nonverbal behavior into three categories:

1. **Sign language** includes all those forms of codification in which words, numbers, and punctuation signs have been supplanted by gestures; these vary from the "monosyllabic" gestures of the hitchiker to such complete systems as the language of the deaf.

2. **Action language** enhances all movements that are not used exclusively as signals. Such acts as walking and drinking, for instance, have a dual function; on the one hand, they serve personal needs, and on the other, they constitute statements to those who may perceive them.

3. **Object languages** comprise all intentional and unintentional display of material things such as implements, machines, art objects, architectural structures, and last but not least, the human body and whatever clothes it. (p. 323)

Duncan (1969) lists the following nonverbal modalities: (1) body motion or kinesic behavior; gestures and other body movements, including facial expression, eye movement, and
posture; (2) paralanguage: voice qualities, speech nonfluencies, and such nonlanguage sounds as laughing, yawning, and grunting; (3) proxemics: use of social and personal space and man's perception of it (Hall, 1966, p. 1); (4) olfaction; (5) skin sensitivity to touch and temperature; and (6) use of artifacts, such as dress and cosmetics.

Argyle (1962) includes in his catalog of nonverbal behaviors: (1) bodily contact; (2) posture; (3) physical appearance; (4) facial and gestural movement; (5) direction of gaze; and (6) nonverbal aspects of speech, such as timing, emotional tone, and accent.

Perhaps the most comprehensive outline of possible nonverbal areas is that provided by Barker and Collins (1970). They list eighteen areas for consideration: (1) animal and insect; (2) culture; (3) environment; (4) gestural, facial expression, bodily movement, and kinesics; (5) human behavior; (6) interaction patterns; (7) learning; (8) machine; (9) media; (10) mental processes, perception, imagination, and creativity; (11) music; (12) paralinguistics; (13) personal grooming and apparel; (14) physiological; (15) pictures; (16) space; (17) tactile and cutaneous; and (18) time.

The consistent aspect of each list is that some form of body movement is involved. Beyond this aspect no clear-cut boundaries are demarcated which precisely delimit the communicative significance of nonverbal behavior. Notwithstanding
the lack of clearly differentiated parameters within which to work, investigators in the field of nonverbal communication have established that interpersonal communication is a function of more than its verbal component.

Reviewing the various classes of nonverbal communication modalities that have been delineated by various investigators, it becomes apparent that everything that is not verbal is classified as nonverbal. Whereas this differentiation is useful in a categorical sense, it is less than adequate in terms of adding specificity to what is communicative and what is not. In building a definition of nonverbal communication that particularizes the distinction between verbal and nonverbal communication, Eisenberg and Smith (1972) wrote: "The real distinction between verbal and nonverbal communicative behavior lies in the system by which action is organized. Verbal behavior is organized by a language system, whereas nonverbal behavior is not." These authors elaborate upon the arbitrary nature of language systems as reflected in grammatical structure and provide the contrasting observation that the majority of nonverbal behavior is not "arbitrarily meaningful." A crucial difference between verbal and nonverbal communication noted by Eisenberg and Smith (1972) is the self-reflexive nature of language. They write:

Verbal expressions are self-reflexive; in other words, language can be used to talk about language. If a person were to say, "I ain't got no car ain't good grammar,"
he would be using (bad) language to talk about (bad) language. But a wave of the hand cannot be used to analyze a wave of the hand.

In this respect, verbal acts differ from nonverbal acts.

Jurgen Ruesch (1970) observes that nonverbal expressions are continuous; for example, a person's hand is almost constantly in motion, whereas sounds and letters have a discrete beginning and end. In this sense, a person can choose to communicate verbally, but he cannot in the presence of others choose to communicate nonverbally. Supporting Ruesch's concept that a person cannot choose to communicate nonverbally is some theoretical work proposed by Ekman and Friesen (1967). These investigators have engaged in experimental work that is directed toward the formulation of a theory to explain why and how nonverbal behavior might function as a leakage channel of communication that is less susceptible than verbal behavior to conscious deception or unconscious censoring.

Another important distinction by Ruesch between verbal and nonverbal communication is that nonverbal cues can be received through many different sense organs simultaneously, for a person can, in one moment, feel, smell, see, and hear one message source. Verbal communication, however, can be received by far fewer types of sense receptors. One only sees written verbal messages and one only hears oral verbal messages. Consequently, one is more likely to receive many
more different nonverbal cues simultaneously than to receive and comprehend two verbal messages at the same time (Eisenberg and Smith, 1972).

A most important distinction between verbal and nonverbal communication is based on the content of what is communicated.

In general, verbal communication has a proportionally larger cognitive content than nonverbal communication, for language can easily designate objects and relationships whereas nonverbal communication, in many instances, is better suited for the projection of emotional states. (Eisenberg and Smith, 1972)

Having in mind some sense of the categorical schema that have evolved to characterize the domain of nonverbal communication, along with a conceptualization of the distinctions between the verbal and nonverbal communication systems, brings us to the point of discussion that delineates the three primary divisions of nonverbal communication.

The major divisions of nonverbal communication as articulated by Duncan (1969) are paralanguage, proxemics, and kinesics. A concise description of each division follows.

Paralanguage.--George Trager (1958) is the primary investigator that isolated the nonverbal components of the speech act--voice set and nonverbal vocalization. These components constitute what has become known as paralanguage. Voice set is measured by the qualities of intensity (volume), pitch, resonance, rate, and rhythm. Mehrabian and Wiener (1967), Davitz and Davitz (1961) and Karmer (1963), among
others, have further elaborated upon the work of Trager and have added extensively to the literature that elucidates the functional relationship between voice type and tonal quality in interpersonal communication. The determination of voice set is influenced by psychological, physiological, and sociological variables.

The second component of paralanguage—nonverbal vocalization—is divided into three types: (1) vocal characterizers, (2) vocal qualifiers, and (3) vocal segregates. Vocal characterizers are such actions as laughing and sobbing while speaking, audibly yawning, moaning, and belching. Vocal qualifiers consist of variations in pitch or volume. Vocal segregates consist of sounds or sentences which appear between the articulation of words such as "uh's," "ah's," "mmmm's," etc. Included in this category are also the period of nonvocalization during an utterance (Eisenberg and Smith, 1972).

In the communication process, the paralanguage components herein defined serve to communicate a particular message about the person speaking. Paralinguistic expression combines with the vocal message to radiate an impression of the person speaking. Thus, as expressed by Mahl and Schulze (1964):

A self-confident person may speak in relatively simple sentences with well-controlled pitch and volume, and with few sighs or nervous laughs. An insecure person, on the other hand, may speak in complex, involved or even unfinished sentences, with poor pitch and volume control, and with frequent nervous mannerisms.
Kinesics.—A second division of nonverbal communication is that of body movement or "kinesics." Birdwhistell (1952) and Scheflen (1964) are the primary investigators who have attempted to organize a systematic methodology for the analysis of nonverbal behavior. The method which Birdwhistell employs to investigate kinesic phenomena is closely related to the methods of the linguist. Just as the linguist attempts to discover the structure of a language, the kinesiologist attempts to find a set of recurrent relationships between various body movements.

In contrast to Birdwhistell's approach, Scheflen (1964) is more concerned with the interpersonal aspects of nonverbal communication. Scheflen has identified twenty-six traditional American gestures and a lesser number of culturally standard postural configurations.

Other prominent investigators who have added to the nonverbal literature concerning body motion are Ekman (1965), Ekman and Friesen (1967, 1969), Dittman (1962), and Dittman, Parloff, and Boomer (1965).

A third major category of nonverbal communication is labeled proxemics. The anthropologist Hall (1959, 1963, 1964) coined the term "proxemics" to umbrella a number of variables implied by psychological or geographic distance in the interaction between addressee and addressee. The avant-garde work of Hall has been augmented by other investigators. Little
found a significant relationship between small interaction distance and positive communicator attitude. Banks (1972) investigated the relationship between interpersonal interaction and the race and sex of the interactants and found that the black subjects, across race, preferred greater interaction distances than did the white subjects. The distance preference of the black subjects was more a function of race than of sex. Kelly (1971) found that the following nonverbal cues are functional in the conveyance of positive affect: closer interaction distances, eye contact, a forward trunk lean, and a face-to-face body orientation. Contributing to the literature of proxemic research is the work of Haase (1970) and Haase and Dimattia (1969). A series of investigations designed to measure the effect of selected proxemic variables and attitudes was conducted by Mehrabian (1965, 1967, 1968, 1969) and Mehrabian and Williams (1969). The major conclusion that Mehrabian posits from this series of experiments is that interaction distance varies as a function of the degree of nonpositive attitude inferred by or communicated to the addressee.

The aim of the foregoing background information on nonverbal communication was to acquaint the reader with the general scope of this area of communication and to furnish a perspective from which to comprehend the current study. The remaining section of this review will pertain to empirical
studies that relate to the specific nonverbal variables of this inquiry. Successively, the behavior cues of eye contact, forward trunk lean, and affirmative head nod will be reviewed as to their importance to this study.

Ekman and Friesen (1969) postulate five types of body expression: (1) emblems, (2) illustrators, (3) regulators, (4) affect displays, and (5) adaptors. The scope of this review does not necessitate an elaboration of each category, but their classification of body movements as regulators more closely particularizes the nature of the expressive movements of which this inquiry is concerned. In their classificatory schema, regulators are defined as actions which serve to control oral interaction.

They tell the speaker to continue, repeat, elaborate, hurry up, become more interesting, less salacious . . . . They can tell the listener to pay special attention, to wait just a minute more to talk, etc. Most regulators . . . . cannot be understood apart from the verbal messages being exchanged. Leaning forward or backward, breaking eye contact, head nodding, and raising the eyebrows are all classified as regulators.

From the perspective of the above definition of regulators, research on the nonverbal components of this investigation will now be reviewed.

Eye Contact

Visual interaction or eye contact has long been recognized for its communication value. Simmel (1908) wrote: "The union and interaction of individuals is based upon
The interaction of eye and eye dies in the moment in which the direction of the function is lost. But the totality of social relations of human beings, their self-assertion and self-abnegation, their intimacies and estrangements, would be changed in unpredictable ways if there occurred no glance of eye to eye. This mutual glance between persons, in distinction from the simple sight or observation of the other, signifies a wholly new and unique union between them.

The limits of this relation are to be determined by the significant fact that the glance by which the one seeks to perceive the other is itself expressive. By the glance which reveals the other, one discloses himself. By the same act in which the observer seeks to know the observed, he surrenders himself to be understood by the observer. The eye cannot take unless at the same time it gives. The eye of a person discloses his own soul when he seeks to uncover that of another. What occurs in this direct mutual glance represents the most perfect reciprocity in the entire field of human relationships. (p. 358)

Without resort to empiricism, Simmel articulated a potent argument for the human eye to function as a reinforcer in human interaction. The author interprets Simmel's position as one in which the eyes convey a mutual sense of sharing between interactants. In contrast to this point of view, from a purely observational level, Satre (1957) and Norman Mailer (1968) speak to the possibility that the mutual glance may be threatening and alienating. Common observation has designated the eyes as influencers of behavior and ascribe to them
cardinal significance in the communicative process.

In the realm of empirical research, a number of experimental investigations using the eye as the independent variable have been effectuated. A selected sample of such studies will be reviewed herein.

Investigators concerned with visual behavior have studied this nonverbal modality both as independent and dependent variables. In a review by Duncan (1969), he denotes the following variables that have been studied in relationship to eye contact: (1) sex of interactants, (2) speaking versus listening, (3) affective quality of the interaction, (4) personality characteristics of the interactants, and (5) distance between interactants. Associated with the variables studied in relationship to eye contact, a research rationale and purpose for studying visual behavior is outlined in question form by Ellsworth and Ludwig (1972). These authors contend that visual behavior serves an information-giving function at several different levels of communication. They propose that research should be designed around the following questions: (1) What does the behavior tell a trained (or untrained) outside observer about the subject? (2) How is the flow of conversation regulated? (3) What is the looker looking for? (4) How does gaze direction influence the receiver? (5) What attribution does a receiver make on the basis of the other person's visual behavior? (6) To what extent is visual
behavior "communicative" in the narrow sense set forth above?

The above questions are each different questions and are not mutually exclusive. This being the case, all research on visual behavior has not been directed toward answering these questions collectively. For the present investigation, question number (4) is of most concern, and research that addresses this question is the focus from which eye contact will here be reviewed. Additionally, those investigations in which sex of the interactants has been the variable manipulated are important to this study.

The effect of the visual behavior of one person on the behavior of another person has received empirical validation. In a methodological study carried out by Krasner (1958), he was able to demonstrate that eye contact served as an effective reinforcer in a verbal conditioning study. However, eye contact in this study was a part of a combined behavioral response which consisted of the experimenter looking at the subject, nodding his head, smiling, and emitting the "mmm-hmm" sound.

A study conducted by Reece and Whitman (1962) in part investigated the potential of eye contact as a social reinforcer. They found that the total number of words produced by a subject was increased when the experimenter's nonverbal behavior indicated a more positive attitude. However, this
study, like the one conducted by Krasner (1958), included eye contact as a part of a combined behavioral act on the part of the experimenter and did not isolate eye contact as the single variable of influence. In a similar experiment, reported by Exline and Eldridge (1967), the exact verbal communication was evaluated as being more favorable by a subject when it was associated with more eye contact than when it was presented with less eye contact.

In a review by Ellsworth and Ludwig (1972), they reference investigations that indicate the influence of visual behavior on other behavior. In such a study by Kleinke and Pohlen (1971), the effect of visual behavior on physiological arousal is explicated. These investigators found that subjects paired with a steadily gazing confederate had a significantly higher heart rate than subjects paired with a confederate who averted his gaze. Along similar lines of inquiry, Nichols and Champness (1971) reported GSR increases for direct eye contact.

Two interesting reports of the effect of visual behavior as influencer of other's behavior are reported in the literature. In the first of five studies carried out by Ellsworth, Carlsmith, and Henson (1972), experimenters stared or did not stare at people who were stopped at a traffic light. Experimenters were standing on a street corner or riding a motor scooter; subjects were pedestrians or automobile
drivers. The dependent measure was the speed at which the subject crossed the intersection when the light changed. Results of these investigations indicated that crossing time was significantly shorter in the stare conditions.

In an experiment by Ellsworth and Carlsmith (in press), they found that consistent eye contact from the victim inhibited aggressive responses (shocks) from angered subjects. However, when the victim's behavior was variable (inconsistent), subjects gave more shocks to the victim when he established eye contact than when he looked away (Ellsworth and Ludwig, 1972). In summarizing the studies reported by Ellsworth and Ludwig above, they conclude:

The direct gaze has an arousing effect on the target. Presumably such a gaze must deviate from the normal background of regulatory visual behavior, or must occur outside of the context of a verbal interaction, in order to be arousing. How the subject copes with the arousal, and what implications he draws probably depend on other aspects of the situation: affective tone, appropriate level of involvement and so on. (p. 390)

The investigations that establish eye contact to be a function of sex and affect characteristics are numerous. For the purpose of this study, reference is only made to a few. In regard to sex of the interactants, Exline (1965) found that women look at women more than men look at men in dyadic interaction, and once eye contact has been established, tend to hold the other's gaze longer than do men. Argyle and Dean (1965) found similar trends. Their research indicates that females look more than males.
In terms of liking and rejection, Exline and his colleagues (e.g., Exline, 1963; Exline, Gray, and Schuette, 1965; Exline and Winter, 1965) have noted the relationship between frequency of eye contact and positive and negative attitudes between communicators, with more eye contact being associated with greater liking.

To conclude this section which has been concerned with man's visual behavior, a review of the work of Kendon (1967) is helpful in providing criteria from which to interpret the research that has been presented. Kendon describes the function of gaze direction in social interaction as being (1) regulatory, (2) cognitive, (3) monitoring, and (4) expressive.

In conversational interchange, the regulatory function of the direction of a speaker's gaze serves to signal the exchange and maintenance of the speaker's role. Thus, at points in the interaction where the speaker and auditor exchange roles, the speaker ends his utterance by looking at the auditor and the auditor looks away as he begins to speak.

The cognitive function of looking behavior gives the speaker time to think and plan. The cognitive function is exhibited when the speaker looks at the auditor during fluent speech, looks away during passages of unfluent speech and during hesitation points in the monologue. In this way the speaker gains time to think and plan his next statement.
The monitoring function of a speaker's gaze direction is operative when his looking behavior is focused on the conversation participants to indicate the conclusion of thought units and to check the interactants' attentiveness and reaction.

The expressive function of gaze direction in social interaction serves to signal the degree of involvement and emotional arousal existent within the conversation. Thus, the amount of mutual looking conversants will engage in can serve to regulate the level of shared emotional arousal. In essence, eye contact will decline in direct proportion as the individuals want to avoid or withdraw from a relationship.

In summary, visual interaction is an expressive function which serves a regulatory purpose in interpersonal communication. In the capacity of communication regulator, eye contact functions to elicit and to suppress verbal communication. Apart from the influence that eye contact exerts on another's verbal behavior, it is also communicative independent of other communication modalities. The context in which visual interaction is operative, the sex of the interactants, and intervening personality variables appear to be active determinants of visual behavior and, in turn, complicate the interpretation of controlled experimental studies.

Head Nod

The head nod constitutes the second nonverbal act of
which this investigation is concerned. The nonverbal behavior of nodding one's head in an affirmative fashion when one is in sympathy with another person's verbalizations is a common observation in daily social intercourse. The opposite act of shaking one's head from left to right to signal disagreement is also readily observable between partners in conversational dyads. Beyond the agreed-upon affirmative-negative meanings of the head nod and head shake, respectively, other communicative functions of the head nod have not been unequivocally established. Observationally, Dittman (1972) classifies the head nod among a group of verbal and nonverbal behaviors which he calls listener responses. He posits that the function of such verbal acts as "I see," "mm-hmm," and nonverbal acts such as "nodding the head" and "smiling" to signal the speaker that the listener is paying attention to the speaker is keeping up with him, or that he has understood what was just said. From his research, Dittman has noted that young children produce far fewer listener behaviors than do adults and suggests that the listener behavior exhibited by adults may serve other communicative functions than those outlined above.

There are few published studies which report the employment of the head nod as a unitary act of influence. Generally, the head nod has been combined with a verbal response and both emitted simultaneously as a reinforcer of
operant behavior. The few studies that exist which studied the effects of the head nod as a single variable are found in the operant verbal conditioning literature. Wickes (1956) contrasted the effect of verbal reinforcement with nonverbal reinforcement. In his results, he reports the nonverbal reinforcers (among which was a head nod) were more effective than the verbal reinforcers in producing operant responses. In contrast to the Wickes study, Hartman (1955) found the negative reinforcer of a head shake to be effective in decreasing the frequency of occurrence of the verbal response. Investigations by Anderson (1970, Dolherty (1967), and Rogers (1960) used the combined verbal response of "hm-mmm" and a head nod as a reinforcer in studies that were designed to modify verbal behavior.

From the studies reviewed, the evidence that the head nod is an effective reinforcer of verbal behavior is inconclusive. The results of such investigations have been discussed from the perspective of the past reinforcement history of the subject, subject awareness of the response-reward contingency, and various philosophical discourses on the nature of reinforcement.

**Trunk Lean**

The orientation and posture of the body in dyadic and group interaction situations have received considerable space in the research literature. James (1932) required subjects
to view photographs in which the position of the model's head, trunk, feet, knees, and arms were systematically varied. He found that the head and the trunk were the most important indications of the four attitude categories judged. His subjects associated a forward trunk lean with the category of positive affect and judged a backward lean of the trunk to be communicative of negative affect.

Since there do not appear to exist empirical investigations in which trunk lean per se was identified as a generalized reinforcer, and its influence on another's behavior quantified, this review of trunk lean assumes the affect of liking as being a requisite of reinforcement in interpersonal communication. There is some empirical justification for such an assumption derived from the Reece and Whitman (1962) study. These investigators defined attitudinal conditions of warmth and coldness and operationalized their definition in terms of experimenter behavior. They then studied the effects of these conditions upon the amount of verbal output in a situation where the subjects were free associating. Part of the definitional component of the warmth condition required the experimenter to lean forward, smile, and maintain eye contact with the subject. It was noted that this condition of warmth was effective in increasing verbal output and was, therefore, considered reinforcing. The assessment of the unitary effect that the forward trunk lean position contributed
to the perception of warmth is impossible to ascertain, but it can be concluded, on the basis of speculation, that it was a significant influential component of the total condition of warmth. If indeed the reinforcing value of a forward trunk lean is associated with the positive affect of liking, the research findings that follow are pertinent to this investigation.

Mehrabian (1968) carried out an investigation similar in nature to the James (1932) study. In his inquiry, Mehrabian was concerned with the communicating significance of a number of communicator postural cues. Using photographs as stimulus material, subjects judged cues which consisted of a combination of body orientation, distance between decoder and encoder, and body posture. Subjects were asked to determine the degree of liking the decoder possessed for the encoder. Results indicated that a forward lean of the trunk toward one's addressee effectively communicated more positive affect than did a backward lean of the trunk and larger interaction distance.

Kelly (1971) investigated the communicative significance of five therapist nonverbal behaviors and concluded that "closer distances to the client, presence of counselor eye contact, a slightly forward trunk lean and a direct body orientation comprise nonverbal therapist behavioral contingencies which communicate positive attitudes or affect to the client,
and thus constitute factors which may expedite the therapeutic process of rapport or strengthen the counselor client bond." Additional research by Haase and Tepper (1972) associates the variables of forward trunk lean and eye contact to the communication of empathy.

From the literature cited, it can be concluded that a forward lean of the trunk is functional in communicating positive affect. If the assumption holds true that a necessary ingredient of reinforcement in interpersonal communication is a liking for the communicator by the addressee, then it can be concluded that a forward trunk lean should function as an effective reinforcer of verbal and nonverbal behavior.

Summary

This chapter has focused on the research literature in two broad fields of human behavior that have important implications for understanding the interpersonal communication processes. Section one of this chapter was concerned with verbal conditioning research and was reviewed from the perspective of the use of the operant conditioning paradigm as an appropriate vehicle from which to study the modification of verbal behavior. Section two of the chapter was devoted to a general review of nonverbal communication literature and focused attention around the nonverbal behavioral acts that constituted the experimental variables of this investigation.
Several studies were reviewed which emphasized the significance of eye contact or visual interaction in the communicative process. Conclusions drawn are indicative that the eyes are potent influences of human behavior, that they serve reward functions which communicate positive affect, that they serve a repressive function and evoke flight, and that the mutual gaze represents the most perfect form of reciprocity; that is, the eyes give as much as is received.

Empirical investigations aimed at the determination of the effect of the nonverbal head nod were reviewed from the perspective of this nonverbal act serving as a reinforcer of verbal behavior. The results of the studies reviewed are inconclusive. The literature highlights the fact that most studies in which the head nod has been used as a contingent reinforcer have been in combination with other verbal and nonverbal cues.

Finally, the unitary act of leaning forward as an act of communicative importance was reviewed. The empirical findings are overwhelmingly supportive of the notion that a forward trunk lean in seated conversational dyads conveys an attitude of positive affect and that a back lean of the trunk is judged to convey negative effect. The literature lacks data to support the notion that a forward lean devoid of positive facial cues is a reinforcing influence on the behavior of another person.
The purpose of this study is to add to the literature information that elucidates the influence of three unitary nonverbal behavioral acts and one verbal sound on the verbal behavior of another person. It is the hope that such information will help illuminate the relationship between the verbal and nonverbal channels of communication.

Purpose of the Study

The purpose of this study was to determine the relative reinforcing potential of four stimulus variables on verbal behavior. Three of the stimulus variables selected for investigation were nonverbal (i.e., eye contact, forward trunk lean, head nod); the fourth variable consisted of the verbal response of "mmm-hmm-good."

Hypotheses

The two major hypotheses of this investigation were:

1. There is no difference among the verbal and nonverbal stimulus conditions relative to their contingent reinforcing value for subject verbalization.

2. There is no difference among the three nonverbal stimulus conditions of eye contact, head nod, and trunk lean in terms of their effectiveness as reinforcers of subject verbalizations.
CHAPTER III

METHODOLOGY

This chapter will discuss the experimental methodology and research procedures utilized in this study. The chapter content is presented in seven major categories: (1) the selection of subjects, (2) a description of the experimenter and technicians, (3) the general design of the study, (4) experimenter training, (5) the experimental procedures, (6) an explication of the stimulus material used in testing the subjects and instrumentation employed, and (7) the rating procedures employed to quantify subject responses.

Subjects

The subjects for this research investigation were white female undergraduate students from the University of Massachusetts and Smith College. A total of forty subjects comprised the research sample. The subjects were volunteers who responded to an advertisement in the University of Massachusetts' Daily Collegian for females to participate as subjects in a doctoral dissertation research study. The subjects were each paid $2.00 for their participation. This notice of monetary gain was made explicit in the newspaper advertisement.

Those female readers who possessed an interest in the
ad called the University Counseling Center and were scheduled by the receptionist into existing openings in the research schedule. From the completed schedule subjects were randomly assigned to one of the four experimental groups. The age of the subjects ranged from eighteen years to twenty-four years. The average age represented in the sample was 19.8 years.

The decision to use female subjects in this investigation was dictated by the research reports of Exline et al. (1955) and Argyle and Dean (1965). These investigators found that in dyadic interaction females look at their partners more than do males, especially when the partner is another female. Thus, using female subjects and a female experimenter enhanced control of the "looking" contingency of the experimental design and circumvented sex of subject by sex of experimenter confounding.

Experimenter and Technicians

Experimenter

The experimenter for this study was a white, female, senior undergraduate majoring in Counseling and Education at the University of Massachusetts. The exact function of the experimenter will be elaborated upon in the section of this chapter that defines the experimental variables under investigation.
Technicians

The writer and a professional colleague served as technicians for this study. These technicians designated T₁ and T₂, respectively, monitored the experimental procedures. The major function of the technicians was to monitor the tape recorder, cue the experimenter with a light signal when she was to emit a random reinforcement, introduce the subject to the experimenter, administer the Semantic Differential, debrief the subject, and rate the subject responses in the data analysis phase of the study.

General Design of the Study

Experimental Task

Following the procedure outlined by Taffel (1955), the subjects were required to make up a sentence. Part of the instructions to the subjects was that they were participating in an experiment to determine how people construct sentences when specifically requested to do so. Each subject was instructed by the experimenter to make up a sentence using one of the following pronouns (I, we, you, he, she, they) and a past tense verb. The stimulus material was typed in large character letters on 3 x 5 cards and presented to the subject by the experimenter. The order of the six pronouns appeared in a random fashion on each card along with a past tense verb that was selected from The Teacher's Word Book of 30,000 Words (Lorge & Thorndike, 1944).
The response class selected for conditioning was all sentences that the subject began with either "I" or "we."
The Appendix contains a list of the past tense verbs that were selected as stimulus material and a pictorial sample of how the stimulus verb and pronouns were arranged on the 3 x 5 card.

**General Design**

The following diagram represents the general design of the study:

```
<table>
<thead>
<tr>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforcing Stimulus</td>
<td>Verbal Eye Contact</td>
<td>Forward Trunk Lean</td>
<td>Head Nod</td>
</tr>
</tbody>
</table>
```

Each experimental group was exposed to a single stimulus condition. The four behaviors of the experimenter that were assumed to have reinforcing power included one verbal response and three nonverbal responses. For purposes of this study the following experimenter responses were defined as reinforcing stimuli: (1) the verbal response of "mmm-hmm-good," and three nonverbal responses: (2) a head nod, (3) a forward trunk lean, and (4) eye contact.

Each experimental group was composed of ten subjects. What follows is a description of each of the stimulus conditions and an elaboration of the experimenter's behavior that was governed by the parameters of each stimulus variable.

Group A was reinforced with a verbal response of "mmm-
hmm-good" each time that the subject emitted the correct response class of sentences beginning with "I" or "we."

Group B was reinforced with a nonverbal behavioral response of eye contact. Each time the subject emitted the correct response class during the conditioning phase (as defined above), the experimenter immediately reinforced the response by making eye contact with the subject.

Group C was reinforced with the nonverbal behavioral response of a forward trunk lean. Contingent upon the subject emitting the correct response class, the experimenter reinforced the subject's response by leaning forward in her chair toward the subject.

Group D was reinforced with the nonverbal behavioral response of a head nod. Each time the subject emitted the correct response class, the experimenter reinforced the subject by nodding her head.

During each of the stimulus conditions described above, the behavior of the experimenter was standardized so that only the reinforcer appropriate to each condition was emitted. As will be described in a later section of this chapter, the experimenter was trained to adhere rigidly to the experimental parameters for each stimulus condition.

Training of Experimenter

The experimenter was trained to carry out her assignment for each of the experimental conditions. It was first
necessary for the experimenter to establish a comfortable seated position which would be standard for each condition and from which she could emit the appropriate reinforcer without engaging in extraneous behaviors that would compromise any other experimental condition.

The standard seated position decided upon called for the experimenter to sit up straight in her chair with the upper part of her body rigid and her back perpendicular to the back of the chair. From this position she sat with her arms placed on the arm rests of the chair, her head tilted downward, and her eye gaze directed past and to the left of the subject. From this posture the experimenter was able to effectuate each reinforcing stimulus.

A significant aspect of the training of the experimenter was the requirement that she be able to identify rapidly the correct response class when emitted by the subject and make the appropriate reinforcing response. This was accomplished by the author composing sentences which varied the beginnings among the group of alternative pronouns selected for use in the study. Initially, the experimenter responded with the verbal reinforcer of "mmm-hmmm-good" when the correct response class of "I" and "we" sentences were recognized. This procedure was practiced until 99 percent accuracy of experimenter responding was obtained. The above procedure was followed for each of the stimulus conditions. In addition to the author serving as trainer for the
experimenter, supplementary practice to sharpen her skill was provided by the technician.

To further refine the experimental procedures and to polish the experimenter behavior, several volunteers experienced each of the experimental conditions. The judgment that the experimenter was performing at an acceptable criterion level was made by the writer, a professional colleague assisting with the study, and on the basis of the self-report of the experimenter.

Procedure

The experimental session was divided into five segments: (1) an opening, (2) free operant period, (3) conditioning period, (4) extinction period, and (5) the administration of an awareness test, State-Trait Anxiety Inventory, Semantic Differential, and the debriefing of the subject.

Following is a diagram of the experimental session:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Period</td>
<td>Free Operant Period</td>
<td>Conditioning Period</td>
<td>Extinction Period</td>
<td>Administration of Instruments and Debriefing</td>
<td></td>
</tr>
</tbody>
</table>

Opening Segment

The subject was introduced to the experimenter by one of the technicians. In the opening segment of the task session, the experimenter made an attempt to relax the subject by engaging her in spontaneous conversation. During this
phase, the nature of the experimental task was explained to the subject and what was required of the subject was explained. The subject was told that her responses would be recorded on a tape recorder which was located in the next room. It was explained that her responses would be rated and used in the data analysis phase of the study. The subject was informed during this period that she would be expected to complete three data gathering instruments at the end of the session. When the experimenter was satisfied that the subject was ready to begin, she read each subject specific instructions (see Appendix for these instructions). To insure that the subject understood what was required of her, each subject was permitted six practice trials. The past tense verbs used for the practice trials were additional to the stimulus verbs used for the experimental task.

**Free Operant Period**

During the free operant period a baseline rate of operant responding for the selected response class was obtained for each subject. This baseline was used in the data analysis to assess the magnitude of conditioning. The baseline was established by counting the number of times the preselected response class was emitted by the subject when constructing sentences from the first stack of forty-five stimulus cards.

During the free operant period the experimenter
emitted the appropriate reinforcing stimulus for each group on a random schedule. The experimenter was cued with a yellow light by the technician when to emit the random reinforcement. The random schedule (for the yellow light) was constructed in the following fashion. A deck of blank cards was used on which were printed the numbers 1 through 5. These numbers represented the number of subject responses separating the yellow light cues. Prior to each session, the technician shuffled the deck to determine the number interval between subject response and the activation of the light cue. He then counted the number of subject responses (number of sentences) dictated by the successive cards in the deck. At the end of the designated number of subject responses, he depressed the switch for the yellow light for approximately three seconds.

**Conditioning Period**

The third phase of the experimental session was the conditioning period. During this period, the experimenter responded immediately with the appropriate reinforcing stimulus whenever the subject emitted the predetermined response class. During this phase the experimenter made the judgment as to when the reinforcer should be given. Again, forty-five stimulus cards composed the trial set.
Extinction Period

The extinction period is a definitional component of the conditioning paradigm. During this period the subject was again administered reinforcement on a random schedule. The experimenter was cued by the technician when to emit the reinforcing stimulus. Theoretically, if conditioning is contingent upon reinforcement, then the absence of reinforcement should cause a decrease in the operant level that was formerly reinforced. From this perspective the extinction period is useful as a measure of the extent of conditioning.

Instrumentation

Awareness Test

Following the extinction period, the experimenter administered a questionnaire to determine the awareness level of the subject. The test used was developed by Matarazzo, Saslow, and Paresis (1960) and modified by Kennedy (1967). The awareness questions were: (1) What do you think was the purpose of this experiment? (2) What evidence do you have for this? (3) Was there anything that you noticed about either the experimenter or yourself during the session?

The following four-point scale was used to evaluate the awareness reports:
<table>
<thead>
<tr>
<th>Awareness Level</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No awareness.</td>
<td>S did not mention either stimulus condition or response class.</td>
</tr>
<tr>
<td>2. Awareness of stimulus condition.</td>
<td>S identified the frequent use of stimulus condition but failed to associate it with anything being said.</td>
</tr>
<tr>
<td>3. Awareness of stimulus condition (plus).</td>
<td>S identified stimulus condition and indicated that its function was to encourage something said or identified an incorrect response class.</td>
</tr>
<tr>
<td>4. Awareness of intent of session.</td>
<td>S identified stimulus condition, response class, and correct relationship.</td>
</tr>
</tbody>
</table>

Equipment and Materials

The experimental task was carried out in a 12x12-foot room in the Counseling Center of the University of Massachusetts. The experimental room was equipped with a table and two chairs. The table separated the chairs, allowing the subject and the experimenter to face each other.

The room was equipped with a microphone connected to a tape recorder in the adjacent technician's room. The experimental room and the technician's room were divided by a two-way mirror. A light panel was attached to the mirror which was located in view of the experimenter but hidden from view of the subject. The light panel consisted of a yellow light. The yellow light was used to cue the experimenter when to emit random reinforcement during the operant and extinction periods.
Raters

To organize the data for analysis, two raters (the writer and the second technician) listened to the taped experimental sessions and independently rated the responses of each subject. The rating task consisted of a frequency count of the number of "I" or "we" sentences constructed by the subject during the operant, conditions, and extinction periods. The data analysis chapter contains details concerning inter-rater reliability.

Semantic Differential

A five-item semantic differential scale was constructed from adjectives that conveyed attitudes of positive-ness and negativeness to assess the degree to which the subjects' perception of the experimenter was functionally related to the experimental conditions under study.

A copy of the semantic differential scale can be found in the Appendix. This particular scale was not subjected to the formal procedures normally employed to establish validity and reliability coefficients. However, on the basis of evidence presented by Osgood, Suci, and Tannenbaum (1957), scales generally constructed that adhere to the original format have face validity and acceptable reliability.

State-Trait Anxiety Inventory

Immediately upon completion of the awareness test,
each subject was asked by the experimenter to complete the State-Trait Anxiety Inventory (Spielberger, Gorsuch, and Lushene, 1970). The rationale for having each subject complete this inventory developed from preliminary investigation in which practice subjects related that the eye contact condition had the effect of arousing more anxiety than it did to reinforce the operant response.

It is generally assumed that eye contact serves more of a facilitative than an inhibitory function in interpersonal relationships. The preliminary self-report data indicated that this may not be the case and imply that certain nonverbal behavior may be anxiety provoking. If this is the case, then knowledge of the emotion-provoking potential of nonverbal behavior has definite implications for understanding and influencing interpersonal behavior.

The State-Trait Anxiety Inventory is comprised of separate self-report scales for measuring two distinct anxiety concepts: State Anxiety (A-State) and Trait Anxiety (A-Trait). The State Anxiety (A-State) is conceptualized as a transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity. A-State may vary in intensity and fluctuate over time.

Trait Anxiety (A-Trait) refers to relatively stable individual differences in anxiety proneness; that is, to
differences between people in the tendency to respond to situations perceived as threatening with elevations in A-State intensity.

The A-State form of this inventory was appropriate for this study because it is a sensitive indicator of the level of transitory anxiety.

The internal consistency of both STAI subscales is reasonably good. The reliability coefficients ranged from .83 to .92 for A-State and .86 to .92 for the A-Trait. The test-retest reliability (stability) of the STAI-A-Trait scale is relatively high, but stability coefficients for the STAI-State scale tend to be low, as would be expected for measures designed to be influenced by situational factors.

The construct validity of the A-State scale was established through a number of correlational studies. Evidence is provided that the scale is a valid discriminative measure. Construct validity of the A-State scale is available for a sample of 977 undergraduate college students at Florida State University. The students were first administered the A-State scale with the standard instructions (norm condition) and then they were asked to respond according to how they believed they would feel just prior to the final examination in an important course (exam condition). The mean score for each individual item of the A-State scale was higher for the exam condition than in the norm condition for both males and females.
Summary

The female subjects in this investigation were required to construct sentences beginning with one of six pronouns printed on a 3 x 5 card. The subjects were divided into four groups of ten and each group experienced a single experimental condition.

The four experimental variables under investigation for their potential reinforcing value were the verbal response of "mmm-hmm-good" and three nonverbal behavioral cues: eye contact, forward trunk lean, and head nod.

Subjects were reinforced by the experimenter whenever they began a sentence with the preselected response class of pronouns which were "I" and "we."

In addition to the verbal conditioning phase of the experimental task, each subject responded to a written test to assess her level of awareness, to a semantic differential scale to assess her perception of the experimenter, and to the S-Trait Anxiety questionnaire to assess her level of situational anxiety.
CHAPTER IV
RESULTS

Before the data were submitted to analytical treatment, the Pearson Product Moment Correlation technique was employed to assess the degree of inter-rater reliability of the frequency count of the correct response class. This correlation was performed on the data from the first ten subjects. The correlation coefficient for each of the segments of the conditioning paradigm is as follows: operant period, .99; conditioning period, .99; and extinction period, 1.00.

It was concluded that, with such a high degree of interjudge agreement on one-fourth of the data, it would not be necessary for each judge to rate independently all remaining protocols. Therefore, the data for the remaining thirty subjects were divided between the raters and independent ratings were made.

The results of the statistical analysis of the data generated from this study are presented in this chapter. The explication of the analysis is organized around the two major hypotheses that were investigated and the specific secondary parameters of interest with which the study was concerned. The ancillary interest of the study was to measure the relationship between verbal conditioning and the subjects' awareness, between experimental condition and the subjects'
perception of the experimenter, and between experimental condition and the subjects' level of anxiety. Each of the variables mentioned above was studied in relationship to each of the experimental conditions.

Hypothesis 1

Hypothesis 1 can be stated in the null form as follows: verbal and nonverbal stimuli do not differ significantly as reinforcers of human verbalizations.

A $4 \times 3$ factorial analysis of variance with repeated measures on the three experimental task levels (operant, conditioning, and extinction) was used to determine the effect of the experimental variables on conditioning. The results of this analysis are presented in Table 1.

**TABLE 1**

**ANALYSIS OF VARIANCE OF CONDITIONING SCORES ACROSS FOUR STIMULUS LEVELS AND THREE CONDITIONING PERIODS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>1758.35</td>
<td>39</td>
<td>108.47</td>
<td>2.73</td>
</tr>
<tr>
<td>Subjects within groups</td>
<td>325.41</td>
<td>3</td>
<td>108.47</td>
<td>2.73</td>
</tr>
<tr>
<td>Within Subjects</td>
<td>1432.94</td>
<td>36</td>
<td>39.80</td>
<td></td>
</tr>
<tr>
<td>Conditioning periods</td>
<td>2881.77</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups x periods</td>
<td>247.41</td>
<td>2</td>
<td>123.71</td>
<td>3.65*</td>
</tr>
<tr>
<td>Bx subjects within groups</td>
<td>195.80</td>
<td>6</td>
<td>32.63</td>
<td>.96</td>
</tr>
<tr>
<td>Total</td>
<td>4640.12</td>
<td>119</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05
It is clear from an inspection of Table 1 that at the .05 level of confidence the null hypothesis cannot be rejected. Within the framework of this study, differential conditioning of verbal and nonverbal reinforcing stimuli was not demonstrated. Thus, subjects in the study were clearly conditioned, but conditioning was not found to be a differential function of the reinforcing stimulus. This is especially reflected in the nonsignificant groups x periods interaction.

Hypothesis 2

Hypothesis 2 can be stated in the null form as follows: there is no significant difference among the three nonverbal stimulus reinforcers with respect to their potential to condition human verbalizations. Table 1 provides statistical justification that militates against rejecting this hypothesis.

The within subject variability summarized in Table 1 reveals that when the data for all groups were averaged across all four stimulus conditions a main effect for conditioning reached significance \((F = 3.65, \text{df} = 2, \text{P} \leq .05)\). Thus, subjects in the study were clearly conditioned, but conditioning was not found to be a differential function of the reinforcing stimulus. This is especially reflected in the nonsignificant groups x periods interaction.

In summary, the test of the two major hypotheses of
this study is presented in Table 1. These data suggest that a verbal statement, head nod, trunk lean, and eye contact are reinforcing stimuli but not differentially so.

In addition to the analysis of variance procedure to which the study data were subjected, the major hypotheses were also tested for a conditioning effect by an analysis of covariance technique which used the operant baseline scores as the covariant. This particular statistical procedure was employed to assess the variability between groups with respect to the reinforcing power of each of the stimulus conditions after adjusting for variability due to subjects' differences during the operant period.

The results of these analyses are presented successively in Tables 2 and 3. Table 2 contains the means and standard deviations for the operant level and for the difference between conditioning and extinction levels. Table 3 is a summary of the analysis of covariance of the data presented in Table 2.

An examination of Table 2 reveals that the largest mean for conditioning occurred for the verbal and the trunk lean conditions. The difference between means of the operant level scores is minimal. It is obvious from observation of the results of the test of these mean scores presented in Table 3 that a statistically significant level of confidence was not obtained. The conclusion that the stimulus variables under investigation are not differentially reinforcing even
### TABLE 2

MEANS AND STANDARD DEVIATIONS OF OPERANT AND CONDITIONING-EXTINCTION SCORES ACROSS FOUR STIMULUS LEVELS

<table>
<thead>
<tr>
<th>Stimulus Condition</th>
<th>Operant Level</th>
<th>Conditioning-Extinction Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>Verbal</td>
<td>20.300</td>
<td>12.221</td>
</tr>
<tr>
<td>Eye Contact</td>
<td>20.900</td>
<td>11.930</td>
</tr>
<tr>
<td>Head Nod</td>
<td>20.100</td>
<td>11.474</td>
</tr>
<tr>
<td>Forward Trunk Lean</td>
<td>20.700</td>
<td>12.979</td>
</tr>
</tbody>
</table>

### TABLE 3

ANALYSIS OF COVARIANCE FOR CONDITIONING ACROSS FOUR STIMULUS LEVELS (Operant Score Is Covariant.)

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditioning</td>
<td>48.054</td>
<td>3</td>
<td>16.018</td>
<td>0.366</td>
</tr>
<tr>
<td>Within</td>
<td>1530.815</td>
<td>35</td>
<td>43.738</td>
<td></td>
</tr>
</tbody>
</table>
after controlling for initial operant levels between subjects seems warranted.

For each of the secondary variables (anxiety, awareness, perception of experimenter), an independent analysis of covariance was performed using the conditioning score as the independent variable and each secondary variable successively as the covariant.

The results from each of these covariance analyses failed to reach significance at the .05 level of confidence. The F value for the awareness dimension as covariant reached 0.126. df = 1,33. For the anxiety score and the semantic differential score as covariant, the F value obtained was 1.879 df = 1,33 and .174 df = 1,33, respectively.

The following three secondary relationships constituted the other set of investigative parameters of this study. Namely, the relationship between the experimental stimulus conditions and subject awareness, subject anxiety, and subject's perception of the experimenter were submitted to individual analyses of variance. The analysis of the data representing the variables of subject anxiety and subject perception of the experimenter is presented in Tables 4, 5, 6, and 7, respectively.

A review of Table 4 reveals minimum variation between the means and standard deviations among each stimulus condition with regard to subject anxiety. From mere face inspection of Table 4, it is evident that the greatest differential
TABLE 4
MEANS AND STANDARD DEVIATIONS OF ANXIETY SCORES
ACROSS FOUR CONDITIONING GROUPS

<table>
<thead>
<tr>
<th>Stimulus Condition</th>
<th>Mean</th>
<th>Standard D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal</td>
<td>34.444</td>
<td>7.452</td>
</tr>
<tr>
<td>Eye Contact</td>
<td>36.100</td>
<td>7.795</td>
</tr>
<tr>
<td>Head Nod</td>
<td>35.400</td>
<td>6.501</td>
</tr>
<tr>
<td>Forward Trunk Lean</td>
<td>36.889</td>
<td>12.313</td>
</tr>
</tbody>
</table>

is found in the eye contact condition and in the forward trunk lean condition. The largest amount of within subject variability is found within the forward trunk lean condition suggesting that the subjects in this group were not nearly so homogeneous in reflected anxiety as were the three other groups.

Table 5 presents the analysis of variance of the data presented in Table 4. The analysis of subject anxiety as measured by the State-Trait Anxiety Inventory resulted in a nonsignificant F value. It is apparent that the amount of anxiety engendered within the subjects was not contingent upon the stimulus condition to which they were exposed.

The data generated from the subjects' perception of the experimenter as measured by a five-item Semantic Differential Scale is presented in Table 6. This table contains the means and the standard deviations for the total Semantic Differential Scores averaged across the four conditioning groups.
### TABLE 5

**ANALYSIS OF VARIANCE OF ANXIETY SCORES ACROSS FOUR CONDITIONING GROUPS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>29.406</td>
<td>3</td>
<td>9.802</td>
<td>0.129</td>
</tr>
<tr>
<td>Within Groups</td>
<td>2583.490</td>
<td></td>
<td>75.985</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2612.896</td>
<td>37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 6

**MEANS AND STANDARD DEVIATIONS OF SEMANTIC DIFFERENTIAL SCORES ACROSS FOUR CONDITIONING GROUPS**

<table>
<thead>
<tr>
<th>Stimulus Condition</th>
<th>Mean</th>
<th>Standard D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal</td>
<td>22.778</td>
<td>7.138</td>
</tr>
<tr>
<td>Eye Contact</td>
<td>22.500</td>
<td>6.151</td>
</tr>
<tr>
<td>Head Nod</td>
<td>21.300</td>
<td>10.209</td>
</tr>
<tr>
<td>Forward Trunk Lean</td>
<td>21.444</td>
<td>7.986</td>
</tr>
</tbody>
</table>
An inspection of Table 6 is suggestive that the subjects' perception of the experimenter was more positive in the verbal condition and in the eye contact condition. The greatest within subject variability was evidenced by the head nod condition.

It is apparent from a review of Table 7 that the variance between experimental groups on the variable of the subjects' perception of the experimenter does not reach statistical significance.

TABLE 7
ANALYSIS OF VARIANCE OF SEMANTIC DIFFERENTIAL SCORES ACROSS FOUR CONDITIONING GROUPS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>15.62</td>
<td>3</td>
<td>5.207</td>
<td>.081</td>
</tr>
<tr>
<td>Within Groups</td>
<td>2185.656</td>
<td>34</td>
<td>64.284</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2201.770</td>
<td>37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is apparent from the analysis of variance results and the covariance analyses that subject conditionability was not contingent upon the subjects being aware or unaware of the stimulus-response contingency, anxiety level and/or qualitative perceptions of the experimenter.
CHAPTER V
DISCUSSION

Interpretation and Findings of the Study

An interpretation of the results of this investigation is presented in this chapter. The findings of the study are discussed from the perspective of the major hypothesis tested and are articulated from two plausible explanations. First, the viewpoint is presented which theorizes that the obtained results are indicative of naturally occurring behavioral principles that are operative in interpersonal interaction. Such a view postulates that what is functional as a reinforcer of human behavior in social interaction is as much a property of the perceived definition of the situation as it is a function of the nature of the reinforcer. What is highlighted in this interpretation is the apparent interrelatedness of behavioral acts that function as reinforcers of social behavior and the atmosphere in which the interaction occurs. Collaterally, an explanation of the observed results is presented which recognizes that intervening variables originating within the experimental design may account for the absence of statistical significance.

The above dimensions of the results of this investigation are discussed within the framework of the secondary
features of the research design and from a focus that outlines suggestions for replication of the study and implications for related areas of research.

As was noted in the preceding chapter, the null hypothesis of no difference between verbal and nonverbal cues as contingent reinforcers of verbal behavior could not be rejected. In essence, this investigation was not successful in demonstrating that there was differential reinforcement potential between the verbal response of "mmm-hmm-good" and the nonverbal behavioral cues (forward trunk lean, eye contact, head nod) on the conditionalability of the subject's verbal responses. Nor was there demonstrated differential reinforcement potential between the three nonverbal contingent reinforcers.

The explanation of these results that most naturally presents itself is one that simply accepts the quantified data as confirmation of a fundamental principle of behavior that is operative in interpersonal interaction. What this seems to suggest is that discrete, isolated behavioral responses in dyadic encounters are not reinforcing of verbal behavior. It can be rationalized that exaggerated behavioral acts emitted by one member of a dyad that are not contiguous with the appropriate ongoing verbal behavior of the other member serve more a confusing than a reinforcing function. Possibly, with the exception of agreed-upon signal responses
such as the head nod for affirmative consequence and the
head shake for denoting negative consequence, verbal and non-
verbal behavioral acts emitted by one member of a dyad to
another member, who is unaware of the contingent relationship
between his behavior and the particularized behavior response,
is simply noncommunicative of positive effect and does not
serve as a reinforcer of verbal operant responses.

The position argued attains some degree of clarity
when it is viewed within the context of the artificiality of
the experimental setting and from the equivocality of the
research data surrounding the issue of subject awareness in
learning.

From an examination of the "awareness test" that was
administered to subjects to assess their comprehension of the
contingencies of the experimental methodology, it was con-
cluded by the raters that at least 98 percent of the subjects
were unaware of the stimulus-reward relationship. Thus, if
subjects were unaware of the operant-reinforcement contingency,
it would appear feasible to conclude that the differential
reinforcement potential of the selected stimuli was not inter-
preted by the majority of the subjects as being influenced by
the responses that they emitted. However, it should be
pointed out that the credibility of such an argument is weak-
ened by the conflicting evidence pertaining to the importance
of awareness in learning.
In a number of verbal conditioning studies the issue of subject awareness has been a central ingredient in the discussion of the results. The research reported, however, is equivocal. A study reported by Matarazzo, Saslow, and Pareis (1968) interpreted conditioning to be highly correlated with subject awareness of the response reinforcement contingency. Along a similar line of investigation, Spielberger and DeNike (1962) found that unaware subjects did not differ significantly in their production of the reinforced response class than did the control group. The point made is somewhat rhetorical in that there are reported verbal conditioning studies which obtained the conditioning effect without reported awareness on the part of the subjects. In point of fact, the present study revealed overall conditioning of unaware subjects. In sharp contrast to the results of this and other studies that have obtained the conditioning effect without subject awareness, an investigation by Resnick and Schwartz (1973) found that informed subjects did not condition. In this particular study, subjects were told the nature of the experiment and the response reinforcement contingency was clearly outlined. The results did not support the conceptions that subjects who are aware of the total experimental process condition and those unaware fail to condition. In fact, the results were in the reverse—unaware subjects conditioned; aware subjects failed to condition and actively
resisted conditioning. From this investigation, it seems safe to conclude that awareness of the operant response-reinforcement contingency on the part of the subject may or may not influence his learning the conditioning response.

From the results obtained in this investigation, it appears that listener or interviewer responses in dyads must somehow be connected to the ongoing flow of verbal dialogue in order to serve a reinforcing function. Some observations from studies in which the verbal responses of the listener were studied provide some generalized support for the conclusion that the speaker expects to receive certain responses from the listener which encourage the continuation of dialogue.

This interpretation gains significance when the situation in which the encounter occurs is highly suggestive of social interaction and personal involvement but in which the interpersonal process is short-circuited and not allowed to develop. The overlay of experimental restrictions seems to negate the effect of behavioral cues and verbal acts that function as reinforcers in naturally occurring conversational settings.

Fries (1952) investigated listener responses via telephone conversation and noted that listener responses consisted of "brief oral sounds" that punctuated the conversation but did not interrupt the "speaker's span of talk." He points
out that the speaker will short-circuit long discourses that have not been punctuated with listener responses and ask such questions as "Do you hear me or are you [still there]?" He further states that in normal face-to-face conversation "signals of continued attention are often made not by words but by nods of the head." The final point that Fries makes concerning verbal listener responses is that they are not unitary, monotonous responses but vary with such expressions as "yes," "unh-hunh," "yeah," "I see," "good," "yes, I know," "oh-oh," and "fine." Not only is the verbal response per se noted, but also certain paralinguistic modalities accompanying these responses, such as tone and volume.

Although Fries confines his observations to the verbal mode of expression, it seems logical to conclude that non-verbal behavioral acts such as the head nod, forward trunk lean, and eye contact summate in social interaction and, in concert, function as reinforcers of verbal behavior. The above speculation should be qualified more by adding that what serves as an effective reinforcer of behavior under one set of circumstances may not operate in a like manner when the circumstances are modified. This is, as B. F. Skinner (1960) pointed out, a function of the past reinforcement history of the learner as well as individual difference variables.

In summary, then, it is plausible to conceptualize the results of this investigation as being indicative of a
principle of human behavior which implies that isolated behavioral acts are not reinforcing of verbal behavior in task-oriented performance situations. It appears more feasible to conclude that the simultaneous emittance of a combination of listener responses, such as leaning forward, smiling, maintaining eye contact, etc., would be construed as more reinforcing than isolated behavioral cues that are emitted in an intermittent manner during conversational interaction. This, in fact, has been supported by Wickes (1956), Ekman (1958), and Reece and Whitman (1962).

An alternative interpretation of the results of this study may be linked to aspects of the methodology employed to implement the research design. These methodological considerations will be discussed within the framework of the following variables: (1) nature of experimental task, (2) artificiality of the experimental situation, and (3) "double message" behavior of the experimenter.

Crucial to the outcome of this investigation was the requirement that subjects look at the experimenter when making a response. Efforts to control the looking behavior of the subjects were incorporated into the instructions which the experimenter read to each subject. These instructions specifically stated that the subject should look at the experimenter when ready to make a response. Whereas this instruction was followed by many of the subjects, self-report data gathered
after completion of the experimental task showed that considerable individual variability existed for this factor.

In retrospect, it seems possible that lack of control over the looking behavior of the subjects is attributable, at least in part, to a number of influences. First of all, the physical nature of the experimental task created a situation in which the subject was looking from left to right and simultaneously making a verbal response. This situation was created by the instruction which stipulated that the subjects should select one card from the stack on her right, think about her response, and then place the card in a stack to her right before making her response. In reality, these instructions seem to have been too segmented and disjointed for a sequence of events that occurs most naturally as a single continuous event.

Contributing to the artificiality of the experimental situation was the behavior of the experimenter. A reasonable expectation on the part of the subject would be that some degree of social interaction would exist between subject and experimenter. This seems a reasonable expectation by the mere fact that they were both physically in the same room within close proximity of each other and the fact that preceding the experimental task the experimenter engaged the subject in social amenities. The cognitive dissonance created in the subject by the experimenter’s incongruent verbal instruction
and consequent behavior may have been so great that the net effect on the subject was behavior that was designed to create psychological distance between the subject and the experimenter. Such distancing behavior was accomplished by the subject failing to look at the experimenter when making a task response.

The experimenter's instruction to look at her when making a response and her consequent behavior of not looking at the subject in each of the experimental conditions except for the eye contact condition (which was governed by criterion responses) may have produced enough tension in the subject to negate the verbal instruction.

The anxiety questionnaire administered to the subjects after completion of the experimental task was not effective in quantifying such anxiety if it existed. This is not an unexpected result in this particular situation in that the establishing of eye contact can be momentarily tension creating, but the opposite act of breaking eye contact and avoiding eye contact is effective in reducing the anxiety to a controllable level. Such being the case, the administration of the State-Trait Anxiety Questionnaire was too far removed in time from the experimental situation to be effective because the anxiety was established and dissipated within the moment of the experimental interaction.

It is possible that the effective self-control of
extraneous behavior exhibited by the experimenter and effectuated for each experimental condition was so devoid of positive effect that the experimenter per se was perceived as a nonrewarding figure. Comments from the subjects, such as "I felt she didn't care" and "She did not pay attention to me," lend support to this speculation. If the experimenter was perceived as a nonrewarding person, it would be doubtful that any isolated act that she effected would be received as rewarding or encouraging of the subjects' behavioral responses.

Perhaps this artifact of experimenter artificiality made the experimental situation appear too removed from the normal conversational atmosphere that its net effect was a nullification of exhibited reinforcement responses by the experimenter.

To conclude, the results obtained from this study may be a function of certain aspects of the experimental design and the artificiality of the experimental setting. Not having sufficient control over the looking behavior of the subjects, combined with the lack of expected social interaction during the experimental task, is at least a factor to be considered in attempting to determine causation of the obtained results. The interpretation of the results of this study is at best tentative and speculative. Of the two alternative explanations offered in this discussion, the writer does not favor one over the other. At this point, each explanation is
equivocal and requires replication and further research before conclusive outcomes can be articulated.

Suggestions for Replication

The remaining section of this chapter is devoted to suggestions for replication of this study and defines related areas of research that have emerged from the present investigation.

Replication of this study would seem a fruitful endeavor. If replication were undertaken, two suggestions for modifying the research design are offered. First, added control over the subjects' looking behavior could be obtained by either pre-training the subjects to look at the experimenter before making a response or by changing the experimental task to one that is more reflective of ordinary social interaction. Secondly, a combination of listener responses, in addition to the discrete behavioral acts that were the subject of this investigation, may prove to have a more reinforcing effect. If such turned out to be the case, it would substantiate the discussion section of this chapter which theorizes that discrete behavioral acts are not reinforcing.

Suggestions of Areas of Related Research

A possible fertile area of research would be to design an experimental situation which would determine the deliberate effect of giving an explicit verbal message and then modeling
the exact opposite of the verbal instruction. In effect, this situation occurred in the present study when the experimenter explicitly requested the subject to look at her when making her response and then subsequently not reciprocating that behavior and modeling the exact opposite. Implications from such a research endeavor could find application in psychotherapy, child rearing, classroom settings, and in all social interpersonal situations where the incongruity between verbal messages and behavioral acts have a decided effect on the behavior of the interactants.

Summary

The focus of this chapter has been on alternative explanations of the results of this investigation. The discussion was presented from a naturalistic perspective that postulates that the obtained results are indicative of a fundamental principle of human behavior that is operative in dyadic situations that are anticipatory of social interaction. In effect, the principle articulated is indicative that discrete, isolated, behavioral acts emitted by the listener in a dyad are not effective as reinforcers of verbal operant responses. In essence, the argument was presented which suggests that behavioral cues, such as forward trunk lean, eye contact, and the head shake, summate in naturally occurring social interaction and in tandem provide a reinforcing effect.
An alternative explanation of the results of this investigation was presented which linked the observed results to factors originating within the framework of the experimental design. It was suggested that (1) the artificiality of the experimental situation, (2) the incongruencies between the experimenter's verbal instructions and subsequent behavior, and (3) the lack of control over the looking behavior of the subjects were possible factors that contributed to the obtained results. Finally, suggestions for replication and areas of further research were articulated.

Conclusions

The results of this investigation were not conclusive in quantifying a differential reinforcement potential between the verbal contingent reinforcer of "mmm-hmm-good" and the nonverbal contingent reinforcers of forward trunk lean, eye contact, and head nod. It was theorized that the probable explanation of these results is to be found within the context of the experimental setting and in certain aspects of the research design.

It was concluded that replication of the present study with certain modifications in the research design would be necessary before decisive conclusions regarding the reinforcement potential of discrete behavioral acts could be explicated.


Cushing, M. C. Affective components of the response class as a factor in verbal conditioning. (Dissertation Abstracts, 1957, 17, No. 2313.)
Daily, J. M. Verbal conditioning without awareness. (Dissertation Abstracts, 1953, 13, No. 1247-1248.)


Dolhenty, L. E., Jr. A comparison of the effects of five schedules of reinforcement on a selected verbal response class. (Dissertation Abstracts, 1967, 28A, No. 1263.)


Williams, R. I., & Blanton, R. L. Verbal conditioning in a psychotherapeutic situation. Behavior Research and Therapy, 1968, 6, 97-104.
INSTRUCTIONS READ TO SUBJECT
BY THE EXPERIMENTER

This is an experiment in verbal behavior which uses a sentence construction task. I will give you a series of 135 cards. Each card will have six pronouns typed on the left and one verb typed in the middle. What I want you to do is to make up a sentence containing the verb in the middle of the card and beginning with any one of the pronouns on the left. For example, you might make up this sentence: "They built a house" or "I built a boat." In every case use the verb in a sentence which begins with any one of the pronouns on the left side of the card. It is crucial to the nature of this study that you follow this sequence when making your response. Select a card from the stack at your left, think about your sentence, and then place the card in a stack at your right. It is equally important that you look at me when you tell me the sentence that you have composed. Do you have any questions? So that you can become familiar with the task, you will have six practice trials.
STIMULUS FORMAT CARD

He
She
They
I
We
You

Thought
<table>
<thead>
<tr>
<th>Practice Verbs</th>
<th>collided</th>
<th>enchanted</th>
<th>impressed</th>
<th>admired</th>
</tr>
</thead>
<tbody>
<tr>
<td>hesitated</td>
<td>collected</td>
<td></td>
<td></td>
<td></td>
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</table>

**Past Tense Stimulus Verbs Used in Study**

<table>
<thead>
<tr>
<th>thought</th>
<th>hung</th>
<th>granted</th>
</tr>
</thead>
<tbody>
<tr>
<td>did</td>
<td>chained</td>
<td>invested</td>
</tr>
<tr>
<td>fled</td>
<td>dressed</td>
<td>napped</td>
</tr>
<tr>
<td>spent</td>
<td>marched</td>
<td>filled</td>
</tr>
<tr>
<td>last</td>
<td>saw</td>
<td>led</td>
</tr>
<tr>
<td>checked</td>
<td>looked</td>
<td>abolished</td>
</tr>
<tr>
<td>discovered</td>
<td>insisted</td>
<td>cultivated</td>
</tr>
<tr>
<td>fascinated</td>
<td>flew</td>
<td>wiggled</td>
</tr>
<tr>
<td>rated</td>
<td>evaded</td>
<td>needed</td>
</tr>
<tr>
<td>presented</td>
<td>pressed</td>
<td>waited</td>
</tr>
<tr>
<td>drew</td>
<td>sowed</td>
<td>invented</td>
</tr>
<tr>
<td>dropped</td>
<td>messed</td>
<td>yearned</td>
</tr>
<tr>
<td>hiked</td>
<td>chased</td>
<td>tried</td>
</tr>
<tr>
<td>lost</td>
<td>wished</td>
<td>beat</td>
</tr>
<tr>
<td>began</td>
<td>rode</td>
<td>tripped</td>
</tr>
<tr>
<td>clipped</td>
<td>frightened</td>
<td>marked</td>
</tr>
<tr>
<td>laid</td>
<td>taught</td>
<td>dried</td>
</tr>
<tr>
<td>completed</td>
<td>tasted</td>
<td>facilitated</td>
</tr>
<tr>
<td>processed</td>
<td>neglected</td>
<td>measured</td>
</tr>
<tr>
<td>exasperated</td>
<td>offered</td>
<td>conceded</td>
</tr>
<tr>
<td>hoped</td>
<td>mixed</td>
<td>taped</td>
</tr>
<tr>
<td>chased</td>
<td>fried</td>
<td>raised</td>
</tr>
<tr>
<td>ate</td>
<td>stopped</td>
<td>forced</td>
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<tr>
<td>walked</td>
<td>cleaned</td>
<td>knocked</td>
</tr>
<tr>
<td>heard</td>
<td>froze</td>
<td>concluded</td>
</tr>
<tr>
<td>attacked</td>
<td>sang</td>
<td>fell</td>
</tr>
<tr>
<td>swam</td>
<td>rubbed</td>
<td>implied</td>
</tr>
<tr>
<td>broke</td>
<td>went</td>
<td>ended</td>
</tr>
<tr>
<td>took</td>
<td>wiped</td>
<td>stuck</td>
</tr>
<tr>
<td>plugged</td>
<td>ran</td>
<td>stood</td>
</tr>
<tr>
<td>grew</td>
<td>came</td>
<td>threw</td>
</tr>
<tr>
<td>hated</td>
<td>created</td>
<td>spoke</td>
</tr>
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<td>trusted</td>
<td>heated</td>
<td>bled</td>
</tr>
<tr>
<td>kept</td>
<td>preferred</td>
<td>knew</td>
</tr>
<tr>
<td>told</td>
<td>hunted</td>
<td>noted</td>
</tr>
<tr>
<td>drive</td>
<td>drank</td>
<td>emphasized</td>
</tr>
<tr>
<td>bent</td>
<td>erased</td>
<td>admired</td>
</tr>
<tr>
<td>laved</td>
<td>blew</td>
<td>licked</td>
</tr>
<tr>
<td>ignored</td>
<td>wore</td>
<td>lit</td>
</tr>
<tr>
<td>gave</td>
<td>washed</td>
<td>cleared</td>
</tr>
<tr>
<td>recalled</td>
<td>scribbled</td>
<td>fooled</td>
</tr>
<tr>
<td>praised</td>
<td>joked</td>
<td>met</td>
</tr>
<tr>
<td>wandered</td>
<td>gave</td>
<td>sent</td>
</tr>
<tr>
<td>latched</td>
<td>smuggled</td>
<td>felt</td>
</tr>
<tr>
<td>touched</td>
<td></td>
<td>produced</td>
</tr>
</tbody>
</table>
SEMANTIC DIFFERENTIAL

I found the interviewer to be

warm

likeable

positive

pleasant

friendly

cold

unlikeable

negative

unpleasant

unfriendly
AWARENESS TEST

1. What do you think was the purpose of the experiment?

2. What evidence do you have for this?

3. Was there anything that you noticed about either the experimenter or yourself during the session?

4. Did you feel comfortable with the task?

NAME __________________________
CLASS __________________________
AGE ____________________________
SELF-ANALYSIS QUESTIONNAIRE

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
</table>

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and in accord with the choices to the right of each statement, decide how you feel right now, that is, at this moment. Once you have decided on your answer, code your answer in the corresponding numbered answer space on the answer sheet provided for you. For example, if your answer was choice 3 to question number one, you would blacken in answer space number one in space three on the answer sheet.

There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Right now I feel calm.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>2. I feel secure at the moment.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>3. I am presently worrying over some possible misfortune.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>4. At this time I feel that I am a steady person.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>5. I feel regretful at the moment.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>6. I feel upset.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>7. I am worrying about something right now.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>8. At the present time I feel rested.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>9. I feel tense and anxious.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>10. At the moment I feel free of guilt.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>11. I feel &quot;high strung.&quot;</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>12. Right now I feel that I am no good at all.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>13. I feel I am about to go to pieces.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>14</td>
<td>I presently feel self-confident.</td>
</tr>
<tr>
<td>15</td>
<td>At this moment I feel happy.</td>
</tr>
<tr>
<td>16</td>
<td>I feel content.</td>
</tr>
<tr>
<td>17</td>
<td>I am worried right now.</td>
</tr>
<tr>
<td>18</td>
<td>I presently feel over-excited and &quot;rattled.&quot;</td>
</tr>
<tr>
<td>19</td>
<td>I feel joyful at the moment.</td>
</tr>
<tr>
<td>20</td>
<td>I feel pleasant.</td>
</tr>
</tbody>
</table>