PROCESS ASSESSMENT: AN EXAMINATION OF THE
ACQUISITION AND RETENTION OF SIGHT WORD VOCABULARY
THROUGH REINFORCEMENT PROCEDURES

by

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ABSTRACT

Four learning disabled children were individually assessed for their ability to learn to read orally 30 words over three teaching sessions. Each subject was also assessed for recall and recognition of the words over three sessions. Subjects received feedback for correct and incorrect responses and one of three reinforcers (praise, token, or self-charting). Results suggested that there was variability in both learning and retention within and between the four subjects. It is suggested that the assessment of the learning process by measuring actual learning and retention provides a promising supplement to traditional testing practices.
INTRODUCTION

The impact of applied behavior analysis on education has been one of moving toward the ideal of individualized instruction, tailored to individual differences in children. In this movement, individuals are trained to systematically observe and report behavioral evidence of learning and behavior problems. Further refinement in this direction takes place when teachers and psychologists task-analyze behaviors involved in learning (cf., Resnick, Wang, and Kaplan, 1973) and assess missing skills and provide materials to teach these skills rather than test for presumed ability deficits (Bijou, 1970; Mann, 1971; Sewell and Severson, 1974; Ysseldyke, 1973). These skills are frequently taught under certain reinforcement contingencies to maximize the quality of the learning situation.

A variety of reinforcement procedures have been applied to the problems in teaching reading skills (Corey and Shamow, 1972; Gray, Baker and Stancyk, 1969; Lahey and Drabman, 1974; Staats, Finley, Minke and Wolf, 1964; Staats, Minke, Finley, Wolf and Brooks, 1964; Staats, Staats, Shutz and Wolf, 1962; Whitlock and Bushell, 1967) and their effects have been monitored to determine how material is retained (Lahey and Drabman, 1974; Risley and Wolf, 1967). While all these studies focused on improving certain reading behaviors, none perceived the reinforcement-teaching situation as a possible assessment vehicle. In fact, the view that children should be assessed by teaching them
new material, rather than depending on static ability measures such as the IQ test, has only recently received attention (cf. Hutson and Niles, 1974; Hutson, 1974; Kratochwill and Severson, 1974; Sewell and Severson, 1974).

The focus on actual learning assessment might best be labeled "process assessment" since the utility of the approach stems from using various reinforcement procedures to improve the learning process. The primary focus of such a strategy would be on the teaching of curriculum-related material (e.g., sight words from a reading curriculum) and would be conceptualized predominately within the framework of a functional analysis paradigm (cf. Bijou and Peterson, 1971; Bijou and Warren, 1969) where various reinforcers are applied to examine improvement in learning.

The purpose of this study is to provide a methodology for such an assessment strategy, demonstrate how process assessment can refine educational assessment technology through a behavioral approach, and examine how such reinforcers as feedback, praise, token, and self-charting improve the acquisition and retention of reading-related behaviors.
REVIEW OF THE LITERATURE

Over the years an impressive amount of knowledge has been gathered on the topic of reinforcement strategies and their relationship to the learning process. Behavior modification, a method for changing an individual's behavior by means of manipulating the antecedent and consequent conditions of his/her environment, has gained increased attention and consideration within the schools. Reading, an area where many children experience great difficulty, has come under study by the behavior modifiers, and attempts have been made to modify the reading/learning behaviors of children.

A number of early studies in the area of reading were conducted by Staats and his associates. Staats and Butterfield (1965) found that school failure, misbehavior, and low reading achievement could be successfully modified using token systems of reinforcement. Their procedure, used with a 14-year old delinquent male, consisted of a variable interval schedule of token reinforcement for correct reading responses using modified Science Research Associates (SRA) materials. The youth, who began this reading training program as a second-grade reader, progressed to a fourth grade level in only four and one-half month's time. The tokens could be exchanged for tangible reinforcers (e.g., food or cash) during the course of the training program. Results of this study not only showed dramatic reading growth but also demonstrated a termination of school related misbehaviors.
Grades in the student's other courses improved as well, and reading gradually became intrinsically reinforcing to the student. The authors suggest that a treatment program such as this, aimed at improving attending behaviors as well as reading responses, could improve the reinforcement value of school for any child and consequently result in better school behavior.

In another study, Staats, Minke, Finley, Wolf and Brooks (1964) demonstrated that operant conditioning curves could be obtained through the use of self-variable reinforcers (tokens) using an operant methodology and apparatus. Complex reading behaviors, unlike the usual simpler behaviors modified under operant procedures, were successfully developed using a reinforcement technique. Chained reading responses were immediately introduced and elicited by verbal prompts and reinforcement. The verbal prompts were gradually faded out and chains were acquired in few trials. Attention to stimuli, often an overlooked factor in the teaching of behavior chains, was demanded in this experiment in order for the subject to make a correct response. The study was most important in that (a) behaviors could be brought under control for proper laboratory study by use of an operant conditioning apparatus, (b) independent variables involved in reading behaviors could be studied by using the specific materials and presentation method designed, and (c) it was demonstrated that reading response records could provide a sensitive measure of the behavior under study.

From time to time some unique operant procedures have been employed to teach reading. For example, it has been demonstrated that
the fading of pictorial stimuli, after having been grouped with printed stimuli, is more efficacious in the teaching of reading than is the superimposition of both stimuli or the subject's overt observing responses (touching) for nursery school children (Corey and Shamow, 1972). The superimposition procedure involved the presentation of picture-word stimuli on a slide screen. The subject was required to name the word shown over five consecutive trials. On the sixth trial the picture was eliminated and the subject was required to make a correct reading response of the word-only stimulus. Fading procedures, though begun similarly, called for the gradual darkening of the picture stimulus during trials two through five. The sixth trial was identical to the superimposition procedure. Results indicated that acquisition of reading behavior is facilitated by the fading procedure.

In a second experiment Corey and Shamow (1972) tested long term retention of reading responses following different training techniques as well as the possible explanation that fading is superior due to the subject's attentional shift at an early point in the acquisition process. Results showed that fading groups retained stimulus materials better than superimposition groups. Also, overt responding, used to measure attentional shift, did not increase retention rate in this study. The experiments indicated that having a child touch a word stimulus is useless and that reading errors should be faded out early in the teaching sequence by means of heavy reinforcement for correct responses.
With regard to the reinforcement for correct responses, research also indicates that reinforcement should be immediate and meaningful if one hopes to attain the target behavior. In the area of reading this has proved especially essential to the acquisition of printed stimuli (Staats, Staats, Shutz and Wolf, 1962; Whitlock and Bushell, 1967; Gray, Baker and Stancyk, 1969).

Other studies have also demonstrated the importance of reinforcement procedures in the acquisition of reading material. A programmed system of presenting graduated materials proved useful for training decoding skills for reading (Gray, Baker and Stancyk, 1969). The authors suggest that the system, based on computer logic, programmed instruction, and reinforcement principles can be carried out effectively by trained aides or clinicians and is a logical step in the remediation of reading problems in the schools. In a study done by Lahey and Drabman (1974), it was found that children receiving token reinforcers acquired sight words in significantly fewer trials than did children who received verbal consequences only. The procedure consisted of giving tokens for correct reading responses to one group of children. These students were told in advance that the tokens could be traded for pennies at the end of the training program. Children in a no-token group were told in advance that they would receive pennies at the termination of the program but they were not given the contingent tokens as the others were. Not only did the token group make fewer incorrect responses but it was noted that the interaction between the tokens and the retention interval was also significant. In other
words, the difference existing between the two groups increased as the retention interval increased. Therefore it is suggested that the importance of the tokens increases as the retention interval increases.

Nearly all the studies in the reading area that have employed behavior modification procedures to teach children new reading responses have not conceived of the teaching sessions as an assessment strategy. However, the teaching of curriculum-based material as an alternative assessment strategy to traditional tests is gaining popularity. The strategy of diagnosing one's abilities by the use of these reinforcement procedures has also taken on new significance in recent years. This strategy might best be labeled "process assessment." This method, encompassing such areas as diagnostic teaching (Severson, 1971), learning potential assessment (Budoff, 1969; Feuerstein, 1968), paired associate learning (Giebink and Goodsell, 1968) and Child Development Observation (Ozer and Richardson, 1974) has been gaining increased research attention in recent years. The process assessment procedure makes use of various reinforcement strategies in the teaching and assessment of curriculum-based information. It has been suggested that curriculum-based material plays an important role in the school learning assessment procedure (Ancevich and Payne, 1961; Bryant, 1966).

Hutson and Niles (1974) have proposed a trial teaching procedure which makes use of a dynamic evaluation of the learning process. This is in direct contrast to the static measures of past learning that is achieved through the use of a standardized intelligence test. The authors indicate that standardized IQ tests are ill-suited to measure
the acquisition of new material. Therefore, the trial teaching sequence (e.g., teaching new material such as sight words) is the necessary link between the school psychologist and the classroom teacher. The method gives the examiner and teacher information concerning the student's learning and retention rate, learning strategy, and frustration level as well as the fundamental analysis of the phonics approach if desired. These authors do not propose trial teaching as a replacement to the standardized measure but merely contend that the procedure yields an extended analysis of a student's learning problems.

Traditionally, the learning assessment technique used most frequently as a measure of school achievement prediction has been the IQ test. This has come under attack, however, with research indicating that there are certain limitations in the IQ, achievement test methods (Bersoff, 1973). Hutson (1974) suggests that diagnosis based on standardized testing does not consider such variables as test and subject characteristics and interactions between the subject and the examiner. She also contends that a current level of functioning should not be considered as a future predictor unless all learning conditions remain constant. This is seldom the case in our current assessment practices.

Process assessment, therefore, can yield an ongoing analysis of a child's learning strategies, skills, motivational and behavioral processes in the learning environment. The information acquired from a process assessment procedure can be easily relayed to any classroom teacher to be used in conjunction with curriculum-related materials.
In contrast, the IQ test yields a score that gives little information on a child's learning style.

Previous studies in the area of process assessment have yielded significant findings. Sewell and Severson (1974) studied achievement in 62 low SES black children from the Milwaukee schools. Each child was taught under three different process assessment techniques. The learning potential assessment strategy which consisted of a pretest-training session-posttest strategy used the Raven's Coloured Progressive Matrices (Budoff, 1969). The second task, a paired associate test, consisted of noun-picture pairs and the children were instructed to remember the pair over three sessions, each one containing more instructor prompts than the last. A third phase, diagnostic teaching, consisted of the reinforcement of correct reading responses to sight-word cards. These words were presented one at a time, by the examiner who stated the correct reading response to the subject on the first trial. Subsequent trials consisted of feedback, social praise, or tangible reinforcement for correct responses. All children were also administered seven subtests of the WISC according to standard procedure. Results showed that intelligence is highly related to the three process assessment techniques. The correlations found between diagnostic teaching and achievement were higher than those found between intelligence and achievement. Although these results are general, one correlation was significant and that was the social praise condition to arithmetic achievement. This relationship was significantly higher than the intelligence to arithmetic measure.
The diagnostic teaching method, therefore, is as effective a predictor of achievement as the IQ measure. Since the IQ measure is considered an inaccurate tool for assessing learning in low SES blacks (Semler and Iscoe, 1963), this recent evidence indicates that the diagnostic teaching model may be the most valuable assessment technique yet devised.

It has recently been suggested that the retention of learned material must also be taken into consideration in the process assessment approach. Krathoochwill (1973) found that criterion-referenced diagnostic teaching of sight words correlated highly with school achievement and that predictability was increased when retention measures were included in the analysis. Additionally, the retention checks assisted in the identification of those children possessing significant memory deficits.

To date, most studies in the area of process assessment have used the between-group experimental or correlational models. While these research procedures have definite advantages in demonstrating the generalizability and predictive efficacy of process approaches, the process strategy must be operationalized for the practicing school psychologist. This applied emphasis would suggest that the procedures should be open to experimental analysis in the individual case — the situation most commonly encountered in the schools. This study is being conducted along the lines of a single subject research strategy, because the writer is interested in studying intrasubject variability in both the learning and retention process. When specific
descriptions of the learning process are made for each individual student, the school psychologist can better meet the needs of their individual clients in the schools.
METHOD

Subjects

Four learning disabled children from the Sunnyside Public School District served as subjects. The mean age of the 3 male and 1 female clients was 6 years and 6 months, with a mean grade level of 1.3. Characteristics of the subjects are described in Table 1.

Setting

Each subject was assessed in the Learning Disabilities Classroom of the Santa Clara Elementary School over a period of one week. The experimental room consisted of a table and two chairs, and only the subject and the experimenter were in the room during the assessment procedures.

Materials

A set of stimulus materials were drawn from the "Basic Sight Vocabulary List" (Dolch, 1949). All words were from three to five letters in length and consisted of only one syllable. All words were presented in lower case letters with black ink on three by five inch white cards.

Experimental Design

All four subjects began the experiment by learning five words under feedback only to a criterion of two successive errorless trials. After this "baseline" condition was completed, the experimental
Table 1. Age, sex, grade level, and characteristic test performance of the four experimental subjects.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Age (Year, Month)</th>
<th>Sex</th>
<th>Grade Level</th>
<th>Characteristic Test Scores</th>
</tr>
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<tbody>
<tr>
<td>S₁</td>
<td>6-3</td>
<td>M</td>
<td>1.1*</td>
<td>WISC: V= 100, P= 98, FS= 99</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WRAT: Reading= 1.3, Math= 2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Grade Equivalent)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bender-Gestalt= 7 errors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Koppitz Scoring System)</td>
</tr>
<tr>
<td>S₂</td>
<td>6-8</td>
<td>M</td>
<td>1.1*</td>
<td>WISC-R: V= 101, P= 92, FS= 96</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WRAT: Reading= 1.2, Spelling= 1.1, Math= 1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bender-Gestalt= 7 errors</td>
</tr>
<tr>
<td>S₃</td>
<td>6-7</td>
<td>M</td>
<td>1.9</td>
<td>WPPSI: V=105, P= 101, FS= 104</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WRAT: Reading= 1.2, Spelling= 1.2, Math= 1.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bender-Gestalt= 13 errors</td>
</tr>
<tr>
<td>S₄</td>
<td>6-6</td>
<td>F</td>
<td>1.1*</td>
<td>WPPSI: V= 94, P= 89, FS= 91</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WRAT: Reading= 1.2, Spelling= 1.1, Math= 1.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bender-Gestalt= 14 errors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PPVT (Form B)= 91 (IQ)</td>
</tr>
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*Student is repeating the first grade.
condition (individually chosen for each subject) was initiated. The experimental conditions consisted of one of three reinforcers (praise, token, or self-charting). This sequence was then replicated for each subject two additional times. If, during the experimental phases, learning was faster than during the baseline phases, it could be concluded that the subject was learning better under the independent variable. This design would best be described as the multielement baseline design (cf. Ulman and Sulzer-Azaroff, 1975). The design seems especially useful when baseline conditions cannot be completely retrieved and where frequent alternation of baseline and treatment are possible.

Since it is possible that the effects of the feedback condition could facilitate how the child responded to a subsequent condition (e.g., praise) if feedback always came first (and vice-versa), a counterbalance sequence was employed. During the second phase, the order of baseline and treatment was reversed, and then switched back to the first order during Phase III.

**Experimental Phases**

The material for the examination of changes in the subjects' behavior under different conditions of reinforcement was 10 words unknown to the subjects. Each subject was presented a list of words of approximately equal learning difficulty in order to select 10 for each acquisition session. Upon completion of this procedure, 30 unknown words were found for each subject.
Phase I: Acquisition Measures

The subject(s) was/were assessed in a combination of two treatments which consisted of feedback only for correct and incorrect responses and/or feedback plus social praise and/or feedback plus token reinforcement and/or feedback plus self-charting. The procedures are described below:

Feedback only. Subsequent to the word knowledge assessment, the subject was required to learn five words which he/she did not know how to decode under feedback from the experimenter. In this condition, the experimenter's specific reaction was limited to neutral information regarding whether subject's response was correct or incorrect. Each child was exposed to the words following a study-test method:

I am going to show you these five words and tell you what they are. Let's see how many you can learn when I show them to you. OK? This word is _____ (say slowly). This word is _____, this is _____, this is _____, and this is _____ (now shuffle them). Let's see how many you can remember.

The order of presentation of the words was random, with subsequent orders being determined by non-systematic shuffling of the cards between trials to eliminate any serial learning effect. Each word was presented for a total of eight seconds. Four seconds after initial exposure, the experimenter provided the correct reading response. Each subject was instructed to look at the word and repeat the response after the experimenter. The word was then placed face down after an additional four seconds. A two second inter-item interval was maintained. Between trials, cards were shuffled to randomize order, allowing a 10 second inter-trial interval.
The experimenter kept records of the number of errors to criterion and number of trials to criterion. (See Appendix E for a description of the record form.)

**Feedback plus social praise.** The subject receiving this condition, in addition to receiving feedback for correct and incorrect responses, was given effusive social praise for each correct response. All other aspects of the procedure were identical.

**Feedback plus token.** The subject receiving this condition, in addition to receiving feedback for correct and incorrect responses, was given two pennies for the first time that he/she correctly named the stimulus word. Subsequent correct responses were awarded with one penny. Pennies were traded for a negotiated reinforcer at the end of the session. All other aspects of the procedure were identical.

**Feedback plus self-charting.** The subject receiving this condition, in addition to receiving feedback for correct and incorrect responses, was given a three by five inch index card with grids drawn so that he/she could chart correct and incorrect responses. Directions on graphing learning rate were administered to the subject prior to this learning phase and these are documented in Appendix A. All other aspects of the procedure were identical.

**Phase II: Retention Measures**

After a one day interval, all subjects who had undergone Phase I training were assessed for their retention of the words learned. Both recall and recognition measures were employed.
The recall format consisted of presenting the subject with the 10 words taught to him/her under Phase I conditions. The words were non-systematically shuffled and presented one at a time.

Each word was presented for one exposure trial only. The subject was given credit for a correct response if it was elicited within five seconds. Credit for a spontaneous correction was also given if the subject did so within the exposure interval. No contingent feedback on the word (other than an occasional neutral "OK" or "all right" verbalized by the experimenter) was given to the subject. This recall procedure always preceded the recognition measure and both were assessed during the same session. Specific instructions for this recall format are given in Appendix B. Also, a recall record form can be found in Appendix F.

Upon completion of the recall assessment, each subject was assessed for recognition of the word. During this procedure the 10 words taught in Phase I were added to four other distractor words of comparable length and configuration to the original list (see Appendix H for a list of the distractor words). The 14 words (10 words plus four distractors) were shuffled and placed on the table in front of the subject. The subject was told to point to the word as the experimenter said it. All 10 words were read and the subject was given 10 seconds to point to the appropriate word-card. Again, the subject was given credit for a spontaneous correction if it occurred within the 10 second interval. As in the previous retention measure, the subject was given no feedback for a response other than an
occasional noncontingent statement from the experimenter such as "OK" or "all right." Specific instructions for this recognition procedure are given in Appendix B. The record form used during the recognition measure is shown in Appendix F.

**Acquisition measures.** This experimental phase involved teaching the child 10 new words, five under a certain combination of the experimental conditions described earlier.

**Phase III: Retention Measures**

Two days after the completion of Phase II, the subjects were assessed for recall and recognition of words taught during the previous phases of the experiment. Children were initially tested for recall and recognition of words learned during Phase I and then were assessed for words learned during Phase II. Procedures for assessment of recall and recognition were identical to those described under Phase II. Four new words, however, were used as distractors in the assessment of recognition of Phase II words.

**Acquisition measures.** The subject was next taught 10 new words, five each under any of the experimental treatments described earlier in Phase I. Procedures were identical to those in Phase I training and records were kept showing analogous dependent variables.

**Phase IV: Retention Measures**

Recall and recognition measures were compiled over the 30 words taught during the previous three acquisition phases. Recall was always assessed first, with recognition immediately following.
Subjects were initially assessed for recall and recognition of 10 words learned during Phase I. Recall and recognition of words taught during Phase II were assessed next, followed by recall and recognition measures over those words taught during Phase III.

Procedures for assessing recall and recognition were identical to those described in Phase II. Directions given prior to these measures are found in Appendix D.
RESULTS

Acquisition and retention measures for each subject are located in Tables 2 and 3.

Subject 1

Graphs showing the dependent variables of cumulative number of errors to criterion and cumulative trials to criterion are found in Figures 1 and 2, respectively. The subject began the experiment under the baseline condition of feedback only for correct and incorrect responses. The child, who appeared rather bored with this procedure, was then switched to token reinforcement during the next word learning task. Subsequently, these two conditions were administered during the other two learning phases. It can be observed in Figure 1 that the subject learned better (as expressed in a lower cumulative error rate) under the token condition. At the end of the three phases the subject had made 19 fewer errors under token learning.

It was obvious that the child enjoyed collecting pennies during the treatment conditions. However, at one point it was necessary for the experimenter to place the reinforcers out of reach since the subject began to count rewards rather than attend to the learning task. The author believes that while token conditions were decidedly more effective than the baseline conditions, the effects may have been even more dramatic if the procedure had been altered immediately so that tokens were not so distracting to the subject.
Table 2. Representation of acquisition and retention measures for each subject under baseline and treatment conditions — number of errors to criterion.

<table>
<thead>
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<th>Subjects</th>
<th>Conditions</th>
<th>Phase Sequence</th>
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<td></td>
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<tr>
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<td>Self-Charting</td>
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</tbody>
</table>

B = Baseline  
T = Treatment  
Ra = Retention/Recall  
Rb = Retention/Recognition  
Ra_T = Retention/Recall Total  
Rb_T = Retention/Recognition Total
Table 3. Representation of acquisition and retention measures for each subject under baseline and treatment conditions — number of trials to criterion.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Conditions</th>
<th>Phase Sequence</th>
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<td></td>
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<td>B₁ T₁</td>
<td>I</td>
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<td>IV</td>
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Figure 1. Subject #1, cumulative errors to criterion.
Figure 2. Subject #1, cumulative trials to criterion.
Figure 2 presents the results for the cumulative number of trials to criterion. While this is not as sensitive a dependent measure as the errors variable, it, too, documents the utility of using token reinforcement for this subject.

Figure 3 presents data on the retention measures over words learned during Phase I and assessed in Phases II, III, and IV. It can be observed that on the recall measures, the subject remembered more words under token reinforcement on Phases II and IV. This is impressive in light of the fact that the subject would have had more overlearning (as reflected in a greater number of trials) on certain feedback words. There was no differential word recall on the Phase III assessment. Overall, the subject remembered one word more from Phase I learning under token reinforcement.

The recognition measures demonstrate somewhat variable performance and no conclusions regarding the token condition can be made from these data.

Figure 4 presents the data for the retention measures of Phase II words. It can be observed that the subject recalled the token reinforced words more frequently than the feedback reinforced words, although the recognition measure is a less sensitive measure of this. Phase III words, which were assessed during Phase IV, show small differences on recall and no difference on recognition.

Subject 2

A graphic representation of number of errors to criterion and number of trials to criterion can be found in Figures 5 and 6,
Figure 3. Subject #1, retention measures over Phase I retention words.
Figure 4. Subject #1, retention measures over Phase II and Phase III words.
Figure 5. Subject #2, cumulative errors to criterion.
Figure 6. Subject #2, cumulative trials to criterion.
respectively. The subject was taught under feedback only and feedback plus self-charting conditions for each of the three acquisition phases. During Phase I, self-charting produced more errors than the baseline condition and this may be partly due to the subject's Mexican background. One word taught during this self-charting condition was 'yes' and the subject repeatedly substituted the Spanish equivalent, 'si'. Although all other words were correctly decoded, this particular error resulted in eight additional learning trials before criterion was reached. Phase II produced a substantive difference in number of cumulative errors to criterion between feedback and treatment words. Self-charting appears to be motivating as judged by less number of errors recorded. This trend continues to the third phase, where it can be observed that the difference was 18 on total cumulative errors.

Figure 6 represents cumulative trials to criterion and it can be seen that following Phase I this measure was nearly identical for each teaching condition. Figure 7 presents retention measures for words learned during Phase I and assessed during Phases II, III, and IV. Average number of Phase I words recalled under each condition is essentially equal. Recall of self-charting words increases from Phase I to Phase II and remains the same to Phase III. Recall of feedback words remains the same from Phase I to Phase II, but decreases to Phase III. Since feedback words were greatly overlearned by this subject (due to more trials to reach criterion) it would be expected that these words would be recalled more accurately. This is not the case.
Figure 7. Subject #2, retention measures over Phase I words.
Recognition of feedback words taught in Phase I was higher than recognition of treatment words during the Phase III assessment. The recognition measures were equal over both conditions in the Phase II and Phase IV assessments. Retention of Phase II words are reported in Figure 8. Recall of words is originally higher under self-charting conditions (Phase III measure) but is much lower during the final assessment (Phase IV measure). Feedback-only produced more correct responses during the Phase III measure of Phase II words. This number equaled the self-charting score at Phase IV, however. Recall of feedback words from Phase III is superior to that of self-charting. An equal number of Phase III words learned under each condition were recognized during the Phase IV assessment. These retention measures for Phase II and Phase III words show no consistent results and no conclusions can be drawn from them.

Subject 3

Dependent variables, cumulative number of errors to criterion and cumulative number of trials to criterion, are graphed and can be located in Figures 9 and 10, respectively.

This subject became readily enthused by the social praise technique. During Phase I learning, the child became so excited that he fell over backwards in his chair! This obviously affected his learning rate as his concentration was greatly reduced. During Phases II and III (when the examiner awarded social praise a bit less emphatically) tremendous improvements in learning rate were noted under the treatment conditions. When feedback only was administered in
Figure 8. Subject #2, retention measures over Phase II and Phase III words.
Figure 9. Subject #3, cumulative errors to criterion.
Figure 10. Subject #3, cumulative trials to criterion.
subsequent phases, the subject appeared bewildered and disinterested. This subject was definitely affected by examiner praise and it is merely a matter of finding the proper level of its administration in order to make it successful. Unfortunately, the data do not demonstrate this dramatically.

Figure 9, presenting cumulative number of errors to criterion, shows that the subject gradually improved in learning rate until the social praise condition was definitely superior to the feedback condition as a teaching technique.

Figure 10, showing cumulative number of trials to criterion is similar to the Figure 9 results. Feedback is originally more effective in reducing amount of acquisition trials required; however this changes at Phase II with social praise becoming more effective. The number of trials to criterion at Phase II for feedback words is three less than for treatment words. This difference increases to 13 at Phase III.

Figure 11 presents data on the retention measures over words learned during Phase I and assessed during Phases II, III, and IV. Feedback appears to be more effective in recall than social praise for the Phase I words as assessed during Phase II. The two conditions are equal in number of correct responses and over recall conditions from Phase III onward.

Recognition measures are superior for social praise conditions during Phase I but not after that. The subject had more learning trials under feedback, however, and this could account for superior scores for this condition.
Figure 11. Subject #3 retention measures over Phase I words.
Retention measures over Phase II and Phase III words are located in Figure 12. Recall of Phase II words is equal in both conditions. Recall of Phase III words is superior under feedback conditions. Recognition of Phase III words is equal under both teaching conditions.

This shows, therefore, that although learning eventually took place in fewer trials and with less overall errors under the social praise conditions, feedback conditions helped in the retention of words learned, undoubtedly due to greater overlearning under feedback conditions.

Subject 4

Cumulative number of errors and cumulative number of trials to criterion are graphically presented in Figures 13 and 14, respectively. This subject had a great deal of difficulty acquiring words in both the baseline and treatment conditions. There appears to be little consistency in her approach to word learning. It was noted, however, that during Phase I treatment conditions, the subject repeatedly confused the word 'soon' with the word 'small.' This error accounted for the increased number of trials to criterion in both conditions.

The subject, who is repeating the first grade, enjoyed the sessions and brought in her own word-cards from home. She seemed eager to be accepted by the examiner and chatted throughout the assessment. It was often necessary for the examiner to remind her of the learning task to be undertaken. This may be partly responsible for her poor scores on both procedures.
Figure 12. Subject #3, retention measures over Phase II and Phase III words.
Figure 13. Subject #4, cumulative errors to criterion.
Figure 14. Subject #4, cumulative trials to criterion.
Figure 13 shows that learning was easier under feedback conditions. The number of errors was much less for the feedback condition; also the cumulative score remained a great deal lower than self-charting and the Phase III session saw the difference widen again. Figure 14, showing cumulative trials to criterion, indicates that under self-charting conditions, the subject required 12 more trials to reach criterion than under feedback conditions. After Phase I, however, this gap closed and cumulative number of trials remained nearly the same to Phase III. There was, therefore, little difference between conditions for this measure. As errors to criterion is so much higher under self-charting conditions, it might be expected that trials to criterion would correspond. This shows that the subject made fewer errors in each trial under the feedback conditions.

Retention measures are located in Figures 15 and 16. Figure 15 represents the recall and recognition of Phase I words assessed during Phases II, III, and IV. It appears that feedback is superior to self-charting for recognition of words for this subject. Figure 16, showing recall and recognition of Phase II and Phase III words, illustrates that Phase II words were better remembered under feedback-only conditions. Phase III words were recalled and recognized better under self-charting conditions. The feedback-only teaching condition appears to be more effective than the treatment condition for this subject.
Figure 15. Subject #4, retention measures over Phase I words.
Figure 16. Subject #4, retention measures over Phase II and Phase III words.
DISCUSSION

This research was conducted to determine if a select number of children identified and "diagnosed" as learning disabled, would improve their actual learning and retention under some select conditions of reinforcement. A second purpose of the study was to develop a methodological approach to assessing children through an actual learning task that would be of benefit to the practicing school psychologist.

Following a functional analysis approach (Bijou and Baer, 1965), some rewards did consistently improve actual learning for two of the subjects, and hence, these functioned as reinforcers. In yet another subject (Subject 4), simple knowledge of results demonstrated better learning, than did the presumed motivational device of self-monitoring. No effective reinforcer could be determined for Subject 3, since he performed nearly the same under both conditions when overall cumulative errors to criterion were examined. However, it should be stated that feedback did result in faster learning over two of the three phases for this subject.

It is interesting to speculate on two somewhat conceptually related factors that relate to the learning task employed in the present study. First, it is possible that the paired associate word-learning task could mask certain treatment effects that some reinforcers may have, or that the task could reduce the saliency of a particular treatment effect. For example, some writers have argued
that the paired-associate task is generally insensitive to reinforcement effects (cf., Cartwright, 1970; Ring and Palermo, 1961; Stevenson, 1965). Stevenson (1965) specifically indicated that such tasks have high interest, have a clear terminus (thus causing the subject to focus on completing the task irrespective of other reinforcement), and that the subject's previous experience with similar tasks may militate against reinforcement effects. This will always be an issue in basic learning tasks that children frequently encounter in school.

The second issue surrounds the fact that the word learning task employed in this study depended on social feedback from the experimenter and that such feedback was as salient a reinforcer as other incentives used. If one considers feedback to be a type of "social reinforcement" (in contrast to the intense praise given to Subject 3), it is possible that it independently affects general motivation (cf., Spear, 1970; Spear and Spear, 1972), and that no further reward is necessary. With at least two subjects, it is possible that feedback (common to all conditions) demonstrated both informational and motivational properties irrespective of other treatment conditions. These properties may have been potent enough to leave little or no need for the treatment conditions. In certain cases, this may support the speculation that it is the amount of feedback (cf. Gray et al., 1969; Staats, Finley, Minke and Wolf, 1964; Whitlock and Bushell, 1967) that may improve learning. Clearly this must be given more attention in the type of applied research described herein.
The retention measures taken during this study generally demonstrated small or equivocal results. While some authors have argued that retention measures should be gathered because of their predictive utility (i.e., they add to multiple regression equations to improve prediction of achievement over learning measures only), it was difficult to discern if the treatment conditions used with the present subjects made any real difference in retention. However, it could be argued that in some of the conditions where retention measures between the two treatments were nearly identical, an effect of the reinforcer was present. This is possible since one would expect greater retention where overlearning was greater, i.e., where greater numbers of trials are necessary to reach criterion.

Lahey and Drabman (1974) found better retention under token learning for this group. However, they employed only a recall measure. Results of the present study would still support the use of both a recall and recognition measure since some subjects differentially performed under the two measures. While recall is the more difficult task (and relates more to the demands of actual reading), the recognition measures would give the school psychologist information on what level the child is capable of remembering curriculum-related content.

Future research along these lines could explore how a longer retention interval may influence both recall and recognition measures. It is possible that the reinforcement conditions would have greater impact over a longer time, such as a week, although the data from the present subjects would argue against this speculation.
The results of this study pose some interesting speculations for the applied behavioral researcher. First, it documents the utility of an individual criterion-referenced approach to assessment (Drew, 1973). In this regard the application of global types of treatment strategies commonly found in the literature for learning disabled children could be questioned, since the subjects in this study showed unique learning and retention patterns. Results of the study further refine diagnostic statements that can be made about the way children learn. For example, in previous research by Lahey and Drabman (1974), the authors concluded that their token groups learned faster than the no-token group (a correct statistical interpretation), but an examination of their learning curves suggests unique patterns of performance within each group. The applied practitioner could make gross errors in suggesting that all children (or even certain types of children) be given tokens for learning. The relevance of this point is further supported by taking into consideration the data from Subject 3 when in the final examination of cumulative errors, there was no actual difference in learning rate.

Furthermore, while some authors have argued that specific learning disabled children often show dramatic improvement in rate of learning where social praise is employed (cf., Severson, 1971), the issue is really how the individual child responds to reinforcement. The fact that one subject fell off his chair in response to social praise is testimony to the importance of clinician response to child behavior. While it demonstrates some of the unique things that can
happen, it also would suggest that the relationship between the child and the examiner is complex and, in turn, may have complex implications for learning and learning related behavior.

Some comments on the methodology in the study are in order. In some of the earlier writings in the area of process assessment (Severson, 1971; 1973) it was recommended that the child be taught under three different methods of reinforcement (e.g., feedback, praise, and token). While this provides further refinement in determining an effective reinforcer, it becomes somewhat impractical when measures of retention are added to the assessment sequence (cf., Kratochwill and Severson, 1974) due to simple time limitations. For example, the average time per session spent with each subject was approximately 25 minutes. Adding additional treatment conditions to this would undoubtedly extend the time to about 35 to 40 minutes. This, coupled with the fact that the child is seen more than one time, presents too many constraints on such an assessment option. Furthermore, it would seem that assessment of retention of already learned material can be an important component of the diagnostic battery, especially where this is targeted as a problem by the teacher. If retention is to be included, there is a necessary trade-off (for time constraints) that will be necessary. In this study, the author would argue that the assessment of retention is a better option, since many of the children referred for learning problems also may have memory disabilities (cf., Myers and Hammill, 1969).
Also important is the fact that other assessment devices may be necessary or even mandated by special education laws. In this regard, process assessment should be conceptualized as broadening the range of measures to gather data relevant to improving the child's functioning. To assume that the assessment should stop at determining some optimal strategies which improve the child's functioning in one situation would be, at the very least, assessment myopia. As Bersoff (1973) has noted, the fact that optimal performance is established in an individual testing situation rarely reflects natural-environment performance.

Although multiple-assessment strategies must be emphasized, there are clearly situations where it is necessary to remove the child from the regular classroom to assess those aspects of behavior and cognitive skills that would be impossible to control under otherwise natural situations.

When process measures are used they appear to blend naturally into a mini-environmental assessment context (Bersoff, 1973; Santostefano, 1968). As such, process models would enable the school psychologist to replicate many information-processing strategies and feedback procedures that could not be optimally assessed in the classroom, home, or during other types of testing. It is important, however, to note that they are not distortion free in this information gathering process since they do isolate the child from many naturalistic contingencies which influence behavior (e.g., teacher and peers). Their merit lies in deliberate attempts to focus on information acquisition processes and strategies that provide leads as to how the child can be
assisted in classrooms, and if necessary, during remedial sessions. With their emphasis on measuring what works for this child they avoid some of the problems inherent in the "current functioning myth," a critical limitation of the IQ test (cf., Bersoff, 1971, 1973). To avoid decisions based exclusively on assumptions that the child is functioning at some level in the testing situation (IQ score) and then generalizing that such functioning is representative in the naturalistic environment, process models make their best contribution with their emphasis on establishing conditions under which optimal performance may be possible. As others have indicated (e.g., Budoff, 1973) this may mean (a) a revision of traditional psychometric models in terms of the effects of practice, and (b) a revision of assessment models emphasizing only norm-referenced data.

Although process models can be supplemented by diagnostic tests of the norm-referenced variety (e.g., reading and math) when specific data are needed to make instructional decisions, the criterion-referenced assessment adds a dimension emphasizing absolute skill mastery which is usually the instructional goal (Drew, 1973). Such information provides a basis for exploring how functioning in the natural environment can be improved, rather than assuming that the child is (or should be) performing at some level when compared to a norm group. Such a procedure also follows a functional analysis paradigm where what improves functioning is evaluated by subsequent change in behavior. This emphasis also allows evaluation of specific skills areas in the child's curriculum and also blends into task-analysis
procedures which allow elaboration on hierarchies of learning objectives (cf., Resnick, Wang and Kaplan, 1973). Task analysis, and process assessment all emphasize a behavioral description of learning in which it is possible to plot and examine systematically the child's performance over time.

Observations in the natural environment further provide necessary decision-making data. The fact that systematic naturalistic environmental assessment is enjoying a "renaissance" (Johnson and Lobitz, 1974) because of disillusionment with traditional measures (Bersoff, 1973), should not lead school psychologists to employ these procedures to the exclusion of the process assessment approaches described herein. Psychologists who employ observational assessment procedures must also demonstrate that they are using reliable and valid data (cf., Evans and Nelson, 1974). To deal with measurement errors, an observational approach that examines behavior across many situations as well as one that emphasizes the inclusion of diagnostic testing supplemented with a process approach will more likely provide data relevant to psycho-educational decision-making.

In conclusion, this study has outlined some assessment procedures that can provide direct information on the child's learning abilities and retention. There is much research to be done relating process approaches to other forms of useful assessment strategies. It must be emphasized that process models should supplement other forms of assessment that are providing us with more useful decision-making data. When school psychologists employ multiple forms of data
gathering, they approach a more valid and definitely more ethical form of assessment. Clearly, a strategy that emphasizes the emerging area of process assessment would be a goal worth striving for.
APPENDIX A

INSTRUCTIONS TO THE SUBJECT DURING PHASE I

Knowledge of Words

After the S (subject) is made to feel comfortable in the testing environment, the following directions are given:

Today you're going to help me find out how children learn to read. We're going to be playing two games.

Before the assessment procedure begins the S is told:

Today I'm going to teach you some new words. I have some words here that I will show you. If you know the word, tell me what it says. If you don't know the word, say "I don't know." We're going to try to find words that you don't know so that I can teach them to you. OK?

Each word is presented one at a time with the following instructions:

See this? What does this say? (If the S responds correctly, the E says "Yes" and goes on to the next word. If the S responds with an "I don't know" the E expresses pleasure at finding an unknown word.)

After 10 unknown words were found, the E (examiner) proceeded to the acquisition assessment. The 10 words were then randomly assigned to a feedback session and one of three reinforcement conditions, depending on the condition in effect for the S.

Feedback

Before the first learning trial under feedback, the following instructions were given:

I am going to show you these five words and tell you what they are. Let's see how many you can learn when I show them to you.
OK? This word is _____ (say slowly). This word is _____, this is _____, this is _____, and this is _____ (now shuffle them). Let's see how many you can remember.

Each word is presented for a total of eight seconds. After an initial exposure period of four seconds, the word is read to the S. Following an additional four second exposure the card is placed face down on the table. A two second inter-item interval is maintained.

Before the first trial in the feedback procedure the S is given the following instructions:

Now I'm going to mix up the words. When I show you a word, you tell me what it says. I'll tell you if you're right or wrong. If you take too long to answer, I'll tell you anyway, so try to answer quickly. If you don't know the word, guess at it. Do you understand?

The S who does not understand is given instructions to clarify the problem or he/she is returned to the regular environment. The feedback to the S consists of a repetition of the word in a neutral tone. Shuffle the cards, allowing a 10 second inter-trial interval. Repeat testing until the S reaches a criterion of two totally correct trials. If the S expresses extreme discomfort or uneasiness at the task, discontinue and praise the child for his/her efforts.

Social Praise

Before the S is presented with the second list of five unknown words he/she is told:

Now I'll show you some more words and tell you what each one is. You are to repeat the word after me. Listen carefully and try to remember. See this, this is . . .

Before the first experimental trial under social praise conditions begins, the S is given these directions:
Now I'll mix up the cards again. When I show you a word you try to tell me what it says. I'll tell if you're right or wrong. If you take too long in answering I'll tell you anyway, so try to answer quickly. If you don't know the word, guess at it. Do you understand?

Before exposure of the first word the E says: "See this, what does this say?" Each word is exposed for four seconds and the E then states the word, whether or not the S has responded. If the S responds correctly the E gives effusive social praise such as "Very good, you're learning so fast!" If the S responds incorrectly, he/she receives no plaise and the E states the word out loud. If the S does not respond at all, the E states the word after it has been exposed for four seconds, gives no praise, and places the card face down on the table after an additional four seconds. For all incorrect and no-response trials the procedure is identical to the feedback-only condition.

**Feedback Plus Tokens**

Before the first learning trial under feedback plus token conditions the following instructions are given:

Now I'll show you a word and tell you what the word is, you repeat the word after me. Listen carefully so that you'll remember it. See this, this is . . .

Each word is presented for a total of eight seconds. After an initial exposure period of four seconds, the word is read to the S. Following an additional four second exposure period the card is placed face down on the table. A two-second inter-item interval is maintained.

Before the first trial in the feedback plus token procedures the S is given the following instructions:
Now I'm going to mix up the cards again. When I show you a word, you try to tell me what it is, then I'll tell you so you can see if you are right or wrong. If you are right, I'll give you a penny which you'll be able to trade for a prize at the end of this week. The first time that you get a word right I'll give you two pennies, after that I'll give you one penny for a right answer. The more pennies you earn, the more prizes I'll give you. Do you understand? Let's begin.

The S who does not understand is given instructions to clarify the problem or he/she is returned to the regular environment. The feedback to the S consists of a repetition of the word in a neutral tone. Shuffle the cards, allowing a 10-second inter-trial interval. Repeat testing until the S reaches a criterion of two totally correct trials. If the S should express extreme uneasiness at the task, discontinue and praise the child for his/her efforts.

Feedback Plus Self-Charting

Before the first learning trial under feedback plus self-charting conditions, the following instructions are given the S.

Now I'll show you some more words and tell you what each one is. You are to repeat the word after me. Listen carefully and try to remember. See this, this is . . .

Each word is presented for a total of eight seconds. After an initial exposure period of four seconds, the word is read to the S. Following an additional four second exposure period the card is placed face down on the table. A two-second inter-item interval is maintained.

Before the first trial in the feedback plus self-charting procedure the S is given the following instructions:

Now I'm going to mix up the cards again. When I show you a word, you try to tell me what it says. Then I'll say the word so you can see if you're right or wrong. Here I have a card and a pencil for you. The card has small squares marked
on it so that you can give yourself a check mark for each right answer that you make. Put one check mark in each square when you say the word correctly. Let's see how many check marks you can earn today! Do you understand?

_E_ may clarify instructions for a non-understanding _S_. Feedback is provided by repeating the word to the _S_ in a neutral tone of voice.

The cards are shuffled between trials and a ten-second inter-trial interval is maintained. The _S_ is tested to a criterion of two error-less trials. Should the _S_ express extreme discomfort he/she may be returned to the regular environment. Praise the _S_ for his/her efforts.

A record form for acquisition training is shown in Appendix E.
APPENDIX B

INSTRUCTIONS TO THE SUBJECT DURING PHASE II

One day later, all Ss who underwent Phase I training procedures are assessed for recall and recognition of words taught. The S is given the following directions:

Yesterday you learned some new words. Let's see how many of those words you can remember.

**Part I: Recall Assessment**

All ten words taught under any one of the four possible treatment conditions; feedback only, feedback plus social praise, feedback plus token or feedback plus self-charting, are presented to the S. He/she is given the following instructions:

I'm going to show you these words. If you know the word, say it. If you don't know it, please say "I don't know." If you're not sure about it, take a guess. Do you understand?

All words are presented to the S one at a time. Order is established by a non-systematic shuffling of the cards. The E then directs:

See this? What does this say? (A correct or incorrect response receives no comment from the E aside from a neutral "OK" or "all right.")

This procedure is carried out for one exposure trial only. The S receives credit for a spontaneously corrected response. Recognition is assessed immediately following recall.
Part 2: Recognition Assessment

After Part 1 of the retention assessment, the E says:

Now I'll show you all the words and I'll say one word at a time. You point to the word as I say it.

All cards are shuffled with the four distractor words added. The distractors are the same for each S. All 14 words are placed on the table in front of the S and the following instructions are given:

When I say a word you point to it. It will be one of the words in front of you on the table. Do you understand?

E goes through one trial on this procedure for recognition assessment. Credit is given for spontaneous corrections. The S is allowed 10 seconds to point to the word after the E has stated it. A Recall and Recognition record form is presented in Appendix F.

Part 3: Acquisition of Words

After the completion of Parts 1 and 2 of Phase II, the S is required to learn 10 new words under the same two diagnostic conditions chosen for him/her during Phase I training. This procedure is carried out one day after the Phase I session is completed. Ss received the following instructions:

Here I have some other words that I want you to learn. I'll show you a word and if you know it, say the word. If you don't know it, say "I don't know." Remember I'm trying to find words that you don't know.

After 10 words are found following procedures outlined in Appendix A, the lists are randomly assigned to one of the two treatment conditions used for this S under the Phase II testing conditions. All words are taken from those listed in Appendix G. At the end of this teaching
phase the S will have been taught 20 new words, ten under each of the two treatment conditions chosen for him/her. The record form for Phase III is presented in Appendix E.
APPENDIX C

INSTRUCTIONS TO THE SUBJECT DURING PHASE III,
PARTS 1, 2 AND 3

One day later, all Ss who went through Phase II are assessed for retention (recall and recognition) of the 20 words taught (10 from Phase I and 10 from Phase II).

After making the S comfortable, the following instructions are given:

This week you've learned some new words. Today I'd like to see how many of those words you remember.

Part 1: Assessment of Retention on Words Learned from Phase I

A. Recall Assessment

The 10 words taught to the S during Phase I procedures are now shown to the S.

I have these words and I would like you to tell me their names. If you know the word, tell me what it says. If you don't know the word say "I don't know." If you're not sure, take a guess. Do you understand?

This procedure is identical to that used in Part 1, Phase II. The words, presented one at a time, are non-systematically shuffled to establish random order. E says the following:

See this? What does this say? (If correct or incorrect, make no response, only a neutral "OK" or "all right.")
This procedure is carried out for one exposure trial only. Credit is given for a spontaneous correction. Upon completion of the recall measure, proceed immediately to the recognition format.

B. **Recognition Assessment**

Following Part A, $E$ goes through the recognition formal for all Phase I words. $E$ says the following:

> Now I will show you the words and tell you one word at a time. You point to the word when I say it.

The 10 words are shuffled with four distractor words. The same four distractor words are to be used for each $S$. Place the 10 words with the distractors on the table in front of the $S$. Say the following:

> When I say a word, point to the word. The word I say will be one of the words in front of you on the table. Do you understand?

$E$ goes through one trial of the recognition procedure. Credit is given for spontaneous corrections and each $S$ is given 10 seconds to point to the word after it is named by the $E$.

**Part 2: Assessment of Words Learned During Phase II**

During this Part, the $S$ is assessed on Recall and Recognition of words learned during Phase II. The following is said to the $S$:

> Now I want to see if you can remember any of the words that I asked you to remember the last time we were together.

All instructions and procedures are identical to those given during Phase II. Additionally, at the end of the session each $S$ is praised
for his/her performance. Record forms for recall and recognition are included in Appendix F.

**Part 3: Acquisition of Words**

After the S has completed Parts 1 and 2 of Phase III, he/she is required to learn 10 new words, five each under the two reinforcement procedures used for him/her in Phases I and II. Ss were taught the new words on the same day as the retention assessment. For those Ss the following instructions are given:

I have some other words that I would like you to learn. I will show you a word and if you know the word, tell me what it says. If you don't know the word, say "I don't know." Remember I want to find words that you don't know.

After 10 words were found, and following procedures identical to those outlined in Appendix A, the lists are randomly assigned to one of the two treatment conditions used for this S in Phases I and II. All words were drawn from Appendix G. The S is then taught 10 new words, five each under one of the two treatment conditions.

At the end of this phase all Ss will have been taught 30 words, 15 under each of the two conditions consisting of either corrective feedback only, corrective feedback plus social praise, and corrective feedback plus tokens or corrective feedback plus self-charting.
APPENDIX D

INSTRUCTIONS TO THE SUBJECT DURING PHASE IV,
PARTS 1, 2 AND 3

One day later, all Ss who participated in Phase III are assessed for recall and recognition of the 30 words taught (10 during Phase I, 10 during Phase II, and 10 during Phase III). After the S is made to feel comfortable say the following:

This week you've learned some new words. Today I want to see how many of those words you can remember.

Part 1: Assessment of Retention of Words Learned from Phase I

A. Recall Assessment

The 10 words taught during Phase I diagnostic procedures are then shown to the S:

I have some words and I'd like you to tell me their name. If you know the word, say it. If you don't know the word, say "I don't know." If you're not sure, take a guess. Do you understand?

As in Phase II, the words are presented one at a time. Order is determined by non-systematic shuffling of the cards. Say the following:

See this? What does this say? (If correct or incorrect, make no response, only a neutral "OK" or "all right.")

This is done for one exposure trial only. The S is given credit for words to which he gives a spontaneous correction. After the S is tested on the recall words, proceed to the recognition format.
B. Recognition Assessment

After Part A, E goes through the recognition format for all Phase I words. The following directions are given:

Now I will show you the words and tell you one word at a time. You point to the word when I say it.

The 10 words are then shuffled with the four distractor words. The same four distractor words are to be used for each S. The 14 cards are placed on the table in front of the S. The following instructions are given:

When I say a word, you point to the word. The word I say will be one of the words in front of you on the table. Do you understand?

The E then goes through one trial of the recognition procedure. The S is given credit for spontaneous corrections if they are made within the allotted 10 second interval. Upon completion of this procedure, E begins the assessment of Phase II words.

Part 2: Assessment of Words Learned During Phase II

The S is now assessed for recall and recognition of words learned during Phase II. Say the following:

Let's see if you can remember any of the words that I asked you to remember a couple of days ago.

The instructions and procedures are identical to those explained in Parts 1 and 2 of Phase II. Record forms for recall and recognition are found in Appendix F.
Part 3: Assessment of Words Learned During Phase III

During Part 3 the S is assessed for recall and recognition of words learned during Phase III. The following directions are given the S.

Now I want to see if you can remember any of the words I asked you to remember the last time we were together. These are the words that you learned.

After this, the E goes through the recall and recognition formats, respectively. All instructions and procedures are identical to those given during Phase II. In addition, each S is praised for his/her performance at the conclusion of this section.
APPENDIX E

RECORD FORM FOR ACQUISITION TASK

Child_________________________ Sex: M F Age_____  
Number of words known___________ Phase_____

Feedback Words: Trials

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<th>Trials</th>
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Dependent Variables:
Errors to criterion______ Observations
Trials to criterion______

Feedback + Words:

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<th>Trials</th>
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Dependent Variables:
Errors to criterion______ Observations
Trials to criterion______
APPENDIX F

RECORD FORM FOR RECALL/RECOGNITION PROCEDURE

Recall/recognition measures on words taught during Phase

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<th>Recall/Recognition</th>
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<tr>
<td>2.</td>
<td>+ - + -</td>
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<tr>
<td>3.</td>
<td>+ - + -</td>
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<tr>
<td>4.</td>
<td>+ - + -</td>
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Recall: Number Retained

Recognition: Number Retained

Distractors:

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<td>+ - + -</td>
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<td>4.</td>
<td>+ - + -</td>
</tr>
<tr>
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Recall: Number Retained

Recognition: Number Retained

Distractors:
### APPENDIX G

#### ACQUISITION WORD LIST

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APPENDIX H

DISTRACTOR WORD LIST

Phase II: Retention Measures

1. and
2. make
3. sleep
4. this

Phase III: Retention Measures

1. take
2. ten
3. try
4. well

Phase IV: Retention Measures

1. hurt
2. show
3. went
4. then
LIST OF REFERENCES


Bersoff, D. N. Silk purses into sow's ears, the decline of psychological testing and a suggestion for its redemption. American Psychologist, 1973, 28, 892-898.


