DOCUMENT RESUME

ED 086 936 CG 008 654

AUTHOR Haase, Richard F.; DiMattia, Dominic J.
TITLE The Effect of the Spatial Environment on the Conditionability and Transfer of Verbalizations.
INSTITUTION Bridgeport Univ., Conn. Coll. of Education.; Massachusetts Univ., Amherst. School of Education.
SPONS AGENCY National Center for Educational Research and Development (DHEW/OE), Washington, D.C.
BUREAU NO BR-I-A-001
PUB DATE 74
GRANT OEG-I-71-0009(509)
NOTE 31p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Conditioning; Environment; Environmental Criteria; *Environmental Influences; Interpersonal Relationship; *Operant Conditioning; *Research Projects; Response Mode; *Self Concept; *Verbal Operant Conditioning

ABSTRACT

Because spatial environment plays an important role in regulating human behavior, the environmental conditions of room size, furniture arrangement and interpersonal distance were systematically varied and studied with 54 male undergraduates for their ability to influence the verbal operant conditioning of positive affective self-reference statements. Two separate studies conducted in disparate geographical locations provided evidence confirming the importance of environmental features in the conditioning process. Findings suggest that room size is of prime consideration, with larger rooms enhancing the conditioning process while smaller rooms tend to inhibit it. Evidence was also found for the transfer of conditioning to certain paralinguistic features of the subjects' behavior. (Author/CJ)

THE EFFECT OF THE SPATIAL ENVIRONMENT ON THE CONDITIONABILITY AND TRANSFER OF VERBALIZATIONS[1]

Richard F. Haase and Dominic J. DiMattia

University of Massachusetts, Amherst University of Bridgeport

ABSTRACT

The environmental conditions of room size, furniture arrangement and interpersonal distance were systematically varied and studied for their ability to influence the verbal operant conditioning of positive affective self-reference statements. Two separate studies conducted in disparate geographical locations provided evidence confirming the importance of environmental features in the conditioning process. Evidence was also found for the transfer of conditioning to certain paralinguistic features of the subjects' behavior.

THE EFFECT OF THE SPATIAL ENVIRONMENT ON THE CONDITIONABILITY AND TRANSFER OF VERBALIZATIONS[1]

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There can be little doubt that the spatial environment plays an important role in regulating human behavior. The past decade has seen renewed interest in environment on behavior and a burgeoning field of environmental psychology has taken root (Wohwill, 1970). Several volumes have recently appeared which cover a wide range of topics in man-environment interactions (Esser, 1971; Moos & Insel, 1974; Proshansky, Ittleson, and Rivlin, 1970; Wohwill and Carson, 1972).

The research reported here represents a limited aspect of the overall environment, namely proxemics (Hall, 1959, 1966) and more specifically the spatial features of the environment of fixed-feature space as defined by Hall. Hall's third classification, personal space, is also of relevance to this study. A recent review of this particular topic can be found in Evans and Howard (1973).

The aim of the studies reported here was to examine the influence of fixed, and semi-fixed feature spatial parameters of the environment on a carefully defined behavioral interaction, i. e., the conditioning of verbalizations. A secondary goal was to assess the transfer of conditioning of verbalizations to related aspects of the individual's

behavioral repertoire. Specifically, transfer of conditioning to certain paralinguistic behaviors was examined.

A relatively small number of investigators have experimentally manipulated fixed-, and semi-fixed feature space with the aim of assessing behavioral outcomes. Hall's (1966) discussion of cultural differentiation along these lines, and Sommer's (1959, 1962) seminal studies in the area provided the early impetus. Earlier, Maslow and Mintz (1956) and Mintz (1956) demonstrated the effect of spatial features of the environment to a growing range of behaviors.

The behavior chosen for study here was the conditioning of verbalizations. This specific behavior, and paradigm, were chosen for several reasons: (1) the established history of the pattern of conditioning of verbalization; (2) the pervasiveness of verbal interaction in human encounters; and (3) the potential relevance of understanding the characteristics of a learning paradigm under diverse environmental influence; especially in the context of the systematic application of the social operant paradigm to behavior change such as psychotherapy and social influence (Bergen and Garfield, 1971; Mehrabian, 1970), The explicit verbal response class chosen for study here was positive affective self reference statements (PASR). The operational definitions of this response class can be found in Crowley (1970) and Kennedy & Zimmer (1968).

An ancillary goal of the studies presented here was an examination of the transfer of conditioning to selected non-linguistic behaviors. As Krasner (1965) has noted, the relevance of the operant paradigm for

any human intervention system is predicated, in part, on the extent to which the conditioning transfers to situations external to the original milieu, and to behaviors other than that which is conditional. Studies of transfer have received mixed support to date (Lapuc & Harmantz, 1970; Hoffnung, 1969; Lanyon, 1967; Rogers, 1960). Nonetheless the issue remains of both theoretical and practical importance. The studies reported here attempted to assess these questions and issues. Study I examined the influence of room size, furniture arrangement, and a single personality variable (Factor L of the 16 PF) on the conditionability of positive affective self reference statements. Secondarily, the extent to which conditioning transferred to the amount of verbalization, duration of verbalization and velocity of verbalization was also assessed. Study II, conducted at a disparate geographical location, was similar in all respects except that the independent variables were room size, interpersonal distance and a personality dimension.

STUDY I

METHODOLOGY

Subjects

Subjects in Study I of this project consisted of 54 undergraduate males enrolled in the University of Massachusetts. Subjects were recruited via newspaper advertisements in the University newspaper and were remunerated at the rate of $2.00 per hour. An initial subject pool of 60 obtained, but four subjects were lost to the experiment due to reasons

unassociated to the experimental treatment per se. Two subjects were lost due to the fact that the recorded interviews were inadvertently erased by one of the author's colleagues. A third subject was lost due to the failure of the tape recorder. And a final subject was lost because the clerical assistant could not understand and transcribe his speech which was heavily influenced by a foreign accent.

Apparatus

Apparatus utilized to implement this study consisted of a time clock which demarcated a series of five-minute periods into sequences of one-minute segments which in turn were divided into periods of 45 and 15 seconds, respectively. This clock operated a series of colored light bulbs in the experimental room in order to cue the experimenter to the type of response he should make within a given time segment. During 45 seconds of each minute of the five-minute conditioning period, a light instructed the experimenter to emit only "mmhm" responses to the critical response class verbalization emitted by the subject. During the remaining 15 seconds of each minute within that period, the counselor-experimenter emitted a paraphrase to the critical response emitted by the subject. A random schedule was employed by the counselor during the base line and extinction periods described in greater detail in the procedure section of this paper.

The experimental rooms consisted of a large room (13.39 sq.meters) and a small room (7.67 sq. meters) both of which were connected to a control room manned by a technician. All tape recording and timing of the cueing

device was controlled from the technician's room which was adjacent to the experimental rooms. With the exception of room size, the two rooms were virtually similar. The same type furniture was employed in each room, which consisted of two desk chairs and a small desk. The rooms contained no other furniture or decoration.

Experimenter and Training

The experimenter employed in this study was male--a Doctoral student in counseling at the University of Massachusetts School of Education. The experimenter had several years of clinical experience. The model employed to train the experimenter was similar in nature to that employed by Crowley (1970), Kennedy and Zimmer (1968), and Pepyne (1968). Essentially, the model required that the experimenter behave as a social reinforcer. The experimenter was trained to emit reinforcements; namely, "mmhm" or "a paraphrase", upon the occurance of the critical response class (positive affective self reference statements--PASR) emitted by the subject. He was trained to (1) discriminate between the verbal response class being reinforced and all other response classes; (2) respond with the appropriate reinforcing stimuli to that response class; and (3) make those responses in accord with the reinforcement schedule imposed by the design of the study. The specific schedule included the random emission of "mmhm" during forty-five seconds of every minute and " a paraphrase" during fifteen seconds of every minute during the base line and extinction periods.

During the conditioning periods the reinforcements from the experimenter ("mmhm" and "a paraphrase") were contingent upon the emission

of PASR statements.

Initial stages of the training focused on presenting and discussing examples of the relevant response class (PASR) and all irrelevant responses. This was accomplished by both the presentation of written examples and actual responses of the experimenters to taped responses of an analogue client. Once the experimenter had adequately mastered this discrimination, the second stage of training was introduced--that of coordinating his responses with the instructions imposed by the design, i.e., with specific, timed segments of selective minutes within the conditioning paradigm. The third stage of the training procedures included extensive practice in a "live" situation in which the experimenter was allowed to practice and coordinate the necessary skills. The entire training procedure took approximately ten-twelve hours.

Criterion Measure and Scoring Procedure

The criterion measure of this study consisted of an increase in positive affective self reference statements made by the subject. This verbal response class has been defined by Salzinger and Pisoni (1960) and has been successfully employed by Crowley (1970), Hoffnung (1969), Kennedy and Zimmer (1968), and Pepyne (1968). The criterion, then, was the emission of positive affective self reference statements emitted by the subject during the baseline, conditioning, and extinction periods of the interaction with the counselor.

Tape recordings of the free operant, conditioning and extinction periods for each subject were transcribed and every response of each

subject was transferred to IBM data cards. The dependent variable for data analysis consisted of the number of verbal statements emitted by the client belonging to the critical response class during the conditioning and extinction periods in ratio to those emitted during the free operant period. This analysis was performed by a computer program designed to analyze verbal data.

The program employed for analyzing the occurance of positve self-reference statements was that described by Zimmer and Cowles (1972). Although a complete description of the program has been provided by Zimmer and Cowles, a brief description is in order here. In essence the program relies on a series of verbal "tags" as criterion words consistent with the definition of positive affective self reference. Each interview analyzed is compared to the criterion statements and each subject statement meeting the criterion is cumulatively recorded. The feature of eliminating problems of interjudge reliability is particularly appealing in this program.

The data generated by the program included frequency and proportion of positive affective self reference statements, total word count per subject per interview period. An additional measure of duration of speech was obtained by timing the total number of seconds during which the subject was speaking.

Design and Procedure

The design of Study I consisted of a 2 x 2 x 3 x 2 mixed factorial analysis of variance. The first three factors were between-group factors,

while the last represented a repeated measures factor of conditioning and extinction periods in which each subject participated. The first factor appearing at two levels represented a personality factor denoted as suspicious--trustful (Cattell's Factor L of the 16 Personality Factor Test, 1962). The second factor represented two levels of room size (large vs. small), and the third between factor represented a furniture arrangement dimension at three levels. The three furniture arrangements used in Study I consisted of: (1) face to face, no desk intervening; (2) across the corner of the desk, experimenter and subject seated at an angle of 45 degrees; and (3) face to face, with a desk intervening between experimenter and subject. The repeated measures factor represents the operant paradigm with subject scores obtained on each of the conditioning and extinction stages of the paradigm. Actual raw data at each of these stages consisted of the subject's score for that stage minus his obtained baseline score. For example, the conditioning score for a given subject represented the difference between his frequency of self reference statements between conditioning and baseline periods. A second score was derived utilizing the subject's extinction and baseline scores.

The procedure of the study was kept as similar as possible for all subjects. Subjects were randomly assigned to only one of the combinations of room size and furniture arrangement. Similarly, subjects were placed in either the suspicious or trustful group, depending on their score on Factor L of the 16 PF. Hence no subject was classified in more than one personality group, nor any subject interviewed in more than one size room or more than one of the three furniture arrangements. The study represented

a completely randomized design with respect to the between factors.

Prior to the interviewing of a subject, he was met by the author and introduced to the experimenter, who was already located in the appropriate room size--furniture arrangement combination. For the first few minutes of the interview the experimenter engaged in a "Warm up" period in an attempt to allow the subject to acclimate to the experimental situation. During this warm up period, the experimenter queried the subject about his educational background and current status at the university.

Following the short warm up period which usually lasted about 3 to 5 minutes, the experimenter explained the nature of the task to the subject, indicating that he could talk about "anything he liked" and that the experimenter would respond to him but could not answer any direct questions. The experimenter answered any subject questions which would not reveal the nature of the experiment at this time. If the subject had no questions, the experimenter instructed him to "go ahead and talk about anything you like". At this point the technician in the adjacent room began tape recording the interview and activated the timing clock and cueing lights. The first five minutes of the interview consisted of the free operant period in which the experimenter's responses were noncontingent upon subject verbalization, but contingent upon a completely random schedule controlled by the technician. The second five-minute period consisted of the conditioning period during which the experimenter's responses were contingent upon the emission of the specified response class (positive affective self reference statements)emitted by the subject. The third and final five-minute period consisted of an extinction period in which the

experimenter reverted to the completely random, noncontingent response schedule employed during the baseline period. The nature of the experimenter's responses was identical to that described for Study I and will not be reiterated here.

At the conclusion of the interview, the subject was asked to respond to the 16 PF and was briefly interviewed by the author to ascertain the extent to which they became aware of the true nature of the experiment. No subject had identified that the experiment dealt with conditioning, and furthermore, no subject correctly identified that the arrangement of the furniture or room size had any bearing whatsoever on the experiment or their performance. The typical response to the questioning revealed suspicions that the experiment was designed to assess student attitudes toward the university. The final stage of the procedure entailed a debriefing of the subject by the author and payment of the subject for his time.

RESULTS

The data from the four dependent variables of frequency of self reference statements, total length of utterance, duration of utterance and velocity of speech were analyzed via an unweighted means solution to the repeated measures analysis of variance (Winer, 1962). Results of this analysis have been presented in Table 1[2].

Insert Table 1 about here

Although several of the Between-subjects effects proved significant

in this analysis, their interpretation is of relatively little importance. The data of the Between-subjects effects is actually the total of the conditioning and extinction periods and has little meaning other than a gross level of overall response rate.

Of paramount importance, however, are the Within-subject main effect (conditioning vs. extinction), and the interactions between the conditioning main effect and the Between-subject effects of room size, furniture arrangement, and personality factor. Inspection of Table 1 reveals that a significant verbal conditioning effect was obtained. In addition the interactions between conditioning and room size (A x D), furniture arrangement (B x D), and personality (C x D) were statistically significant. The three factor interaction of arrangements x personality x conditioning (B x C x D) also proved significant. It is apparent that not only was conditioning achieved in the study, but, moreover, the pattern of that conditioning was significantly affected by room size, furniture arrangement and subject personality.

Regarding the question of transfer of conditioning to certain paralinguistic behaviors, examination of Table 1 clearly suggests that such transfer took place. The conditioning main effects for length, duration and velocity of utterance all reached significance. In addition the arrangement x conditioning, personality x conditioning, room x arrangement x conditioning x personality interactions reached significance on at least one of the paralinguistic response variables. A discussion of the implications of these results will be presented as an integrated discussion following a presentation of the method and results of the

second study reported here.

Study II

METHOD

Subjects & Experimenter

Subjects in the study consisted of eighteen male undergraduate students attending the University of Bridgeport who were recruited through advertisement in the local college newspaper and through contact with professors of undergraduate courses at the University. Subjects were remunerated at the rate of $2.00 per hour for their participation.

An advanced graduate student in Counseling and Guidance with a Master's degree from the University of Bridgeport was specifically trained as the experimenter-counselor. The training of the experimenter was identical to that described in Study I. Also, the apparatus and criteria were identical to those described previously for Study I.

Design

The design employed in Study II was a 2 x 2 x 3 factorial analysis of variance design with repeated measures on 2 factors (Winer, 1962). Factor A (at two levels) was a personality variable. The personality variable was represented by Factor L of the 16PF (Suspectory - Trustful). Subject scores of Factor L were computed and dichotomized at the median, thus forming two groups--suspecting and trustful. Factor B (at two

levels) was a room size variable. One small and one large room represented the two levels on this factor. Factor C (at three levels) was the distance factor imposed upon the interaction between counselor and client. The levels of this factor were represented by distances of 36 inches, 48 inches, and 60 inches measured from the center of the counselor chair to the center of the client chair. These distances were chosen to represent the theoretically stated distances (Hall, 1966) appropriate for differing types of social interaction.

Procedure

The interview consisted of a baseline period, six conditioning periods (small room at 91.44 cm, small room at 121.92 cm, small room at 152.40 cm, large room at 91.44 cm, large room at 121.92 cm, large room at 152.40 cm) and an extinction period, each five minutes in length. The six conditioning periods were randomly ordered and as subjects were interviewed they were assigned to the appropriate order of conditioning. Several minutes prior to the interview the experimenter-counselor chatted with the subject in a warm up period during which he was told that he would be asked to change rooms periodically during the interview. He was also instructed to talk about "anything he liked" and told that the counselor would respond to him, but could not answer any direct questions. During the first and last five minutes of the interview period, the counselor's responses--either paraphrase or mmhmm--were on a completely random schedule (non-contingent on subject response class) controlled by the technician. During the conditioning period the counselor's responses (paraphrase or

mmhmm) were contingent on the emission of PASR statements by the subject. Timing of the conditioning period was not begun until the subject emitted the first operant of the appropriate class. At the end of each conditioning period the technician signaled the counselor to stop the interview and either move to the next room or ask the subject to leave the room in order to rearrange the chairs to the appropriate distance depending on the specific random order of conditioning for that particular interview.

At the conclusion of the interview the subject responded to the 16 PF (Form c) and completed an awareness check to ascertain the degree to which he had been aware of the relevant variables of the experiment (Salzinger and Pisoni, 1960).

The experimental sessions were conducted in three adjoining rooms at the University of Bridgeport especially equipped for the study. The room designated as the "large room" was 20.83 square meters and the room designated as the "small room" was 11.90 square meters. Each room was equipped with two comfortable chairs and a small table to hold the microphone recording the sessions. No additional decorations or furniture were included. The chairs were positioned in such a manner that the lights cueing the counselor were not visible to the subject. A third room separating the two experimental rooms was used as a control room equipped with the apparatus described above, one-way mirrors, and tape recorders with the capability of recording a belltone at the intersection between segments of the conditioning sequence (free operant, conditioning, and extinction). A trained technician operated the experimental apparatus and visually monitored the process.

RESULTS

Prior to the major data analysis as outlined in the design of Study II, the question of an overall conditioning effect was assessed. All Within-subject effects were averaged and this "conditioning" average was tested against baseline and extinction scores across all subjects. A one way analysis of variance across the baseline, average conditioning and extinction trials revealed a significant F value ($F = 3.40$; $df = 2,32$; $P < .05$). Post hoc testing employing Scheffe's test revealed that conditioning and extinction periods, and baseline and extinction periods differed significantly from one another, but baseline and conditioning did not differ from one another. On the average, subjects were maintained at baseline levels during conditioning, but they significantly decreased their rate of responding during the extinction period. Closer examination of the data suggested that conditioning was related to initial baseline levels. A point biserial r between baseline and conditioning scores yielded an $r = -.70$. Re-analysis of the above data including a blocking factor for high and low levels of baseline responding is presented in Table 2.

Insert Table 2 about here

The importance of Table 2 resides in the blocks x conditioning interaction. As suspected, the interaction showed the conditioning pattern illustrated in Figure 1.

Insert Figure 1 here

It is clear that for the subjects with comparatively low baseline score conditioning was markedly successful. For those with high baseline scores the paradigm obviously was less powerful. When these two groups of subjects are pooled the less dramatic conditioning effect reported above is observed. However, since the principal aim of the study was an examination of the within-subjects effect of room size and distance, the decision was made to proceed with the "pooled" analysis even though the degree of subject baseline heterogeneity must necessarily reduce the power of the statistical tests performed.

The results of the major 2 (room) x 3 (distance) x 2 (personality) ANOVA are presented in Table 3.

Insert Table 3 about here

The most significant finding (statistically and practically) represented in Table 3 is the main effect for room size. Room sized proved to have a statistically significant influence on the conditioning of verbalizations (PASR), and on the transfer of conditioning to length of utterance. A marginally significant effect was found for room size on the velocity of speech variable. Examination of the mean scores for the small and large rooms in this study clearly indicate that the small room inhibited the conditioning and transfer process and the large room was more conducive to that effect.

The remaining main effects (personality and distance) as well as the interactions present failed to produce any statistically reliable results in this study. The remainder of this paper discusses the implications of the results of both the studies presented here.

DISCUSSION

The results of the studies presented here clearly demonstrate that the process of conditioning of self reference statements in a quasi-interview setting is significantly altered, in some cases markedly so, by certain characteristics of the physical environment in which the conditioning takes place. The findings presented here suggest that room size was one of the more important factors studied. Its importance is enhanced when the fact is considered that similar results were obtained in two separate studies, in two diverse geographical locations with two qualitatively different subject pools. While room size has been shown to influence verbal responses (Dumont, 1971; Desor, 1972), it has not previously been demonstrated that fixed feature space variations have such marked effects on the conditioning-learning process.

In the studies presented here the findings suggest that "larger" rooms enhance the conditioning process while "smaller" rooms tend to inhibit that process. The literature on nonverbal communication would suggest that the smaller rooms used here may well have generated a feeling of "crowding" on the part of our subjects. Crowding, both in terms of population density and in terms of interpersonal space, has been related to several behavioral manifestations of anxiety (Calhoun, 1962; Esser, 1971; Moos and Insel, 1972; Hutt and Vaizey, 1966; Evans, 1972; Dinges and Oetting, 1972). It is possible that higher levels of anxiety generated in the small room condition of these studies led to a decrement in performance of these subjects during the conditioning process. Unfortunately, we did not assess the degree of discomfort of the ects under different conditions of these studies. However, the

literature which has directly examined this point suggests that such an interpretation of the findings presented here may not be far afield (Dinges and Oetting, 1972; Evans, 1972).

Further support for the contention that certain features of the environment may produce elevated levels of autonomic arousal can be found by examining the performance of subjects under conditions of varying furniture arrangements.

Insert Figure 2 about here

Inspection of the graphic presentation of the arrangements x conditioning interaction reveals that the most efficacious furniture arrangement was that of the across-the-desk arrangement. The arrangements of across-the-corner of a desk and face-to-face, no desk intervening proved significantly less effective in supporting the conditioning process. In line with our earlier argument, it may be possible that the relatively open and "unprotected" arrangements created anxiety in the subjects to a degree which demonstrably interfered with conditioning.

An alternate explanation for the arrangements effect might be that the across-the-desk arrangement was most effective because of the authority and status implications of such an arrangement (Lott and Sommer, 1967; Mehrahian, 1968, 1969). It is possible that higher perceived status could lead to increased power as a social reinforcer. This explanation does not appear completely adequate, however. Certainly one might predict greater conditioning under the across-the-desk arrangement. However, such an explanation does not account for the essentially non-

contingent performance of subjects under the remaining conditions. Were perceived status and authority the only central determining characteristic of the differences between arrangements one might reasonably expect a "normal" pattern of conditioning in all three arrangements with the across-the-desk arrangement being most influential. Such an expectation is not commensurate with the data reviewed here.

Regarding the transfer of conditioning to several non-linguistic features of the subjects' behavior, evidence was found in these studies that such transfer took place. Data presented in Table 1 demonstrate that the conditioning effect transferred to all the paralinguistic variables studied--length, duration and velocity of utterance. In addition several interactions showed the same pattern of results for the paralinguistic variables as for the verbalizations.

While previous research has demonstrated transfer of conditioning to personality and therapist ratings (Lapuc and Harmantz, 1970), and to an external task (Hoffnung, 1969), the studies reported here have significantly demonstrated transfer to non-contingent behaviors during the conditioning process. The importance of these findings would seem to lie in the demonstration that chnage in one aspect of behavior may produce important concomitant changes in other areas of the subjects' behavioral repertoire. These findings have implications for an activity such as a reinforcement based, conditioning oriented psychotherapy. If changing one's verbal behavior, namely increasing the frequency of positive self references, is a goal of the therapeutic process aimed at increasing the client's external adjustment, then concomitant changes in

paralinguistic-nonverbal behaviors may be an important side effect. The rationale for this assertion is based on the increasing understanding of nonverbal behavior in the communication process. More specifically, it has recently been demonstrated that the process of interpersonal perception is heavily based on assessment of the nonverbal behavior of others (Bayes, 1972). Presumably, these findings have a relevance for a wide range of interpersonal encounters where behavior change is an important aim and consequence.

While the studies reported here have affirmed the importance of the spatial environment on the outcome of a conditioning paradigm, the generality of the findings is necessarily limited by the scope of the variables studied. Empirical support for the influence of other environmental characteristics on a wide range of bahaviors is needed. The point is well made by Moos. "Furhter conceptualization and knowledge about environmental dimensions are essential for the central task of psychology, which is to understand, predict and change behavior. The optimal arrangement of environments is probably the most powerful behavior modification technique which we currently have available " (1973, p. 662).

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FOOTNOTES

1 The research reported herein was supported by a grant from the U. S. Office of Education, Department of Health, Education and Welfare, No. OEG-1-71-0009(509). Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

2 Copies of the full ANOVA Tables can be obtained by writing the first author.

Table 1

Analysis of Variance of Room Size, Furniture Arrangement, Personality, and Conditioning Across Four Dependent Variables

		Frequency			
		PASR	Length	Duration	Velocity
Source	df	F	F	F	F
Between Ss	49				
Room Size (A)	1	.39	.03	.35	.35
Arrangements (B)	2	.07	2.36	1.76	.09
Personality (C)	1	.01	.95	2.15	2.57
AB	2	.04	1.54	1.39	.38
AC	1	.00	9.88**	8.73**	.09
BC	2	1.06	.97	2.97	4.40*
ABC	2	.16	2.80	2.91	7.88**
Subjects within ABC	38				
Within Ss	50				
Conditioning (D)	1	6.85*	20.46**	16.04**	7.04**
AD	1	9.49**	0.3	.62	.03
BD	2	4.04*	3.76*	3.41*	2.75
CD	1	11.09**	2.91	13.02**	1.24
ABD	2	3.07	2.90	3.85*	1.71
ACD	1	.05	.82	.69	.99
BCD	2	10.57**	.59	.21	1.55
ABCD	2	3.00	.20	2.42	4.61*
C x Subjects within ABC	38				

* $P < .05$

** $< .01$

Table 2

Analysis of Variance of Conditioning

With Baseline Scores as Blocks

Source	df	MS	F
Between Ss	17		
Baseline Blocks	1	107.02	6.36
Subjects within Blocks	16	16.82	
Within Ss	36		
Conditioning	2	.030	5.00*
Blocks x Conditioning	2	.030	5.00*
Cond. x Subjects within Blocks	32	.006	

* $P < .05$

Table 3

Analysis of Variance of Room Size, Distance and Personality Factor (L) on Frequency of Verbalization; and, Length, Duration and Velocity of Speech

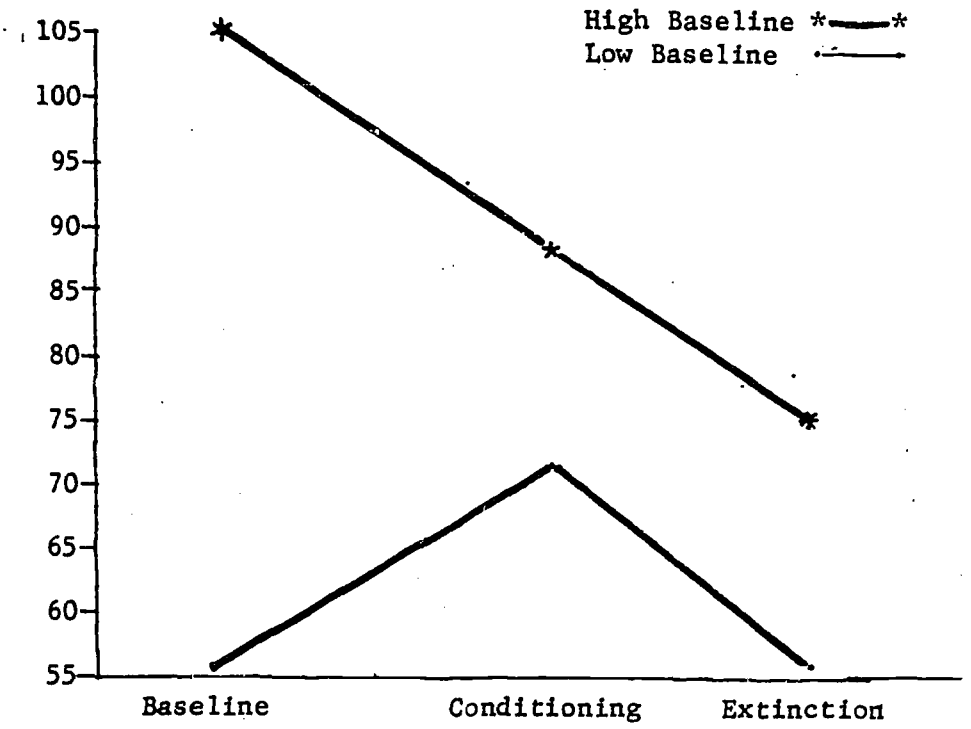
		Frequency			
		PASR	Length	Duration	Velocity
Source	df	F	F	F	F
Between Ss	17				
Personality (A)	1	.07	1.82	.84	1.01
Subjects within A	16				
Within Ss	18				
Room Size (B)	1	5.05*	5.91*	.86	3.58
A x B	1	.79	2.24	.04	.92
B x Subjects within A	16				
Distance (C)	2	.18	.28	1.26	.35
A x C	2	.39	.25	2.06	1.19
C x Subjects within A	32				
B x C	2	.96	2.15	.39	2.05
A x B x C	2	.75	2.71	1.38	1.98
BC x Subjects within A	32				

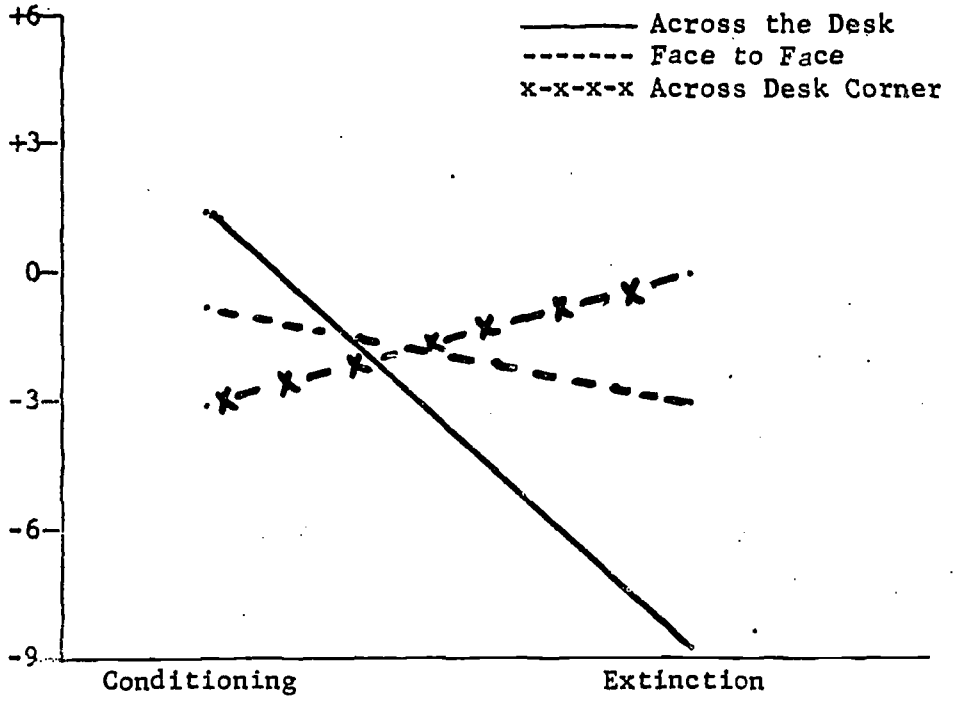
*P < .05

Figure Captions

Fig. 1 Pattern of conditioning of verbalizations for High & Low Baseline groups

Fig. 2 Pattern of conditioning for three furniture arrangements


High Baseline
Low Baseline
105
100
95
90
85
80
75
70
65
60
55
Baseline
Conditioning
Extinction


+6
+3
0
-3
-6
-9
Across the Desk
Face to Face
x-x-x-x Across Desk Corner
Conditioning
Extinction