IMPROVED READING BY HOME TOKEN ECONOMY AND ITS EFFECT ON BEHAVIOR

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ABSTRACT

The aim of the present research was to investigate whether a specific treatment would raise the reading level of grade four children who were within the average range of intelligence and who were reading at least a year or more behind their grade level. The main experimental procedure was that of a token economy administered by parents reinforcing correct reading responses, with money as a back-up reinforcer, for a duration of three months. In addition to the regular no-treatment control group, effects due to the contingent nature of the reinforcement were isolated by using an "attention control" group who received noncontingent reinforcement for participation in the experiment. The same instructional materials were used for both treatment groups. In addition to the two experimental groups, there was a no-treatment "waiting list" control group. The 46 children who met the necessary criteria for inclusion in the investigation were matched in threes on the two main reading measures (The Wide Range Achievement Test and 100 word sample from the SRA Lab) and on WISC-R intelligence scores. Then each one of the three was randomly assigned to one of the three treatment groups. Pre- and post-treatment measures were taken on the two previously mentioned reading tests, and a third measure was the number of errors made in reading a paragraph. At the same time, by taking pre- and post-treatment behavioral measures, the present research sought

to determine whether a change in general behavior either at school or at home accompanied treatment of the reading deficiency. Of the original 46 subjects selected for this research, seven did not complete the three-month program, and were not included in the results. There were no significant differences between the three groups in the pre-treatment means on either of the reading measures, the WISC-R or either of the behavioral measures. To assess behavioral changes, three questionnaires were used: a Children's Behavior Questionnaire for completion by teachers, a C.B.Q. for completion by parents, and Sarason's Test Anxiety Scale for Children.

The analysis of variance performed on change scores for the WRAT showed a significant overall effect ($p < .05$). A Scheffe procedure showed the Contingent Reinforcement group to be significantly different from the Attention group ($p < .10$) and from the Control group ($p < .05$). There were no significant differences between Attention and Control groups. On the 100 random words, the mean number of words increase was not significantly different between the Contingent Reinforcement and Attention groups; however, the mean for each of these treatment groups was significantly different from the Control group mean ($p < .01$). The analysis of variance on the mean decrease in errors for the paragraph reading showed that there were no significant differences across the groups. Pre- to post-treatment change as shown on the Teachers' and on the Parents' Questionnaire was not significant; neither was change on the Anxiety Questionnaire.

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INTRODUCTION

There have been few well-researched studies to date involving both the diagnosis and treatment of reading disability from a population of children in the regular classroom, some of whom may not previously have been diagnosed. Most subjects used in treatment programs have been children who have already become problems in some way (either academic or behavioral) and have therefore been referred to a specialist.

The aim of the present research was to investigate whether a specific treatment would raise the reading level of grade four children who were within the average range of intelligence and who were reading at least a year or more behind their grade level.

The experimental procedure was that of a token economy administered by parents reinforcing correct reading responses, with money as a back-up reinforcer, for a duration of three months.

In addition to the regular no-treatment control group, effects due to the contingent nature of the reinforcement were isolated by using an "attention control" group who received noncontingent reinforcement for participation in the experiment. The same instructional materials were used for both treatment groups.

At the same time, by taking pre- and post-treatment behavioral measures, the present research sought to determine whether a change in general behavior either at school or at

home accompanied treatment.

From a practical standpoint, as well as being of use to these particular children here and now, the research is significant in that the method of using parents as therapists is an economical one, saving the time of both school teacher and therapist. It can have a snowballing effect in that these parents could each train another parent after the treatment has concluded. There is actually a behavior modification program under way in the United States where one of the conditions of parents' receiving instruction in the first place is that they agree to assist in the training of another parent later on (Ora, 1971; Wagner & Ora, 1970).

REVIEW OF THEORY AND RESEARCH

Possible Causes of Reading Disability

Love (1970) lists the following factors which are necessary for a child to learn to read successfully:

- visual and auditory discrimination;
- mental maturity (a mental age of six years or more);
- body concept - that is, awareness of the existence of two hands and two feet, in order to be able to go from left to right;
- self-image, as a result of healthy emotional development;
- speech fluency;
- skill in listening and following directions;
- social adjustments;
- interest in pictures and books;
- physical skills in eye movements;
- a desire to learn to read.

Conversely, factors which contribute to poor reading include poor vision, hearing, speech, teaching or environment, minimal or gross brain damage, emotional maladjustment, low intelligence and possible mixed lateral dominance.

Love defines "dyslexia" in its broadest sense as "the inability to read when the child has a normal IQ, proper instruction and a good home environment". Dyslexia, however, is a somewhat nebulous concept generally and there are no

rigid lines between "proper" and "improper" instruction for a particular child or between a "good" or mediocre home environment. Therefore, precluding obvious obstacles such as defective eyesight, hearing, serious speech pathology or general mental retardation, no matter whether the cause is a vague physical possibility - such as minimal brain damage - or whether the child is emotionally disturbed, it is still necessary for that child to learn to read. Parents and teachers can help him by manipulating his environment in order to raise his motivation, thus enabling him to function at a more adequate level.

Interacting with motivation also is another direct cause of any learning difficulty, that is, lack of attention. Hallahan, Kauffman and Bell (1973) studied low and high achieving grade six boys. By direct classroom observation the low achievers were found to be more impulsive and showed less selective attention. Similarly Bryan (1974) has found that in addition to having different relationships with peers and teachers than other children, learning disabled children spend less time quantitatively attending in class.

Fisher (1970) has discussed the attention deficit in brain damaged children and Broman (1970) has also investigated the short attention span. Broman observed seven children individually for a whole day each, who had been pointed out by teachers as having learning difficulties because of a short attention span. She found that each did have a short attention span but that at some period of the

day each one also demonstrated a long attention span which she concluded was due to adequate ability to perform a given task, greater interest in a particular task, or satisfaction in completing a task so that he could get on with something else. On questioning the children directly, possible reasons for lack of attention at other times included a difference between a situation at home and at school, (for example, extent of involvement in reading a story), under or over placement in grade or group according to ability, physical disability (for example, faulty vision, or lag in fine muscle development), thinking about something pleasant in store instead of immediate assignment, or a recent emotional experience (for example, parents fighting) which interfered with concentration. She deduces therefore that the short attention span is a "myth" and that distractible attention is a symptom rather than a cause and children should be thoroughly observed in a variety of activities before hasty conclusions are made about them.

A further study by Bryan (1974a) reviews research on learning disabled children. Projected figures estimate that this includes between one and three per cent of the school population. The main findings are that most of these children have normal intelligence and that only approximately 25 per cent of children experiencing learning difficulties are actually mentally retarded. In the area of auditory discrimination the differences were in stimulus and response complexity and these differences were explained by deficits

in attention, language and reinforcement history. As regards the visual processing mechanism, the main differences between learning disabled and normal children were in the latency of response or in impulsive errors made. They also appeared less competent at attaching verbal labels to visual stimuli. Some information organization defect was evident and difficulty was experienced with Broadbent's dichotic listening. However, hyperactivity was not found as a difference and there was a failure to locate specific neurological deficits. The main difficulties therefore were in paying attention, use of language and coping with complex auditory and visual presentations.

Audio-visual integration has been considered by Birch and Belmont (1965). In their study of 220 elementary school children they found that the improvement in this area is most rapid up to and including grade five, whereas later on reading and IQ have a more positive correlation. They conclude that in initially acquiring reading skill, primary perceptual factors play an important role. Relationship between failure to integrate adequately and poor performance in reading is further demonstrated by Coy (1974). Children aged 8-10 were administered a Bender-Gestalt and arithmetic and reading achievement measures. Although there was no significant correlation between total score on the Bender and academic achievement, the integration errors were more significant in the low reading achievement group.

Faulty saccades, that is, the small rapid jerks of the eyes involved in searching movements, has been investigated as a possible cause of reading disability (Griffin, Walton & Ives, 1974). However, the general conclusion reached was that this was a symptom rather than cause of poor reading since eye movements become better controlled as an improvement is affected in reading.

Goldberg and Guthrie (1972) postulated a deficit in coordination of three different memory functions required in reading. A positive association was found between visual sequential memory, as measured on the Benton Visual Retention Test and paragraph comprehension, oral reading and word recognition.

Whether causes of reading disability are general or specific, mental of physical, internal or external, the only way to begin treatment is from outside the child in order to change his attitude and his performance.

Remedial Methods

A variety of criticism has been levelled at remedial methods used in the special education classroom. Ensher (1973) claims that teacher attitudes are negative and inflexible which is why many programs fail. Fischer (1971) compares schools with mental institutions in respect to rules being made for the benefit of teachers and administrators rather than to provide effective help for students and patients.

Hartman and Hartman (1973) maintain that the wrong approach is often made to reading remediation due to confusion of terms, for example, "perceptual handicap" and a lack of communication between reading specialists. Martin (1973) finds that Frostig's and Horne's program of visual perceptual training does not increase reading ability and there is doubt whether it improves actual visual perceptual skills.

A remedial method used with success by Allen and Feldman (1973) was having low-achieving grade five students tutor grade three pupils in reading. In doing so, their own reading also improved.

Goodman (1973) concludes that it is not necessary to break up words into syllables when teaching reading and maintains children master longer, more abstract elements. This has been demonstrated also by Fuller (1974) with her Ball-Stick-Bird method where mentally retarded children and adults with intelligence quotients lower than 30 have learned to read and comprehend complex stories quite early in her program.

The superiority of individual treatment over group treatment has been demonstrated on a number of occasions. Even when tutors are grade five and six children the effects of their individual instruction are more beneficial than when children are instructed in small groups by a teacher (Jenkins, Mayhall, Peschka & Jenkins, 1974). Among individually tutored third and fourth graders there were not only gains in reading comprehension and total reading achievement but also an improvement in personal adjustment (Kux, 1973).

The effect of class size was also examined in relation to the teaching of mathematics (Moody, Bausell, Barker & Jenkins, 1973). A total of 249 grade four children were divided into classes of one, two, five and twenty-three children. All the smaller groups performed better and made faster gains than the larger classes and the ones with a one to one ratio in turn were better than one to five, providing yet another argument in favor of individual instruction.

Rawson (1966) did a long term survey from the records of a private elementary school which had a special tutoring program in language development involving much individual instruction and plenty of encouragement. Of 56 records of adults who had attended the school for at least three years the 20 who then experienced the most difficulty in reading and spelling and therefore who received individual instruction, were at the time of the survey as advanced academically or by occupation as the other students. Apart from one or two, all had had some university education and were in jobs classified as upper middle class or upper class. This sample did exclude on the whole children from lower socio-economic groups so there were few problems due to deprivation. There was nevertheless considerable incidence of chronic reading disability in the lower grades, which because of the type of school it was, was treated on an individual basis so that no child was permanently disabled by it.

There are two particularly interesting studies which show reading improvement on training materials, but not on

general achievement tests and which would seem to indicate that generalization does not take place in such remedial programs.

The first is by Ellson, Harris and Barber (1968). Since an earlier study had found programmed tutoring of reading was effective they wanted to determine whether success was due to the technique or to the individual attention. There were four experimental groups - programmed tutoring groups either one or two sessions weekly and individual (directed) tutoring groups - one or two sessions weekly. All programs emphasized success and not failure. Individual training made use of various "reading readiness" materials, for example, Ginn, with special attention paid to visual and auditory discrimination, left to right sequence, rhyming words and visual motor skills. The programmed training was very systematic, using branches, and not giving away answers very easily. Although the only significant improvement was 20 per cent found in the two-session programmed group, the main findings were that the positive effects were greater for children with the poorest achievement at the beginning, especially the lowest quartile. They also found that there were more significant figures at midpoint testing than post-testing. In the final results the Ginn achievement scores showed significant effects of tutoring but the Stanford Achievement scores did not. The authors concluded that the latter were less familiar materials.

Camp and Van Doorninck (1971) went into this question in more detail in their discussion. They had made use of the Staats technique with the SRA labs, 1A, 1B and 1C during two half-hour sessions weekly with grade three to six children at least two years behind in reading. Bonuses were used with the slower ones so that no child made less than ten cents per session. Although various reading lists did improve significantly, the Wide Range Achievement test for Reading was not one of them, although there was an improvement in the arithmetic section. They suggest that more frequent instruction or a longer duration appears to affect a change in the Wide Range Achievement test reading score.

Camp and Van Doorninck also suggest that improvement in reading is often accompanied by improvement in other academic areas and in behavior generally but they do not discuss this last aspect because of difficulties in measuring behavioral change. Both groups of investigators recommend either extrinsic rewards in a group situation or individual instruction. Extrinsic rewards in addition to individual instruction,therefore,should provide even more effective learning conditions.

Parallel findings are noted by Harris (1973) with regard to children receiving tutoring in spelling and arithmetic from their peers. They benefitted directly from the interaction, while homework assignments for independent completion did not improve in rate and accuracy until reinforcing consequences were introduced.

Behavior Modification Programs

Perhaps the largest and one of the more fruitful areas of research with school children is that of behavior modification by contingent reinforcement, in particular that of the token economy. This topic relative to children has been discussed in detail in a number of reviews (Anderson & Faust, 1973; Boisvert & Trudel, 1971-2). Children who have benefitted from these methods have included the mentally retarded, delinquents, the emotionally disturbed, children with behavior problems (both antisocial and neurotic), children of normal intelligence but with some kind of learning disability and other low achievers or children whose motivation for some reason is not quite up to average. Quay suggested in 1963 in his article "Some Basic Considerations in the Education of Emotionally Disturbed Children" that these children are novelty seekers, therefore a system of novel rewards such as tokens, plus money, should raise their motivation to perform.

With particular regard to behavior in the classroom, Farmer (1973) discusses behavior modification techniques, focussing on the elimination of disruptive behavior and the development and maintenance of attentive, cooperative and diligent work behavior as an alternative response. Gagne (1973) has also discussed positive reinforcement for children grades one to twelve as one of the factors which support learning, as have Meacham and Wiesen (1974).

Specific studies successfully using positive reinforcement to raise motivation in the classroom have involved military cadets (Madill, 1973), three nine-year-old boys causing a disturbance in an elementary art class (Mitchell & Crowell, 1973) and six 14-year-old boys with Down's syndrome (Dalton, Rubin & Hislop, 1973).

In a study involving 100 kindergarten children, aged five to six, performing tasks in visual discrimination, Brown (1973) compared effects of immediate tangible reinforcement (IT), delayed tangible reinforcement (DT) and none at all. As expected the IT group persisted at the task for the longest period of time with the DR group second. However, it appears that the only effect was to raise their motivation since the accuracy did not vary significantly between groups.

O'Leary and Becker (1967) took the eight most disruptive children in a grade three adjustment class and reinforced appropriate behaviors with tokens, ignoring maladaptive behaviors; they used candies and trinkets as back-up reinforcers. Once an improvement was established not only were they able to delay reinforcement for four days, but there was a generalization of appropriate behavior to other school situations.

Two systematic studies were carried out in a junior high school special education class of grade seven and eight students (Broden, Hall, Dunlop & Clark, 1970). The aim was first to improve general classroom behavior and then to increase study behavior. First of all social reinforcement

was given for good behavior and there was some improvement; then a timer was introduced. Every time a pupil was in his seat and quiet when the timer rang, he would be allowed to leave one minute earlier for lunch. This was extremely successful. Then a further experiment was carried out introducing a token points system for study behavior. Children were each given a table showing how they could earn points, how they would lose points and on what privileges they could spend the points once they had been earned. There were hourly postings by the teacher of total points accumulated by each child and the mean study time per child rose from 30 per cent during the baseline to 83 per cent once the token economy was in effect.

Some investigators have used self-recording or self-imposed standards either in conjuction with or in comparison to tangible reinforcers. Felixbrod and O'Leary (1973) examined the effects of reinforcement on grade two children's academic behavior and found that both the externally-imposed contingencies group and a self-determined contingencies group performed better than a no-reinforcement group, but that the self-imposed group became more and more lenient with themselves over a six-week period. Frankel (1973) found that with groups of five in a children's outpatient clinic with the children administering tokens to each other for play participation, friendship choices did affect the trading sequences. In addition, when subjects were allowed to choose their own group activity, they participated more. With a nine-year-old

boy (Milar, 1973), self-control procedures were attempted with regard to the specific behavior of putting either his fingers or a foreign object in his nose or mouth. During baseline and self-recording phases there was little or no improvement but with the teacher recording and tokens as reinforcement there was a significant reduction. However, when Knapczyk and Livingstone (1973) investigated the variable of self-recording as compared to student teacher supervision within a token economy structure, they found that the accuracy of assignments of grade seven to nine students improved as they recorded their own assignment completion. It appears from the research literature that straightforward contingency management with a responsible person (teacher or parent) recording and reinforcing works better with younger children (elementary level) but that as children get older self-recording becomes more effective. This is endorsed by Libb, House and Green (1973) in a comparison of behavior charting and contingency management techniques in two foster homes containing children aged six to sixteen. They did indeed find that self-charting reduced undesirable behavior in the older children but that contingency management was more effective for the younger ones.

In addition to references previously quoted, with regard to specific treatment in reading, operant techniques have also proved very effective with elementary school children (Garcia, 1973; Gray, Baker & Stancyk, 1969; Lahey, McNees & Brown, 1973; Whitlock & Bushell, 1967). Some studies have

shown in addition that once a child has experienced success in reading, his reading behavior does not tend to return to baseline when he no longer received primary reinforcement (Corey & Shamow, 1972). Presumably secondary reinforcers take over, for example, internal satisfaction at performance, external verbal praise, and the interest and entertainment that material which is read now provides.

Studies where token economies have been reported as having failed are not nearly as numerous as the successful ones. There is no real way of determining just what proportion of such studies do fail since some may remain unreported. However, Kazdin (1973) reviews what evidence there is and suggests that failure may be due to any of the following reasons:

1. The backup reinforcer for the tokens may not be strong enough.
2. The response for which tokens are given may not be in the subject's repertoire.
3. The patient may not be aware of the relationship between performance and reinforcement, therefore clear instructions should be provided wherever possible.
4. There may be too long a delay between either performance and token or between tokens and backup reinforcer.
5. The failures may be confined to one subgroup of patients or subjects, for example,

those who experience high anxiety.

For instance, Hanley (1973) demonstrated that normal children aged eight to ten performed better on a finger tapping task than minimally brain damaged children under either high incentive conditions or punishment, while there was no significant difference between groups in the low incentive condition or in a downshift or upshift in reinforcement.

The point about specific instructions too is of importance. Lowe (1973) used verbal reinforcement for achievement statements made by under achieving grade four boys in a counselling situation, without noticeable improvement. This could have been due to lack of backup reinforcement or the dissimilarity of the counselling sessions to the classroom situation. Also it could have resulted from absence of instructions and the failure of the boys to realize what it was they were being praised for.

Parents as Teachers or Therapists

The benefits of a program giving the child individual attention and raising his motivation have been demonstrated in a number of studies involving slow learners and emotionally disturbed adolescents (Staats, Minke, Goodwin & Landen, 1967), juvenile delinquents (Staats & Butterfield, 1965) and problem black children from a ghetto (Staats, Minke & Butts, 1970). Ages have ranged from eight to 15 years; therapists have included high school seniors and adult volunteers (Staats, Minke, Goodwin & Landen, 1967) and, in a pilot study, four

mothers of different occupations (Ryeback & Staats, 1970).

The Staats technique (Staats & Butterfield, 1965) basically is a token economy and makes use of materials specially prepared from the Scientific Research Associates (SRA) Reading Labs. Each lesson comprises three stages:

1. Vocabulary - The child is presented with new words on separate cards. The value of the tokens he receives depends on how quickly he is able to read aloud correctly each new word. Incorrect pronunciations are corrected but no criticism is given. Presentations of words are repeated until they are read correctly.
2. Oral Reading - Paragraphs are presented one at a time with tokens again given for correct reading, with repeated presentations for incorrect paragraphs.
3. Silent Reading and Comprehension - Subject then reads the whole story to himself after which he is given written questions on it, usually multiple choice, and is appropriately reinforced with tokens. A more detailed explanation and step-by-step procedure is given in the Methodology section.

Techniques used by Ryeback and Staats have been successfully replicated by Koven and LeBow (1973) in a single subject, multiple baseline design. Mothers were used as

therapists and there was greater initial supervision of the lessons by the Experimenter than in the Ryeback and Staats study. There were still only three subjects, however, and intelligence test scores were available for only two of them - these were average and above average. Treatment was successful in all three cases over a nine-week period and a follow-up, two months after some additional spelling treatment was terminated, showed high retention in two out of the three subjects. The third child, of above average intelligence, whose parents had recently separated, appeared very anxious and was again lacking in attention. However, since he did respond to reinforcement previously on two occasions, the treatment could almost certainly have been reinstated successfully a third time.

The Staats technique has also been replicated successfully in a clinical setting (Camp, 1971), using aides and volunteers as therapists. In the four case histories given, the author states that an accompanying improvement in behavior was noted as the reading improved.

Behavior modification techniques have been used successfully even by a four-and-one-half-year-old to teach her hearing-impaired sister (Bennett, 1973). The mothers who participated in the Ryeback and Staats (1970) and the Koven and Lebow (1973) studies had had no previous training other than the few sessions provided for that specific program.

Parents have been instructed how to deal with problem behaviors by applying learning principles of removal of

attention by ignoring disruptive behavior and applying reinforcement contingent on performance of cooperative behavior, or whatever the alternative behavior is which is being developed. Treatment sometimes begins in a controlled setting as in the single-subject design involving four case histories by Wahler, Winkel, Peterson and Marrison (1965). Each mother interacted with her child in a therapy room with two one-way mirrors and proper observation techniques. A light was used by the Experimenter first of all to cue the mother how to respond to child's behavior and later as a reinforcer for the mother's self-initiated responses. In only one case of the four was it necessary to use punishment for oppositional behavior in addition to contingent reinforcement for cooperative behavior and this took the form of five minutes isolation in an adjacent room. One problem with behavior management programs carried out in a clinic or other controlled setting is whether or not generalization will occur so that appropriate behaviors will also take place in the home.

Similar techniques were used, for example, quite successfully so that mothers could manipulate the behavior of deaf children running away from mother in supermarket or removing deaf aid from ear (Mura, 1972). Another mother trained her eight-and-a-half year-old- emotionally-disturbed boy with step-by-step sessions videotaped and behavioral feedback given her by closed circuit TV and his abusive behavior decreased (Bernal, Duryee, Pruett & Burns, 1968).

A number of studies involving mothers as treatment therapists for enuresis are reviewed by James and Foreman (1973) in the report of their own study on conditioning.

One novel type of project made use of the Early Childhood Curriculum Guide and Developmental Skill Age Inventory with an individualized curriculum prescribed for each child by the teacher in the home, once a week for one and one-half hours (Shearer & Shearer, 1972). Parents were taught to record responses and they began with one or two prescriptions a week, increasing to four with one in each area, for example, buttoning coat, reducing tantrums, counting objects and jumping might be assigned one week. There were five areas, namely, cognitive, language, self-help, motor and socialization. Candy and happy face stickers were used as reinforcement.

Specific behaviors have been taught to mothers of mentally retarded children. In one case eight mothers were taught with the teacher trainee modelling, to function as educational therapists and to become more aware of their children's needs (Freeman & Thompson, 1973). Through this they all developed more positive attitudes to their children. Similarly parents of four ten-year-old mentally retarded children were taught effective play behavior (Mash & Terdal, 1973). These authors stress the importance of developing parent training methods dealing with non-deviant types of behavior and suggest the evaluation of parent training programs in terms of parent-child behavior as a unit. The

parents in this study involved some mothers and some fathers.

The variable of whether parents taking part are mothers or fathers has not been given much attention. Johnson and Katz (1973) review a variety of behaviors which are treated at home, using the parents as the agents of change. Some studies refer to "mothers" and others to "parents" but do not state which one or whether it refers to both parents' participation. LeBow (1973) in discussing the behavior modification process in relation to parent-child therapy says for a child with a behavior problem one of the given alternatives is:

> "the therapist may instruct the mother (or father, or both) on what to do for the child in order to help him behave more appropriately".

Goldman in a pilot study on children's learning to read in Israel (1973) uses one mother and one father. In some group counselling sessions with "parents of pre-adolescent under achievers" the sample consisted mainly of nonworking mothers to coincide with the psychologists' daytime-only work schedule (Esterson, Feldman, Krigsman & Warshaw, 1973). However, at the request of some of the mothers, some evening sessions were also held to include the fathers.

For the purposes of any study involving lengthy participation on the part of one parent per child, it does not appear to be as important to designate which parent it is as much as to have the parent most willing to take part in terms of interest and availability. For instance, a mother with several small children would probably not have

the opportunity to be alone with any one child and even when the younger ones were in bed would possibly be too tired to want to start instructing and recording.

Reading Improvement and Behavioral Change

Some studies, therefore, have been able to show reading improvement with small numbers of children and parents but few have sought systematically to determine whether there is any concommitant behavioral change. However, certain studies do show that reading difficulty and problem behavior may be related. In the epidemiological survey on the Isle of Wight, an attempt was made to discover relationships between reading difficulty and deviant behavior. The investigators (Rutter, Tizard & Whitmore, 1970) considered this information essential, in order eventually to determine whether the treatment approach should be mainly psychiatric or educational.

It was found that of the four per cent of children aged nine to ten who had specific reading retardation of at least 28 months (as opposed to educational retardation generally) one-third showed antisocial behavior. This seemed an abnormally high proportion compared to the two per cent of the general population who were antisocial. Taking a different approach, out of the entire antisocial group over one-third were 28 months retarded in reading. The rate of reading retardation in the pure neurotic group on the other hand was little above that found in the general population.

The authors discussed three possible ways that this correlation could be interpreted:

1. Antisocial behavior develops as a reaction to educational failure caused by reading difficulties.
2. Retardation of reading is a result of the emotional or motivational difficulties which are at the root of antisocial behavior.
3. Predisposing factors in either the child or the environment cause both.

Retarded readers were found to have had difficulty from when they first started to learn to read, whereas onset of antisocial disorder seemed to be more recent, two-thirds of the group having had some disorder of three years' duration. Exact onset of an antisocial disorder is a difficult thing to pinpoint, however, as some children show antisocial tendencies before committing any overt act.

From the above study, therefore, there is evidence for a correlation between antisocial disorder and reading retardation of 28 months.

The relationship of "Behavior problems" and inability to read was also discussed in connection with the role of the nurse (Bogle, 1974). The author stresses that if reading disability precedes or accompanies social deviance, co-operative work with the interdisciplinary approach is needed, involving the school nurse. He outlined three possible hypotheses:

1. There is a behavior difference between children with and without reading disabilities.
2. High risk population can be identified in the first grade and help given to avoid both deviant behavior and reading disability.
3. That to identify and to help affect a change the multidisciplinary approach is required.

This study made use of grade six cumulative records of 96 children, all black, and mostly of low socio-economic groups and traced back all negative comments regarding their behavior. The criterion used for a reading disability was more than two grade levels below. By this means Bogle was able to study the children's records back as far as grade one when they had been given a reading readiness test, and make several formulations regarding the relationship of reading disability and deviant behavior.

The overall findings showed a significant difference in behavior ($p < .001$) between children with and without reading disabilities. Of the 56 with reading disability, 51 per cent also had deviant behavior whereas only 15 per cent of the 40 children without reading disability were considered to have deviant behavior. Further results showed that of the grade six children with deviant behavior, 90 per cent had failed the reading readiness test in grade one and 72 per cent

still had a reading problem. Of the total children who failed the grade one reading readiness test, 41.8 per cent had deviant behavior as compared to only seven per cent of the 26 children who did not fail it. After a further breakdown of statistics, Bogle concluded that as well as the significant difference between the behavior of children with and without reading disabilities, reading disability did play a significant part in this behavioral difference. He then discussed the role of the nurse in investigating developmental history and family interaction in the homes of children who fail the reading readiness test in grade one and recommended more extensive communication between public health nurse and teacher.

Bakwin and Bakwin (1960) found that ten per cent of American children were unable to read at their grade level and pointed out that they usually only came to the attention of the authorities because they were "truants", "class disrupters" or "dullards". Miller, Margolin and Yolles (1957) had discovered from the court records of adolescents that reading difficulties had also frequently been present.

In the large scale study by the California State Department of Education, which identified emotionally disturbed children in the classroom population, it was found that these children scored significantly lower on reading and arithmetic achievement tests. The higher the school grade, the greater were the differences between the test results of these children and the rest of the class (Bower, 1957).

The prognosis, therefore, may be serious unless the problems are treated early.

Another study which made reference to the relationship of behavior and academic achievement was that of Drabman, Spitalnik and O'Leary (1973). Among eight, nine to ten-year-old boys in a remedial class who were placed on a token economy system to improve their general classroom behavior, it was found that the improved behavior did generalize to parts of the day when they were not in that classroom and that their overall academic output was increased.

Camp and Van Doorninck (1971) in their reading program making use of the Staats technique, note that improvement in reading is often accompanied by improvement in other academic areas and in behavior generally. In their own treatment group they found an almost significant improvement in arithmetic. They state, however, that they do not intend to discuss behavioral aspects because of difficulties involved in measuring behavioral change. Since this change does appear to be indicated, however, it seems the next step in research would be to obtain a measurement of such change.

HYPOTHESIS

Reading Skills

It was hypothesized that in a three-month home reading program of half an hour a day, both contingent reinforcement and attention groups would increase their reading skill on three measures over that of a no-treatment control group, with the increase being greater in the contingent-reinforcement group.

Behavior

For those problem readers who were found at the beginning to have scores significantly deviant from the norm, as measured on behavioral questionnaires completed by teachers and parents, this research sought to determine whether deviance score on such questionnaires decreased with an increase in reading score. The study also sought to determine whether children's anxiety score decreased with an improvement in reading. Since there has been little formal research in this area, this portion took the form of an exploratory investigation and no specific hypotheses were stated regarding deviant behavioral and anxiety scores.

Such correlations as were considered necessary were carried out to demonstrate reliability and validity of measures used and to determine how they could best be used effectively in future research.

METHODOLOGY

Selection of Subjects

The children involved in the study came from grade four (ages nine to ten) in five elementary schools in the city of St. John's, Newfoundland. The schools were located in a variety of areas within the city covering most socio-economic groups. Geographically the children were scattered from the central downtown area to a few miles outside town.

Phase 1 - Preliminary Screening. The majority of the children were initially administered the Durrell Listening-Reading Series, Intermediate Level (Appendix A) which served as a screening test. This was given by the teachers as part of the regular classroom work in order to minimize test anxiety. In the case of two schools the children had already received the Stanford Achievement Test so it was not considered necessary to duplicate results and these scores were used for screening purposes instead. By April 1975, these children should have been scoring at a grade 4.7 or 4.8 level. Of the first four schools examined, all children scoring 3.3 or less on the screening test were selected for further testing. By the time testing began at the final school, since the year was further advanced a few subjects were taken who scored slightly higher - around the middle of grade 3 level. In addition children who were absent for the screening test, or who scored on the borderline but were referred by their teachers as problem readers, were also

included for further testing. In all, there were 105 children to be tested individually out of a classroom population of approximately 350 students.

Phase 2 - Reading Measures. Three individual oral tests were given to each child, as follows:

1. The Wide Range Achievement Test (WRAT) (Appendix B) Level L - reading section only, to determine grade level of reading achievement.
2. One hundred random words selected from SRA Reading Laboratory 1C, grade 1 through grade 4 readers (Appendix C). Children who were up to date with their reading should have had an almost perfect score on this.
3. A relatively simple paragraph taken from a story at approximately half way through grade 2 level which everyone should have been able to read without any problem (Appendix D). The measurement here was the number of errors made, counting each incorrect word or part of a word as one error. Omissions or extra words inserted were also counted as errors unless they were spontaneously corrected by the child.

Phase 3 - Measurement of Intelligence. All children scoring 3.6 or less on the WRAT were administered the Wechsler

Intelligence Scale for Children - Revised version (WISC-R) (Appendix E). In addition two children scoring at a 3.8 grade level on the WRAT were included since their scores on the one hundred word sample were only 69 and 56, respectively. Children with a full scale intelligence of less than 80 were then excluded from the treatment program since it was felt that in relation to their intelligence score they were already reading up to capacity and this would only introduce another variable. The WISC-R was chosen for this purpose as it provides a thorough individual assessment of each child and as well as yielding an intelligence measurement, at the same time may prove of value diagnostically for referrals of children with severe learning difficulties. It is worth noting that of the eventual subjects taking part in the experiment, 80 per cent had a verbal score lower than performance.

Phase 4 - Final Selection and Distribution of Subjects. The 46 children who met the necessary criteria for inclusion in the investigation were then matched in threes on the two main reading measures (WRAT and one hundred word sample) and on WISC-R intelligence scores. Then each one of the three was randomly assigned to one of three groups - Contingent Reinforcement (R), Attention (A), or Control (C).

The parents were then approached as to their willingness to take part. Some were told they would start immediately and others that they would be on a waiting list and would start in three months' time. Based on previous and current

literature the variable of which parent participated did not seem to be as relevant as which one had the most time and was the most willing to participate. The other parent, however, would be encouraged to take an interest in order to help out, if necessary, because of illness or other unexpected circumstances.

It was necessary to have a control or "waiting list" group from the beginning, whose parents had declared their willingness to participate, on the understanding that if the treatment proved successful they would be provided with the techniques and materials at no cost to themselves. By this means one would ensure that no additional variables were involved (for example, mother refusing to take part because she does not have sufficient interest in the child). There were also practical problems of having questionnaires completed and testing children before and after the experimental treatment period, which required all parents' cooperation.

There were currently remedial groups operating in some of the schools, of varying sizes and time involvement. It was felt that, having matched the children on intelligence and reading ability and then having randomly assigned them to groups, this should control for any differences occasioned by instruction in school. All subjects had had vision and hearing checked by the school nurse within the previous few months.

Of the original 46 suitable subjects, seven did not take part in the final project, for the following reasons:

- One child's parents were unable to read themselves. It was necessary for any parent taking part to be reading at least at a grade four level.
- One left town before the program started.
- Two mothers were reluctant even to discuss the program and kept making excuses not to see the experimenter.
- One of the control group was to be away most of the summer so the mother could not commit herself to take part at the later date.
- One of the control group could not be located to take the final measures after the three-month treatment program was over.
- One of the mothers originally assigned to the Contingent Reinforcement group dropped out after two weeks, having spent very little time on the lessons, saying she did not have the patience to go on with it.

Before-treatment means and standard deviations for all groups, therefore, were computed without these seven subjects. They are shown in Table 1.

A one-way analysis of variance was performed on each of the six measures and no significant differences were found between groups on any of the measures ($p > .05$). The resulting F values are given in Appendix K.

TABLE 1

Means and Standard Deviations of Reading and Intelligence Measures for Treatment and Control Groups

	$\bar{X}$ Group R (N = 13)	$\bar{X}$ Group A (N = 15)	$\bar{X}$ Group C (N = 11)
WRAT - Grade Level	2.885 (s.d.0.494)	2.873 (s.d.0.549)	2.845 (s.d.0.597)
100 Words	55.23 (s.d.14.433)	50.933 (s.d.14.988)	52.363 (s.d.15.852)
Errors	4.38 (s.d.4.469)	8.933 (s.d.9.191)	6.364 (s.d.5.244)
Verbal IQ	91.846 (s.d.10.437)	89.867 (s.d.11.772)	91.818 (s.d.11.521)
Performance IQ	101.769 (s.d. 12.029)	95.533 (s.d.13.323)	105.273 (s.d.11.777)
Full Scale IQ	96.0 (s.d.8.367)	91.933 (s.d.12.904)	97.636 (s.d.9.997)

Behavioral Questionnaires

In an endeavor to measure any behavioral changes which accompanied change in reading, three separate questionnaires were used. There had been no precedents set in this particular area in relation to reading change, so the choice depended on which measures had been generally successful and well researched in other areas of behavior. Whether or not they proved sensitive for this particular purpose would in any event provide a basis for future research.

Before treatment began the following measures therefore were administered:

1. A Children's Behavior Questionnaire for Completion by Teachers (Rutter, 1967) Appendix F)

   This scale was developed from and intended for children between seven and 13 years. The original sample comprised several classes in eight different schools in the Isle of Wight, England, and whenever possible two or more teachers completed the scale on the same child. Specific behaviors were first defined by the teachers and then observed by the author. Rutter found that two-point scales sometimes led to disagreement between teachers while many did not make fine enough discriminations to use a four or five point scale; so a scale of three was found best suited for the purpose. The 26 statements about behavior, therefore, are rated "certainly applies", "applies somewhat" or "doesn't apply" - 2, 1 or 0, respectively. The range of total score is from 0 to 52. The classification of disorder is a two-stage procedure. Stage one assesses those children having a total score of nine or

over as having some disorder. Out of these children stage two discriminates antisocial from neurotic disorders. The neurotic subscore is obtained by summing the scores for items 7, 10, 17 and 23, and the antisocial subscore by summing items 4, 5, 15, 19, 20 and 26. Children with either score greater than the other are diagnosed accordingly. When the two subtotals are equal the diagnosis is undifferentiated.

Reliability of the Behavior Questionnaire for Teachers. Regarding the Test-retest reliability, four teachers rated 80 boys and girls two months apart and a correlation of .89 was obtained. As an indication of the inter-rater reliability, 70 children were first rated by four teachers in one school and then by four different teachers four months later when they went to a new school. The reliability coefficient was .72.

Validity of the Behavior Questionnaire for Teachers. Regarding the discriminative power of the Behavior Questionnaire, 55 boys and 31 girls aged nine to 13 from the general population in Aberdeen were compared with

(1) 22 boys and 12 girls at the Children's Hospital Psychiatric Clinic in Aberdeen and

(2) 46 boys and 29 girls at the Maudsley Hospital.

As with previous pilot studies the best discriminating score was nine or over. The incidence of this in the general population was 11 per cent of the boys and three and one-half per cent of the girls, compared with 80 per cent of the boys and 60 per cent of the girls in the clinic.

Rutter's Behavior Questionnaire has been cross-validated a number of times with continued high reliability and validity. Even though a few false negatives and positives are unavoidable, it was considered an adequate instrument for the present study since it was not being used for diagnostic purposes but for comparing differences in each child before and after treatment.

In view of the fact that end-of-term was only six weeks away and teachers were very busy, it was decided to measure the change only in those children scoring five or over. This group comprised 23 subjects. The original pre-treatment means for these 23 subjects, divided into their respective groups, were 7.125 for the Contingent Reinforcement Group (N = 8), 10.1 for the Attention Group (N = 10) and 9.2 for the Control Group (N = 5). An analysis of variance on these means showed that the groups were not significantly different ($p > .05$). The ANOV summary is given in Appendix L. Since schools were closing for the summer, teachers were asked to complete the second questionnaire six weeks later (before the treatment program had terminated).

2. Parents' Behavior Questionnaire (Rutter, Tizzard & Whitmore, 1970)

This questionnaire was administered to all parents taking part in the project (Appendix G) before and after the treatment period. This is a parallel instrument to the questionnaire for teachers and gives a measure of the child's behavior in the home. The severity of various symptoms is appropriately weighted for scoring from 0 to 2, giving a total possible range of 0 to 62. The Questionnaire has also been used to discriminate between neurotic and antisocial disorders, the neurotic subscore being obtained from items C, G, V, 6 and 15 and the antisocial subscore from items III, 3, 13, 17 and 18. Once again the classification of disorder is a two-stage procedure:

(1) children with a total score of 13 or over are classed as having some kind of disorder and

(2) of those children whichever is the higher subscore would place them in either the neurotic or antisocial category.

Reliability of Behavior Questionnaire for Parents. The Test-retest reliability using a two-month interval for children aged nine to 13 is .74. The inter-rater reliability

between father and mother is .63. Since this is a fairly high correlation but by no means perfect, it was important that the same parent filled out both "pre" and "post" questionnaires.

Validity. Validation studies have been carried out by administering the questionnaire to parents of 99 boys and 99 girls in the general population of Aberdeen and to a clinic sample (72 boys and 48 girls) from the Maudsley Hospital. The incidence of a score of 13 or more in the general population was 15.1 per cent of boys and 8.1 per cent of girls compared with 70.8 per cent of boys and 66.6 per cent of girls in the clinic sample. Comparisons were made of diagnosis on the basis of the questionnaire and diagnosis previously made from case notes of those children with a score of 13 or higher and there was approximately 80 per cent agreement between the two.

Of the 37 parents from the present sample who returned both copies of the questionnaire, means were computed for the different groups from the pre-treatment scores. They were as follows: Contingent Reinforcement - 9 (N = 13); Attention - 9 (N = 13); and Control - 8.363 (N = 11). An analysis of variance showed that there were no significant differences between groups ($p > .05$). The ANOV summary is given in Appendix L.

3. Oral Administration of Sarason's Test Anxiety Scale for Children (TASC) (Sarason et al., 1960) (Appendix H).

This questionnaire, having 30 items,

was administered to all children before and after the treatment period. It consists largely of school items. The child was told that nobody besides the Experimenter would know his answers and that all he had to do was answer "yes" or "no". This test has been well validated by the authors. It usually precedes the General Anxiety Scale for Children (GASC) but it was decided not to make use of this additional questionnaire for the following reasons:

- It was not wished to suggest fears to the children which may not even have been considered. A number of items on the GASC tend to do this; for example, "When you go to the dentist, do you worry that he may hurt you?"; "When your mother is away from home, do you worry about whether she is going to come back?", etc.
- A total of 75 questions would be too time-consuming and tiring for the child.
- The TASC questions alone, which concern school worries, are much more

pertinent to the particular situation under investigation.

Two of the pre-treatment questionnaires were inadvertently not completed; but of the remaining 37, means before treatment were as follows: Contingent Reinforcement - 34 (N = 13); Attention - 33.615 (N = 13); and Control - 26.454 (N = 11). A further analysis of variance was performed which showed no significant differences between groups ($p > .05$). The ANOV summary is given in Appendix L.

Reading Instruction - Materials and Preparation

The main basis for preparing the reading kits followed the Staats, Minke, Goodwin and Landen (1967) procedure. In this case the Scientific Research Associates (SRA) Labs 1C was used. This material is graded into tenths of grade units with 20 stories at each stated level (see Table 2). On the average, each story has 18.5 new words. When used in the classroom it is not considered necessary to read the whole 20 stories at each level but throughout this experiment each child did read the complete 20 before progressing to the next level. As well, all children were started at a level just below that attained on the WRAT as it was felt that many had failed to learn certain basic words at school earlier on and that this was partially responsible for their current difficulty.

Each lesson, representing one story, consisted of:

1. New vocabulary words, each cut out and

glued on to an index card - one word per card. In this study, the size used was $3\frac{1}{2}$" x 5" cards cut in half.

2. One copy of the story was cut into paragraphs and each paragraph was stuck on a separate index card, $3\frac{1}{2}$" x 5", and numbered.
3. One copy of the whole story.
4. Questions from the "How well did you read?" section of each story - usually 5 to 7 in number.

TABLE 2

Description of the SRA Reading Material Used

Color	Reading Level	No. of Words per Selection
aqua	1.4	70-80
purple	1.7	100-125
orange	2.0	175-225
olive	2.3	300
blue	2.6	350
brown	3.0	400
green	3.5	450
red	4.0	500
tan	4.5	600
gold	5.0	700

Other materials required were a notebook (to serve as a "bankbook") and marker for each person in both treatment groups (28 of each) and a box of poker chips for each person in the Contingent Reinforcement group (13). These are standard boxes obtainable from any novelty store and contain 50 white chips and 25 each of red and blue.

Typed instructions of the lesson procedure were prepared for both treatment groups (Appendices I and J).

Group Procedures

Group 1 - Contingent Reinforcement Group (R). This was the main experimental group. Parents were visited in their own homes. Several of them had younger children, and some worked during days or evenings; so it was more convenient to arrange individual visits at a time suitable to them. The first visit was quite short, and was with the parent(s) only. They were told a little about the program, that it would involve half an hour a day for three months, and why it was thought that their child could benefit by it. They were also shown a sample reading kit, and were then given a set of instructions to read (Appendix I). A time was arranged for the first reading lesson the following week.

Session Procedure. At this time the child was present also and a sample reading lesson was conducted step by step with the mother presenting the cards to the child under the supervision of the Experimenter.

Instructions were as follows:

"Each envelope contains one lesson and each lesson has three parts. First of all the vocabulary (demonstrate small vocabulary cards); then the paragraphs (demonstrate); and finally the whole story and questions on it (demonstrate both).

1. Vocabulary

"We'll start with the vocabulary. You show Peter (etc.) the first word and ask him to read it aloud. If he says it correctly the first time, give him a white poker chip (medium value) and put the card down on the table which means it's finished with. However, if he says it incorrectly or needs any help from you, tell him what the word is and get him to repeat it after you as he looks at it. Explain the meaning to him if the word is unfamiliar. Then put the card behind the others in your hand so that you'll come back to it later." The parent would then go through the vocabulary accordingly with any necessary corrections made as the lesson progresses. Both in the written instructions and at this time it was stressed that mistakes should be corrected non-critically and correct responses should be acknowledged in an encouraging way, for example, "Right!", "Good!", "That's it!",

etc. The Experimenter joined in with such encouragement when necessary in order for modelling to take place if the mother was not accustomed to giving such encouragement. When words were read successfully after the first time around, the child received a blue poker chip (low value).

2. Oral Reading

Similar instructions were given for the paragraphs. If a child read a paragraph perfectly without any mistakes or help he received a red poker chip (high value) and the card was placed on the table. If he required help the card was placed behind the others and read again later. When he finally read it carefully, he received a white poker chip (medium value).

3. Silent Reading and Comprehension

The child then read the whole story silently to get the sense of it once he knew how to read it and received four white tokens as long as he was concentrating and scanning. He then answered the questions. The parent was permitted to help with reading questions aloud if the child wished; then when the child had answered them on the paper the parent checked the answers and gave a red token (high value) for each correct answer. If an answer was wrong the child was asked to

re-read the paragraph where the correct answer might be found and then to do the question again. This time he received a blue token (low value) for a correct answer.

A number of the children were able to complete an entire lesson a day but it was pointed out to the parents that they should stop at the end of half an hour regardless of where they had reached and continue on from that place the following day. At the end of each day they were to record in the notebook how many tokens were earned of each color and at what point they finished each day (lesson number and section).

Token Value. Rates of tokens were always announced ahead of time. To begin with, it was decided to increase the value from that stated on the instruction sheet (i.e. red = $\frac{1}{2}$¢, white = $\frac{1}{5}$¢, blue = $\frac{1}{10}$¢) due to inflation and bearing in mind Kazdin's (1973) warning that reinforcement should be sufficient. The values, therefore, for the first four weeks were: red = 1¢; white = $\frac{1}{2}$¢; and blue = $\frac{1}{5}$¢. In addition bonuses were given as in the Camp and Van Doorninck (1971) study to provide initial encouragement, at the discretion of the experimenter. That is, if a child had obviously been working hard, but results were slow at first, bonuses were given to increase the reward; however, if a child's earnings were low because he had not put the required time in, then he would just get what he had earned. The fifth and sixth week the rates were the same but there were no bonuses. The

seventh and eighth weeks red and blue values remained unchanged but it was necessary to earn three white chips for 1¢ instead of two. The ninth and tenth weeks red became worth $\frac{1}{2}$¢ instead of 1¢ and white and blue were still worth $\frac{1}{3}$¢ and $\frac{1}{5}$¢, respectively. There were, however, bonuses in effect once again. Then for the last two weeks bonuses were again removed. These rates were in effect for all children, with two exceptions: subject nine worked extremely slowly and with difficulty so the original rates were maintained throughout. The mother of subject one had to go into hospital for a hysterectomy half way through and for a period of three to four weeks there was no one to help him since it was a one-parent family. Therefore, when they started lessons again the same rates were kept in effect, and that child's total instruction period was two months rather than three months. The effect on his own progress and on the overall analysis is discussed in the Results section.

Visits. Weekly visits were paid initially to all parents for a period of six weeks. These took the form of sitting in on the reading lessons, providing verbal reinforcement to both mother and child, calculating the amount earned by the child from the tokens recorded in the book and paying the child his/her earnings, and discussing any problems which were being experienced. Visits were then reduced to every two weeks until the end of the program (12 weeks altogether).

Group 2 - Attention (A). Reading instructions and materials for this group were identical to the Contingent

Reinforcement Group except that no poker chips were given for correct reading responses. The children were paid $1.00 a week for taking part in the program. In only two cases was the $1.00 withheld on one occasion each, because little or no work had been done since the week before and in those cases it was explained that an extra week would be added on at the end of the program to give the child the chance to earn the same amount of money. At the same time this would keep the total amount of time spent at the program more or less constant between subjects. In these cases it was stressed to the parents that the program was of a nature which required their help and that the child could not be expected to carry on by himself.

Written instructions for this group were also provided (Appendix J). Parents were also asked to keep a record in a notebook and instead of recording tokens they were just asked to note where each lesson began and where it ended and the day's date.

It was not explicitly stated to parents that there were two different groups. However, if a child had been comparing notes at school and queried the fact that a classmate was receiving a different amount of money, it was then explained that there were two different groups and that they were being paid in slightly different ways. This explanation seemed adequate for both parents and children.

Number of visits was also kept constant between treatment groups (R and A) so that experimenter-attention

was not a variable. The only manipulable variable, therefore, was the contingency which operated in group 1.

Group 3 - Control (C). This was a no-treatment "waiting list" control group. Apart from the initial visit where the program was explained briefly and the parents agreed to participate, there was no contact at all during the 12-week treatment period between experimenter and parents. As mentioned in the introduction it was impossible to control for any intermediate measures the parent might take to improve the child's reading and one or two did in effect encourage the child to read books on his own once the holidays began.

Post-Treatment Measures

At the end of 12 weeks subjects from all three groups were given the following repeat measures:

1. WRAT - Reading Level 1;
2. 100 random words from SRA Labs;
3. Paragraph from grade 2 story;
4. Anxiety Scale (TASC).

The parents (all except two) completed another questionnaire. The teachers' questionnaire, as explained previously, had already been repeated for 23 subjects at the end of six weeks when school closed.

RESULTS

Reading Measures

WRAT - Reading Level 1. The measure here was the amount of change in grade level. Table 3 shows individual scores and means for the three groups.

TABLE 3

Individual WRAT Change Scores and Group Means

Contingent Reinforcement (N = 13)	Attention (N = 15)	Control (N = 11)
.5	.9	.7
.9	.4	-.2
.7	.5	.2
1.8	1.1	-.2
.9	0.0	.8
1.2	.2	1.1
1.9	-.1	.2
1.2	.3	.5
.7	.3	.5
.6	.9	.7
.3	1.2	-.2
.4	-.2	
.8	1.1	
	.3	
	.2	
$\bar{X}$ .915	.473	.372

An analysis of variance was performed and results were found to be significant at a .05 level (F = 4.803), and approached significance at a .01 level. Table 4 summarizes the results of this ANOV. A Scheffé procedure was used to compare group means; the results are shown in Table 5. The Contingent Reinforcement group was found to be significantly different from the Attention group at a .1 level (see footnote to Table 5).

TABLE 4

Summary of ANOV for Change in Grade Level

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	209.961	2	104.98
Within	786.809	36	21.855
Total	996.77	38	*F=4.803

*F required for significance at .05 level = 3.26
F required for significance at .01 level = 5.25

There were no significant differences between Attention and Control groups although the means were in the expected direction.

On the final Scheffé (Table 5) between Contingent Reinforcement and Control Groups there was a significant

difference, this time using the required level of F for significance at .05 level, when computing F prime.

TABLE 5

Summary of Scheffé Procedures

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{sw^2}{n_1} + \frac{sw^2}{n_2}}}$$

Groups R & A $t = 2.495$

$F = t^2 = \underline{6.225}$

From tables F required for significance at .1 level* = 2.84

$F' = 2 \times 2.84 = \underline{5.68}$ - significant

Groups A & C $t = .54$

$F = t^2 = \underline{0.293} < F'$ - not significant

Groups R & C $t = 2.834$

$F = t^2 = \underline{8.031}$

F required for significance at .05 level = 3.26

$F' = 2 \times 3.26 = \underline{6.52}$ - significant

*when computing F prime it is considered sufficiently accurate to take the F which is required for significance at a .1 level (Scheffé, 1959)

These analyses included results from subject 1, whose treatment period, as explained in the Methodology section, was shortened by one month.*

100 Random Words from SRA Labs. On the 100 random words taken from the SRA Labs 1C, which were also the training materials, the measure was "number of words increase". Table 6 shows individual amounts of increase and means for each group. An analysis of variance summarized in Table 7 resulted in an $F = 8.884$ which was significant at the .01 level. In the Scheffé Comparison of Means (Table 8) there was no significant difference between the Contingent Reinforcement and Attention groups ($p > .1$). However, there were significant differences between the Contingent Reinforcement and Control groups and between the Attention and Control groups, both results $p < .01$.

Decrease in Errors. The mean changes here were 3.23 words (R), 6.333 (A) and 3.181 (C). Although the greatest change was found in the Attention group, there was greater room for change here; since the original mean and standard deviation were larger (although not significantly so) than the other two groups. However, an analysis of variance showed that this difference was not significant. The decrease in error score was not such a reliable measure as the other two since there was too much variability and there was also

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*An ANOV, dropping Subject 1 from each group was also performed, yielding $F = 5.56$. This is significant at a .01 level. In the Scheffé procedure between groups R and A using data from this ANOV, F' became significant at a .05 level ($F' = 6.52$, $F = 7.51$).

TABLE 6

Individual Random Words Change Scores and Group Means

Contingent Reinforcement (N = 13)	Attention (N = 15)	Control (N = 11)
14	28	12
11	23	0
23	19	23
21	22	-1
22	25	1
38	20	10
20	14	6
16	25	23
40	16	16
32	14	5
14	17	11
16	24	
28	22	
	25	
	5	
$\bar{X}$ 22.692	19.933	9.636

TABLE 7

Summary of ANOV for Change in Score on 100 Random Words

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	1111.649	2	555.824
Within	2252.249	36	62.562
Total	3363.898	38	*F=8.884

*p < .01

TABLE 8

Summary of Scheffé Procedures

Groups R & A	t = 0.92	
	$F = t^2 =$	0.846
	F' (p ≤ .1) =	5.68 - not significant
Groups A & C	t = 3.28	
	$F = t^2 =$	10.76
	F' (p < .01) =	10.5 - significant
Groups R & C	t = 4.029	
	$F = t^2$	16.23
	F' (p < .01) =	10.5 - significant

a ceiling effect in a number of subjects who did not make mistakes. It was only therefore in the worst readers that the decrease in errors was really noticeable and here there were some quite dramatic results such as 17 to 0 (R subject) and 19 to 5, 16 to 0, 34 to 15, 18 to 0 (A subjects).

Behavioral Questionnaires

Teachers' Questionnaire. Mean decreases in score over a 6-week period were 1 (R), 2.9 (A) and .667 (C). An analysis of variance showed that these differences were not significant. It should be noted that these changes were measured only over a 6-week period instead of 12 weeks because of the school holidays. There were a few actual increases in scores; 4 in the R group, 1 in the A group and 2 in the C group.

Parents' Questionnaire. Means here were surprising in that both Contingent Reinforcement and Attention groups showed negative means, that is increases in score of .307 and 2.769 respectively, while the Control group mean was positive, that is a decrease in score of 1.909. The analysis of variance and Scheffé procedure showed the differences to be not significant although comparison of the Attention and Control group means did approach significance at a .1 level in the reverse direction from what would have been expected. Possible implications of this as regards the usefulness of this questionnaire as a behavioral measure will be discussed in the final section.

Anxiety Questionnaire. Here the means (representing decrease in anxiety) were in the expected direction, although the analysis of variance showed the mean differences to be significant only at a .25 level. The mean change in anxiety scores were: 5.923 (R), 2.153 (A) and -3.272 (that is, an increase in anxiety) (C).

Correlations

The following correlations were done in an endeavor to discover more about relationships between reading measures themselves and to find out more about the nature and relationships of the behavioral measures in order to determine whether they can be effectively used in future in academic studies of this nature.

WRAT and 100 Words. The correlation before treatment was computed using scores of all 39 subjects and was found to be 0.744 which is significant ($p < .01$). After treatment, in spite of different outcomes for different groups, there continued to be an overall correlation between these two measures of oral reading, this time 0.795 (significant $p < .01$), indicating that for grade four students the 100 random words is an acceptable measurement to use for word recognition skills and is especially useful when making before and after treatment comparisons.

Parents' Questionnaire Before and After Treatment.

Because of the generally increased scores after treatment in both experimental groups, the question as to the

validity of this questionnaire in studies of this nature was raised and explanations sought as to the increased scores. To aid in this investigation three more correlations were done:

1. All subjects whose parents had filled in questionnaires (N = 37) - A correlation was performed with before treatment and after treatment scores. This was to ensure the overall reliability of the questionnaire with this particular sample. The correlation coefficient was .71, highly significant ($p < .01$). This was almost identical to the original test-retest reliability coefficient which was .74 over a two-month period (Rutter, Rizzard & Whitmore, 1970).
2. Because of the apparent increase in scores in the two treatment groups, a separate correlation was performed for R and A parents combined (N = 26) before and after treatment. This lowered the correlation to .63.
3. To see how this effect compared with that of the control group and to preclude the change in correlation being due to the second questionnaire's being administered during the holidays, a correlation was

carried out between pre- and post-treatment scores of the Control group. This produced a correlation coefficient of .89, higher even than the original Isle of Wight sample.

Other Correlations. The final set of correlations was between some of the different behavioral measures, using R and A subjects only (N = 26). Teachers' and Parents' before treatment scores produced an extremely low correlation of 0.047. However, teachers' questionnaire scores before treatment compared with parents' questionnaire score after treatment raised the correlation to 0.223. Implications of this will also be discussed in the next section.

The correlation coefficient between teachers' questionnaire and Anxiety Scale for all subjects (N = 37) was 0.417 which is significant ($p < .02$).

Individual Questionnaire Items

In order to learn more about common characteristics of the children in this sample and for future use in compiling questionnaires, an examination was made of total scores on each item of the Parents' and Teachers' questionnaires of subjects in all groups. Details are listed in Appendix M.

While appreciating that the frequency of checking such items is statistically meaningless without obtaining similar data from non-problem readers, a record of these items, compared with items which are checked less frequently, might

be of use in compiling future behavioral questionnaires in studies on reading disabilities.

Summary of Results

Reading Measures. The two main reading measures showed significant but varying results. On the WRAT there were significant differences ($p < .05$) between the Contingent Reinforcement and Attention groups and between the Contingent Reinforcement and Control Groups, but not between the Attention and Control groups. On the 100 Random Words, however, there was no significant difference between Contingent Reinforcement and Attention groups but there is a significant difference between Contingent Reinforcement and Control, and Attention and Control groups at a $p < .01$ level. This showed that both treatments had been successful as regards specific training materials, but only the contingent reinforcement treatment had been effective in producing a more generalized achievement. Correlation between the two measures remained high before and after treatment.

Behavioral Questionnaires. No significant differences were found here although changes in the Anxiety Scale score were in the expected direction with mean decreases 5.923 (R) and 2.153 (A) and a mean increase of 3.272 in the control group ($p = .25$). There was a positive correlation of .417 between Teachers' Questionnaire and Anxiety Scale ($p = .02$).

DISCUSSION

Interpretation of Results - Reading Program

The results were somewhat unexpected since they were different for the two main reading measures. Yet the two measures, WRAT and SRA 100 Random Words, were fairly highly correlated before and after treatment (.744 and .795). It appears, therefore, that using this reading method, individual attention and $1.00 a week for taking part can produce a significant change in word recognition when the stimulus words are taken from the training materials. For a more generalized effect over this particular time period it seems the addition of the contingency aspect of reinforcement is necessary.

From regular observation of reading lessons in the Contingent Reinforcement and Attention groups the most logical and straightforward explanation of the above is that the tokens raise the motivation of the children and they are actually more willing to try a new word unaided and often read it correctly the first time. They acquire a "set" to do this during training so that by the time final test measures are taken they are prepared to try words they have not actually learned. During training, however, the Attention group may, without completely concentrating, say a word which looks similar to the stimulus word or simply say they do not know the word and are then told the answer, without being penalized for it. This is also a "set". When they are

presented with the 100 Random Words after treatment they have improved because they have learned most of the words through the enforced repetition which is part of the reading method. When presented with new words, however, on the WRAT, even ones which are spelled phonically, for example, "plot" or "bulk", they have not developed confidence in their ability to tackle new words and are likely to say what first comes into their head - "pilot" or "plot" or "bluk" or simply, "I don't know".

The results of the Attention group coincide with those of Ellson, Harris and Barber (1968) who found that their final results showed significant effects of tutoring in the Ginn achievement scores, having used Ginn reading readiness materials throughout, but no change in the Stanford Achievement scores which were less familiar materials. Camp and Van Doorninck (1971) found similar results even though they used contingent reinforcement. In their study, however, the children received two half-hour lessons a week compared to half an hour a day in the present study. They themselves suggest that more frequent instruction or a longer duration appears to affect a change in the WRAT reading score.

Frequency and regularity seem essential no matter what method of remediation is used. As well as forming a disciplinary habit for the child it makes learning easier when the previous day's lesson is fresh in the mind. A certain amount of discipline is required on the parent's part to carry this through. Even though children are delighted

at first to take part and to receive monetary gains, the novelty does wear off after a while. The best way of keeping children at the task is of course by setting a good example and a parent, no matter how busy he or she is, must always set aside that half an hour a day as an important commitment.

Parents in this study were for the most part conscientious about the program. Most of them would mention informally if they had missed a day and the notebooks were a formal record of the time they put in. Periodic spot-checks were also made of the question sheets. An extra variable involved here could be that some felt an obligation towards the university which was financing the project. Results could have been different if the parents were providing the money themselves, particularly among the less affluent of them. Whether or not the parents were working did not seem to be a variable as to how conscientious they were. If a mother was going to make time for her child she did it no matter how many other commitments she had. There were some mothers working in full-time jobs, with large families to raise, who made a point of sitting down with the reading materials at a specific time every day. On the other hand, the one lady who dropped out near the beginning used to sleep till noon every day and did not work but still "could not find the time or the patience".

Most parents and children did not work with the same regularity during the second half of the program. The reason for this on the surface appeared to be because of the school

holidays. Friends would come and call just as the children were starting the lesson or they did not want to come in from outside, or simply neither children nor parents felt it was fair doing schoolwork when school had finished for the summer. The Newfoundland summer is very short so that people take advantage of it when it comes and spend all the time they can outside. Yet the holidays may not have been the entire reason. Subsequent to data collection at the end of July, the "waiting list" or Control group was started on a similar program and they too worked conscientiously at it for the first six weeks, even though they were on holiday. Then they too began to slow down, and the reason given this time was the fact that school had started again and that the other homework left them little time for the reading program.

This suggests that during the first six weeks the program is a novelty and the child, his motivation increased, works at his maximum capacity. Then possibly through a process of fatigue, or reactive inhibition, the motivation is lowered and the system and reinforcers become less meaningful. Knowing that the program is half over could also affect the motivational aspect. Ellson, Harris and Barber (1968) show parallel findings in their study where the most gains are demonstrated at the midpoint. The duration of their study is longer. However, the frequency of lessons was much less so that in actual lesson time their findings are comparable. One concludes, therefore, that if one is planning to use the

system on a long term basis, innovations should be introduced periodically or else some change of reinforcement might be made. In a school setting this could take the form of various privileges - leaving early, class responsibilities, attending movies. An alternative method would be to work at the program for six weeks; then have a break for a month; then resume. This way the program would cease each time at a point when the child's motivation and enthusiasm were still high. It might also help if the child were under the impression that the program was twice as long as the one intended.

Interpretation of Results - Behavioral Questionnaire Scores

The Results section on behavioral scores is self-explanatory with very little in the way of significant results. The only significant correlation of any kind was .417 between the teachers' questionnaire and the children's anxiety scale ($p = .02$). This, combined with the variability of the parents' questionnaires, suggests that the teachers' questionnaire might be the more objective measure and that this and the anxiety scale might be made use of in further research into behavioral correlates. A possible explanation as to the reverse direction of scores on the parents' questionnaires is that, as the parents come to work with their children and spend time with them on a regular basis, they become more aware of problems in behavior associated with learning which are obvious to the classroom teacher. There is also the possibility that as they come to know the Experimenter during

the series of visits they become a little more honest in their appraisal of the child than when giving out information initially to a stranger. It is unlikely that the child's being at home more due to holidays is the explanation since there was no change in the Control group's scores and there was a higher test-retest correlation for the Control group.

Other Variables to Consider in Relation to the Reading Program

Financing. Already mentioned is the factor that the university was financing the project. This had two advantages. First of all the parents felt that the university was taking an interest in their children and tried to co-operate as much as possible. Many comments were received to the effect that they were grateful such a program had been started and that it was an excellent opportunity for the children to earn money for their holidays.

The other advantage was that reinforcement was both regular and predictable. It has been noted since, that when applying the method within another school system where parents were paying the children themselves, they would not always have the ready cash. Although they would pay the children eventually, the additional variable of delayed reinforcement was being introduced. Even though any system using secondary reinforcement involves a delay in the primary reinforcement to an extent, at least in a controlled study the exact time of primary reinforcement is predictable and the children in

the present research knew that they would always be paid regularly, even in a snowstorm.

Age. Another variable for the success of such a program could be age. This study demonstrates that the reading method with contingent reinforcement works for the majority of grade four students. This particular age group was chosen because they were old enough to determine if they had a serious reading problem, yet at the same time young enough to benefit from training. If the children selected had been two years younger it would be difficult to distinguish between a genuine reading difficulty and a developmental or a perceptual lag which is maturational. Older students might be more resistant to training, having already experienced more failure associated with reading. In addition contingent reinforcement might not be the best method for grade six and seven students. The older ones in the foster home study (Libb, House & Green, 1973) showed a greater reduction in undesirable behavior from self-charting, while contingency management proved more effective for the younger ones. It should be stressed too that children this age require discipline in the sense that the program must be both structured and fully supervised. In the Felixbrod and O'Leary study (1973) the self-determined contingencies group, although performing well at first, gradually became more and more lenient with themselves. In the present research, too, some children would try and get away with a less-than-perfect reading of a word or paragraph and it was necessary for the

parents from the start to maintain a consistent attitude. When one becomes a little more familiar with the method it is possible to relax the expectations a little and indeed in certain individual cases it would seem desirable, either with a highly anxious child or with a child whose own expectations are so high that a single mistake is viewed as a failure. However, for the purposes of this study parents were encouraged to adhere strictly to the method.

Locality. This study took place in a Newfoundland city. Norms on the WISC for Newfoundland city children parallel those of the regular Canadian norms. The main difference is that of dialect, however, which can sometimes produce "errors" such as "we likes" instead of "we like". The possibility of an interference effect from dialect is discussed by Walker (1975) who cites references for and against in the literature on black children with dialects in parts of the United States. His own study, conducted in a small harbor town did not show an interference effect in the way children performed in oral reading at a grade three level although he stated this did not necessarily mean there had not been interference in the development of their reading skills up to that point. He also recommends that teachers should not correct dialect-based errors and distinguishes between such errors as opposed to errors which do actually interfere with the reading process:

Text:

Rabbits Are Scarce This Year

Oral Reading:

(1) Rabbits bees scarce this year.

(2) Rabbits are scared this year.

In the second oral reading the substitution of "scared" for "scarce" changes the meaning and is an error that is interfering with the reading. As such, it requires a different response from the teacher than the first oral reading which is simply a transformation of "are" to "bees" (Walker, 1975, p. 14). While for purposes of research all kinds of errors were treated identically in the present study, in implementing the program in a practical setting, the above suggestion should be taken into account. A parallel exists in the Toronto area where many West Indian students are experiencing difficulty with reading in comparison to their peers. If, therefore, the teachers would confine their correction to the second form of error it would possibly, over a long term period, aid the child's comprehension and fluency.

Sex. Of the original 39 subjects who fulfilled the basic requirements for the study, there were 25 boys and 14 girls, a ratio of almost 2:1 rather than the usual 3:1 (Tarnopol, 1971). No outstanding differences were noted in the way they adapted to the program or in the final results, although the girls tended to stick at the lessons more during the holidays. This was probably due to the interaction with the mothers, as the boys who did work regularly up to the end were ones whose mothers were quite firm with them. An interesting trend was found which might provide a basis for

further study. Taking all the subjects who demonstrated a change in WRAT score of at least .8 of a grade, there were six girls and six boys in the two experimental groups. Of the girls, four were in the Attention group and only two in the contingent reinforcement group while five of the boys were in the latter group compared with only one in the Attention group. Although numbers here were not sufficient to perform an analysis on these differences, a future study might be concerned with whether boys are more responsive to the contingency aspect than girls.

Therapist Attention. During the first few weeks this is particularly important, and as well as providing reinforcement for the mothes does so for the child, who looks forward to "teacher hearing me read" as well as to the weekly payments. The frequency of visits could be yet another variable to study. In the present research six visits were made once a week, then visits were made alternate weeks for the remainder of the period.

Changing the Value of the Tokens. Staats (1965) maintains that it is possible to decrease the value of the tokens as the secondary reinforcers of praise, self-achievement and general interest take over. This was attempted also in this study and in some cases was extremely successful. The children worked harder and earned more tokens, as the value of the tokens went down. In other cases, however, this may have contributed to the child's decline of interest, in conjunction with the holidays. The amount of reinforcement

in relation to the work may not have been considered worthwhile. It should be noted that although a slump in the performance of subjects was observed after the mid-point of the present programme, and also was noted in the Ellson et al. (1968) study, this does not occur in Staats' studies. His subjects show a typical positive acceleration in responding throughout the period of training (which is typically four and one-half months). Thus it would appear likely that the method of reducing the value of the tokens in the present treatment influenced the performance of subjects. In actually reducing the value of the tokens, this research has not followed Staats' procedure, where the value of the tokens is fixed throughout. In Staats' procedure, what is reduced is the tokens received per word that is read by the subject. This occurs naturally as the reading material becomes more difficult. That is, as the sentences and paragraphs and stories and questions grow longer, the subject has to read more words before he receives reinforcement. But this is a gradual progression. Moreover, the increasing skill and work habits of the subject can and do overcome this lessening reinforcement, so that for period of time, or for effort expended, the subject receives as much reinforcement as before. On the other hand, the procedure of changing the value of the tokens as used in the present research involved an abrupt diminution of reinforcement. This would appear to effect performance adversely. This topic is discussed further in some individual case studies, which are presented in Appendix N.

Additionally, data showing subject variation in token acquisition throughout the twelve-week treatment period for the Contingent Reinforcement subjects are presented in Appendix O. Information characterizing each subject is also given so that possible hypotheses to account for the observed individual differences may be tentatively made and perhaps used to guide future research in this area.

Level of Education of Parents. It has been noted in the case of one or two mothers who are highly educated, that they sometimes have difficulty believing that their child cannot recognize what to them is a simple word, and unintentionally they convey a message of criticism to the child. A mother who herself is only a little ahead of the child appears to have more sympathy with the child's difficulties, as was indeed the case with S's mother (see Appendix N). This has implications in the area of making use of other children as tutors, as in the use of grade five or six children giving individual instruction to lower grades (Jenkins, Mayhall, Peschka & Jenkins, 1974).

What Subjects Benefit Most from the Contingency Factor? Kazdin (1973) has said there may be subjects, such as high anxiety ones, who fail to respond to token economies. There was one extremely anxious child in the present study whose reading improved but whose anxiety increased; therefore, the child's anxiety level should also perhaps be taken into consideration when planning individual programs. It would also be interesting to investigate whether a child such as

subject S, who failed to show any progress in the Attention group, would benefit from the structure of a token economy. Certainly anti-social children would seem to respond to material gain.

The Control or "Waiting List" Group. It was noted that two or three of the control group had shown significant gains also. The most likely reason for this, as mentioned in a previous section, is that the parents, having been made aware of the child's problems encouraged him to read during the "waiting list" period. One mother stated specifically that her daughter had read two or three books while they were away on holiday.

Summary of Discussion

The results per se were discussed first and the more generalized effects of the token economy method were attributed to the learning "set" acquired by the children in this group during training. A structured and regular approach is necessary on the part of the parent so that the child may benefit from such a program.

Additional variables other than the treatment variable used in the study were discussed. These included financial arrangements, age of child, an interaction between treatment and sex, locality and dialect, and therapist attention. Whether or not it was useful to decrease the value of the tokens appeared to vary among subjects and was somewhat confounded by the start of the summer holidays at the same time.

Personality factors such as high anxiety level were also discussed in relation to token economies.

Some case studies are reviewed (Appendix N) which demonstrate the variety among subjects of both experimental groups.

Disadvantages of the Study and What Could Be Done to Improve Future Research in this Area

This investigation was extremely time-consuming and involved working days, evenings and weekends over a period of several months. In planning a study of this nature one really requires a team rather than one teacher or therapist, particularly if one is to have large enough numbers of subjects to study additional variables. This would mean delegation and distribution of work.

A research assistant/librarian could take entire charge of distributing and updating the reading kits, of which large numbers are required, with constant sorting out, paragraphs to be put in order and new question pages inserted ready for use by somebody else.

Original screening of subjects could be carried out by students in clinical assessment or developmental courses, wishing to gain testing experience. Some kind of inter-tester reliability would be necessary here, however.

Then in order to handle all the visits, possibly two or three therapists could be used, if the number of subjects were doubled or tripled. A factorial design could

control for therapist variable with each therapist taking an appropriate fraction of each group. Therapists involved need to be willing to work evenings and weekends, otherwise the sample would have to be confined to children whose mothers do not work; the sample would then cease to be a random one.

An additional problem in the present design is the control of the actual time which is spent by the subjects on the project. All possible efforts were made to control this; the importance of regularity was stressed from the beginning and throughout, and each parent was provided with notebook and colored marker to keep a record of the date and the amount covered each day. One could usually tell if the week's progress was very little in contrast to the amount accomplished during the therapist's visit, and on one or two occasions the weekly dollar was not forthcoming. The token group were easier to control for in this sense, as the children knew they had to work in order to make any money.

If the program is to be used on a smaller scale, as remediation rather than scientific research, it is possible to take on just three or four children at a time. These could be seen once a week in the child's school setting for a reading lesson - if possible, with the parent attending also. Then the program could be carried on for the rest of the week at home. Once these were well into the program four more children could be started so that eventually 12 children could all be at different stages in the program. During

reading lessons, one could spot parents who might be able to educate new parents in the program and so have a snowballing effect. Use should be made of all resources in a school; for instance grade five or six students could administer the program for half an hour a day to those students whose parents could not participate. At the same time their own reading would improve from teaching others. Even an interest and skill in basic number facts is built up through the addition and division processes involved in calculating the earnings.

Most of the disadvantages encountered in the present research were, therefore, of a practical nature. The possible remedial effect of being placed on a "waiting list" has already been discussed. In a relatively large scale study, it is felt that the present procedure would have a less serious effect than attempting to contact control group parents at the end of the experimental period. Certain of them might be unwilling to participate and would, therefore, affect the original data on group means.

Summary of Investigation

Overall, the study has been a success, in that it has been able to demonstrate the distinctive effects of contingent reinforcement as opposed to non-contingent, among a sample of poor readers, taken from the regular classroom and randomly assigned to groups. This research, in addition to benefitting the present sample of children, has suggested

directions for future investigations in this particular field of applied research.

Finally, disadvantages of the study were noted, mainly in relation to the practical aspects of implementation, and ways of making fuller use of available resources were suggested.

BIBLIOGRAPHY

Ackerman, P.T. Children with specific learning disabilities: WISC Profiles. Journal of Learning Disabilities, 1971, 4, 3, 33-49.

Allen, V.L. & Feldman, R.S. Learning through tutoring: Low achieving children as tutors. Journal of Experimental Education, 1973 (Fall), 42, 1, 1-5.

Anderson, R.C. & Faust, G.W. Educational Psychology: The Science of Instruction and Learning. New York: Dodd, Mead, 1973.

Ashem, B.A. & Poser, E.G. Adaptive Learning: Behavior Modification with Children. Pergamon Press, Inc. New York, 1973.

Askov, E.N. & Fischbach, T.J. An investigation of primary pupils' attitudes toward reading. Journal of Experimental Education, 1973 (Spring), 41, 3, 1-7.

Bakwin, H. & Bakwin, R. Clinical Management of Behavior Disorders in Children, 2nd edition. Philadelphia: W.B. Saunders, 1960, 347-357.

Barr, K.L. & McDowell, R.L. Comparison of learning disabled and emotionally disturbed children on three deviant classroom behaviors. Exceptional Children, 1972 (Sept.) 39, 1, 60-62.

Bartlett, D., Ora, J.P., Brown, E. & Butler, J. The effects of reinforcement on psychotic speech in a case of early infantile autism, age 12. Journal of Behavior Therapy and Experimental Psychiatry, 1971 (July), 2, 2, 145-149.

Beere, C.A. Development of a group instrument to measure young children's attitudes toward school. Psychology in the Schools, 1973, 10, 3, 308-315.

Benedet, M.J. Qualitative aspects of intellectual processes of normal or superior children who fail in school. Revista de Psicologia General y Aplicada, 1973 (January), 28, 120-121, 41-69.

Bennett, C.W. A $4\frac{1}{2}$-year-old as a teacher of her hearing-impaired sister: A case study. Journal of Communication Disorders, 1974 (June), 6, 2, 67-75.

Bernal, M.E., Duryee, J.S., Pruett, H.L. & Burns, B.J. Behavior modification and the brat syndrome. Journal of Consulting and Clinical Psychology, 1968, 32, 447-455.

Birch, H.C. & Belmont, L. Audio-visual integration, intelligence and reading ability in school children. Perceptual

and Motor Skills, 1965, 20, 293-305.

Blanco, R.F. Prescriptions for Children with Learning and Adjustment Problems. Springfield, Illinois: Charles C. Thomas, 1972.

Bogle, M.W. Relationship between deviant behavior and reading disability: A retrospective study of the role of the nurse. Journal of School Health, 1973 (May), 43, 5, 312-315.

Boisvert, J.M. & Trudel, G. A behavioral approach to life in a group among children: The token economy. Bulletin de Psychologie, 1971-72, 25, 14-17, 872-881.

Bower, E. A process for identifying disturbed children. Children, 1957, 4, 143-147.

Bower, E.M. Comparison of the characteristics of identified emotionally disturbed children with other children. Bulletin of the California State Department of Education, 1958, 27, 6.

Bracken, D.K. & Malmquist, E. Improving reading ability around the world. Proceedings of the Third International Reading Association World Congress on Reading, Sydney, Australia, August 7-9, 1970. International Reading Association, 6 Tyre Avenue, Newark, Delaware.

Bridgeland, M. Pioneer Work With Maladjusted Children (A study of the Development of Therapeutic Education) 1971, Staples Press, London.

Broden, M., Hall, R.V., Dunlap, A. & Clark, R. Effects of teacher attention and a token reinforcement system in a Junior High School Special Education Class. Exceptional Child, 1970, 36, 341-349.

Broman, Betty. The short attention span: Fact and myth. Childhood Education, 1970 (December), 156-158.

Brown, M.Q. The effects of different techniques of reinforcement upon sustaining behavior at reading readiness tasks. Dissertation Abstracts International, 1973 (May), 33, 11-B, 5506-5507.

Brutten, M., Richardson, S.O., Mangel, C. Something's Wrong With My Child, 1973, Harcourt Brace Jovanovich, Inc., New York.

Bryan, T.S. An observational analysis of classroom behaviors of children with learning disabilities. Journal of Learning Disabilities, 1974 (January), 7, 1, 26-34.

Bryan, T.S. Learning disabilities: A new stereotype. Journal of Learning Disabilities, 1974a, 7, 5, 304-309.

Camp, B.W. Remedial reading in a pediatric clinic. Clinical Pediatrics, 1971, 10, 36-42.

Camp, B.W. & Van Doorninck, W.J. Assessment of motivated reading therapy with elementary school children. Behavior Therapy, 1971, 2, 214-222.

Carroll, J.L. Demonstration techniques simulating four learning disabilities. Journal of Learning Disabilities, 1974 (May), 7, 5, 287-289.

Clegg, A. & Megson, B. Children in Distress, 2nd edition, 1973. Penguin Books, Inc., Harmondsworth, Middlesex (first publication 1968).

Clements, S.C. Minimal Brain Dynfunction in Children. NINDB Monograph No. 3, 1966, U.S. Department of Health, Education and Welfare.

Cockburn, J.M. Annual surveys of reading disability in a Scottish county. British Journal of Educational Psychology, 1973 (June), 43, 2, 188-191.

Cohen, H.L. Behavior modification and socially deviant youth. In C.E. Thoresen (Ed.), Behavior Modification in Education: I, Chicago, Ill. National Society for the Study of Education, 1972.

Corey, J.R. & Shamow, J. The effects of fading on the acquisition and retention of oral reading. Journal of Applied Behavior Analysis, 1972, 5, 311-315.

Cote, R.W. Behavior modification: Some questions. Elementary School Journal, 1973 (October), 74, 1, 44-47.

Coy, M.N. The Bender Visual-Motor Gestalt Test as a predictor of academic achievement. Journal of Learning Disabilities, 1974 (May), 7, 5, 59-61.

Dalton, A.J., Rubino, C.A. & Hislop, M.W. Some effects of token rewards on school achievement of children with Down's Syndrome. Journal of Applied Behavior Analysis, 1973 (Summer), 6, 2, 251-259.

Dearborn, W.F. Structural factors which condition special disability in reading. Proceedings and Addresses of the Fifty-seventh Annual Session of the American Association on Mental Deficiency, 1933.

Delacato, C.H. Diagnosis and Treatment of Speech and Reading Problems, 1963. C.C. Thomas, New York.

Drabman, R.S., Spitalnik, R. & O'Leary, K.D. Teaching self-control to disruptive children. Journal of Abnormal Psychology, 1973 (August), 82, 1, 10-16.

Ellson, D.G., Harris, P. & Barber, L. A field test of programmed and directed tutoring. Reading Research Quarterly, 1968, 3, 307-367.

Ensher, G.L. The hidden handicap: Attitudes toward children and their implication. Mental Retardation, 1973 (August), 11, 4, 40-41.

Esterson, H., Feldman, C., Krigsman, N. & Warshaw, S. Time-limited group counselling with parents of pre-adolescent underachievers: A pilot program. Proceedings of the 81st Annual Convention of the Psychological Association, Montreal, 1973, 8, 701-702.

Eysenck, H.J. The Dynamics of Anxiety and Hysteria, 1957, New York, Praegar.

Farmer, R.G. Behavior modification in the classroom. Australian Psychologist, 1973 (July), 8, 2, 109-119.

Felixbrod, J.J. & O'Leary, K.D. Effects of reinforcement on children's academic behavior as a function of self-determined and externally imposed contingencies. Journal of Applied Behavior Analysis, 1973 (Summer), 6, 2, 241-250.

Fischer, R.W. Mental institutions and similar phenomena called schools. Personnel and Guidance Journal, 1971 (September), 50, 1, 45-50.

Fisher, Lawrence. Attention deficit in brain-damaged children. American Journal of Mental Deficiency, 1970, 74, 4, 502-508.

Frankel, A.J. A client mediated token economy for groups of disturbed children in an open setting. Dissertation Abstracts International, 1973 (May), 33, 11-B, 5512.

Freeman, S.W. & Thompson, C.L. Parent-child training for the mentally retarded. Mental Retardation, 1973 (August), 11, 4, 8-10.

Fuller, R. Breaking down the IQ walls: Severely retarded people can learn to read. Psychology Today, October 1974, 8, 5, 96-102.

Gagne, R.M. The Conditions of Learning. Holt, Rinehart and Winston, New York, 1965.

Gagne, R.M. Educational technology and the learning process. Educational Researcher, 1974, 3, 1, 3-8.

Gagne, R.M. Observations of school learning. Educational Psychologist, 1973 (Fall), 10, 3, 112-116.

Garcia, C.H. et al. Modification of frequency of words read correctly by elementary school children with reading difficulties. Revista Latinoamericana de Psicologia, 1973, 5, 1, 25-40.

Goldberg, H.K. & Guthrie, J.T. Visual sequential memory in reading disability. Journal of Learning Disabilities, 1972 (January), 5, 1, 41-46.

Goldberg, H.K. & Schiffman, G.B. Dyslexia: Problems of Reading Disabilities. New York: Grune and Stratton, 1972.

Goldman, R. Cross-cultural adaptation of a program to involve parents in their children's learning. Child Welfare, 1973 (October), 52, 8, 521-532.

Goodman, K.S. The thirteenth easy way to make learning to read difficult: A reaction to Gleitman and Rozin. Reading Research Quarterly, 1973 (Summer), 8, 4, 484-493.

Gottwald, P. Behavior therapy of children in their natural environment. Schweizerische Zeitschrift fur Psychologie und ihre Anwendungen, 1973, 32, 3, 220-239.

Griffin, D.C., Walton, H.N. & Ives, V. Saccades as related to reading disorders. Journal of Learning Disabilities, 1974 (May), 7, 5, 310-316.

Gray, B.B., Baker, R.D. & Stancyk, S.E. Performance determined instruction for training in remedial reading. Journal of Applied Behavior Analysis, 1969, 2, 255-263.

Hallahan, D.P., Kauffman, J.M. & Ball, D.W. Selective attention and cognitive tempo of low achieving and high achieving sixth grade males. Perceptual and Motor Skills, 1973 (April), 36, 2, 579-583.

Hamerlynck, L.A., Davidson, P.O. & Acker, L.E. (Eds.). Behavior Modification and Ideal Mental Health Services. 1st Banff International Congress on Behavior Modification. University of Calgary, Calgary, Alberta, 1969.

Hanley, C.F. Effect of magnitude of reinforcement on tapping performance of MBD children. Dissertation Abstracts International, 1973 (May), 33, 11-B, 5514-5515.

Harris, V.W. Effects of peer tutoring, homework, and consequences upon the academic performance of elementary school children. Dissertation Abstracts International, 1973 (May), 33, 11-A, 6175.

Harth, Robert (Ed.), Issues in Behavior Disorders: A Book of Readings. Springfield, Illinois: Charles C. Thomas 1971.

Hartman, N.C. & Hartman, R.K. Perceptual handicap or reading disability? Reading Teacher, 1973 (April), 26, 7, 684-695.

Hertzig, M.E., Bortner, M. & Birch, H.G. Neurologic findings in children educationally designated as "brain-damaged". American Journal of Orthopsychiatry, 1969, 39, 3, 437-446.

Highberger, R. & Brooks, H. Vocabulary growth of Head Start children participating in a mothers' reading program. Home Economics Research Journal, 1973 (March), 1, 3, 185-187.

Holland, C. An interview guide for behavioral counselling with parents. Behavior Therapy, 1, 70-79.

Humphrey, J.H. Child Learning (Through Elementary School Physical Education), 1965, W.C. Brown Co. Inc., Dubuque, Iowa.

Humphrey, J.H. & Moore, V.D. Read and Play Series. Garrard Publishing Company, Champaign, Illinois, 1962.

James, L.E. & Foreman, M.E. A-B status of behavior therapy technicians as related to success of Mowrer's conditioning treatment for enuresis. Journal of Consulting and Clinical Psychology, 1973, 41, 2, 224-229.

Jenkins, R.R., Mayhall, W.F., Peschka, C.M. & Jenkins, L.M. Comparing small group and tutorial instruction in resource rooms. Exceptional Children, 1974 (January), 40, 4, 245-250.

Johns, J. Children's perceptions of reading and their reading achievement. Journal of the Association for the Study of Perception, 1972 (Fall), 7, 2, 18-20.

Johnson, C.A. & Katz, R.C. Using parents as change agents for their children: A review. Journal of Child Psychology and Psychiatry, 1973 (September), 14, 3, 181-200.

Johnson, D.D. Sex differences in reading across cultures. Reading Research Quarterly, 1973-74, 9, 1, 67-86.

Johnson, W.D. & Pancrazio, S.B. Promoting effective pupil thinking through non-verbal communication. College Student Journal, 1973 (January), 7, 1, 92-96.

Jones, W.E. Learning Disabilities - Monograph, B.C. Teachers' Federation, Vancouver 9, B.C., 1958.

Kanfer, F.H. Behavior modification: An overview. In C.E. Thoresen (Ed.), Behavior Modification in Education I. Chicago, Illinois. National Society for the Study of Education, 1972.

Kass, C.E. Educational management of reading deficits. In J.V. Irwin & M. Marge (Eds.), Principles of Childhood Language Disabilities. New York: Appleton-Century-Crofts, 1972.

Kazdin, A.E. The failure of some patients to respond to token programs. Journal of Behavior Therapy and Experimental Psychiatry, 1973 (March), 4, 1, 7-14.

Kennedy, D.K. & Weener, P. Vexing criticisms of research on reading: A response to Wardrop and Essex. Reading Research Quarterly, 1973 (Summer), 8, 4, 558-565.

Kephart, N.C. The Slow Learner in the Classroom. Columbus, Ohio: Charles E. Merrill, 1960.

Knapczyk, D.R. & Livingstone, G. Self-recording and student teacher supervision: Variables within a token economy structure. Journal of Applied Behavior Analysis, 1973 (Fall), 6, 3, 481-486.

Koven, J. & LeBow, M.D. Teaching parents to remediate the academic problems of their children. Journal of Experimental Education, 1973 (Summer), 41, 4, 64-73.

Kux, J.A. The effects of a one-to-one tutorial relationship upon pupils' attitude toward reading, selected personality factors and reading achievement. Southern Journal of Educational Research, 1973 (Winter), 7, 1, 21-30.

Lahey, B.B., McNees, M.P. & Brown, C.C. Modification of deficits in reading for comprehension. Journal of Applied Behavior Analysis, 1973 (Fall), 6, 3, 475-480.

LeBow, M.C. The behavior modification process for parent-child therapy. Family Coordinator, 1973 (July), 22, 3, 313-319.

Libb, J.W., House, C. & Green, M. Charting and contingency management procedures in a children's home. Child Care Quarterly, 1973 (Summer), 2, 2, 113-123.

Lovaas, O.I. & Bucher, B.C. (Eds.), Perspectives in Behavior Modification with Deviant Children. Prentice-Hall, Inc., Englewood Cliffs, N.J., 1974.

Love, H.D. Parents Diagnose and Correct Reading Problems. Charles C. Thomas, Springfield, Illinois, 1970.

Lowe, T.O. The utilization of verbal reinforcement by cadet teachers in the treatment of underachieving fourth grade boys. Dissertation Abstracts International, 1973 (May), 33, 11-A, 6093-6094.

Madill, J.W. Effects of motivational modes and personality types upon academic performance. Dissertation Abstracts International, 1973 (May), 33, 11-A, 6065.

Malmquist, E. Factors Related to Reading Disabilities in the First Grade of the Elementary School. Almquist and Wiksell, Stockholm, 1958.

Martin, H.P. Vision and its role in reading disability and dyslexia. Journal of School Health, 1971 (November), 41, 9, 468-472.

Martin, J.C. Effects of visual perceptual training on visual perceptual skills and reading achievement. Perceptual and Motor Skills, 1973 (October), 37, 2, 564.

Mash, E.J. & Terdal, L. Modification of mother-child interactions: Playing with children. Mental Retardation, 1973 (October), 11, 5, 44-49.

Meacham, M.L. & Wiesen, A.E. Changing Classroom Behavior, 2nd edition. New York: Intext 1974.

Merry, F.K. & Merry, R.V. The First Two Decades of Life. Harper & Brothers, New York, 1958.

Milar, C.R. The use of token reinforcement and response cost in modifying a socially offensive behavior. School Applications of Learning Theory, 1973 (March), 5, 2, 16-23.

Miller, A.D., Margolin, J.B., Yolles, S.F. Epidemiology of reading disabilities, some methodological considerations

and early findings. AJPM, 1957, 47, 2, 1250-1256.

Mira, M. Behavior modification applied to young deaf children. Exceptional Children, 1972 (November), 39, 3, 225-229.

Mitchell, D.W. & Crowell, P.J. Modifying inappropriate behavior in an elementary art class.

Money, J. & Nurcombe, B. Ability tests and cultural heritage: The Draw-a-Person and Bender Tests in aboriginal Australia. Journal of Learning Disabilities, 1974 (May), 7, 5, 297-303.

Monroe, M. Children Who Cannot Read. Chicago: University of Chicago Press, 1932.

Moody, W.B., Bausell, R., Barker, & Jenkins, J.R. The effect of class size on the learning of Mathematics: A parametric study with 4th grade students. Journal for Research in Mathematics Education, 1973 (May), 4, 3, 170-176.

Morris, R. Success and Failure in Learning to Read. Penguin Books Limited, Harmondsworth, 1973 (first published 1963).

Muehl, S. & Forell, E.R. A follow-up study of disabled readers: Variables related to high school reading performance. Reading Research Quarterly 1973-74, 9, 1, 110-123.

MacDonough, T.S. & McNamara, J.R. Design-criteria relationships in behavior therapy research with children. Journal of Child Psychology and Psychiatry, 1973 (December), 14, 4, 271-282.

MacGinitie, W.H. Testing reading achievement in urban schools Reading Teacher, 1973 (October), 27, 1, 13-21.

MacLay, D. Treatment for Children (The Work of a Child Guidance Clinic), London: George Allen & Unwin Limited, 1970.

McMillan, W.B. The effectiveness of tangible reward systems with sixth grade ghetto children in a regular classroom situation: An experimental investigation. Psychology in the Schools, 1973, 10, 3, 373-378.

Nutzhorn, H. Untersuchungen zum Rechts-Links Problem (Investigations of the Right-Left Problem). Braunschweig, West Germany: Technischen Hochschule Carolo-Wilhelmina, 1953.

Oakland, T. Diagnostic help 5¢: Examiner is in. Psychology in the Schools, 1969, 6, 359-367.

O'Donnell, C.R. & Stanley, K. Paying students for academic performance: A demonstration project. Journal of Community Psychology, 1973 (April), 1, 2, 215-216.

O'Leary, K.D. & Becker, W.C. Behavior modification of an adjustment class: Token reinforcement program. Exceptional Child, 1967, 33, 637-642.

Ora, J.P. & Burgess, M.M. Operant conditioning of a deviant child by a psychiatric patient-mother. Psychotherapy: Theory, Research and Practice, 1971 (Spring), 8, 1.

Peralta, J. Discussion: The role of parents and peers in controlling children's behavior. In S. Bijou and E. Ribes-Inesta (Eds.), Behavior Modification: Issues and Extensions, New York Academic Press, 1972.

Phillips, B.N. Sex, social class and anxiety as sources of variations in school achievement. Journal of Educational Psychology, 53, 6, 316-322.

Pitcher-Baker, G. Does perceptual training improve reading? Academic Therapy, 1973 (Fall), 9, 1, 41-45.

Quay, H.Q. Some basic considerations in the education of emotionally distrubed children. Exceptional Child, 1963, 30, 27-32.

Ramanauskas, S. & Borrow, W.H. WISC profiles: Above average and MR good and poor readers. Mental Retardation, 1973 (April), 11, 2, 12-14.

Ramp, E.A. Long distance behavioral research: The effect of token systems and teacher praise on student reading. Dissertation Abstracts International, 1973 (May), 33, 11-B, 5498.

Rawson, H.E. Academic remediation and behavior modification in a summer school camp. Elementary School Journal, 1973 (October), 74, 1, 34-43.

Rawson, M.B. Prognosis in dyslexia. Academic Therapy Quarterly, 1966, 1, 164-173.

Ray, J.S. The family training centre: An experiment in normalization. Mental Retardation, 1974 (February), 12, 1, 12-13.

Reid, J.B. & Hendriks, A.F. Preliminary analysis of the effectiveness of direct home intervention for the treatment of predelinquent boys who steal. In L.A. Hamerlynck, L.C. Handy & E.J. Mash (Eds.), Behavioral Change: Methodology, Concepts and Practice, Champaign, Illinois: Research Press, 1973.

Rickard, H.C., Melvin, K.B., Creel, J. & Creel, L. The effect of bonus tokens upon productivity in a remedial classroom for behaviorally disturbed children. Behavior Therapy, 1973 (May), 4, 3, 378-385.

Ringer, V.M. The use of a "token helper" in the management of classroom behavior problems and in teacher training. Journal of Applied Behavior Analysis, 1973 (Winter), 6, 4, 671-677.

Roberts, J. & Baird, J.T. Behavior patterns of children in school: United States Vital and Health Statistics, Series 11, 1972 (February), 113.

Robinson, B.N. A study of visual functions in institutionalized juveniles who are demonstrated underachieving readers. American Journal of Optometry and Archives of American Academy of Optometry, 1973 (February), 50, 2, 113-116.

Robinson, M.E. & Schwartz, L.B. Visuo-motor skills and reading ability: A longitudinal study. Developmental Medicine and Child Neurology, 1973 (June), 15, 3, 281-286.

Roswell, F. & Natchez, G. Reading Disability (Diagnosis and treatment), 2nd edition. Basic Books, Inc., New York, London, 1971.

Rowell, C.G. An investigation of factors related to change in attitude toward reading. Journal of Reading Behavior, 1972-3 (Fall), 5, 4, 266-272.

Rubin, R. & Balow, B. Learning and behavior disorders: A longitudinal study. Exceptional Children, 1971 (December), 293-299.

Rugel, R.P. WISC subtest scores of disabled readers: A review with respect to Bannatynes reclassification. Journal of Learning Disabilities, 1974 (January), 7, 1, 48-55.

Rudner, H.L. A practical model for controlling a group of behavior problems in the classroom. Canadian Counsellor, 1973 (April), 7, 2, 119-125.

Rutter, M. A children's behavior questionnaire for completion by teachers: Preliminary findings. Journal of Child Psychology and Psychiatry, 1967, 8, 1-11.

Rutter, M. & Graham, P. Psychiatric assessment of children - I. Interview with the child, 1967.

Rutter, M. & Graham, P. Psychiatric disorder in 10- and 11-year old children. Proceedings of the Royal Society of Medicine, 59, 382-387.

Rutter, M., Tizard, J. & Whitmore, K. Education, Health and Behavior, 1970, Longman Group Limited, London.

Ryback, D. & Staats, A.W. Parents as behavior therapy technicians in treating reading deficits (dyslexia). Journal of Behavior Therapy and Experimental Psychiatry, 1970, 1, 109-119.

Sajwaj, T. Difficulties in the use of behavioral techniques by parents in changing child behavior: Guides to success. Journal of Nervous and Mental Diseases, 1973 (June), 156, 6, 395-403.

Samuels, J. & Turnure, J.E. Attention and reading achievement in first grade boys and girls. Journal of Educational Psychology, 1974 (February), 66, 1, 29-32.

Santogrossi, D.A., O'Leary, K.D., Romanczuk, R.G. & Kaufman, K.F. Self-evaluation by adolescents in a psychiatric hospital school token program. Journal of Applied Behavior Analysis, 1973 (Summer), 6, 2, 277-287.

Sarason, S.B., Davidson, K.S., Lightall, F.F., Waite, R.R. & Ruebush, B.K. Anxiety in Elementary School Children.

Schanzer, S.S. Independent reading for children with learning disabilities. Academic Therapy, 1973 (Fall), 9, 1, 109-114.

Scheffe, H. The Analysis of Variance, 1959, John Wiley & Sons, Inc., New York.

Shearer, M.S. & Shearer, D.E. The portage project: A model for early childhood education. Exceptional Children, 1972 (November), 39, 3, 210-217.

Spence, K.W. A theory of emotionally based drive (D) and its relation to performance in simple learning situations. American Psychologist, 1958, 13, 131-141.

Spencer, R.J. An empirical study of elementary teacher's attention as reinforcement for student behavior. Child Study Journal, 3, 3, 145-158.

Spivack, G. & Swift, M. The classroom behavior of children: A critical review of teacher-administered rating scales. Journal of Special Education, 1973 (Spring), 7, 1, 55-89.

Staats, A.W. A general apparatus for the investigation of complex learning in children. Behavior Research and Therapy, 1968, 6, 45-50.

Staats, A.W. Behavior analysis and token reinforcement in educational behavior modification and curriculum research.

In C.E. Thoreson (Ed.), Behavior Modification in Education I, Chicago, Illinois, National Society for the Stufy of Education, 1972.

Staats, A.W. & Butterfield, W.H. Treatment of non-reading in a culturally deprived juvenile delinquent: An application of reinforcement principles. Child Development, 1965, 36, 4, 925-942.

Staats, A.W., Finley, J.R., Minke, K.A. & Wolf, M. Reinforcement variables in the control of unit reading responses. Journal of Experimental Analysis Behavior, 1964, 7, 139-149.

Staats, A.W., Minke, K.A. & Butts, P. A token reinforcement remedial training program administered by black therapy technicians to problem black children. Behavior Therapy, 1970, 1, 331-353.

Staats, A.W., Minke, K.A., Goodwin, W. & Landen, J. Cognitive behavior modification: 'Motivated learning" reading. Treatment with subprofessional therapy-technicians. Behavior Research and Therapy, 1967, 5, 283-299.

Staats, A.W., Staats, C.K., Schutz, R.E. & Wolf, M. The conditioning of reading responses utilizing "extrinsic" reinforcers. Journal of Experimental Analysis Behavior, 1962, 5, 33-40.

Staats, A.W., Van Mondfrans, A.P. & Minke, K.A. Manual of Administration and Recording Methods for the Staats 'Motivated Learning' Reading Procedure. Wisconsin Research and Development Center for Cognitive Learning, Madison, 1967.

Staiger, R.C. & Anderson, O. Reading: A human right and a human problem. Proceedings of 2nd World Congress on Reading. Copenhagen, Denmark, August 1-3, 1968, International Reading Association, 6 Tyre Avenue, Newark, Delaware.

Stamps, L.W. The effects of intervention techniques on children's fear of failure behavior. Journal of Genetic Psychology, 1973 (September), 123, 1, 85-97.

Stephens, T.M., Hartman, A.C. & Cooper, J.O. Directive teaching of reading with low achieving 1st and 2nd year students. Journal of Special Education, 1973 (Summer), 7, 2, 187-196.

Stott, D.H. Manual to the Bristol Social Adjustment Guides, 1963, London, University of London Press.

Stott, D.H. The Parent as Teacher, 1972, New Press, Toronto.

Stott, D.H. Some less obvious cognitive aspects of learning to read. Reading Teacher, 1973 (January), 26, 4, 374-383.

Stott, D.H. Studies of Troublesome Children. Tavistock Publications, London, 1966.

Strauss, & Lehtinen, . Psychopathology of the brain-injured child, 1947.

Tarnopol, L. (Ed.), Learning Disorders in Children, 1971, Little, Brown & Company, Boston.

Taylor, J.A. Drive theory and manifest anxiety. Psychological Bulletin, 1956, 303-321.

Taylor, J.A. The relationship of anxiety to the conditioned eyelid response. Journal of Experimental Psychology, 1951, 41, 81-92.

Taylor, J.H. Newcastle upon Tyne: Asian pupils do better than whites. British Journal of Sociology, 1973 (December) 24, 4, 431-447.

Thompson, M. et al. Contingency management in the schools: How often and how well does it work? American Educational Research Journal, 1974 (Winter), 11, 1, 19-28.

Ullman, L. & Krasner, L. (Eds.), Case Studies in Behavior Modification. New York, Holt, Rinehart & Winston, 1965.

Ulrich, Roger, Stchnik, T. & Mabry, J. Control of Human Behavior: III. Behavior Modification in Education. Dallas, Texas: Scott, Foresman, 1974.

Vande, V., Lewis, & Senf, G.M. Audiovisual integration in retarded readers. Journal of Learning Disabilities, 1973 (March), 6, 3, 170-179.

Vroegh, K. The relationship of sex of teacher and father presence-absence to academic achievement. Proceedings of the 81st Annual Convention of the American Psychological Association, Montreal, 1973, 8, 665-666.

Wagner, R.F. Dyslexia and Your Child: A Guide for Teacher and Parents. New York, N.Y., Harper and Row, 1971.

Wagner, R.F. Secondary emotional reactions in children with learning disabilities. Mental Hygiene, 1970 (October), 54, 4, 577-579.

Wahler, R.G., Winkel, G.H., Peterson, R.F. & Morrison, D.C. Mothers as behavior therapists for their own children. Behavior Research Therapy, 1965, 3, 113-124.

Walker, H. Empirical assessment of deviant behavior in children. Psychology in the Schools, 1969, 6, 93-97.

Walker, L. Dialect and reading in Newfoundland schools. The Evening Telegram, St. John's, March 5, 1975.

Walter, H.I. & Gilmore, S.K. Placebo versus social learning effects in parent training procedures designed to alter the behavior of aggressive boys. Behavior Therapy, 1973 (May), 4, 3, 361-377.

Webb, A.B. & Cormier, W.H. Improving classroom behavior and achievement. Journal of Experimental Education, 1972 (Winter), 41, 2, 92-96.

Weintraub, S., Robinson, H.M., Smith, H.K. & Plessas, G.P. Summaries of specific aspects of reading research. Reading Research Quarterly, 1973 (Spring), 8, 3, 249-251.

Welsh, E.C. & Alvord, J.R. The home token economy: A case study. Corrective and Social Psychiatry and Journal of Applied Behavior Therapy, 1973, 19, 3, 3-9.

West, M. A therapeutic tutoring program for children with psychogenic learning disabilities. Canadian Counsellor, 1973 (June), 7, 3, 192-199.

Whelan, R. The relevance of behavior modification procedures for teachers of emotionally disturbed children. In Knoblock, P. (Ed.), Intervention Approaches in Educating Emotionally Disturbed Children. Syracuse: Syracuse University Press, 1966, 35-78.

White, R.W. Motivation reconsidered: The concept of competence. Psychological Review, 1959, 66, 297-333.

White, S.H. Evidence for a hierarchical arrangement of learning processes. In J.P. Lipsitt & G.C. Spiker (Eds.), Advances in Child Development and Behavior, 1965, 2, 187-220, New York: Academic Press.

Whitlock, C. & Bushell, D. Some effects of "back-up" reinforcer on reading behavior. Journal of Experimental Child Psychology, 1967, 5, 50-57.

Williams, B.S. Your Child has a Learning Disability: What is it? A Guide for Parents and Teachers of Children with a Hidden Handicap. Chicago, Illinois, National Easter Seal Society for Crippled Children and Adults, 1971.

Winett, R.A. & Roach, A.M. The effects of reinforcing academic performance on social behavior: A brief report. Psychological Record, 1973 (Summer), 23, 3, 391-396.

Witty, P.A. & Kopel, D. Sinistral and mixed manual-occular behavior in reading disability. Journal of Educational Psychology, 1936, 27, 119-134.

Wolf, M.M., Giles, D.K. & Hall, R.V. Experiments with token reinforcement in a remedial classroom. Behavior Research and Therapy, 1968, 6, 51-64.

Yule, W. Differential prognosis of reading backwardness and specific reading retardation. British Journal of Educational Psychology, 1973 (November), 43, 3, 244-248.

Zwier, M. Psychosocial characteristics of superior and average readers. Proceedings of the 81st Annual Convention of the American Psychological Association, Montreal, 1973, 8, 693-694.

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PUPIL IDENTIFICATION BOX

NAME _____ (last) (first) (initial)

SCHOOL _____

CITY _____ STATE _____

GRADE _____ TEACHER _____

DATE OF BIRTH _____ (yr. mo. day) BOY ☐ GIRL ☐ AGE _____ (yrs. mos.)

SCORE BOX

Listening Test						Reading Test					
Vocabulary		Paragraphs		Total		Vocabulary		Paragraphs		Total	
1 Number Right	2 Potential Reading Grade Equiv.	3 Number Right	4 Potential Reading Grade Equiv.	5 Number Right	6 Potential Reading Grade Equiv.	7 Number Right	8 Actual Reading Grade Equiv.	9 Number Right	10 Actual Reading Grade Equiv.	11 Number Right	12 Actual Reading Grade Equiv.

ste of Testing _____

ade Placement _____ (yr. mo.)

Date of Testing _____

HARCOURT BRACE JOVANOVICH, INC. NEW YORK

Listening Test

TEST 1: VOCABULARY LISTENING

SAMPLES

	 House	 Cook	 Move	 Flower
S1	⬭	⬬	⬭	⬭
S2	⬭	⬭	⬭	⬬
S3	⬭	⬭	⬭	⬭
S4	⬭	⬭	⬭	⬭

I

	 Strength	 Place	 Plan	 Fear
1	⬭	⬭	⬭	⬭
2	⬭	⬭	⬭	⬭
3	⬭	⬭	⬭	⬭
4	⬭	⬭	⬭	⬭
5	⬭	⬭	⬭	⬭
6	⬭	⬭	⬭	⬭
7	⬭	⬭	⬭	⬭
8	⬭	⬭	⬭	⬭
9	⬭	⬭	⬭	⬭
10	⬭	⬭	⬭	⬭
11	⬭	⬭	⬭	⬭
12	⬭	⬭	⬭	⬭

II

	 World	 Thought	 Enough	 Sad
13	⬭	⬭	⬭	⬭
14	⬭	⬭	⬭	⬭
15	⬭	⬭	⬭	⬭
16	⬭	⬭	⬭	⬭
17	⬭	⬭	⬭	⬭
18	⬭	⬭	⬭	⬭
19	⬭	⬭	⬭	⬭
20	⬭	⬭	⬭	⬭
21	⬭	⬭	⬭	⬭
22	⬭	⬭	⬭	⬭
23	⬭	⬭	⬭	⬭
24	⬭	⬭	⬭	⬭

III

	 Order	 Passage	 Rest	 Accuse
25	⬭	⬭	⬭	⬭
26	⬭	⬭	⬭	⬭
27	⬭	⬭	⬭	⬭
28	⬭	⬭	⬭	⬭
29	⬭	⬭	⬭	⬭
30	⬭	⬭	⬭	⬭
31	⬭	⬭	⬭	⬭
32	⬭	⬭	⬭	⬭
33	⬭	⬭	⬭	⬭
34	⬭	⬭	⬭	⬭
35	⬭	⬭	⬭	⬭
36	⬭	⬭	⬭	⬭

IV

	 Hardness	 Give	 Experiment	 Pleasure
37	⬭	⬭	⬭	⬭
38	⬭	⬭	⬭	⬭
39	⬭	⬭	⬭	⬭
40	⬭	⬭	⬭	⬭
41	⬭	⬭	⬭	⬭
42	⬭	⬭	⬭	⬭
43	⬭	⬭	⬭	⬭
44	⬭	⬭	⬭	⬭
45	⬭	⬭	⬭	⬭
46	⬭	⬭	⬭	⬭
47	⬭	⬭	⬭	⬭
48	⬭	⬭	⬭	⬭

V

	 Difference	 Container	 Picture	 Persuade
49	⬭	⬭	⬭	⬭
50	⬭	⬭	⬭	⬭
51	⬭	⬭	⬭	⬭
52	⬭	⬭	⬭	⬭
53	⬭	⬭	⬭	⬭
54	⬭	⬭	⬭	⬭
55	⬭	⬭	⬭	⬭
56	⬭	⬭	⬭	⬭
57	⬭	⬭	⬭	⬭
58	⬭	⬭	⬭	⬭
59	⬭	⬭	⬭	⬭
60	⬭	⬭	⬭	⬭

VI

	 Fold	 Dark	 Teach	 Polite
61	⬭	⬭	⬭	⬭
62	⬭	⬭	⬭	⬭
63	⬭	⬭	⬭	⬭
64	⬭	⬭	⬭	⬭
65	⬭	⬭	⬭	⬭
66	⬭	⬭	⬭	⬭
67	⬭	⬭	⬭	⬭
68	⬭	⬭	⬭	⬭
69	⬭	⬭	⬭	⬭
70	⬭	⬭	⬭	⬭
71	⬭	⬭	⬭	⬭
72	⬭	⬭	⬭	⬭

VII

	 Home	 Water	 Measure	 Pain
73	⬭	⬭	⬭	⬭
74	⬭	⬭	⬭	⬭
75	⬭	⬭	⬭	⬭
76	⬭	⬭	⬭	⬭
77	⬭	⬭	⬭	⬭
78	⬭	⬭	⬭	⬭
79	⬭	⬭	⬭	⬭
80	⬭	⬭	⬭	⬭
81	⬭	⬭	⬭	⬭
82	⬭	⬭	⬭	⬭
83	⬭	⬭	⬭	⬭
84	⬭	⬭	⬭	⬭

VIII

	 Length	 Soften	 Writing	 Sell
85	⬭	⬭	⬭	⬭
86	⬭	⬭	⬭	⬭
87	⬭	⬭	⬭	⬭
88	⬭	⬭	⬭	⬭
89	⬭	⬭	⬭	⬭
90	⬭	⬭	⬭	⬭
91	⬭	⬭	⬭	⬭
92	⬭	⬭	⬭	⬭
93	⬭	⬭	⬭	⬭
94	⬭	⬭	⬭	⬭
95	⬭	⬭	⬭	⬭
96	⬭	⬭	⬭	⬭

Page 6 Score_____ Total Vocabulary Listening Score (pages 2-6)_____

Listening Test

TEST 2: PARAGRAPH LISTENING

SAMPLES

	True only of Bill	True only of George	True of both	Answer is not given
S1	▬	⬭	⬭	⬭
S2	⬭	⬭	▬	⬭
S3	⬭	⬭	⬭	⬭
S4	⬭	⬭	⬭	⬭

I

	True only of Donald	True only of Paul	True of both	Answer is not given
1	⬭	⬭	⬭	⬭
2	⬭	⬭	⬭	⬭
3	⬭	⬭	⬭	⬭
4	⬭	⬭	⬭	⬭
5	⬭	⬭	⬭	⬭
6	⬭	⬭	⬭	⬭
7	⬭	⬭	⬭	⬭
8	⬭	⬭	⬭	⬭

II

	True only of beaver	True only of otter	True of both	Answer is not given
9	⬭	⬭	⬭	⬭
10	⬭	⬭	⬭	⬭
11	⬭	⬭	⬭	⬭
12	⬭	⬭	⬭	⬭
13	⬭	⬭	⬭	⬭
14	⬭	⬭	⬭	⬭
15	⬭	⬭	⬭	⬭
16	⬭	⬭	⬭	⬭

III

	True only of mermaids	True only of centaurs	True of both	Answer is not given
17	⬭	⬭	⬭	⬭
18	⬭	⬭	⬭	⬭
19	⬭	⬭	⬭	⬭
20	⬭	⬭	⬭	⬭
21	⬭	⬭	⬭	⬭
22	⬭	⬭	⬭	⬭
23	⬭	⬭	⬭	⬭
24	⬭	⬭	⬭	⬭

IV

	True only of "barbarian"	True only of "hypocrite"	True of both	Answer is not given
25	⬭	⬭	⬭	⬭
26	⬭	⬭	⬭	⬭
27	⬭	⬭	⬭	⬭
28	⬭	⬭	⬭	⬭
29	⬭	⬭	⬭	⬭
30	⬭	⬭	⬭	⬭
31	⬭	⬭	⬭	⬭
32	⬭	⬭	⬭	⬭

V

	True only of asteroids	True only of comets	True of both	Answer is not given
33	⬭	⬭	⬭	⬭
34	⬭	⬭	⬭	⬭
35	⬭	⬭	⬭	⬭
36	⬭	⬭	⬭	⬭
37	⬭	⬭	⬭	⬭
38	⬭	⬭	⬭	⬭
39	⬭	⬭	⬭	⬭
40	⬭	⬭	⬭	⬭

VI

	True only of Norway	True only of Switzerland	True of both	Answer is not given
41	⬭	⬭	⬭	⬭
42	⬭	⬭	⬭	⬭
43	⬭	⬭	⬭	⬭
44	⬭	⬭	⬭	⬭
45	⬭	⬭	⬭	⬭
46	⬭	⬭	⬭	⬭
47	⬭	⬭	⬭	⬭
48	⬭	⬭	⬭	⬭

VII

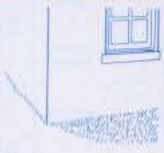
	True only of Mazur	True only of Lokar	True of both	Answer is not given
49	⬭	⬭	⬭	⬭
50	⬭	⬭	⬭	⬭
51	⬭	⬭	⬭	⬭
52	⬭	⬭	⬭	⬭
53	⬭	⬭	⬭	⬭
54	⬭	⬭	⬭	⬭
55	⬭	⬭	⬭	⬭
56	⬭	⬭	⬭	⬭

VIII

	True only of rain forest	True only of cloud forest	True of both	Answer is not given
57	⬭	⬭	⬭	⬭
58	⬭	⬭	⬭	⬭
59	⬭	⬭	⬭	⬭
60	⬭	⬭	⬭	⬭
61	⬭	⬭	⬭	⬭
62	⬭	⬭	⬭	⬭
63	⬭	⬭	⬭	⬭
64	⬭	⬭	⬭	⬭

Reading Test

TEST 3: VOCABULARY READING

SAMPLES			 House	 Cook	 Move	 Flower
S1	bake	S1	○	●	○	○
S2	daisy	S2	○	○	○	●
S3	window	S3	○	○	○	○
S4	travel	S4	○	○	○	○

I

			 Part	 Expand	 Animal	 Choose
1	beast	1	⬭	⬭	⬭	⬭
2	spread	2	⬭	⬭	⬭	⬭
3	ingredient	3	⬭	⬭	⬭	⬭
4	extend	4	⬭	⬭	⬭	⬭
5	creature	5	⬭	⬭	⬭	⬭
6	select	6	⬭	⬭	⬭	⬭
7	element	7	⬭	⬭	⬭	⬭
8	adopt	8	⬭	⬭	⬭	⬭
9	reptile	9	⬭	⬭	⬭	⬭
10	dilate	10	⬭	⬭	⬭	⬭
11	component	11	⬭	⬭	⬭	⬭
12	vertebrate	12	⬭	⬭	⬭	⬭

II

			 Group	 Uncertain	 Wasteful	 Courage
13	team	13	⬭	⬭	⬭	⬭
14	bravery	14	⬭	⬭	⬭	⬭
15	spendthrift	15	⬭	⬭	⬭	⬭
16	flock	16	⬭	⬭	⬭	⬭
17	doubtful	17	⬭	⬭	⬭	⬭
18	cluster	18	⬭	⬭	⬭	⬭
19	congregation	19	⬭	⬭	⬭	⬭
20	boldness	20	⬭	⬭	⬭	⬭
21	extravagant	21	⬭	⬭	⬭	⬭
22	galaxy	22	⬭	⬭	⬭	⬭
23	undecided	23	⬭	⬭	⬭	⬭
24	thriftless	24	⬭	⬭	⬭	⬭

III

			Equal	Speed	Hot	Sickness
25	tropical	25	⬭	⬭	⬭	⬭
26	rapidity	26	⬭	⬭	⬭	⬭
27	disorder	27	⬭	⬭	⬭	⬭
28	fiery	28	⬭	⬭	⬭	⬭
29	haste	29	⬭	⬭	⬭	⬭
30	identical	30	⬭	⬭	⬭	⬭
31	ailment	31	⬭	⬭	⬭	⬭
32	velocity	32	⬭	⬭	⬭	⬭
33	contagion	33	⬭	⬭	⬭	⬭
34	torrid	34	⬭	⬭	⬭	⬭
35	malady	35	⬭	⬭	⬭	⬭
36	synonymous	36	⬭	⬭	⬭	⬭

IV

			Excite	Tell	Inhabitant	Reward
37	describe	37	⬭	⬭	⬭	⬭
38	resident	38	⬭	⬭	⬭	⬭
39	inform	39	⬭	⬭	⬭	⬭
40	quicken	40	⬭	⬭	⬭	⬭
41	tenant	41	⬭	⬭	⬭	⬭
42	recompense	42	⬭	⬭	⬭	⬭
43	inflame	43	⬭	⬭	⬭	⬭
44	notify	44	⬭	⬭	⬭	⬭
45	dweller	45	⬭	⬭	⬭	⬭
46	impart	46	⬭	⬭	⬭	⬭
47	occupant	47	⬭	⬭	⬭	⬭
48	remuneration	48	⬭	⬭	⬭	⬭

V

			 Size	 Question	 Improve	 Punishment
49	penalty	49	⬭	⬭	⬭	⬭
50	volume	50	⬭	⬭	⬭	⬭
51	revise	51	⬭	⬭	⬭	⬭
52	inquire	52	⬭	⬭	⬭	⬭
53	purify	53	⬭	⬭	⬭	⬭
54	vengeance	54	⬭	⬭	⬭	⬭
55	magnitude	55	⬭	⬭	⬭	⬭
56	examine	56	⬭	⬭	⬭	⬭
57	refine	57	⬭	⬭	⬭	⬭
58	immensity	58	⬭	⬭	⬭	⬭
59	interrogate	59	⬭	⬭	⬭	⬭
60	amplitude	60	⬭	⬭	⬭	⬭

VI

			 Likeness	 Grow	 Trap	 Dislike
61	agreement	61	⬭	⬭	⬭	⬭
62	disgust	62	⬭	⬭	⬭	⬭
63	sprout	63	⬭	⬭	⬭	⬭
64	hatred	64	⬭	⬭	⬭	⬭
65	resemblance	65	⬭	⬭	⬭	⬭
66	flourish	66	⬭	⬭	⬭	⬭
67	similarity	67	⬭	⬭	⬭	⬭
68	ambush	68	⬭	⬭	⬭	⬭
69	germinate	69	⬭	⬭	⬭	⬭
70	snare	70	⬭	⬭	⬭	⬭
71	repetition	71	⬭	⬭	⬭	⬭
72	antipathy	72	⬭	⬭	⬭	⬭

VII

			 List	 Solve	 Worship	 Dirt
73	soil	73	⬭	⬭	⬭	⬭
74	interpret	74	⬭	⬭	⬭	⬭
75	index	75	⬭	⬭	⬭	⬭
76	praise	76	⬭	⬭	⬭	⬭
77	unravel	77	⬭	⬭	⬭	⬭
78	catalogue	78	⬭	⬭	⬭	⬭
79	impurity	79	⬭	⬭	⬭	⬭
80	inventory	80	⬭	⬭	⬭	⬭
81	dregs	81	⬭	⬭	⬭	⬭
82	fathom	82	⬭	⬭	⬭	⬭
83	disentangle	83	⬭	⬭	⬭	⬭
84	syllabus	84	⬭	⬭	⬭	⬭

VIII

			 Family	 Clothing	 Country	 Not Enough
85	generation	85	⬭	⬭	⬭	⬭
86	rural	86	⬭	⬭	⬭	⬭
87	raiment	87	⬭	⬭	⬭	⬭
88	kindred	88	⬭	⬭	⬭	⬭
89	scant	89	⬭	⬭	⬭	⬭
90	clan	90	⬭	⬭	⬭	⬭
91	pastoral	91	⬭	⬭	⬭	⬭
92	inadequate	92	⬭	⬭	⬭	⬭
93	rustic	93	⬭	⬭	⬭	⬭
94	meager	94	⬭	⬭	⬭	⬭
95	attire	95	⬭	⬭	⬭	⬭
96	bucolic	96	⬭	⬭	⬭	⬭

STOP!

Reading Test

TEST 4: PARAGRAPH READING

DIRECTIONS

Here are some stories which tell about two people, places, or things which are alike in some ways but different in other ways. After each story there are statements for you to classify. You do this by filling in the answer space under the right heading. The sample will be done for you.

SAMPLE

Bill and George are two boys who are neighbors and go to the same school. Bill likes sports and is good in all of them. George doesn't care for sports; he likes to play the piano and listen to music.

Bill's favorite sport is football. He is quarterback on the school team. He would like to be a professional football player some day.

Although George likes the piano best, he plays clarinet in the school band. When the band plays at football games, the boys ride home together after the game.

		True only of Bill	True only of George	True of both	Answer is not given
S1	He plays football.	S1	○	○	○
S2	He goes to school.	S2	○	○	○
S3	He earns money after school.	S3	○	○	○
S4	He plays the clarinet.	S4	○	○	○

Go on to the next

I

My father made a bird feeder after the first fall snowstorm. The holes were very small. I thought it would be hard for the birds to get the food.

When the feeder was hung in the yard, a blue jay appeared. He tried to get into the box, but he was too big. A little chickadee came, but the blue jay chased him away and scolded noisily. Still, the blue jay could not get into the box.

The chickadee flew over to the next yard, where there was a bigger feeder, and began to eat. Soon the blue jay went there too. He chased the chickadee away again and began to eat the seed himself. Now the chickadee came back to our feeder, and the blue jay did not bother him again. I could see why my father had made the holes so small.

		True only of blue jay	True only of chickadee	True of both	Answer is not given
1 This bird could not eat from the small feeder.	1	⬭	⬭	⬭	⬭
2 He ate in our yard.	2	⬭	⬭	⬭	⬭
3 He is smaller than the other bird.	3	⬭	⬭	⬭	⬭
4 This bird was noisy.	4	⬭	⬭	⬭	⬭
5 He was hungry.	5	⬭	⬭	⬭	⬭
6 He ate at the big feeder.	6	⬭	⬭	⬭	⬭
7 My father made the feeder to help birds like this one.	7	⬭	⬭	⬭	⬭
8 This bird stays north in the winter.	8	⬭	⬭	⬭	⬭

II

Amphibian animals spend part of their lives in water and part on land. Two of our commonest amphibians are the toad and the bullfrog. Both of these animals hatch from eggs laid in the water, where they develop into tadpoles and swim about, breathing by means of gills. Gradually they lose their gills and form lungs, so that they are able to live on land.

From this point on, toads live away from water, returning to it only in the spring to lay their eggs. They are slow, ugly animals with rough, warty skin, and in past times they were connected with witches' spells. But the toad is really the gardener's best friend, for it spends the night-time hours feeding on all sorts of insect pests.

Bullfrogs stay near the water. They have smooth, slippery skin, are much quicker in movement than toads, and may grow to a much greater size. Unlike toads, they have loud, bass voices; on a summer night, you may hear their croak echoing from the shores of ponds and streams.

		True only of toads	True only of bullfrogs	True of both	Answer is not given
9 They lay their eggs in the water.	9	⬭	⬭	⬭	⬭
10 Their skin is rough.	10	⬭	⬭	⬭	⬭
11 When young, they breathe through gills.	11	⬭	⬭	⬭	⬭
12 These are usually the larger of the two.	12	⬭	⬭	⬭	⬭
13 Some of them burrow underground.	13	⬭	⬭	⬭	⬭
14 They are a great help to gardeners.	14	⬭	⬭	⬭	⬭
15 They make loud, croaking sounds.	15	⬭	⬭	⬭	⬭
16 People used to think that witches used them.	16	⬭	⬭	⬭	⬭

III

Boxing is an old sport, going back to the days of ancient Greece, where it was an important part of the Olympic Games. The Olympics were held during the hottest part of the summer, and the boxers were rubbed with oil to limit perspiration. Their hands were bound with heavy leather strips, called *cesti*, often loaded with lead or iron. These made the hands so cumbersome that the fighters used swinging and hammering blows rather than punches. Teeth were often knocked out, and ears were especially vulnerable; fighters were frequently maimed for life. There were no rounds and no time limits—the men fought until one of them conceded defeat.

The sport passed from Greece to Rome, but after the fall of Rome it was unknown in Europe until the 18th century, when, in England, James Figg introduced bare-knuckle, or gloveless fighting and opened a boxing school in London. He built an amphitheatre with a square space roped off for the fighters. The men used to soak their hands in astringents to keep them hard. Figg did not believe in rest periods, and a fight would continue without stop until one man had obviously won.

		True only of Greek boxing	True only of first English boxing	True of both	Answer is not given
17 This was the more brutal way of boxing.	17	⬭	⬭	⬭	⬭
18 Bare fists were used in fighting.	18	⬭	⬭	⬭	⬭
19 The boxers rubbed themselves with oil.	19	⬭	⬭	⬭	⬭
20 There were no rounds.	20	⬭	⬭	⬭	⬭
21 Leather strips weighted with metal were used on the hands.	21	⬭	⬭	⬭	⬭
22 Boxing matches were held in roped-off spaces.	22	⬭	⬭	⬭	⬭
23 Astringent solutions were used to keep the hands hard.	23	⬭	⬭	⬭	⬭
24 Soft gloves were used for practice.	24	⬭	⬭	⬭	⬭

IV

The monster called the dragon appears in the legends and works of art of many countries. Its form and meaning vary; but all dragons have snakelike bodies, usually covered with scales. In different parts of the world they may be pictured as having forelegs or wings, or the heads of other creatures.

In Chinese art dragons are brilliantly colored and often have feathers or fur. They have no wings, although in pictures they may appear in the sky. The Chinese have always believed dragons to be a sign of good fortune. The dragon is the symbol of the country and was the badge of the imperial family.

In medieval European art, on the other hand, the dragon is a symbol of Satan or sin. It is often shown breathing fire, and with huge wings. Its color is usually dull green or gray. The most heroic achievement of the legendary knights of the early Middle Ages was to slay a dragon and thus conquer the forces of evil.

		True only of Chinese dragon	True only of European dragon	True of both	Answer is not given
25 Its body is snakelike.	25	⬭	⬭	⬭	⬭
26 People honor this dragon.	26	⬭	⬭	⬭	⬭
27 This dragon appears in many paintings.	27	⬭	⬭	⬭	⬭
28 It is a symbol of evil.	28	⬭	⬭	⬭	⬭
29 This dragon has the head of an eagle.	29	⬭	⬭	⬭	⬭
30 It often breathes fire.	30	⬭	⬭	⬭	⬭
31 It is brightly colored.	31	⬭	⬭	⬭	⬭
32 In pictures, it sometimes flies without wings.	32	⬭	⬭	⬭	⬭

V

Eastville and Westmont lie on opposite shores of the river. Many years ago, they were villages of about the same size, both surrounded by green farmland. Today, however, they are very different.

About a hundred years ago, a railroad was built along the eastern shore of the river. It passed through Eastville, and soon many industries came to the town because the products of their factories could easily be shipped from the railway station. The village grew until it became an industrial city.

Westmont grew too, but in a different way. Because it had no railroad, it did not become industrial; but when a bridge over the river was finally built, people who worked in Eastville flocked to Westmont to buy and build homes. Today Westmont is a pleasant, green-lawned, residential city.

		True only of Eastville	True only of Westmont	True of both	Answer is not given
33 It used to be a village.	33	⬭	⬭	⬭	⬭
34 The railroad passed through it.	34	⬭	⬭	⬭	⬭
35 It now has a bridge connecting it with the opposite shore.	35	⬭	⬭	⬭	⬭
36 It is primarily a city of homes.	36	⬭	⬭	⬭	⬭
37 Today it has the larger population.	37	⬭	⬭	⬭	⬭
38 Now it is an industrial city.	38	⬭	⬭	⬭	⬭
39 Before the bridge was built, people crossed the river by ferry.	39	⬭	⬭	⬭	⬭
40 Factories were not built here because there was no railroad.	40	⬭	⬭	⬭	⬭

VIII

The principle of the sun compass, which tells direction from the time of day, is the reverse of that of the sundial, which relies on a knowledge of direction to tell the hour.

A sundial consists of a horizontal clock face with a flat piece of metal, or "gnomon," set vertically in the center. The gnomon points in a north-south direction. As the sun moves across the sky, the shadow cast by the gnomon on the face of the dial shows the approximate time. Sundials were used in ancient times, before clocks were known. Today they are sometimes found in gardens as ornamental substitutes for clocks.

The sun compass, on the other hand, consists of a dial which must be turned until the shadow of the gnomon in its center shows the approximate hour. One can then read north-south direction from the markings on the dial plate. Sun compasses are especially useful in polar regions, where magnetic compasses are difficult to use.

		True only of sundial	True only of sun compass	True of both	Answer is not given
57 If the direction of north is known, this instrument can tell the time of day.	57	⬭	⬭	⬭	⬭
58 One must turn its dial before reading the information.	58	⬭	⬭	⬭	⬭
59 It is of no use if the sun is not shining.	59	⬭	⬭	⬭	⬭
60 Arctic explorers probably find it useful.	60	⬭	⬭	⬭	⬭
61 One can use it in place of other instruments.	61	⬭	⬭	⬭	⬭
62 It must be adjusted for the degree of latitude in which it is used.	62	⬭	⬭	⬭	⬭
63 The gnomon is in the center of the dial.	63	⬭	⬭	⬭	⬭
64 It does not show exact time.	64	⬭	⬭	⬭	⬭

APPENDIX B

Wide Range Achievement - Reading

Level 1 (page 4 of form)

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IN APPENDIX B, LEAF 98,

NOT MICROFILMED.

WIDE RANGE ACHIEVEMENT TEST

Reading, Spelling, Arithmetic from Pre-School to College

By J. F. Jastak, S. W. Bijou, S. R. Jastak

Printed in U.S.A.
1937, 1946, 1963
Revised Edition
1965

ame..... Birthdate..... M. F. Chron. Age.....

chool..... Grade..... Reading Score..... Grade..... Stand-Sc..... %ile.....

eferred by..... Spelling Score..... Grade..... Stand-Sc..... %ile.....

ate..... Examiner..... Arithmetic Score.... Grade..... Stand-Sc..... %ile.....

rcentiles and Standard Scores corresponding to grade ratings and age may be found in the Manual.

el I—Spelling—Grade Norms.

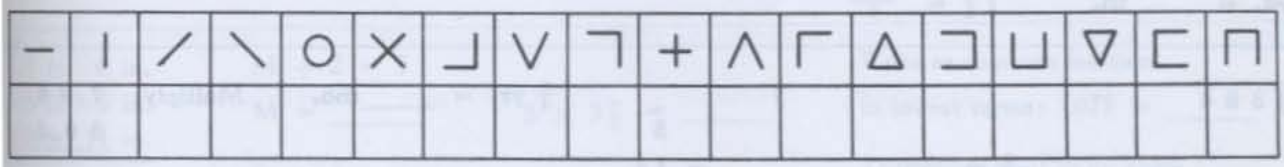
e Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade
N.5	12	Kg.4	23	1.5	34	3.0	45	5.7	56	10.3
N.8	13	Kg.5	24	1.6	35	3.2	46	6.0	57	10.9
Pk.1	14	Kg.6	25	1.7	36	3.5	47	6.3	58	11.5
Pk.2	15	Kg.7	26	1.8	37	3.7	48	6.5	59	12.2
Pk.3	16	Kg.8	27	2.0	38	3.9	49	6.8	60	13.0
Pk.5	17	Kg.9	28	2.2	39	4.2	50	7.2	61	13.8
Pk.7	18	Gr.1.0	29	2.3	40	4.5	51	7.7	62	14.5
Pk.9	19	1.1	30	2.5	41	4.7	52	8.2	63	15.2
Kg.1	20	1.2	31	2.6	42	5.0	53	8.7	64	15.9
Kg.2	21	1.3	32	2.7	43	5.3	54	9.2	65	16.7
Kg.3	22	1.4	33	2.9	44	5.5	55	9.7		

Level II—Spelling—Grade Norms.

Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade
0	Kg.2	11	4.0	21	6.7	31	9.0	41	12.4
1	Kg.6	12	4.3	22	6.8	32	9.3	42	12.8
2	Gr.1.0	13	4.6	23	7.0	33	9.6	43	13.2
3	1.3	14	4.9	24	7.2	34	9.9	44	13.6
4	1.6	15	5.2	25	7.4	35	10.2	45	14.0
5	1.9	16	5.5	26	7.6	36	10.5	46	14.4
6	2.2	17	5.8	27	7.8	37	10.8	47	15.0
7	2.6	18	6.1	28	8.1	38	11.2	48	15.7
8	3.0	19	6.3	29	8.4	39	11.6	49	16.4
9	3.3	20	6.5	30	8.7	40	12.0	50	17.2
10	3.7							51	18.0

Spelling Scores

Level I		Level II	
Test	Cumul Score	Test	Cumul Score
Copying		**Copying**	
1 point per mark	1 to 18	4-9 10-17 18	1 2 3
Name		**Name**	
1 letter	19	1 letter	4
2 letters	20	2 letters	5
Spelling		**Spelling**	
1 point per word	21 to 65	1 point per word	6 to 51



ne _____ 31. _____

_____ 16. _____ 32. _____

_____ 17. _____ 33. _____

_____ 18. _____ 34. _____

_____ 19. _____ 35. _____

_____ 20. _____ 36. _____

_____ 21. _____ 37. _____

_____ 22. _____ 38. _____

_____ 23. _____ 39. _____

_____ 24. _____ 40. _____

_____ 25. _____ 41. _____

_____ 26. _____ 42. _____

_____ 27. _____ 43. _____

_____ 28. _____ 44. _____

_____ 29. _____ 45. _____

_____ 30. _____ 46. _____

LEVEL I, Oral Part

3 Fingers, 8 fingers. 9 or 6? 42 or 28?

3 pennies, spend 1 ?_____ ; 3 + 4 apples?_____ ; 9 marbles, lose 3?_____

Written part.

$1 + 1 =$ _____ $\quad 4 - 1 =$ _____

$\begin{array}{r} 6 \\ +\ 2 \end{array}$ $\quad \begin{array}{r} 5 \\ -\ 3 \end{array}$ $\quad \begin{array}{r} 32 \\ 24 \\ +\ 40 \end{array}$ $\quad 4 \times 2 =$ _____ $\quad \begin{array}{r} 23 \\ \times\ 3 \end{array}$ $\quad \begin{array}{r} 29 \\ -\ 18 \end{array}$ $\quad \begin{array}{r} 75 \\ +\ 8 \end{array}$

$\begin{array}{r} 452 \\ 137 \\ +\ 245 \end{array}$ $\quad 6 \div 2 =$ _____ $\quad \begin{array}{r} \$62.04 \\ -\ 5.30 \end{array}$ $\quad 1\frac{1}{2}$ hr. = ____ min. $\quad 6\overline{)968}$

$\frac{1}{3} + \frac{1}{3} =$ _____

$\frac{15}{5} =$ _____ $\quad \frac{7}{9} - \frac{5}{9} =$ _____ $\quad \begin{array}{r} 823 \\ \times\ 96 \end{array}$ $\quad \begin{array}{r} 4\frac{5}{6} \\ 3\frac{1}{3} \\ +\ 2\frac{1}{2} \end{array}$ $\quad \frac{2}{5}$ of 35 = _____

$\frac{1}{2}$ yd. = ____ in. $\quad 1\frac{3}{4} = \frac{\quad}{4}$

$27\overline{)384}$ $\quad \frac{2}{3} = \frac{\quad}{12}$ $\quad \begin{array}{r} 5 \\ -\ 1\frac{1}{3} \end{array}$ $\quad \frac{3}{4}$ yr. = ____ mo. $\quad$ Multiply: $\begin{array}{r} 7.96 \\ \times\ 30.8 \end{array}$

$2\frac{1}{3}$ doz. = _____

Which is more?

$\frac{7}{8}$ or $\frac{13}{15}$ Ans. _____

Find the average of

24, 18, 21, 26, 17

Ans. _____

Write as a percent

$\frac{3}{4} =$ _____%

$4\frac{1}{5} \times 3\frac{1}{3} =$ _____

$\frac{3}{10} \div \frac{3}{4} =$ _____ $\quad \frac{8}{9} \times \frac{9}{4} \times \frac{1}{2} =$ _____

Write as decimal:

$\frac{2}{3} =$ _____ $\quad$ 20% of 120 = _____

$8.2\overline{)62.703}$ $\quad 6^2 =$ _____

Change to familiar numerals:

M C X L II = _____

$(-5)(+9) =$ _____

Find interest on

$300 at $4\frac{1}{2}\%$ for 7 mo.

Ans. _____

Solve:

$y + (9 - 8y) = 65$

$y =$ _____

Find square root: $\sqrt{334.89}$

Percentiles and Standard Scores corresponding to grade ratings and age may be found in the Manual.

Arithmetic—Level I—Grade Norms.

Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade
1	N.5	8	Kg.1	15	Kg.9	22	2.1	29	3.6	36	5.3	43	6.7	50	10.0	57	14.9
2	N.8	9	Kg.2	16	Gr.1.0	23	2.2	30	3.9	37	5.5	44	7.0	51	10.7	58	15.6
3	Pk.1	10	Kg.3	17	1.2	24	2.4	31	4.2	38	5.7	45	7.2	52	11.4	59	16.5
4	Pk.2	11	Kg.4	18	1.4	25	2.6	32	4.5	39	5.9	46	7.6	53	12.1		
5	Pk.4	12	Kg.5	19	1.6	26	2.8	33	4.7	40	6.1	47	8.2	54	12.8		
6	Pk.6	13	Kg.6	20	1.8	27	3.0	34	5.0	41	6.3	48	8.8	55	13.5		
7	Pk.8	14	Kg.7	21	1.9	28	3.2	35	5.2	42	6.5	49	9.4	56	14.2		

3. Arithmetic

EL II, Oral Part 1. Counts 1-5 2. Counts 6-15 3. Reads 3 4. Reads 5 5. Reads 6
6. Reads 17 7. Reads 41 8. Pennies 3-1 9. Apples 3 + 4 10. Marbles 9-3

10

en part.

$2\frac{1}{2} + 1\frac{1}{2} =$ _____

$\frac{1}{6}$ of 30 = _____

43	94	$4.95	726	229	
+ 6	− 64	× 3	− 349	5048	
				63	
				+ 1381	

17

9)4527

$1\frac{1}{3}$ ft. = _____ in.

$2 -$ _____ $= \frac{1}{4}$

Add:

$6\frac{1}{4}$

$1\frac{5}{8}$

$4\frac{1}{2}$

809
× 47

Write as percent:

.42 = _____%

23

act:

$\frac{1}{4}$

$\frac{2}{3}$

Multiply: 6.23
12.7

Ans. _____

Find average:

34, 16, 45, 39, 27

Ans. _____

Write as decimal:

$52\frac{1}{2}\% =$ _____

Write as percent:

$\frac{3}{8} =$ _____%

2.9)308.85

29

3 ft. 6 in.
5 ft. 5 in.
8 ft. 11 in.

M + 2 = 5

M = _____

2x = 3

x = _____

$6 \times 3\frac{7}{8} =$ _____

15% of 175 = _____

Write as common fraction in lowest terms: .075 = _____

The complement of an angle *of 30°* = _____

36

= _____

$\div 1\frac{1}{5} =$ _____

If a = 7, b = 3,

$a^2 + 3b =$ _____

$\frac{1}{4}\%$ *of 60* = _____

66 sq. ft. = _____ sq. yd.

Solve:

$\frac{7 - (6 + 8)}{2} =$ _____

Add:

− x − y − 23
x − y + 22

43

tor:

$+ 25 - 10r$

_____

$\frac{r^2 - 5r - 6}{r + 1}$

Ans. _____

Change to familiar numerals: M D C X C I = _____

Find interest on $1,200 at 6% for 70 days. Ans. _____

$3p - q = 10$

$2p - q = 7$

p = _____

q = _____

$\sqrt{2ax} = 6$

x = _____

$\frac{7}{17} = \frac{6}{x}$

x = _____

51

square root:

67081

$\log_{10}\left(\frac{1}{100}\right)$

Ans. _____

$\log_5 5\sqrt{5}$

Ans. _____

Reduce:

$\frac{k^2 + k}{k^2} \cdot \frac{3k - 3}{k^2 - 1}$

Ans. _____

Find root:

$2x^2 - 36x = 162$

Ans. _____

56

rentiles and Standard Scores corresponding to grade ratings and age may be found in the Manual.

matic—Level II—Grade Norms.

Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade
3.5	7	Kg.8	14	3.9	21	6.3	28	8.5	35	12.5	42	15.9
Pt.1	8	Gr.1.0	15	4.4	22	6.7	29	9.0	36	12.8	43	16.5
Pt.2	9	1.5	16	4.9	23	6.9	30	9.5	37	13.3	44	17.1
Pt.3	10	1.9	17	5.3	24	7.1	31	10.1	38	13.8	45	17.7
Kg.1	11	2.3	18	5.7	25	7.4	32	10.8	39	14.4	46	18.3
Kg.4	12	2.9	19	6.1	26	7.7	33	11.3	40	14.9	47	18.9
Kg.6	13	3.4	20	6.3	27	8.0	34	11.8	41	15.4	48	19.5
											49	20.0

Percentiles and Standard Scores corresponding to grade ratings and age may be found in the Manu

Level I—Reading—Grade Norms.

Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade
1	N.3	16-17	Kg.6	36-37	1.9	53	3.5	66	5.3	79	8.1	92	12.9
2	N.8	18	Kg.7	38	2.0	54	3.5	67	5.5	80	8.4	93	13.3
3	Pk.1	19-20	Kg.8	39-40	2.1	55	3.6	68	5.7	81	8.7	94	13.7
4	Pk.2	21	Kg.9	41	2.2	56	3.8	69	5.9	82	9.0	95	14.1
5	Pk.4	22	Gr.1.0	42-43	2.3	57	3.9	70	6.1	83	9.3	96	14.5
6	Pk.5	23	1.1	44	2.4	58	4.1	71	6.3	84	9.7	97	14.9
7	Pk.7	24-25	1.2	45-46	2.5	59	4.2	72	6.5	85	10.1	98	15.4
8	Pk.9	26-27	1.3	47	2.6	60	4.4	73	6.7	86	10.5	99	15.8
9	Kg.1	28-29	1.4	48	2.7	61	4.5	74	6.8	87	10.9	100	16.2
10-11	Kg.2	30-31	1.5	49	2.8	62	4.7	75	7.0	88	11.3		
12	Kg.3	32-33	1.6	50	2.9	63	4.8	76	7.2	89	11.7		
13-14	Kg.4	34	1.7	51	3.0	64	5.0	77	7.3	90	12.1		
15	Kg.3	35	1.8	52	3.1	65	5.1	78	7.8	91	12.5		

Level II—Reading—Grade Norms

Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score
0	Pk.3	16	1.3	29	4.4	42	6.8	55	9.3	68	13.0	81
1	Pk.8	17	1.5	30	4.6	43	6.9	56	9.6	69	13.2	82
2	Kg.1	18	1.7	31	4.8	44	7.1	57	9.9	70	13.5	83
3-4	Kg.2	19	1.8	32	5.0	45	7.3	58	10.2	71	13.8	84
5-6	Kg.3	20	2.0	33	5.2	46	7.5	59	10.5	72	14.1	85
7	Kg.4	21	2.2	34	5.4	47	7.7	60	10.8	73	14.4	86
8	Kg.5	22	2.4	35	5.6	48	7.9	61	11.3	74	14.7	87
9	Kg.6	23	2.6	36	5.8	49	8.1	62	11.6	75	15.0	88
10-11	Kg.7	24	2.8	37	6.0	50	8.3	63	11.9	76	15.3	89
12	Kg.8	25	3.0	38	6.2	51	8.5	64	12.2	77	15.6	
13	Kg.9	26	3.5	39	6.5	52	8.7	65	12.4	78	15.9	
14	Gr.1.0	27	3.9	40	6.5	53	8.9	66	12.6	79	16.2	
15	1.1	28	4.2	41	6.6	54	9.1	67	12.8	80	16.5	

LEVEL 2

Two letters in name (2) A B O S E R T H P I U Z Q (13)

milk city in tree animal himself between chin split form

grunt stretch theory contagious grieve toughen aboard triumph

contemporary escape eliminate tranquillity conspiracy image ethics

deny rancid humiliate bibliography unanimous predatory alcove

scald mosaic municipal decisive contemptuous deteriorate stratagem

benign desolate protuberance prevalence regime irascible peculiarity

pugilist enigmatic predilection covetousness soliloquize longevity abysma

ingratiating oligarchy coercion vehemence sepulcher emaciated evanescence

centrifugal subtlety beatify succinct regicidal schism ebullience

misogyny beneficent desuetude egregious heinous internecine synecdoche

LEVEL 1

cat see red to big work book eat was him how

then open letter jar deep even spell awake block size

weather should lip finger tray felt stalk cliff lame struck

approve plot huge quality sour imply humidity urge

bulk exhaust abuse collapse glutton clarify

recession threshold horizon residence participate quarantine

luxurious rescinded emphasis aeronautic intrigue repugnant

putative endeavor heresy discretionary persevere anomaly

rudimentary miscreant usurp novice audacious mitosis

seismograph spurious idiosyncrasy itinerary pseudonym aborigine

A R Z H I Q S E B

Two letters in name (2) A B O S E R T H P I U Z

APPENDIX C

SRA 100 Random Words

Grades 1-4 Level

SRA 100 Random Words - Grades 1-4 Level

house	street	elephant	understand
friend	summer	railroad	material
star	ice	scent	chimneys
little	good	insects	journey
hello	cookies	slowly	discovering
blue	walking	buttoned	pleasant
flowers	zoo	furry	radar
grow	rain	build	temperate
birds	father	beginning	desert
morning	wonderful	station	supplies
bell	rocket	decide	uniform
face	ground	thought	muscles
picnic	football	notice	pouch
river	airplane	message	fastened
trees	wait	studying	entrance
sat	happy	potatoes	magic
shopping	gingerbread	through	beauty
down	engine	submarine	crew
umbrella	talking	freezer	hurricane
paint	country	trouble	exciting
looked	scientist	breakfast	national
flying	leaves	happens	mountain
something	penguin	general	gunpowder
box	clothes	imagine	instruments
boat	difficult	victory	invention

APPENDIX D

Paragraph from SRA Reader -

"The Greedy Dog"

THE GREEDY DOG

There was once a dog who was very greedy. He wanted everything for himself.

One day he had a large piece of fresh meat. He did not want to share it with any of his brothers and sisters.

"I will take it into the woods," he said. "I can hide there and eat it all myself."

He picked up the piece of meat with his teeth and started for the woods. He looked to the right and to the left. He did not want anyone to follow him and get even a bite of his meat.

APPENDIX E

Wechsler Intelligence Scale for Children - Revised

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WISC-R Record Form (Wechsler Intelligence Scale for Children - Revised). Copyright 1971, 1974 by The Psychological Corporation, New York, N.Y., U.S.A. 10017. Printed in U.S.A.

WISC-R RECORD FORM

Wechsler Intelligence Scale for Children—Revised

NAME _____ AGE _____ SEX _____

ADDRESS _____

PARENT'S NAME _____

SCHOOL _____ GRADE _____

PLACE OF TESTING _____ TESTED BY _____

REFERRED BY _____

WISC-R PROFILE

nicians who wish to draw a profile should first transfer the child's *scaled scores* to the row of boxes low. Then mark an X on the dot corresponding to the scaled score for each test, and draw a line necting the X's.*

	VERBAL TESTS							PERFORMANCE TESTS						
	Information	Similarities	Arithmetic	Vocabulary	Comprehension	Digit Span	Scaled Score	Picture Completion	Picture Arrangement	Block Design	Object Assembly	Coding	Mazes	Scaled Score
Scaled Score														
19	•	•	•	•	•	•	19	•	•	•	•	•	•	19
18	•	•	•	•	•	•	18	•	•	•	•	•	•	18
17	•	•	•	•	•	•	17	•	•	•	•	•	•	17
16	•	•	•	•	•	•	16	•	•	•	•	•	•	16
15	•	•	•	•	•	•	15	•	•	•	•	•	•	15
14	•	•	•	•	•	•	14	•	•	•	•	•	•	14
13	•	•	•	•	•	•	13	•	•	•	•	•	•	13
12	•	•	•	•	•	•	12	•	•	•	•	•	•	12
11	•	•	•	•	•	•	11	•	•	•	•	•	•	11
10	•	•	•	•	•	•	10	•	•	•	•	•	•	10
9	•	•	•	•	•	•	9	•	•	•	•	•	•	9
8	•	•	•	•	•	•	8	•	•	•	•	•	•	8
7	•	•	•	•	•	•	7	•	•	•	•	•	•	7
6	•	•	•	•	•	•	6	•	•	•	•	•	•	6
5	•	•	•	•	•	•	5	•	•	•	•	•	•	5
4	•	•	•	•	•	•	4	•	•	•	•	•	•	4
3	•	•	•	•	•	•	3	•	•	•	•	•	•	3
2	•	•	•	•	•	•	2	•	•	•	•	•	•	2
1	•	•	•	•	•	•	1	•	•	•	•	•	•	1

See Chapter 4 in the manual for a discussion of the significance of differences between scores on the tests.

	Year	Month	Day
Date Tested			
Date of Birth			
Age			

	Raw Score	Scaled Score
VERBAL TESTS		
Information		
Similarities		
Arithmetic		
Vocabulary		
Comprehension		
(Digit Span)	( )	( )
Verbal Score		
PERFORMANCE TESTS		
Picture Completion		
Picture Arrangement		
Block Design		
Object Assembly		
Coding		
(Mazes)	( )	( )
Performance Score		

	Scaled Score	IQ
Verbal Score	*	
Performance Score	*	
Full Scale Score		

*Prorated from 4 tests, if necessary.

NOTES

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74-10

1. INFORMATION

Discontinue after 5 consecutive failures.

	Score 1 or 0
1. Finger	
2. Ears	
3. Legs	
4. Boil	
5. Nickel	
6. Cow	
7. Week	
8. March	
9. Bacon	
10. Dozen	
11. Seasons	
12. America	
13. Stomach	
14. Sun	
15. Leap Year	
16. Bulb	
17. 1776	
18. Oil	
19. Border	
20. Ton	
21. Chile	
22. Glass	
23. Greece	
24. Tall	
25. Barometer	
26. Rust	
27. Los Angeles	
28. Hieroglyphics	
29. Darwin	
30. Turpentine	
Total	Max. = 30

2. PICTURE COMPLETION

Discontinue after 4 consecutive failures.

	Score 1 or 0		Score 1 or 0
1. Comb		14. Playing Card	
2. Woman		15. Girl Running	
3. Fox		16. Coat	
4. Hand		17. Boy	
5. Cat		18. Scissors	
6. Mirror		19. Girl	
7. Clock		20. Screw	
8. Elephant		21. Cow	
9. Ladder		22. Thermometer	
10. Dresser		23. House	
11. Belt		24. Telephone	
12. Man		25. Profile	
13. Door		26. Umbrella	

Total

3. SIMILARITIES

Discontinue after 3 consecutive failures.

	Score 2, 1 or 0
1. Wheel—ball	
2. Candle—lamp	
3. Shirt—hat	
4. Piano—guitar	
5. Apple—banana	
6. Beer—wine	
7. Cat—mouse	
8. Elbow—knee	
9. Telephone—radio	
10. Pound—yard	
11. Anger—joy	
12. Scissors—copper pan	
13. Mountain—lake	
14. Liberty—justice	
15. First—last	
*16. The numbers 49 and 121	
17. Salt—water	

*If the child gives a 1-point response to Item 16, say, "How else are the numbers 49 and 121 alike?"

Total

8. OBJECT ASSEMBLY Give entire test to all children.

Object	Time	Enter Number of Correctly Joined Cuts	Multiply by	Score (Circle the appropriate score for each item.)
Apple (SAMPLE)				
1. Girl 120"		(0-6)	1	0 1 2 3 4 5 [31-120: 6] [21-30: 7] [1-20: 8] PERFECT ASSEMBLY
2. Horse 150"		(0-5)	1	0 1 2 3 4 [36-150: 5] [21-35: 6] [16-20: 7] [1-15: 8] PERFECT ASSEMBLY
3. Car 150"		(0-9)	½ *	0 1 2 3 4 [51-150: 5] [36-50: 6] [26-35: 7] [1-25: 8] PERFECT ASSEMBLY
4. Face 180"		(0-12)	½ *	0 1 2 3 4 5 [76-180: 6] [51-75: 7] [36-50: 8] [1-35: 9] PERFECT ASSEMBLY

*Round half-scores upward.

Total — Max.=33

9. COMPREHENSION Discontinue after 4 consecutive failures.

	Score 2, 1, or 0
1. Cut finger	
2. Find wallet	
*3. Smoke	
*4. Policemen	
5. Lose ball	
6. Fight	
*7. Build house	
*8. License plates	
*9. Criminals	
10. Stamps	
11. Inspect meat	
*12. Charity	
13. Secret ballot	
*14. Paperbacks	
15. Promise	
*16. Cotton	
*17. Senators	

*If the child replies with only one idea, ask him for a second response. Rephrase the test item appropriately, saying, "Tell me another thing to do (reason why, advantage of)...."

Total — Max.=34

10. CODING

		Time	Score
A (for children under 8)	120"		(0-50)
B (for children 8 & older)	120"		(0-93)

CODING A
Score Including Time Bonus for Perfect Performance

Time in Seconds	Score
111-120	45
101-110	46
91-100	47
81-90	48
71-80	49
1-70	50

7. VOCABULARY

Discontinue after 5 consecutive failures.

1. Knife	
2. Umbrella	
3. Clock	
4. Hat	
5. Bicycle	
6. Nail	
7. Alphabet	
8. Donkey	
9. Thief	
10. Join	
11. Brave	
12. Diamond	
13. Gamble	
14. Nonsense	
15. Prevent	
16. Contagious	
17. Nuisance	
18. Fable	
19. Hazardous	
20. Migrate	
21. Stanza	
22. Seclude	
23. Mantis	
24. Espionage	
25. Belfry	
26. Rivalry	
27. Amendment	
28. Compel	
29. Affliction	
30. Obliterate	
31. Imminent	
32. Dilatory	

Total

4. PICTURE ARRANGEMENT

Discontinue after 3 consecutive failures.

Arrangement	Time	Order	Score (Circle the appropriate score for each item.)
Scale (SAMPLE)			
1. Fight 45″	1 / 2		0 — 1 OUT — 2 OUT
2. Picnic 45″	1 / 2		0 — 1 DOG — 2 DOG
3. Fire 45″	1 / 2		0 — 1 FIRE — 2 FIRE
4. Plank 45″	1 / 2		0 — 1 WALK — 2 WALK
5. Burglar 45″			0 — 16-45 [3 — 11-15 4 — 1-10 5] THUG
6. Sleeper 45″			0 — 16-45 [3 — 11-15 4 — 1-10 5] RUSH
7. Artist 45″			0 — 16-45 [3 — 11-15 4 — 1-10 5] VAMP
8. Lasso 45″			0 — 16-45 [3 — 11-15 4 — 1-10 5] CASH
9. Boat 60″			0 — 2 HCASE — 21-60 [3 — 11-20 4 — 1-10 5] CHASE
10. Gardener 60″			0 — 2 WROMS — 26-60 [3 — 16-25 4 — 1-15 5] WORMS
11. Bench 60″			0 — 2 BECHN — 26-60 [3 — 16-25 4 — 1-15 5] BENCH
12. Rain 60″			0 — 2 COLUD — 26-60 [3 — 16-25 4 — 1-15 5] CLOUD

…ple item first.

Total — Max.=48

5. ARITHMETIC

Discontinue after 3 consecutive failures.

Problem	Response	Score 1 or 0
1. 30″		
*2. 30″		
*3. 30″		
4. 30″		
5. 30″		
6. 30″		
7. 30″		
8. 30″		
9. 30″		
10. 30″		
11. 30″		
12. 30″		
13. 30″		
14. 45″		
15. 45″		
16. 75″		
17. 75″		
18. 75″		

*Problems 2 and 3 are given ½ point each if child makes error but corrects it within time limit.
†Round half-scores upward.

Total — Max.=18†

6. BLOCK DESIGN

Discontinue after 2 consecutive failures.

8-16 yrs.

Design	Time	Pass-Fail	Score (Circle the appropriate score for each design.)
1. 45″	1 / 2		0 — 1 — 2
2. 45″	1 / 2		0 — 1 — 2
3. 45″	1 / 2		0 — 1 — 2
4. 45″			0 — 21-45 4 — 16-20 5 — 11-15 6 — 1-10 7
5. 75″			0 — 21-75 4 — 16-20 5 — 11-15 6 — 1-10 7
6. 75″			0 — 21-75 4 — 16-20 5 — 11-15 6 — 1-10 7
7. 75″			0 — 21-75 4 — 16-20 5 — 11-15 6 — 1-10 7
8. 75″			0 — 26-75 4 — 21-25 5 — 16-20 6 — 1-15 7
9. 120″			0 — 56-120 4 — 36-55 5 — 26-35 6 — 1-25 7
10. 120″			0 — 76-120 4 — 56-75 5 — 41-55 6 — 1-40 7
11. 120″			0 — 81-120 4 — 56-80 5 — 41-55 6 — 1-40 7

Total — Max.= 62

11. DIGIT SPAN (Optional)

Discontinue after failure on *both trials* of any item.
Administer *both trials* of each item, even if child passes first trial.

DIGITS FORWARD

	Trial 1	Pass-Fail	Trial 2	Pass-Fail	Score 2, 1, or 0
1.	3-8-6		6-1-2		
2.	3-4-1-7		6-1-5-8		
3.	8-4-2-3-9		5-2-1-8-6		
4.	3-8-9-1-7-4		7-9-6-4-8-3		
5.	5-1-7-4-2-3-8		9-8-5-2-1-6-3		
6.	1-6-4-5-9-7-6-3		2-9-7-6-3-1-5-4		
7.	5-3-8-7-1-2-4-6-9		4-2-6-9-1-7-8-3-5		

Max.=14

Administer DIGITS BACKWARD even if child scores 0 on DIGITS FORWARD.

Total Forward

DIGITS BACKWARD

	Trial 1	Pass-Fail	Trial 2	Pass-Fail	Score 2, 1, or 0
1.	2-5		6-3		
2.	5-7-4		2-5-9		
3.	7-2-9-6		8-4-9-3		
4.	4-1-3-5-7		9-7-8-5-2		
5.	1-6-5-2-9-8		3-6-7-1-9-4		
6.	8-5-9-2-3-4-2		4-5-7-9-2-8-1		
7.	6-9-1-6-3-2-5-8		3-1-7-9-5-4-8-2		

Max.=14

Total Backward

Max.=28

\+ =

Forward Backward Total

12. MAZES (Optional)

Discontinue after 2 consecutive failures.

	Maze	Maximum Errors	Errors	Score (Circle the appropriate score for each maze.)
	SAMPLE			
1.	30"	1		0 — 1 Error 1 — 0 Errors 2
2.	30"	1		0 — 1 Error 1 — 0 Errors 2
3.	30"	1		0 — 1 Error 1 — 0 Errors 2
4.	30"	2		0 — 2 Errors 1 — 1 Error 2 — 0 Errors 3
5.	45"	2		0 — 2 Errors 1 — 1 Error 2 — 0 Errors 3
6.	60"	3		0 — 3 Errors 1 — 2 Errors 2 — 1 Error 3 — 0 Errors 4
7.	120"	3		0 — 3 Errors 1 — 2 Errors 2 — 1 Error 3 — 0 Errors 4
8.	120"	4		0 — 4 Errors 1 — 3 Errors 2 — 2 Errors 3 — 1 Error 4 — 0 Errors 5
9.	150"	4		0 — 4 Errors 1 — 3 Errors 2 — 2 Errors 3 — 1 Error 4 — 0 Errors 5

8-16 yrs.

Max.=30

Total

APPENDIX F

Teachers' Questionnaire

TEACHERS' QUESTIONNAIRE

Below are a series of descriptions of behavior often shown by children. After each statement are three columns: "Doesn't Apply", "Applies Somewhat", and "Certainly Applies". If the child definitely shows the behavior described by the statement place a cross in the box under "Certainly Applies". If the child shows the behavior described by the statement but to a lesser degree or less often place a cross in the box under "Applies Somewhat". If, as far as you are aware, the child does not show the behavior place a cross in the box under "Doesn't Apply". Please put ONE cross against EACH statement. Thank you.

Statement	Doesn't Apply	Applies Somewhat	Certainly Applies
1. Very restless. Often running about or jumping up and down. Hardly ever still.	☐	☐	☐
2. Truants from school.	☐	☐	☐
3. Squirmy, fidgety child.	☐	☐	☐
4. Often destroys own or others' belongings.	☐	☐	☐
5. Frequently fights with other children.	☐	☐	☐
6. Not much liked by other children.	☐	☐	☐
7. Often worries, worries about many things.	☐	☐	☐
8. Tends to do things on his own - rather solitary.	☐	☐	☐
9. Irritable. Is quick to "fly off the handle".	☐	☐	☐
10. Often appears miserable, unhappy, tearful or distressed.	☐	☐	☐
11. Has twitches, mannerisms, or tics of the face or body.	☐	☐	☐

Statement	Doesn't Apply	Applies Somewhat	Certainly Applies
12. Frequently sucks thumb or finger.	☐	☐	☐
13. Frequently bites nails or fingers.	☐	☐	☐
14. Tends to be absent from school for trivial reasons.	☐	☐	☐
15. Is often disobedient.	☐	☐	☐
16. Has poor concentration or short attention span.	☐	☐	☐
17. Tends to be fearful or afraid of new things or new situations.	☐	☐	☐
18. Fussy or over-particular child.	☐	☐	☐
19. Often tells lies.	☐	☐	☐
20. Has stolen things on one or more occasions.	☐	☐	☐
21. Has wet or soiled self at school this year.	☐	☐	☐
22. Often complains of pains or aches.	☐	☐	☐
23. Has had tears on arrival at school or has refused to come into the building this year.	☐	☐	☐
24. Has a stutter or stammer.	☐	☐	☐
25. Has other speech difficulty.	☐	☐	☐
26. Bullies other children.	☐	☐	☐

Are there any other problems of behavior? _____

_____

_____

_____

SIGNATURE: MR. MRS. MISS _____

How well do you know this child? Very well ☐

Moderately well ☐

Not very well ☐

THANK YOU VERY MUCH FOR YOUR HELP.

APPENDIX G

Parents' Questionnaire

PARENTS' QUESTIONNAIRE - STRICTLY CONFIDENTIAL

NAME OF CHILD _____ BOY/GIRL
DATE OF BIRTH _____

ADDRESS _____ SCHOOL _____

How to fill in this form

The questionnaire asks about various kinds of behavior that many children show at some time. Please cross the answers according to the way your child is NOW.

Health Problems

Below is a list of minor health problems which most children have at some time. Please tell us how often each of these happens with your child by putting a cross in the correct box.

	Never in the last year	Less often than once per month	At least once per month	At least once per week
A. Complains of headaches	☐	☐	☐	☐
B. Has stomach-ache or vomiting	☐	☐	☐	☐
C. Complains of biliousness	☐	☐	☐	☐
D. Wets his/her bed or pants	☐	☐	☐	☐
E. Soils him/herself or loses control of bowels	☐	☐	☐	☐
F. Has temper tantrums (i.e., complete loss of temper with shouting, angry movements, etc.	☐	☐	☐	☐
G. Had tears on arrival at school or refused to go into the building	☐	☐	☐	☐

	Never in the last year	Less often than once per month	At least once per month	At least once per week
H. Truants from school	☐	☐	☐	☐

Habits

Please place a cross against the correct answer.

I. Does he/she stammer or stutter?

☐ No ☐ Yes - mildly ☐ Yes - severely

II. Has he/she any difficulty with speech other than stammering or stuttering?

☐ No ☐ Yes - mild ☐ Yes - severely

If yes, is the difficulty

☐ "lisping"

☐ cannot say words properly

☐ other, please describe _____

III. Does he/she ever steal things?

☐ No ☐ Yes - occasionally ☐ Yes - frequently

If yes, (occasionally or frequently)
when he/she steals, does it involve

☐ minor pilfering of pens, sweets, toys, small sums of money, etc.

☐ stealing of big things

☐ both minor pilfering and stealing of big things

When he/she steals, is it done

☐ in the home

☐ elsewhere

☐ both in the home and elsewhere

When he/she steals, does he/she do it

☐ on his/her own

☐ with other children

☐ sometimes on his/her own, sometimes with others

IV. Does he/she have any eating difficulty?

☐ No ☐ Yes - mild ☐ Yes - severe

If yes, is it

☐ faddiness

☐ not eating enough

☐ eating too much

☐ other, please describe _____

_____

V. Does he/she have any sleeping difficulty?

☐ No ☐ Yes - mild ☐ Yes - severe

If yes, is it difficulty in

☐ getting off to sleep

☐ waking during the night

☐ waking early in the morning

☐ other, please describe _____

PARENTS' QUESTIONNAIRE - STRICTLY CONFIDENTIAL

Below are a series of descriptions of behavior often shown by children. After each statement are three columns - "Doesn't Apply", "Applies Somewhat", and "Certainly Applies". If your child definitely shows the behavior described by the statement place a cross in the box under "Certainly Applies". If he or she shows the behavior described by the statement but to a lesser degree or less often, place a cross under "Applies Somewhat". If, so far as you are aware, your child does not show the behavior, place a cross under "Doesn't Apply".

Please put ONE cross against EACH statement.

Statement	Doesn't Apply	Applies Somewhat	Certainly Applies
1. Very restless. Often running about or jumping up and down. Hardly ever still.	☐	☐	☐
2. Squirmy, fidgety child	☐	☐	☐
3. Often destroys own or others' belongings.	☐	☐	☐
4. Frequently fights with other children.	☐	☐	☐
5. Not much liked by other children.	☐	☐	☐
6. Often worried, worries about many things.	☐	☐	☐
7. Tends to do things on his own - rather solitary.	☐	☐	☐
8. Irritable. Is quick to "fly off the handle".	☐	☐	☐
9. Often appears miserable, unhappy, tearful or distressed.	☐	☐	☐
10. Has twitches, mannerisms or tics of the face or body.	☐	☐	☐

	Doesn't Apply	Applies Somewhat	Certainly Applies
11. Frequently sucks thumb or finger.	☐	☐	☐
12. Frequently bites nails or fingers.	☐	☐	☐
13. Is often disobedient.	☐	☐	☐
14. Cannot settle to anything for more than a few moments.	☐	☐	☐
15. Tends to be fearful or afraid of new things or new situations.	☐	☐	☐
16. Fussy or over-particular child.	☐	☐	☐
17. Often tells lies.	☐	☐	☐
18. Bullies other children.	☐	☐	☐

ARE THERE ANY OTHER PROBLEMS?

SIGNATURE: MR. MRS. MISS _____

THANK YOU VERY MUCH FOR YOUR HELP.

APPENDIX H

Children's Questionnaire

CHILDREN'S QUESTIONNAIRE

	YES	NO
1. Do you worry when the teacher says that she is going to ask you questions to find out how much you know?	___	___
2. Do you worry about being promoted, that is, passing from the fourth to the fifth grade at the end of the year?	___	___
3. When the teacher asks you to get up in front of the class and read aloud, are you afraid that you are going to make some bad mistakes?	___	___
4. When the teacher says that she is going to call upon some boys and girls in the class to do arithmetic problems, do you hope that she will call upon someone else and not on you?	___	___
5. Do you sometimes dream at night that you are in school and cannot answer the teacher's questions?	___	___
6. When the teacher says that she is going to find out how much you have learned, does your heart begin to beat faster?	___	___
7. When the teacher is teaching you about arithmetic, do you feel that other children in the class understand her better than you?	___	___
8. When you are in bed at night, do you sometimes worry about how you are going to do in class the next day?	___	___
9. When the teacher asks you to write on the blackboard in front of the class, does the hand you write with sometimes shake a little?	___	___
10. When the teacher is teaching you about reading, do you feel that other children in class understand her better than you?	___	___
11. Do you think you worry more about school than other children?	___	___
12. When you are at home and you are thinking about your arithmetic lesson for the next day, do you become afraid that you will get the answers wrong when the teacher calls upon you?	___	___

	YES	NO
13. If you are sick and miss school, do you worry that you will do more poorly in your school-work than other children when you return to school?	—	—
14. Do you sometimes dream at night that other boys and girls in your class can do things you cannot do?	—	—
15. When you are home and you are thinking about your reading lesson for the next day, do you worry that you will do poorly on the lesson?	—	—
16. When the teacher says that she is going to find out how much you have learned, do you get a funny feeling in your stomach?	—	—
17. If you did very poorly when the teacher called on you, would you probably feel like crying even though you would try not to cry?	—	—
18. Do you sometimes dream at night that the teacher is angry because you do not know your lessons?	—	—
19. Are you afraid of school tests?	—	—
20. Do you worry a lot <u>before</u> you take a test?	—	—
21. Do you worry a lot <u>while</u> you are taking a test?	—	—
22. <u>After</u> you have taken a test do you worry about how well you did on the test?	—	—
23. Do you sometimes dream at night that you did poorly on a test you had in school that day?	—	—
24. When you are taking a test, does the hand you write with shake a little?	—	—
25. When the teacher says that she is going to give the class a test, do you become afraid that you will do poorly?	—	—
26. When you are taking a hard test, do you forget some things you knew very well before you started taking the test?	—	—
27. Do you wish a lot of times that you didn't worry so much about tests?	—	—

	YES	NO
28. When the teacher says that she is going to give the class a test, do you get a nervous or funny feeling?	___	___
29. While you are taking a test do you usually think you are doing poorly?	___	___
30. While you are on your way to school, do you sometimes worry that the teacher may give the class a test?	___	___

APPENDIX I

Instructions for Contingent Reinforcement Group Parents

ST. JOHN'S HOME READING PROGRAM

You are about to begin a program to help your child to read better. It is important especially at this age that children learn basic words which make up the English language, because reading is a part of all school subjects, e.g. history and geography - even being able to read arithmetic problems in order to do them. Although your child is of normal intelligence, for some reason he (she) has found some difficulty with reading. Some of the problems will be taken care of at school but a little extra individual attention at this time will make life a lot easier for him (her) later on.

Work which has been done in schools all over Canada and the States has shown that a child's reading will improve more quickly if he (she) has individual instruction, whether it is from a teacher, parent, or even another child who is a little better at reading. Parents often wish to help their children but need some guidance as to what materials to use and how to go about it. The materials for this program therefore will be provided and regular help and advice given during the 3 months you will be using it.

You should spend half an hour a day on the program - no more and no less. Do not try to rush through the lessons. It is important that your child masters one lesson well before you proceed to the next. It is also important that both you and your child should enjoy the lessons as an

activity you do together. If you are enthusiastic and at the same time relaxed about it, your child will develop the same attitude. When correcting mistakes, try and do so without appearing in any way critical or discouraging - even in your tone of voice or the expression on your face. Just give him (her) the correct answer and carry on with the lesson.

As an extra feature, to make the program more exciting for your child, a system of token rewards (poker chips) will be used throughout the lessons. Different colors will have different values (red - 1/2¢, white - 1/5¢, blue - 1/10¢) and every week or two he will be able to cash the chips in for a small amount of money. He (she) should average about $1.00 a week. As the results of this program will form part of a university research project, the Psychology Department is willing to provide the money for a 3-month period. Later, as reading becomes easier, it will have its own advantages, such as being able to read movie ads, comic strips, stories, etc.

Following is the general method you will take as you work through the lessons - one envelope at a time - although we shall go through this together in detail before you begin.

Sample Lesson - Home Reading Program

1. Vocabulary

Show the child the vocabulary cards, one at a time, and ask him to read the word. If correct, say "Right!", give

him a white token, put the card aside and go on to the next one. If wrong, say the word correctly while your child looks at it. At the same time ask him if he knows what the word means, and if not explain it to him. Then put the card at the bottom of the pile so that you will come to it again. Go through the pile again, this time giving him a blue token for correct answers. Keep going through the pile in this way and giving blue chips until all cards have been put aside as your child is able to read each of the 10 words.

2. Paragraphs

Each card has one paragraph on it. Show the child the cards one at a time and put aside the ones he can read without any mistakes, giving him a red token for each. When he makes mistakes, correct them quietly, pointing at the word as you read it, and put the card at the bottom of the pile to be tried later. Keep going through the pile until all cards are laid aside. When a paragraph is read correctly give a white token.

3. Comprehension

Give your child the sheet of paper containing the whole story to read silently and understand it ready for questions. When he finishes silent reading, so long as he has been scanning and concentrating he gets 4 white tokens, no matter how long it took him. Then let him write the answers on the question paper. If necessary you may help

him with the directions in the "How well did you read?" part. For each correct answer he gets a red token. If there is a spelling error tell him what it should be, let him print or write the word again, and give him a white token. If an answer is wrong, show your child the paragraph where he will find the right answer and let him try it again, giving him a blue token when he gets it.

Each day keep a record in the notebook which is provided. This should be along the following lines:

	Tokens Earned			Where Lessons Finished		
Day's Date	Color	No.	Value	Env. No.	Section	Completed

Once the program is under way you will be visited regularly during the 3 months at a time to be arranged. However, if you ever have any queries or problems in between visits, please do not hesitate to phone me any time either at home, 753-1093, or at university, 753-1200, extension 2215. Should you have any difficulty reaching me, I shall make a point of being at one of these numbers between 2:00 and 3:00 p.m. daily Monday to Friday.

APPENDIX J

Instructions for Attention Control Group Parents

ST. JOHN'S HOME READING PROGRAM

You are about to begin a program to help your child to read better. It is important especially at this age that children learn basic words which make up the English language, because reading is a part of all school subjects, e.g., history and geography - even being able to read arithmetic problems in order to do them. Although your child is of normal intelligence, for some reason he (she) has found some difficulty with reading. Some of the problems will be taken care of at school but a little extra individual attention at this time will make life a lot easier for him (her) later on.

Work which has been done in schools all over Canada and the States has shown that a child's reading will improve more quickly if he (she) has individual instruction, whether it is from a teacher, parent, or even another child who is a little better at reading. Parents often wish to help their children but need some guidance as to what materials to use and how to go about it. The materials for this program therefore will be provided and regular help and advice given during the 3 months you will be using it.

You should spend half an hour a day on the program - no more and no less. Do not try to rush through the lessons. It is important that your child masters one lesson well before you proceed to the next. It is also important that both you and your child should enjoy the lessons as an activity you do together. If you are enthusiastic and at the same

time relaxed about it, your child will develop the same attitude. When correcting mistakes, try and do so without appearing in any way critical or discouraging - even in your tone of voice or the expression on your face. Just give him (her) the correct answer and carry on with the lesson.

As the results of this program will form part of a university research project, the Psychology Department is willing to pay your child $1.00 a week for 3 months for taking part in it. This will help gain his (her) interest at the beginning and he (she) will be told that he (she) must "earn" the dollar each week by spending half an hour a day with you practising his (her) reading. As reading becomes easier it will have its own advantages, such as being able to read movie ads, comic strips, etc.

Following is the general method you will take as you work through the lessons - one envelope at a time - although we shall go through this together in detail before you begin.

Sample Lesson - Home Reading Program

1. Vocabulary

Show the child the vocabulary cards, one at a time and ask him to read the word. If correct, say "Right!", put the card aside, and go on to the next card. If wrong, say the word correctly while your child looks at it. At the same time ask him if he knows what the word means, and if not explain it to him. Then put the card at the bottom of

the pile so that you will come to it again. Go through the pile until all cards have been put aside as your child is able to read each of the 10 words.

2. Paragraphs

Each card has one paragraph on it. Show the child the cards, one at a time and put aside the ones he can read without any mistakes. When he makes mistakes, correct them quietly, pointing at the word as you read it, and put the card at the bottom of the pile to be tried later. Keep going through the pile until all cards are laid aside.

3. Comprehension

Give your child the sheet of paper containing the whole story to read silently then let him write the answers on the question paper. If necessary you may help him with the directions in the "How well did you read?" part. If there is a spelling error tell him what it should be and let him print or write the word again. If an answer is wrong show your child the paragraph where he will find the right answer and let him try it again.

Each day keep a record in the notebook which is provided. This should be along the following lines:

	Began		Ended	
Day's Date	Env. No.	Section	Env. No.	Section
_____	_____	_____	_____	_____

Once the program is under way you will be visited regularly during the 3 months at a time to be arranged. However, if you ever have any queries or problems in between visits, please do not hesitate to phone me any time either at home, 753-1093, or at university, 753-1000, extension 2215. Should you have any difficulty reaching me, I shall make a point of being at one of these numbers between 2:00 and 3:00 p.m. daily Monday to Friday.

APPENDIX K

ANOV Between Original Scores of Reading and Intelligence Measures

Summary of ANOV for Before-treatment Means on the WRAT

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	0.953	2	0.476
Within	1157.36	36	32.148
Total	1158.31	38	F = 0.014 (N.S.)

Summany of ANOV for Before-treatment Means on the SRA 100 Words

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	131.136	2	65.568
Within	8841.788	36	245.605
Total	8972.924	38	F = 0.266 (N.S.)

Summary of ANOV for Before-treatment Means on Errors in Paragraph

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	145.751	2	72.875
Within	1828.557	36	50.793
Total	1974.308	38	F = 1.434 (N.S.)

Summary of ANOV for Before-treatment Means on the WISC - Verbal IQ

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	35.706	2	17.853
Within	4735.064	36	131.529
Total	4770.770	38	F = 0.135 (N.S.)

Summary of ANOV for Before-treatment Means on the WISC - Performance IQ

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	640.751	2	320.375
Within	6708.975	36	186.360
Total	7349.726	38	F = 1.719 (N.S.)

Summary of ANOV for Before-treatment Means on the WISC - Full Scale IQ

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	230.11	2	115.055
Within	4505.48	36	125.152
Total	4735.59	38	F = 0.919 (N.S.)

APPENDIX L

ANOV Between Original Scores on Behavioral Questionnaires

Summary of ANOV for Before-treatment Means on the Teachers' Questionnaire

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	40.040	2	20.02
Within	368.575	20	18.43
Total	408.615	22	F = 1.09 (N.S.)

Summary of ANOV for Before-treatment Means on the Parents' Questionnaire

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	3.13	2	1.565
Within	4794.87	34	141.025
Total	4798.00	36	F = 0.011 (N.S.)

Summary of ANOV for Before-treatment Means on the Anxiety Scale

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	418.898	2	209.449
Within	4169.805	34	122.641
Total	4588.703	36	F = 1.707

APPENDIX M

Some Individual Questionnaire Items -

Teachers' and Parents' Questionnaires

1. Teachers' Questionnaire (Appendix F)

The item producing the highest total score was #16, "Has poor concentration or short attention span" with a total score of 37. This and other characteristics which were checked fairly frequently are listed below.

	Item	Total Score
#1	Very restless, often running about or jumping up and down. Hardly ever still	19
#3	Squirmy, fidgety child	20
#5	Frequently fights with other children	10
#6	Not much liked by other children	10
#7	Often worried, worries about many things	15
#8	Tends to do things on his own - rather solitary	16
#16	Has poor concentration or short attention span	37

2. Parents' Questionnaire (Appendix G)

The most frequently checked questions by parents before and after treatment are listed below:

	Item	Score Pre	Score Post
A.	Complains of headaches	17	15
B.	Has stomach ache or vomiting	14	12
F.	Has temper tantrums	11	15
IV.	Eating difficulty	8	11
1.	Very restless. Often jumping up and down. Hardly ever still	16	17

	Score	
	Pre	Post
2. Squirmy, fidgety child	12	14
4. Frequently fights with other children	15	17
6. Often worried - worries about many things	18	20
7. Tends to do things on his own - rather solitary	10	19
8. Irritable - is quick to fly off the handle	21	21
9. Often appears miserable, unhappy, tearful or distressed	10	13
13. Is often disobedient	23	24
14. Cannot settle to anything for more than a few moments	18	19
15. Tends to be fearful or afraid of new things or situations	11	12
16. Fussy or over-particular child	10	10
17. Often tells lies	12	11
18. Bullies other children	8	11

APPENDIX N

Individual Case Studies

INDIVIDUAL CASE STUDIES - CONTINGENT REINFORCEMENT

Subject M

A girl with verbal IQ of 84, performance 104 and full scale of 92 who when first seen had a word recognition score of grade 2.6 on the WRAT and knew only 45 out of the 100 random words. She had had problems with the kindergarten teacher and as well as being put off school from the beginning failed to establish adequate reading readiness skills. Here is an example of Birch and Belmont's (1965) primary perceptual factors playing an important role in initially acquiring reading skill. There were no current behavior problems at home or at school. Both she and her mother were hard working and motivated throughout the program and her final scores were 3.8 on the WRAT with 83 out of the 100 SRA words read correctly. Her graph of token acquisition demonstrated how the program can develop ideally if it is strictly adhered to (Fig. 1).

Subject C (Fig. 2)

A boy with the face of an angel and the highest antisocial score on both Teachers' and Parents' Questionnaires. He had a verbal IQ of 88, performance of 108 and full scale of 97. His score on the WRAT before treatment was 3.1 although he had only produced 2.4 on the Durrell in class. He knew 74 words out of the 100 to begin with. His enthusiasm was very high the first five weeks then declined steadily

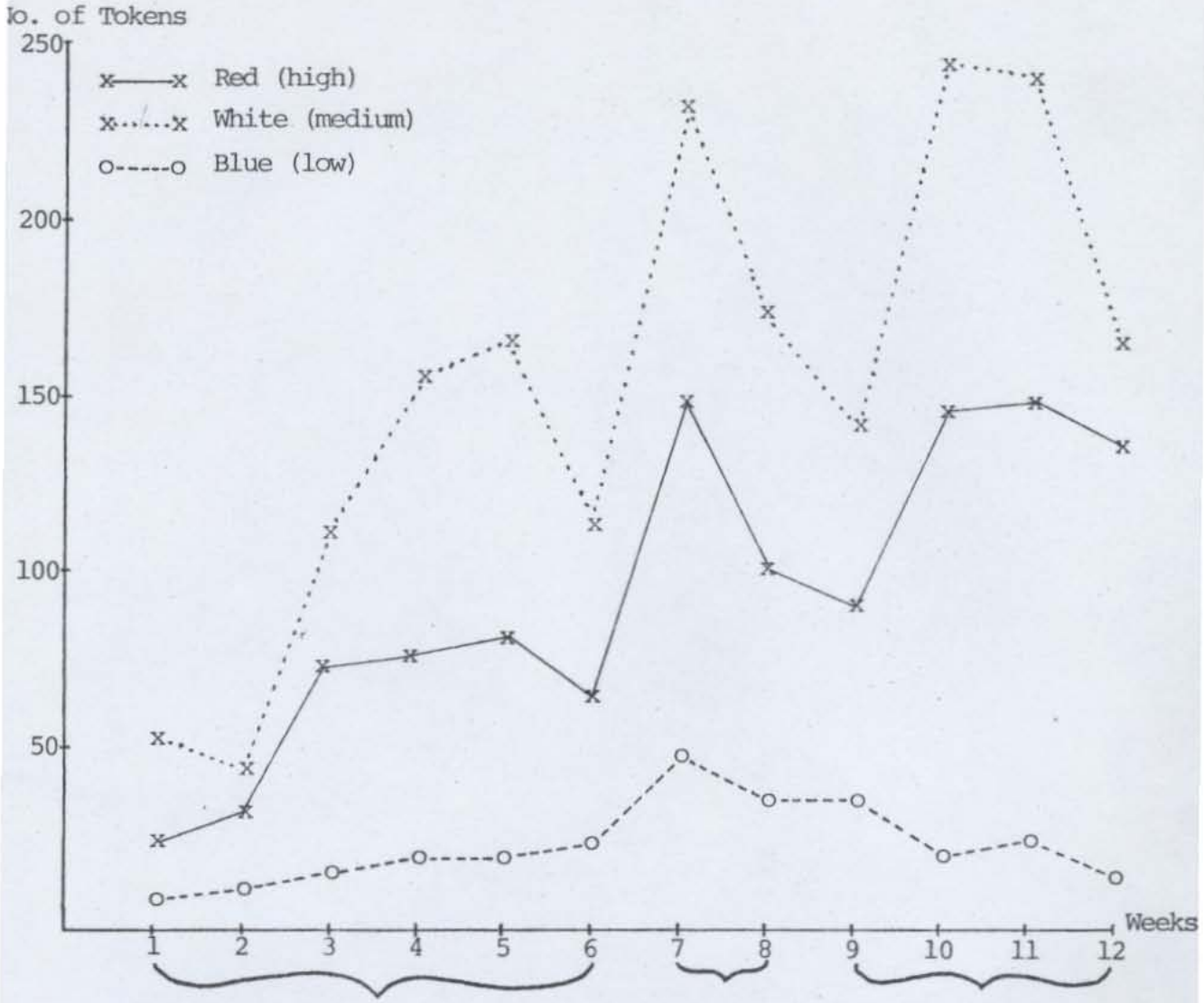

Fig. 1. Subject M - Token acquisition increases as values decrease

Weeks 1-6: Red = 1¢
White = 1/2¢
Blue = 1/5¢
Bonuses - weeks 1 and 2

Weeks 7-8: Red = 1¢
White = 1/3¢
Blue = 1/5¢

Weeks 9-12: Red = 1/2¢
White = 1/3¢
Blue = 1/5¢
Bonuses - weeks 9 and 10

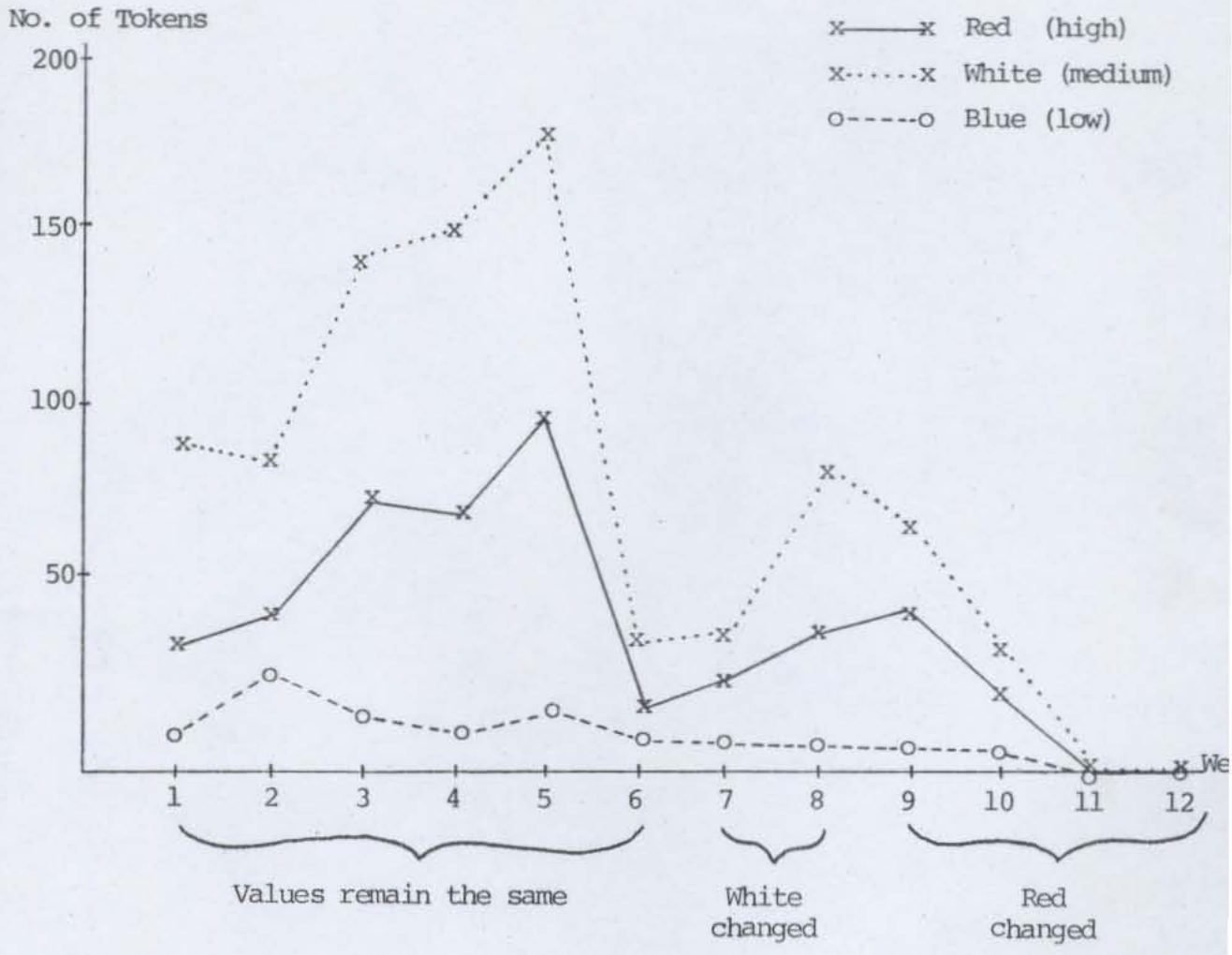

Fig. 2. Subject C - tried slightly harder as values changed - then gave up.

with the acquisition of a new mini-bike and the start of the holidays. However, on the final test his WRAT score was 5.0 and he knew 94 out of 100 words. Most of the gains must have taken place during the initial 5 weeks.

Subject D (Fig 3)

A girl of not very high verbal intelligence but who tried extremely hard and made steady progress at her own rate. Her verbal score was 78, performance 90 and full scale 82. Before treatment her reading scores were 3.1 on the WRAT and 60 on the 100 random words. Afterwards her WRAT score had reached 3.8 and her SRA score 82 out of 100.

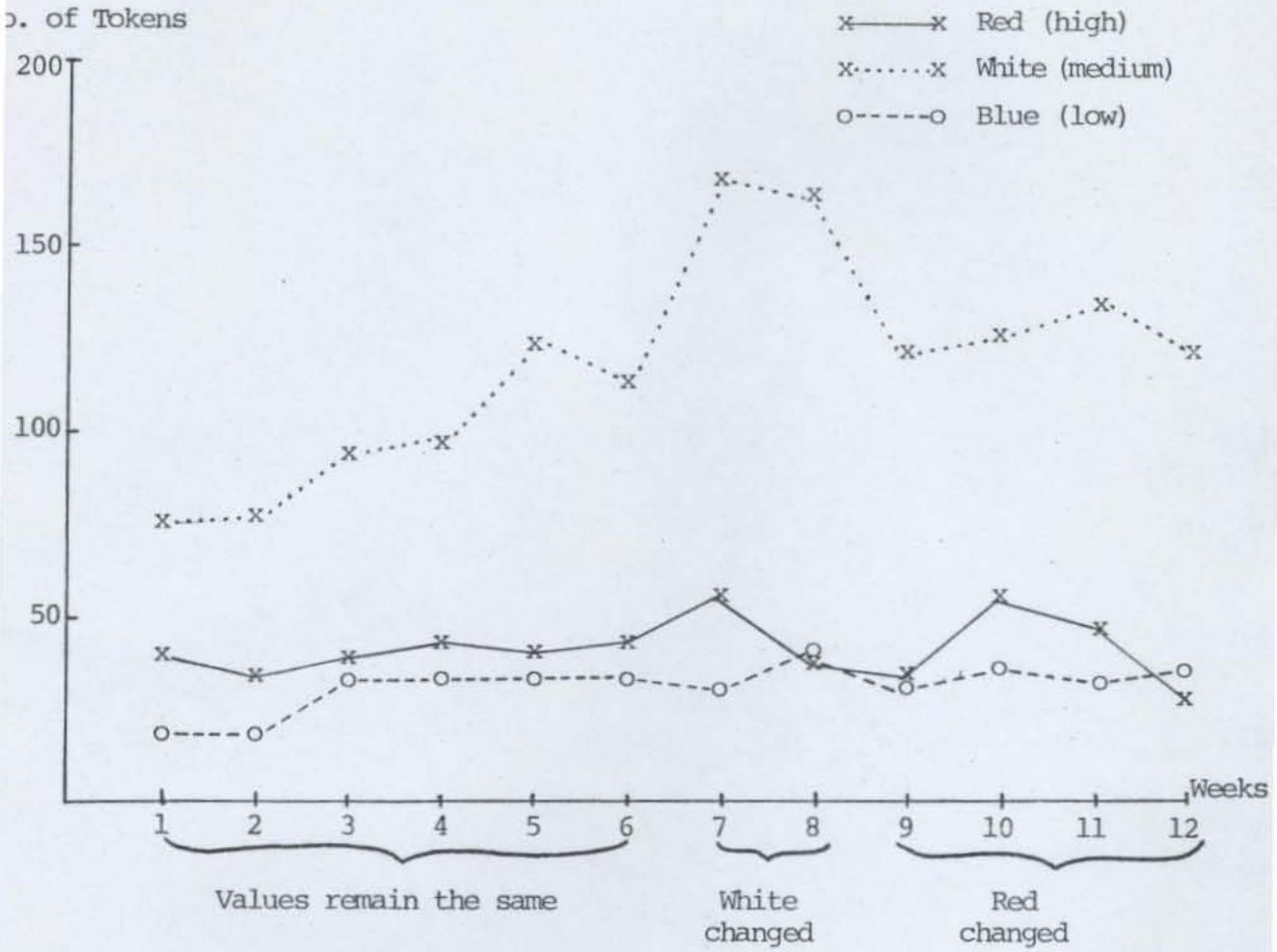

Fig. 3. Subject D - plodded on slowly but steadily

INDIVIDUAL CASE STUDIES - ATTENTION CONTROL GROUP

Subject K

A girl with a verbal score of 80, performance 90 and full scale score of 84. She improved from a 3.0 to 3.9 in the WRAT and went from 61 to 75 in the SRA words. The interesting factor in her improvement is that her mother had only a grade 4 education herself. She would read the story through the day before and check any words she was uncertain of with her husband.

Subject R

This girl started off slowly. She had a verbal score of 80, performance 85 and full scale of 81 and was a chronically poor reader with a score of 2.4 on the WRAT and only 34 out of the 100 words to start with. She was one of a family of six children and during term time when she began, her mother was also working as a cashier in the evenings so they did not have much time together. However, when the holidays started, her mother was available in the daytime and her 12-year-old brother, freed from his own homework, began helping her also and taking a genuine interest in her progress. By the end of the three months her WRAT score was 3.5 and she knew 59 out of the 100 words.

Subject S

A very fidgety girl with some neurotic tendencies and slightly disobedient and grumbling. She was the only one in

either experimental group who failed to show any real progress. Her WRAT score went from 2.6 to 2.9 and her increase on the SRA words was only from 41 to 46. She continued to make the same type of mistakes as she did at the beginning. She appeared to suffer from the kind of dyslexia where even when she understood the meaning of a word or phrase, her oral reading came out completely differently. For instance she might read "small" for "little". At other times, however, she was inattentive and restless and through guessing at a series of words she would wander completely away from text and context. It would have been interesting to see if such a subject would have responded more to the structure of the token economy program.

Subject T

This boy is an example of the myth of the short attention span (Broman, 1970). He has a verbal intelligence score of 123, a performance score of 131, giving him a full scale intelligence of 130. Yet he was reading at a 3.1 level in the WRAT (2.4 in the Durrell) and knew only 63 of the 100 words to begin with. Although quite cooperative he could become visibly tired and yawn during lessons. Yet the same boy was spending hours pouring over plans and constructing a workable go-cart. He was fascinated by putting together and operating an electric train complex. His mother pointed out too that when the day's reading lesson happened to be about a submarine and how it worked, he

astered the new words and sentences much more rapidly
han usual. His WRAT score did not change at all over the
months although his knowledge of words did increase from
3 to 88. He also would provide an interesting candidate
or a token economy program.

APPENDIX O

Data Descriptive of the Subjects in the

Contingent Reinforcement Group

1) Intelligence scores and reading measures before and after treatment

2) Total tokens - scored each week

3) Separate records of red, white and blue tokens

MEASURES

Students	WISC-R			WRAT		100 Words		Para. Errors	
	Verbal	Perf.	Full Scale	Before	After	Before	After	Before	After
YVONNE	80	123	100	2.7	3.1	39	50	17	0
DAVID	90	93	91	3.5	4.4	46	86	9	3
RICKY	78	96	85	2.4	2.9	38	66	6	0
JIMMY	94	102	97	2.1	3.9	46	78	4	0
CHRIS	88	108	97	3.1	5.0	74	94	3	2
CHARLES	112	117	116	3.6	4.4	80	94	2	1
DEBBIE	78	90	82	3.1	3.8	60	82	0	3
ALLISON	101	106	103	3.8	4.1	68	91	4	1
MICHELLE	84	104	92	2.6	3.8	45	83	2	1
SANDRA	107	74	90	3.0	4.2	74	90	1	0
DARRYL	98	109	103	2.6	3.3	49	63	7	0
DARRELL	97	95	96	2.6	3.5	61	77	0	1
PAUL	87	106	96	2.4	3.0	38	59	2	3

TOTAL TOKENS

Students	WEEKS 1	2	3	4	5	6	7	8	9	10	11	12
YVONNE	102	29	39	79	67	101	103	120	119	-	136	109
DAVID	189	201	223	245	288	315	341	318	299	322	319	44
RICKY	93	88	113	141	145	295	mother in hospital			208	305	226
JIMMY	89	79	119	173	250	299	158	254	222	on holiday	268	174
CHRIS	139	130	228	226	280	started losing interest 52	60	121	107	49	on holiday	
CHARLES	131	149	190	240	251	245	181	295	178	309	323	305
DEBBIE	data missing - torn from book		pages	192	145	?	?	?	?	211	202	193
ALLISON	145	145	191	180	228	227	197	228	305	190	186	335
MICHELLE	103	95	207	259	222	251	415	274	262	321	322	218
SANDRA	138	125	179	140	175	242	90	86	203	45	mother looking after sick grandparent	
DARRYL	76	108	141	249	254	127	163	154	258	176	129	stopped due to anxiety
DARRELL	69	126	127	138	138	87	72	mother in hosp. 163	46	77	175	226
PAUL	128	112	165	211	206	224	106	161	on holiday		14	44

RED TOKENS (High Value)

Students	WEEKS 1	2	3	4	5	6	7	8	9	10	11	12
YVONNE	14	1	6	38	36	44	27	36	36	-	47	28
DAVID	46	52	54	62	76	81	96	94	85	103	91	13
RICKY	37	29	48	58	63	87	-	-	-	59	84	73
JIMMY	37	32	57	51	93	102	53	87	81	-	98	60
CHRIS	35	41	74	69	95	16	24	37	39	19	-	-
CHARLES	27	34	46	65	83	72	51	100	62	113	112	126
DEBBIE	-	-	-	43	36	-	-	-	-	48	49	35
ALLISON	29	41	57	58	69	87	63	92	113	67	66	136
MICHELLE	35	43	76	80	55	103	132	80	90	116	121	115
SANDRA	26	27	44	32	44	56	27	27	57	13	-	-
DARRYL	24	43	35	74	83	46	58	53	91	64	47	-
DARRELL	17	34	32	37	47	20	19	35	15	24	35	70
PAUL	20	19	34	46	49	58	28	41	-	-	6	12

WHITE TOKENS (Medium Value)

Students	WEEKS 1	2	3	4	5	6	7	8	9	10	11	12
YVONNE	72	16	24	27	15	46	55	69	69	-	78	75
DAVID	125	138	151	143	175	200	219	199	198	194	202	31
RICKY	46	55	57	71	66	197	-	-	-	137	196	130
JIMMY	47	41	58	117	152	191	103	159	139	-	166	114
CHRIS	94	84	140	147	173	32	35	81	65	29	-	-
CHARLES	88	104	117	155	147	163	115	175	106	166	187	153
DEBBIE	-	-	-	121	79	-	-	-	-	123	130	120
ALLISON	99	98	120	112	148	125	85	124	175	113	107	185
MICHELLE	53	44	112	158	158	114	234	173	140	188	186	181
SANDRA	90	88	114	90	113	165	69	53	137	31	-	-
DARRYL	30	56	83	136	148	63	84	79	146	90	67	-
DARRELL	43	77	83	90	77	63	46	93	20	40	110	116
PAUL	71	73	97	121	120	110	56	78	-	-	8	19

BLUE TOKENS (Low Value)

Students	WEEKS 1	2	3	4	5	6	7	8	9	10	11	12
YVONNE	16	12	9	14	16	11	21	15	14	-	11	6
DAVID	18	11	18	40	37	34	26	25	16	25	26	2
RICKY	10	4	8	12	16	11	-	-	-	12	25	23
JIMMY	5	6	4	5	5	6	2	7	2	-	4	0
CHRIS	10	5	14	10	12	4	1	3	3	1	-	-
CHARLES	16	11	27	20	21	10	15	20	10	30	24	26
DEBBIE	-	-	-	28	30	-	-	-	-	40	23	38
ALLISON	17	6	14	10	11	15	4	12	17	10	13	14
MICHELLE	15	8	19	21	9	34	49	21	32	17	15	12
SANDRA	22	10	21	18	18	21	10	6	9	4	-	-
DARRYL	22	19	23	39	23	18	21	22	21	22	15	-
DARRELL	9	15	12	11	14	4	7	35	11	13	30	40
PAUL	37	20	34	44	37	56	22	42	-	-	0	13