FEEDBACK AND INSTRUCTIONS IN
VERBAL DISCRIMINATION LEARNING

by

ALFRED PAUL FERRANTE

Approved by

Chairman, Thesis Committee

Associate Professor of Psychology

Assistant Professor of Psychology

Chairperson, Department of Psychology

Dean of the Graduate School

FEEDBACK AND INSTRUCTIONS IN

VERBAL DISCRIMINATION LEARNING

A THESIS

PRESENTED TO

THE FACULTY OF THE GRADUATE SCHOOL

APPALACHIAN STATE UNIVERSITY

IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE

MASTERS OF ARTS

---

by

ALFRED PAUL FERRANTE

MAY, 1978

ACKNOWLEDGEMENTS

I gratefully acknowledge the encouragement, suggestions, and help that have been extended to me throughout the preparation of this thesis by my Chairman, Dr. Henry G. Schneider. I also wish to thank Dr. William May and Dr. Arthur Skibbe for their continued support and encouragement. Finally, I extend my love and appreciation to both my parents and Susan, without whose patience and trust this research may not have been completed.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

A 2 X 2 X 3 factorial analysis of variance was employed to investigate the effects of instructions and feedback on performance in a discrimination learning task. The three factors investigated were: task instruction (informed and uninformed), feedback instruction (informed and uninformed), and type of feedback [Right-wrong (R-W), Right-nothing (Rn), Wrong-nothing (Wn)]. One hundred and twenty, volunteer undergraduate students served as subjects for the research. A post-experimental questionnaire was completed by all subjects to assess understanding of the experiment. One of the results of the present study revealed that task instruction (informed) produced a significantly higher level of performance, ($p < .05$). Feedback instruction and type of feedback had no significant effect on performance which failed to support Spence, Lair and Goodstein's (1963) opinion that the use of non-informative instructions were necessary in producing performance differences in the Rn and Wn feedback conditions.

With regard to instruction, it has been argued that the discovery, or learn as you go method facilitates the retention of subject matter (Ausubel, 1963; Bruner, 1961). Guthrie's (1967) article points out however, that empirical research has failed to sustain such opinions. When speed of learning and retention were used as criteria, instructions containing rules (expository instruction) has proved superior to instructions without rules (discovery method) (Craig, 1956; Kittel, 1957; Haslerud and Meyers, 1958; Whittrock, 1963). The literature dealing with the effects of instructions on performance is at best equivocal. One example of the problem which may be related to the effects of instructions is in the area of feedback in discrimination learning.

The discrimination learning procedure involves a complex type of problem-solving task. In order to master the task, the subject must not only discover the principal governing the response-reinforcement contingency, but also that there is a specific relationship between the reinforcement and his responses. With further regard to the complex nature of the discrimination learning procedure, Kanfer and Marston (1961, 1962) pointed out that in such a task the subject is presented with an unstructured and ambiguous task that requires him to make several concurrent and independent discriminations. In their opinion, the strengthening of the selected response-class by reinforcement (feedback) is secondary to the subject discovering the purposes of the experiment and the

relationships between his behavior and the experimenter's reinforcement. Consequently, these authors hypothesized that a reduction in the ambiguity of the task through the use of more specific task-relevant instructions would facilitate learning. The results of their studies supported this contention in that groups receiving instruction relating the nature of the feedback contingencies performed significantly better than groups receiving no instruction relating the nature of the feedback contingencies.

A number of studies (Spence, Lair and Goodstein, 1963; Spence, 1964; Spence and Lair, 1965; Kausler and Lair, 1968) have examined the effects of feedback in a verbal-discrimination (VD) learning task with varying results.

Feedback in a VD task deals with the verbal cues provided by the experimenter following a subject's given response. In the standard right-wrong (R-W) condition, the subject receives appropriate feedback following each response (i.e., when the response is correct the subject is told that he is right, and when a response is incorrect, the subject is told that he is wrong). Two variations of the standard R-W condition require the experimenter to omit either the positive or negative verbal cue. In the first of these conditions, Right-nothing (Rn), the subject receives feedback only for correct responses. The experimenter gives no verbal reinforcement for the subject's incorrect responses. In the Wrong-nothing (Wn) condition, the feedback or reinforcement contingencies

are merely reversed. That is to say, the subject receives feedback only when his response is wrong. Correct responses are not reinforced in any way by the experimenter.

Spence, Lair and Goodstein (1963), examined the effects of feedback in schizophrenic and non-psychiatric subjects using a verbal discrimination task. In place of the standard R-W condition however, an information condition was employed whereby a visual representation of the correct item would appear on a presentation screen following a subject's response. Although analysis of the three feedback conditions examined (i.e., information, Rn, Wn) showed that performance was best in the information condition, there were no significant differences recorded between groups in the two verbal feedback conditions. Further examination of these results implied that the experimenter's silence in the Rn and Wn conditions, had an equal effect on performance once the meaning of this silence was understood. This notion prompted the authors to suggest that the use of non-informative instructions may be necessary for obtaining performance differences between the Rn and Wn feedback conditions.

In a subsequent study employing non-informative instructions, where subjects were simply told to "learn to call out the correct member of each word pair and that it will become clear to you as we go along which word in each pair is correct", Spence (1964) found performance on a two-alternative VD task to be significantly

better under a Wn and R-W verbal reinforcement schedule than under a Rn verbal reinforcement condition. Analysis suggested that the results were due to the experimenter's silence acquiring less reinforcement (information) value when combined with Rn than when combined with Wn. These results paralleled those of prior studies employing conceptual tasks with moot or vague instructions to the subject (Buss, Braden, Orgel and Buss, 1956; Buss and Buss, 1956; Ferguson and Buss, 1959). In this succession of studies on concept formation, Buss and his associates investigated the effects of feedback combinations on performance. In each of these investigations, subjects were instructed to "learn to respond correctly". The information which would allow them to do so, however, was not included in the instructions. Results indicated performance was superior in the Wn feedback combination as opposed to the Rn feedback combination. Based on these findings, Buss et al. hypothesized that "wrong" per se was a more powerful reinforcer than "right". Similar results have also been reported by Buchwald (1959) whose research showed that the experimenter's silence (blank), in a verbal feedback combination, appears to acquire a reinforcing value which is opposite to the type of feedback it is paired with. That is, in the Rn feedback condition, the experimenter's silence becomes a punisher while in the Wn feedback condition, this identical silence acquires positive reinforcement value. Based on these findings however, it does not follow that the empirical superiority

of the Wn feedback condition over the Rn feedback condition is due to the relative strengths of "right" or "wrong" but rather due, perhaps, to the rate at which the experimenter's silences gain in reinforcement value. In other words, in the absence of prior explanation or instruction regarding the nature of the feedback contingencies, subjects in the Rn feedback conditon were less able than those in the Wn feedback condition to grasp the information being conveyed by the experimenter's silences or failures to respond.

In a later study using college students, Spence and Lair (1965) reported that the three feedback conditions (R-W, Rn, Wn) were found to be equal in terms of their effects on performance in discrimination learning, provided the subject was informed as to the nature of the feedback contingencies. In this study however, no prearranged schedules were employed to predetermine the subject's initial or first trial performance level. This had not been true of Spence's earlier studies and may well account for this apparent divergence of results.

That instructions providing more relevant information regarding the nature of the feedback contingencies may facilitate verbal conditioning has been shown in several other studies (Speilberger, 1962; and Denike and Speilberger, 1963) which were primarily concerned with the problem of "learning without awareness". The contention of these investigators was that task-relevant information induces in the subject a set to "look for a principal" which

will lead to greater awareness of the response-reinforcement sequence and ultimately to a higher level of conditioning. The conclusion drawn from these studies was that more specific instructions affect performance on verbal conditioning tasks, but does so indirectly by inducing a greater awareness of the reinforcement or feedback contingencies. Here again, however, information relating the nature of the feedback contingencies was seen as the impetus to increased performance.

Adding to the literature, Kausler and Lair (1968) investigated the effects of feedback using informative instructions and found that a slower rate of acquisition was displayed in the Wn condition than in the Rn and R-W conditions, with the latter two conditions being equal. These results differ with those of Spence's earlier studies but may be accounted for by considering the variations in populations examined and informational sets provided to the subjects.

A general comparison of results among studies shows that the best overall performance in a VD task almost consistently has been found in the R-W feedback conditon with the subject receiving the experimenter's cues following each response. There is obvious disagreement regarding the other two (Rn, Wn) feedback conditions.

These results are confounded however, when one examines the nature of instructions to the subject in these studies. Generally, instructions in a VD task have been seen as providing adequate information with regard to the nature of the feedback contingencies,

or they simply have provided no information at all and subjects learned the task as they went along.

Statement of the Problem

In order to produce an effect of feedback in discrimination learning, certain authors have found it necessary to keep the subjects uninformed with regard to the feedback contingencies. The fact that the VD task itself is obviously rather complex and difficult to understand only serves to complicate the issue. Because each of these studies examined the same phenomena, namely, the effects of feedback conditions on performance in a VD task, it is interesting to note that different sets of instructions to the subject were employed, thus confounding results even further.

As stated earlier, instructions to the subject in a VD task have either been of an expository nature, providing adequate information with regard to the contingencies of the feedback or they provide no information at all and subjects were simply told to "learn to call out the correct member of each word pair and that it will become clear to you as we go along which word in each pair is correct".

These instructional proceedings represent an interesting and important question. The only difficulty with these procedures is that both methods have inadvertently kept subjects uninformed with regard to the nature of the task itself. Based on the fact that there are two separate and distinct informational components comprising instructions to the subject in a VD task, the current paper

sought to investigate this particular issue and asked the question: What are the critical aspects of instructions that affect performance on a VD task; knowledge of the feedback contingencies, or knowledge regarding the nature of the task? Such a distinction had yet to be made in published research. Based on findings indicating that performance has proved superior when combined with expository instruction, it was predicted that: (a) subjects receiving task instruction would perform significantly better than subjects not receiving task instruction, and (b) subjects receiving instruction relating the nature of the feedback contingencies would perform significantly better than subjects not receiving feedback instruction. Adhering to the present notion that instructional information represents the impetus for superior performance in a VD task, it was also predicted that: (c) there would be no significant effect of feedback (R-W, Rn, Wn).

Method

Subjects. One hundred and twenty subjects from Appalachian State University were obtained by making appeals for volunteers in undergraduate psychology classes. All subjects were naive to discrimination learning and received extra credit points toward their final grades for participating in the experiment. All subjects were told that they would be asked to perform a task in which they would rely upon specific sets of instructions and verbal cues that would be provided by the experimenter. In addition, subjects were told that they would be asked to complete a post-experiment questionnaire (Appendix A) to further assess their performance and general understanding of the experiment.

Male and female subjects were randomly assigned to conditions separately so as to assure an equal distribution of the sexes across conditions. All treatment conditions contained ten subjects per cell. Due to an inadvertent experimenter error however, nine subjects were assigned to the treatment condition providing task instruction, feedback instruction and Rn feedback. Additionally, eleven subjects were placed in the condition providing feedback instruction only, and R-W feedback.

Materials and Apparatus. A pool of 24 four-letter words were selected from the Thorndike-Lorge Tables (1944) and randomly paired to form a list of twelve word pairs (Appendix B). These words

have been reported as possessing frequencies that occur between 0 to 5 times in 4.5 million words.

Each word pair was photographed and presented upon a slide viewing screen via carousel slide projector. Stimuli were presented for up to ten trials at a rate of 2.5 seconds per slide with a .5 second interval between slides. Timing was done by a Lafayette timer.

Procedure. The design was a 2 X 2 X 3 factorial analysis of variance (see Appendix C, Figure 1). Task instruction was one factor with two informational conditions being: informed, with regard to the requirements of the task and non-informed with regard to the requirements of the task (see Appendix D). Feedback instruction was the second factor with two informational conditions being: informed with regard to the feedback contingencies and non-informed with regard to the feedback contingencies (see Appendix D). Type of feedback was the third factor, with three feedback conditions being: Right-Wrong (R-W), Right-nothing (Rn), and Wrong-nothing (Wn). In the R-W condition, subjects were given feedback by the experimenter for all of their responses. All correct responses were reinforced in a positive manner (i.e., the experimenter said "good, right, or correct"), and all incorrect responses were reinforced in such a way as to indicate an error (i.e., the experimenter said "no, wrong, or incorrect"). In the Rn condition, only the subject's correct responses received the verbal feedback (i.e., the

experimenter said "good, right, or correct") and all incorrect responses received no verbal reinforcement as the experimenter remained silent. In the Wn condition, the above-mentioned feedback contingency was merely reversed and only incorrect subject responses received the experimenter's verbal reinforcement (i.e., the experimenter said "wrong, no, or incorrect"). All correct responses received no verbal reinforcement and the experimenter remained silent.

Each subject was escorted to the experimental room, seated to the right of the experimenter and reminded that they would be asked to perform a task in which they would rely upon the specific set of instructions and verbal cues provided by the experimenter. The subject was then read the appropriate set of instructions (see Appendix D) and the experiment was begun. It should be noted that any questions relating to the experiment which were asked by subjects were met by the experimenter simply restating the specific set of instructions which had previously been read to the particular subject.

Criterion was achieved when subjects had accomplished two consecutive errorless trials or upon completion of trial 10, whichever came first. The dependent variable was the total number of trials to criterion. Trial one performance was manipulated to insure a 50% correct starting level for all subjects. This was accomplished by a random selection of six out of twelve slides upon which either item was considered to be correct and the subject had merely to choose one

item or the other. Any item choice on the remaining six slides was automatically wrong. This procedure was repeated prior to running each subject.

Upon completion of the experiment proper, each subject completed a post-experiment questionnaire to further assess overall performance and understanding of the task.

Results

Performance Data. Performance, which was measured by trials to criterion, was analyzed employing a 2 X 2 X 3 factorial analysis of variance which is summarized in Appendix E, Table 1. There were significant main effects associated with task instruction, $F(1,108) = 4.74$; $p < .05$. Means and standard deviations, in parentheses, for the informed group versus the uninformed group were 7.339 (1.824) versus 8.115 (1.674) respectively. Means and standard deviations for all conditions are provided in Appendix E, Table 2. The major purpose of the current research was to inquire further regarding the critical aspects of instructions to the subject in discrimination learning. It is of particular interest to note that only instruction regarding the nature of the task itself had a significant effect on performance. The effects of feedback instruction and type of feedback failed to achieve significance.

Using the same factors as in the above analysis, an additional analysis of variance was performed using errors to criterion as the dependent measure (see Appendix E, Table 3). Although there were no significant main effects, task instruction approached significance, $F(1,108) = 3.265$; $p \cong .07$. This measure correlated .70 with the trials to criterion measure. All interactions failed to achieve significance.

Questionnaire Data. A post-experiment questionnaire was administered to all subjects taking part in the experiment (see Appendix A). While most questionnaire items were designed to assure

that subjects understood the experiment, various questions are of particular interest with regard to the overall results. A three-way analysis of variance was performed which revealed significant main effects for the following items: Question 6; "When did the task become clear to you?" Results of the analysis of variance, which are summarized in Table 4, showed that there was a significant main effect for task instruction ($F(1,71) = 8.64$; $p < .01$). Means and standard deviations for the task informed group versus the task uninformed group were 5.695 (1.329) and 4.902 (1.546) respectively. The analysis also revealed a significant main effect for feedback instruction ($F(1,71) = 10.65$; $p < .01$). Means and standard deviations for the feedback informed group versus the feedback uninformed group were 5.567 (1.332) and 5.017 (1.600) respectively. These results indicated that subjects receiving task and/or feedback instruction reported that the task became clear earlier than subjects who did not receive task and/or feedback instruction.

Question 8; "Did you understand how the feedback worked?" Results of the analysis, which are summarized in Table 5, revealed a significant main effect for task instruction ($F(1,71) = 6.90$; $p \leq .01$). Means and standard deviations for the task informed group versus the task uninformed group were 6.169 (1.392) and 5.492 (1.876) respectively. In addition, the analysis revealed a significant main effect for feedback instruction ($F(1,71) = 10.65$; $p < .01$). Means and standard deviations for the feedback informed group versus the feedback uninformed group

were 6.200 (1.412) and 5.450 (1.854) respectively. These results indicated that subjects who received task and/or feedback instruction reported that they understood more about how the feedback worked than subjects who did not receive task and/or feedback instruction.

Question 9; "Did the experimenter's silences mean anything to you?" (The data from the R-W feedback condition were not included in this analysis since this particular question applied only to the Rn and Wn feedback conditions.) Results of the analysis, which are summarized in Table 6, revealed a significant main effect of feedback, $F(1,71) = 7.40$; $p < .01$. Means and standard deviations for the Rn feedback condition versus the Wn feedback condition were 6.256 (1.666) versus 4.975 (2.391) respectively. These results indicated that subjects in the Rn feedback condition reported that they better understood the meaning of the experimenter's silences than did subjects in the Wn feedback condition. The interesting aspect of these results is that despite this reported awareness regarding the meaning of the experimenter's silence, subjects in the Rn feedback condition were unable to use this information to improve their overall performance. All other interactions failed to achieve significance.

Discussion

Performance Data. The results of the current research indicate that performance in discrimination learning is superior when subjects are informed as to the nature of the task proper. These results support the prediction that subjects receiving task instruction would perform significantly better than subjects not receiving task instruction. These results lend additional support to the hypothesis made by Kanfer and Marston (1961, 1962) that a reduction in the ambiguity of the discrimination learning task through the use of more specific task-relevant instructions would facilitate learning. The current research however, attempted to delineate the critical aspects of instructions to the subject in a discrimination learning task into feedback and task instruction. This was not true of the authors cited above.

Results of the current research do not concur with the prediction that subjects receiving feedback instruction would perform significantly better than subjects not receiving instruction relating the nature of the feedback contingencies. Additionally, type of feedback was found to have no significant effect on performance. While this finding sustains the final prediction made in the current paper, the combined results of the latter two predictions fail to support Spence, Lair and Goodstein's (1963) earlier notion that the use of non-informative instructions may be necessary for obtaining

performance differences between the Rn and Wn feedback conditions. This particular notion was prompted by the author's opinions that the experimenter's silences in the Rn and Wn feedback conditions had an equal effect on performance, once the meaning of this silence was understood. The current research however, examined both feedback instructed and feedback uninstructed conditions and found that there were no significant differences associated with the type of feedback and/or instruction or lack of instruction relating to the nature of the feedback contingencies.

Questionnaire Data. While most questionnaire items were designed to assure that subjects understood the experiment, various questions are of particular interest.

Question 6 asked: "When did the task become clear to you?" Results revealed significant main effects for both task and feedback instructed conditions. The former finding is not of particular interest as it merely attests that subjects who had the task explained reported that the task became clear sooner than subjects who did not have the benefit of task instruction. More important is the significant main effect for feedback instruction which indicates that subjects who received feedback instruction reported that the task became clear sooner than subjects who were not feedback instructed. The major aspect of this finding is that task understanding did not enhance performance.

Question 8 asked: "Did you understand how the feedback worked?"

Once again, the analysis revealed significant main effects for both task and feedback instructed groups. It is not surprising to note that subjects who were instructed regarding the nature of the feedback contingencies would report that they understood how the feedback worked better than subjects who did not receive feedback instructions. What is of particular interest however, is that this apparent awareness of how the feedback worked did not enhance performance in comparison to subjects who did not receive feedback instructions. This finding in particular, fails to support Spence, Lair and Goodstein's (1963) notion regarding the use of non-informative instructions which was cited earlier.

Question 9 asked: "Did the experimenter's silences mean anything to you?" The major focus of this item was directed toward subjects in the Rn and Wn feedback conditions. Results of the analysis of variance revealed a significant main effect of feedback which indicated that subjects in the Rn feedback condition reported that the experimenter's silences possessed more meaning than subjects in the Wn feedback condition. In both the Rn and Wn feedback conditions the experimenter's silences infer the presence of a closed informational system, (e.g., the experimenter tells the subject when his choice is correct but remains silent when his choice is incorrect). Therefore, when the experimenter says nothing, the subject's choice is wrong. The above results would then imply that subjects in the Rn feedback condition were more aware of this closed

informational system than subjects in the Wn feedback condition. The interesting aspect of these results is that despite this apparent awareness, subjects in the Rn feedback condition were unable to capitalize upon this information to improve their overall performance. Conversely, subjects in the Wn feedback condition reported that the experimenter's silences held little meaning for them. This may indicate that subjects in the Wn feedback condition were unable to perceive the situation as a closed informational system and may in fact have viewed the experimenter's silences, in addition to his periodic negative feedback, as criticism. Interestingly however, there is no evidence of a performance deficit as compared to subjects in the Rn feedback condition. That is to say, that the presence or absence of meaning regarding the experimenter's silences ultimately had no affective meaning, and subjects in the Rn and Wn feedback conditions performed the task at comparable levels. In addition, it can be stated that in the present experiment, the experimenter's silences tended to affect perception in contrast to performance.

References

Ausubel, D. P. The psychology of meaningful verbal learning. New York: Grune and Stratton, 1963.

Bruner, J.S. The act of discovery. Harvard Educational Review, 1961, 31, 21-32.

Buchwald, A.M. Experimental alterations in effectiveness of verbal reinforcement combinations. Journal of Experimental Psychology, 1959, 57, 351-361.

Buss, A.H., Braden, W., Orgel, A. and Buss, E.H. Acquisition and extinction with different verbal reinforcement procedures. Journal of Experimental Psychology, 1956, 52, 288-295.

Buss, A.H. and Buss, E.H. The effect of verbal reinforcement combinations on conceptual learning. Journal of Experimental Psychology, 1956, 52, 283-287.

Craig, R.C. Directed versus independent discovery of established relations. Journal of Educational Psychology, 1956, 47, 223-234.

DeNike, L.D. and Speilberger, C.D. Induced mediating states in verbal conditioning. Journal of Verbal Learning and Verbal Behavior, 1963, 1, 339-345.

Ferguson, E.L. and Buss, A.H. Supplementary report: Acquisition, extinction and counter-conditioning with different verbal reinforcement conditions. Journal of Experimental Psychology, 1959, 58, 94-95.

Guthrie, J.T. Expository instruction versus a discovery method. Journal of Educational Psychology, 1967, 58, 45-49.

Haslerud, G.N. and Meyers, S. The transfer value of given and individually derived principals. Journal of Educational Psychology, 1958, 49, 293-298.

Kanfer, F.H. and Marston, A.R. Verbal conditioning, ambiguity and psychotherapy. Psychological Reports, 1961, 9, 461-475.

Kanfer, F.H. and Marston, A.R. The effect of task-relevant information on verbal conditioning. Journal of Psychology, 1962, 53, 29-35.

Kausler, D.H. and Lair, C.V. Informative feedback conditions and verbal discrimination in elderly subjects. Psychonomic Science, 1968, 10(6), 193-194.

Kittel, J.E. An experimental sutdy of the effect of external direction during learning on transfer and retention of principals. Journal of Educational Psychology, 1957, 48, 391-405.

Speilberger, C.D. The role of awareness in verbal conditioning. Journal of Personality, 1962, 30(2, Suppl. 6), 102-129.

Spence, J.T. Verbal discrimination performance under different verbal reinforcement combinations. Journal of Experimental Psychology, 1964, 67, 195-197.

Spence, J.T. and Lair, C.V. The effect of different reinforcement combinations on the verbal discrimination performance of schizophrenics. Journal of Personality and Social Psychology, 1965, 1, 245-249.

Spence, J.T., Lair, C.V. and Goodstein, L.D. Effects of different feedback conditions on verbal discrimination learning in schizophrenic and non-psychiatric subjects. Journal of Verbal Learning and Verbal Behavior, 1963, 2, 339-345.

Thorndike, E.L. and Lorge, I. The teacher's word book of 30,000 words. New York: Columbia University Press, 1944.

Whittrock, M.C. Verbal stimuli in concept formation: Learning by discovery. Journal of Educational Psychology, 1963, 54, 183-190.

APPENDIX A

POST EXPERIMENTAL QUESTIONNAIRE

NAME: _____ DATE: _____ PROFESSOR: _____

INSTRUCTIONS: Please evaluate the experiment and the experimenter on the following adjective scale by circling the appropriate number which most closely corresponds to your feelings.

THE EXPERIMENT

1. enjoyable — terrible

   7 6 5 4 3 2 1

2. complicated — simple

   7 6 5 4 3 2 1

3. exciting — boring

   7 6 5 4 3 2 1

4. hard — easy

   7 6 5 4 3 2 1

5. Were the instructions clear to you?

   7 6 5 4 3 2 1

   clear — unclear

6. When did the task become clear to you?

   7 6 5 4 3 2 1

   at the beginning — never clear

7. How confusing did you find the task to be?

   7 6 5 4 3 2 1

   very confusing — not confusing

8. Did you understand how the feedback worked?

   7 6 5 4 3 2 1

   understood — never understood

9. (If applicable) Did the experimenter's silences mean anything to you?

   7 6 5 4 3 2 1

   held meaning — no meaning

10. How nervous were you?

    7 6 5 4 3 2 1

    very nervous — not nervous

11. Did you remain nervous throughout the experiment? yes no

12. The experimenter . . .

    7 6 5 4 3 2 1

    good — bad

13. Would you be willing to participate in some other experimentation?

    yes no

14. With regard to the question concerning the experimenter's silence... When during the experiment did the experimenter's silence take on meaning?

    7 6 5 4 3 2 1

    beginning — end

15. In your own words, what was the meaning of this silence as it appeared to you?

APPENDIX B

VERBAL DISCRIMINATION WORD LIST

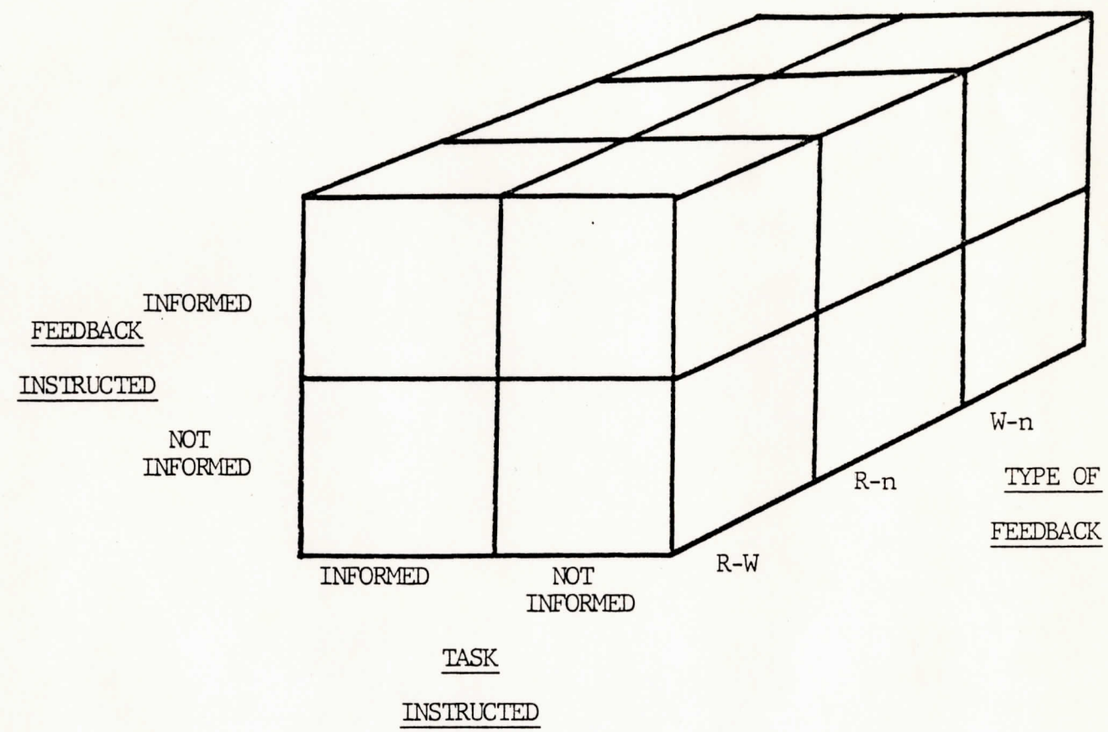
BRIG	-	SNIP
SKIT	-	COLE
HARK	-	CEDE
LEEK	-	BANE
DOSS	-	RINK
FLEX	-	NOUN
CZAR	-	PENT
NULL	-	TRIG
LOCH	-	MOTE
AVER	-	MICA
SLUR	-	LICE
JUTE	-	DUNK

APPENDIX C

FIGURE 1

EXPERIMENTAL DESIGN

TOTAL N = 120



2 X 2 X 3 FACTORIAL

ANALYSIS OF VARIANCE

APPENDIX D

INSTRUCTIONS TO SUBJECTS

BY CONDITION

1. No feedback instruction, no task instruction (NFI-NTI): "This is a verbal learning task. You will see a series of word pairs. Please learn to call out the correct member of each word pair. It will become clear to you as we go along which word in each pair is correct."
2. Feedback instruction, no task instruction (FI-NTI): "This is a verbal learning task. You will see a series of word pairs. Please learn to call out the correct member of each word pair. It will become clear to you as we go along which word in each pair is correct. I will help you by providing you with feedback (R-W, Rn, Wn). That is to say, e.g., I will tell you when your response is correct."
3. Task instruction, no feedback instruction (TI-NFI): "This is a verbal learning task. You will see a series of word pairs. Each slide has two words pictured on it. I have arbitrarily chosen one word on each slide to be what I will term the correct word. The same words will always be paired together but may shift in left-right position or in order of presentation. The same words will always be either correct or incorrect, as I will make no attempt to trick you. Your task is to learn

the list of correct words. Now, please learn to call out the correct member of each word pair. It will become clear to you as we go along which word in each pair is correct."
4. Task instruction, feedback instruction (TI-FI): "This is a verbal learning task. You will see a series of word pairs. Each slide has two words pictured on it. I have arbitrarily chosen one word on each slide to be what I will term the correct word. The same words will always be paired together but may shift in left-right position or in order of presentation. The same words will always be either correct or incorrect, as I will make no attempt to trick you. Your task is to learn the list of correct words. Now, please learn to call out the correct member of each word pair. It will become clear to you as we go along which word in each pair is correct. I will help you by providing you with feedback (R-W, Rn, Wn). That is to say, e.g., I will tell you when your choice is wrong."

APPENDIX E

TABLE 1

ANALYSIS OF VARIANCE FOR TRIALS TO CRITERION

SOURCE	Df	MEAN SQUARE	F
TYPE OF FEEDBACK (FB)	2	2.788	0.715
FEEDBACK INSTRUCTION (FI)	1	7.155	1.836
TASK INSTRUCTION (TI)	1	18.452	4.735**
FB X FI	2	4.487	1.152
FB X TI	2	2.544	0.653
FI X TI	1	2.869	0.736
FB X FI X TI	2	0.299	0.077
WITHIN SUBJECTS	108	3.897	
TOTAL	119	3.945	

** $p < .05$

TABLE 2

MEANS AND STANDARD DEVIATIONS FOR ALL CONDITIONS
(MEASURED BY TRIALS TO CRITERION)

CONDITION	MEAN	STANDARD DEVIATION
TASK INFORMED, FEEDBACK INFORMED		
RIGHT-NOTHING FEEDBACK	6.556	2.186
RIGHT-WRONG FEEDBACK	7.400	2.633
WRONG-NOTHING FEEDBACK	6.800	2.486
TASK INFORMED, FEEDBACK UNINFORMED		
RIGHT-NOTHING FEEDBACK	8.100	1.449
RIGHT-WRONG FEEDBACK	7.300	2.541
WRONG-NOTHING FEEDBACK	7.800	1.932
TASK UNINFORMED, FEEDBACK INFORMED		
RIGHT-NOTHING FEEDBACK	7.200	2.150
RIGHT-WRONG FEEDBACK	8.727	0.905
WRONG-NOTHING FEEDBACK	8.100	1.663
TASK UNINFORMED, FEEDBACK UNINFORMED		
RIGHT-NOTHING FEEDBACK	7.900	2.025
RIGHT-WRONG FEEDBACK	8.400	1.578
WRONG-NOTHING FEEDBACK	8.300	1.494

TABLE 3

ANALYSIS OF VARIANCE FOR ERRORS TO CRITERION

SOURCE	Df	MEAN SQUARE	F
TYPE OF FEEDBACK (FB)	2	290.918	1.517
FEEDBACK INSTRUCTION (FI)	1	225.689	1.177
TASK INSTRUCTION (TI)	1	626.154	3.265
FB X FI	2	280.853	1.464
FB X TI	2	216.177	1.127
FI X TI	1	52.425	0.273
FB X FI X TI	2	261.016	1.361
WITHIN SUBJECTS	108	191.795	
TOTAL	119	198.943	

TABLE 4

ANALYSIS OF VARIANCE FOR QUESTION 6

SOURCE	Df	MEAN SQUARE	F
TYPE OF FEEDBACK (FB)	1	1.333	0.705
FEEDBACK INSTRUCTION (FI)	1	20.132	10.651**
TASK INSTRUCTION (TI)	1	16.342	8.646**
FB X FI	1	2.464	1.304
FB X TI	1	0.464	0.246
FI X TI	1	5.000	2.645
FB X FI X TI	1	1.233	0.652
WITHIN SUBJECTS	71	1.890	
TOTAL	78	2.312	

** $p < .01$

TABLE 5

ANALYSIS OF VARIANCE FOR QUESTION 8

SOURCE	Df	MEAN SQUARE	F
TYPE OF FEEDBACK (FB)	1	2.825	1.280
FEEDBACK INSTRUCTION (FI)	1	22.952	10.400**
TASK INSTRUCTION (TI)	1	15.227	6.900
FB X FI	1	4.600	2.085
FB X TI	1	0.136	0.061
FI X TI	1	1.579	0.715
FB X FI X TI	1	2.733	1.238
WITHIN SUBJECTS	71	2.207	
TOTAL	78	2.638	

** $p \leq .01$

TABLE 6

ANALYSIS OF VARIANCE FOR QUESTION 9

SOURCE	Df	MEAN SQUARE	F
TYPE OF FEEDBACK (FB)	1	32.789	7.400**
FEEDBACK INSTRUCTION (FI)	1	0.704	0.159
TASK INSTRUCTION (TI)	1	2.984	0.674
FB X FI	1	2.551	0.576
FB X TI	1	1.140	0.257
FI X TI	1	1.140	0.257
FB X FI X TI	1	5.266	1.188
WITHIN SUBJECTS	71	4.431	
TOTAL	78	4.626	

** $p < .01$