A COMPARATIVE STUDY OF THE EFFECTS OF PROGRAMED PRESENTATIONS OF SELECTED PORTIONS OF THE STANFORD-BINET INTELLIGENCE TEST ON STUDENT EXAMINERS

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CHAPTER I

THE PROBLEM

One of the major problems of colleges and universities today is the number of students in ratio to the number of full time faculty members. Graduate classes that in the past have had five to ten students, today may have an enrollment of twenty to thirty students. To compound the problem of overcrowded classes, knowledge is increasing at a tremendous rate. The new information, in most cases, does not replace other knowledge but rather supplements what is already known. Today, due to the increasing number of students continuing their formal education past high school, college faculties must investigate all methods of instruction that may prove useful and effective in helping them meet this challenge of increasing student numbers at all levels of college work.

The purpose of this paper is to investigate programmed instruction as a method of teaching at the graduate level of instruction. Programing has been used in military service schools and secondary public schools, but little has been done at the university level, especially at the graduate level of instruction. If it can be determined that certain portions of a course can be learned effectively via programmed instruction, then a partial solution might be found to the increasing student-teacher ratio problem that many of the universities are now facing.

The programed materials that were written for this experiment utilized material from two sections of the 1960 Stanford-Binet Intelligence Scale, Form L-M. The 1960 Stanford-Binet is the third Terman-Merrill revision of the original Binet-Simon Scale developed in France in 1905.

The results of a Stanford-Binet Intelligence Test are often a major part of the information used to decide whether or not a child should be put in a special education class or removed from a normal family atmosphere. The accuracy of the test results depends upon the competency of the examiner. Dr. Merrill states that a student examiner given 50 hours of work in administering and scoring the Stanford-Binet Test has received enough instruction to qualify the student to be an effective examiner.

This research experiment was set up to determine whether or not a graduate class given a combination of programed learning and regular classroom instruction would make fewer errors in computing chronological age and scoring vocabulary answers on Stanford-Binet Intelligence Tests than would another graduate class utilizing only regular classroom instruction.

The class utilizing the programs plus classroom instruction will be designated as the experimental group. The class receiving classroom instruction only will be the control group.

The Stanford-Binet Test is one that is individually administered as opposed to a group administered intelligence test. The examiner has a specific set of questions to ask the examinee, and the answers to the questions are written down for a complete evaluation at a later time. One part of the test is the vocabulary portion. The total number of

words asked the subject depends upon the number of correct responses that the examinee makes. The words have been selected and arranged by the test designers so that as the subject reaches his level of vocabulary ability, as determined by his definitions of the vocabulary words, the probability that he will get any more correct after missing six in a row is highly unlikely. For the examiner to decide when the subject has missed six definitions in a row, the examiner must know the correct definitions of the vocabulary words. This present experiment is being done to determine if the student examiners can learn the correct definitions as efficiently or more efficiently through a program study technique and regular classroom instruction than they would if they received the regular classroom method only.

The other portion of the Stanford-Binet Intelligence Test that was programed is the procedure for computing the examinees' chronological ages. In order for the Intelligence Quotient of the examinee to be computed, his chronological age must be figured and compared with his mental age. If the Intelligence Quotient is to be accurate, both the mental age and the chronological age must be computed and compared accurately. In computing the chronological age of a subject for use with the Stanford-Binet Intelligence Test, special attention must be given to the subject's age, not just in years and months but to the exact day of the month. If the subject's age falls on or before the fifteenth of a month, his chronological age is computed using that month. However, should his age fall on the sixteenth day of the month or later, his chronological age is advanced to the next month. If the examiner makes an error in computing the subject's chronological age, the final score depicting the subject's IQ, as derived from the test,

will be incorrect. In this experiment it is expected that the student examiners will learn the correct method of figuring chronological age from the programed materials and, consequently, will make fewer errors. Seven hypotheses were formulated to be tested using the data obtained from this experiment.

The hypotheses to be tested are:

1. There is no significant difference in the experimental group's combined chronological age and vocabulary scoring errors and the control group's combined chronological age and vocabulary scoring errors.

2. There is no significant difference in the experimental group's average number of chronological age scoring errors compared to the control group's average number of chronological age scoring errors.

3. There is no significant difference in the experimental group's average number of vocabulary scoring errors compared to the control group's average number of vocabulary scoring errors.

4. The pattern of the vocabulary scoring errors of the experimental group does not change significantly with increasing experience in administering the Stanford-Binet Intelligence Test.

5. The pattern of the vocabulary scoring errors of the control group does not change significantly with increasing experience in administering the Stanford-Binet Intelligence Test.

6. The pattern of the chronological age scoring errors of the experimental group does not change significantly with increasing experience in administering the Stanford-Binet Intelligence Test.

7. The pattern of the chronological age scoring errors of the control group does not change significantly with increasing experience in administering the Stanford-Binet Intelligence Test.

CHAPTER II

RELATED RESEARCH

Programmed instruction was first conceived of and practiced by E. L. Pressey in 1926. Pressey called his teaching machine "a self-instruction device."

> The writer has also felt that the procedure in mastery of drill and informational material were in many instances simple and definite enough to permit handling of much routine teaching by mechanical means. The average teacher is woefully brudened by such routine as drill and information fixing. It would seem highly desirable to lift from her shoulders as much as possible of this burden and make her freer for those inspirational and thought-stimulating activities which are presumably, the real function of the teacher. (Pressey, 1926.)

The basic reason Pressey had for developing the instructional device was to improve the educational process. The teaching device Pressey is discussing above had been exhibited in 1924 and an improved version shown in 1925 at the American Psychological Association meeting of those years. A "drill" machine was demonstrated by Pressey (1927), and in 1932 Pressey discussed the advantages of mechanized teaching and scoring devices. He also described a mechanical scoring and tabulating machine.

The first recorded research testing the effects of the "self-instructor and tester" was done by one of Pressey's students. The results of the experiment were to show that the experimental group which utilized the teaching machine "gained from 2.4 to 3.0 times as

much information" as did those who used the regular study method (Peterson, 1930).

In 1934 another student of Pressey, James Little, ran an experiment utilizing the drill machine and the automatic scoring device. It was found that the students who received immediate appraisal of their test results were allowed to cover the test material on the drill machine until they could do the test without error did better than the control group that utilized the regular classroom method. It was determined that the people who scored in the lower portion of the distribution made more improvement than did those from the upper portion. Little believed that his work demonstrated that mechanical teaching devices could be used effectively in the normal classroom setting.

Following the research by Pressey on self-scoring devices, Angell and Troyer (1948) produced a small punchboard device which the student could use at his desk. The device was so designed that different scoring keys could be easily made by the instructor and utilized by the student. The instructor could give the class a test, the students would read the questions, decide upon an answer and then punch the appropriate hole in the punchboard. When the student punched the paper, if he had selected the correct answer, the pencil went through the paper and a red dot was visible on the scoring key showing the student his choice had been correct. If when he punched the paper the choice was not correct, it showed an incorrect try. He knew then that he must select another hole to find the correct answer.

These punchboards were used in college classes and found to be effective. The test given via the punchboard technique became an effective teaching device because the student immediately could

determine whether or not he had the correct answer. If the answer was incorrect, he had the opportunity to keep making choices until the correct answer was found.

Another experiment utilizing the punchboard technique was done by Jensen (1949). Jensen set up a laboratory section in which students could come and work with materials and reading assignments utilized in an educational psychology course. The students took a practice test over the material on the section of the course they had been studying via the punchboard technique. When they found that they had scored an answer incorrectly they were referred to the page number in the book. After taking the first practice test they were allowed to take another punchboard test. These practice tests were not part of the regular course grading criterion. When final course grades were assigned as determined by a 200 item multiple choice test, it was found that fifty four per cent of the superior students in the experimental group got an "A" in the course while only ten per cent of the superior students in the control group, regular classroom method, got an "A". Jensen also reported that the students were able to learn the course material at a much faster rate with the punchboards than in regular classroom situations.

Further work utilizing the punchboard was done by Pressey (1950). The study involved some 500 Ohio University students in varying class situations. Eight groups, divided into four accelerated seminars, two examination-for-course-credit groups and two self-instructional laboratory groups, all used the punchboards as a learning device and made superior grades in comparison to the twenty seven regular class sections in educational psychology. Programing was experimented with and

utilized by the armed forces schools from the early 1950's until the present day. In fact, the service schools seem to be utilizing more programed instruction than any other organization.

Programed instruction was brought back from obscurity as a method of improving instruction in public schools by Skinner (1954) in a paper read at a psychological conference. In this paper Skinner explained his interpretation of reinforcement theory and its application both to classroom situations and teaching machines. Skinner described an "arithmetic-teaching machine" and its practical and theoretical classroom application.

The next major paper on programing also was published by Skinner (1959). In this paper Skinner described a more elaborate teaching machine. This machine employed a disc on which the programed information was written. The student wrote his response to the given information then he checked his answer by uncovering a remaining portion of the frame. If his answer was correct, as interpreted by the student, he then moved a lever to the score position. This tallied his response and moved the machine to the next slot on the program. In this way the student worked through the disc twice; however, on the second time around only those questions that were incorrect on the first trial appeared in the window. Skinner again discussed the practical and theoretical importance of his machine. In this second paper Skinner also discussed programing techniques and the theory behind his approach. He maintained that the steps must be very small in putting ideas or recall information into a programed format.

In a subsequent report to the Fund for the Advancement of Education, Skinner and Holland (1958) discussed the programing of verbal

knowledge. Specific rules or guides for programing information were demonstrated. An experiment was described utilizing the teaching machine in a natural sciences 114 course. The subjects were Harvard and Radcliffe students. The experiment was done mainly to check the attitude of the students toward programed instruction and to verify that this approach could be utilized effectively. The results of the study showed that a majority of the students were very favorably impressed with programed instruction and that, as had been shown in earlier studies, programing was an effective teaching device.

Working at the University of Pittsburg, Glaser, Homme and Evans (1959) began to apply programing techniques to textbooks. The idea of a programed textbook was tried and found effective. In several experiments using programed textbooks in the areas of statistics and music, the effectiveness of this technique was tested. It was found that in both areas the students using the programed materials did better, though not significantly so, than did the group using the regular textbook.

Three very important results also came out of these early studies: (i) the groups utilizing smaller programed steps did significantly better on immediate test performance and the total number of errors was less with this group, (ii) students making overt responses did not do significantly better than did students who did not write their answers. In some instances the students not making overt responses actually scored better than the overt responses group, (iii) generally the programed textbook group achieved a higher score and showed less variability than did the group using the regular textbook. The programed textbook technique was also being worked with by Skinner and Holland at Harvard during this time.

Approaches to programing other than Pressey's and Skinner's were being tested. Crowder (1958) was developing a branching technique of material presentation. He based his approach on the idea that fast learners should not need to take all the small steps that Skinner proposed to achieve mastery of the material. Crowder's idea of "intrinsic programing" was to allow the individual's achievement to determine the sequence the programed material should be presented to the student, instead of relying on the linear fixed sequence that Skinner advocated.

Crowder's theory was experimentally tested by Coulson and Silberman (1960). Two major questions were under consideration in this study. One was the Crowder-Skinner controversy over linear versus branching programs, and the other was the method or type of subject presentation, multiple choice versus constructed response modes. In their experiment Coulson and Silberman used material from Holland and Skinner's programed textbook and developed multiple choice response items over the same material. This part of the experiment was designed to test whether or not Pressey's multiple choice type of response was better than Skinner's constructed response proposal.

In order to control the branching versus linear program variable, the teaching machines were manually operated by the experimenters instead of using fully automatic machines. The results of the experiment, though not significant, did show a difference in favor of Skinner's proposals, that of using small rather than large steps. There was no evidence showing the superiority of either the multiple choice format favored by Pressey or the constructed response format favored by Skinner. The branching technique took less time than did the linear program, but no significant difference was shown by either group on

the criterion test.

Coulson and Silberman also used time as a variable and found that branching and multiple choice formats took significantly less time than did linear, constructed response format. The other significant finding was that the small steps took significantly more time but produced significantly higher criterion scores than did the large step format. Fry (1960) ran a similar experiment and reported similar results.

Further study on the branching technique was done by Silberman, Melaragno, Coulson and Estavan (1961). The results of this study supported the earlier research and found that those students who had an "option" as to what material they reviewed did better than either the fixed sequence or preselected branching groups. A study by Feldhusen and Birt (1962) also had similar findings. Roe (1962) also did a study concerning branching versus linear programs, and the findings were consistent with Crowder's results. In addition, Roe found that a "careful" sequencing of steps in long programs did give significantly better scores on the criterion test than did normal sequencing of steps.

Pursuing the work done at Pittsburgh, Silverman and Alter (1962) did a series of five experiments testing three variables of response mode. The variables were overt versus covert, pacing time allowed for viewing each frame and motivational effects in teaching machines. In this study, covert responding was "thinking" the answer instead of writing or speaking. The five groups used were identified as the (1) covert, (2) speaking, (3) writing, (4) speaking-writing group which was required to say and write the answer and (5) no-learning group.

Three experiments were done to study response mode. The first

experiment found no significant difference between overt and covert responding groups. It was found that the covert, speaking, writing experimental groups did have significantly fewer errors on a criterion test than did the no-learning control group. The overt responding, speaking-writing group did not differ significantly from the no-learning control group.

The second experiment also utilized a set of programs to test overt versus covert responding. For one group a fill-in format was used, while the other group just read the material. This second group was the no-response group. The results showed that the no-response group made significantly fewer errors than did the fill-in group.

The third experiment was essentially the same as number two; however, completely unfamiliar material was used for the program contents. The results of this experiment supported those of experiment number two, that the no-response group had significantly fewer errors than did the fill-in group. This led the authors to believe that the "constructed-response is superfluous when teaching machines are used."

The fourth experiment was concerned with pacing. In this experiment one group was paced at a rate of a frame every twenty seconds on the first disc and one frame every thirty five seconds on the second and third discs. The long-paced group was paced at thirty second and fifty second intervals per frame. A third group was not paced. The results showed no significant difference in retention of material for any group.

The fifth study was undertaken to study the motivational effects of two types of teaching machines versus a programed textbook. One machine was called an "elaborate" electronic machine and the other was

the "crude", wood encased machine. There was no significant difference found in number of errors made on a criterion test for any group.

A summary of the Silverman and Alter study shows that they ran three experiments to study response mode and the results indicated that overt responses were not better than covert nor is a constructed response, whether overt or covert, necessarily advantageous. In the fourth study they found that pacing did not impair learning but did not seem to help learning. The fifth study showed that programed textbooks were as efficient and effective as were teaching machines.

In contrast to the Silverman study, Cummings and Goldstein (1962) found a significant difference in favor of the overt responding groups. This difference was attributed to the degree of difficulty of the material and its presentation in the program. Goldback and Campbell (1962) found that overt responding is more effective with difficult rather than with easy material. The results showed that with unusual material of high factual information levels, overt responders scored significantly better than did covert responders. With material of a low level there was no significant difference. Similar findings are reported by Evans, Glaser and Homme (1962) and by Stolurow and Walker (1962).

Eigen (1962) completed a study comparing three modes of program presentation (i) machine, (ii) horizontal text, and (iii) vertical text. His results showed no significant difference between the modes of presentation. In 1962 Gabriel Della-Piana reported on a study in which motivational differences and the form of the learners' responses were the variables. The results showed no significant difference between the experimental and control groups, but they did find the

more highly prompted treatments yielded the same score on a criterion test with less time and fewer errors.

There are four studies, (Detambel and Stolurow, 1956; Gagne, 1962; Jensen, 1963; and Eigen and Feldhusen, 1963), which support the idea that IQ as presently measured will have little correlation with individual achievement of students who are utilizing programed materials.

> In this earlier study the scores of the different ability groups on the achievement test (Detambel and Stolurow, 1956) revealed that the lowest ability group obtained scores that were significantly lower than the highest ability group. In other words, the best sequence did for the poorest ability group what the highest ability groups could do for themselves regardless of sequence. Others have also found that the more effective teaching machine program sequences result in essentially zero correlation between achievement scores and IQ measure. These findings do not mean that all of the intellectual requirements of a learning task can be eliminated by proper sequencing. They merely say that if the students have the minimum ability to master the task then the efficient sequence will produce a set of learning scores that will not be correlated with IQ (Stolurow, 1962).

This finding through research on programed materials may be the most significant finding to date.

In summary, the literature seems to show that programed teaching is an effective teaching method (Little, 1934; Jensen, 1949; and Skinner and Holland, 1958). Programed material presented in textbook format seems to be just as effective a presentation method as does the teaching machine (Glaser, Homme and Evans, 1959; Holland and Skinner, 1959; and Silverman and Alter, 1961).

In general, either overt or covert responses are successful, but if time is an important factor the covert response method is a significantly faster method of presenting the material to be learned (Coulson and Silberman, 1959).

A newer variable, sequencing of steps within the program, has

become the most promising aspect for research recently. Better sequenced programs affect both the branching and linear programs and studies, (Detambel and Stolurow, 1956; Gagne, 1962; Jensen, 1963; and Eigen and Feldhusen, 1963), seem to indicate that careful sequencing of steps may be the key variable in making programed learning a more effective and efficient method of material presentation than it already is.

CHAPTER III

MATERIALS AND METHOD

The subject matter selected to be programed for use in this experiment was taken from the Stanford-Binet Intelligence scale. The first program was written using the Stanford-Binet method of computing chronological age as the content. The second program was written utilizing the vocabulary list of the Stanford-Binet Intelligence scale. The complete chronological age and vocabulary list programs are appendices A and B of this study.

Both programs are of the constructed response type, requiring the subject to write out or think of an answer as opposed to choosing one of several alternative answers. The chronological age program was a combination of overt and covert type responding. The vocabulary program was completely a covert responding program.

The chronological age program consisted of thirty-four frames in a horizontal format. The function of this program was to teach the student examiners how to compute chronological age according to the Stanford-Binet method. The following is an explanation of this method of computation. For a person born on the fifteenth of November, 1956 and taking the test on the sixteenth of December, 1963, the examiner must count the number of years, months and days intervening between the date of birth and the administration of the test. If the number of days left after counting the years and months is sixteen or more, he must

add one month to the chronological age. If the days are fifteen or less, he must disregard the number of days. The chronological age of a person born on 15 November, 1956 who is taking the test on 16 December, 1963 is seven years, one month. Another person born on 15 November, 1956 who is taking the test on 31 December, 1963 would have a chronological age of seven years, two months. In the second case there are sixteen days left after figuring the years and months, so according to the Stanford-Binet method of computation a month must be added to the chronological age of the examinee.

The chronological age program was completed and administered to a graduate class taking Educational Psychology 503. Only two people in the class of thirty five had figured chronological age previously. The average time taken to complete the program was thirty minutes. In evaluating the results of this first administration of the program, it was determined that six frames were producing the majority of the errors made by the subjects. These six frames were altered and the program was administered to another graduate class. The analysis of these results showed that the program was acceptable with an error rate of thirteen per cent. The program was utilized without further revision. The main factor considered in accepting the program with the thirteen per cent error rate was that several of the errors were mathematical errors made in actual computation of chronological age. Most of the errors were subtraction errors. Eliminating the errors in subtraction, the error rate was less than ten per cent.

The second program also was written in a horizontal presentation format, using the Stanford-Binet vocabulary list as the subject matter. The intent of this program was to familiarize the student with the

vocabulary words and to teach him the definitions of the words. Only correct definitions or definitions that would be scored correct or as plus responses on the Stanford-Binet test were used in the programing sequence. Since it would be impossible to write out all the acceptable answers for the vocabulary words, the meanings of the words were presented in terms of use, description of something, or place in special categories. The programed material for the vocabulary word ORANGE will be used as an example of the approach used.

13.	ORANGE has two conceptual formats: a fruit and a color. The orange usually is represented as being perfectly round. This last concept may be the easiest for the small child to explain. He could give, "Round like a ball"; this giving and adequate d_____ of the concept of the word ORANGE.	13. description
14.	"To eat" would be a u__, and "a fruit" would be a c_____ response.	14. use category
15.	The general use of an orange is that it may be e____.	15. eaten
16.	A descriptive answer could give its color or its s____. The more advanced answer would put the orange in the c_____ of fruit.	16. shape category

The complete vocabulary list was programed in a similar format. The first form of the program was checked for accuracy of content.* Then a corrected form of the program was administered to a graduate class in Educational Psychology 513. An analysis of their answers showed that the program had a seven per cent error rate. Item analysis of the program and the students' answers indicated that ten frames were

*The check was made by Dr. Richard Rankin, professor in charge of teaching the Stanford-Binet Scale to student examiners.

contributing greatly to the error rate. These frames were reworded and the program was administered to a group of ten graduate students. Analysis of their answers showed that the revision had improved the ten frames and had reduced the error rate. This revision then became the final form of the program administered to the experimental group.

Sample

The sample population for this study consisted of twenty five Oklahoma State University graduate students who were enrolled in Individual Intelligence Testing 5H3. The experimental group consisted of fourteen students, twelve masters degree candidates and two doctoral degree candidates. All but two of the students in the experimental group were majoring either in psychology or in the student personnel and guidance field. One of the other two students was majoring in educational administration and the other student was working in the field of reading. The grade point average, at the graduate level, for the group was 3.37 based on a 4.0 scale.

The control group consisted of a group of eleven students enrolled in the testing course the following semester. These students also were masters degree candidates with the exception of two who were doctoral degree candidates. Nine of the students were majoring in psychology or student personnel and guidance. The tenth student was a health, physical education and recreation major, and the eleventh student was majoring in elementary education. The graduate grade point average of the group was 3.41 based on a 4.0 scale. The difference in graduate grade point averages between the two groups was .04. This was not a significant difference.

In reviewing the personnel records of the students in both groups, it was found that they had similar educational objectives, and according to their grade point averages, their levels of academic achievement were comparable. The majority of both groups were masters degree candidates, only two members of each group being doctoral candidates. Other data such as IQ scores, Graduate Record scores and personality test evaluations were not available for the two groups.

Method

The chronological age program was administered to the experimental group during the third class meeting. The group had read part of the manual for administering and scoring the Stanford-Binet and had been given information about the history of the test. A mimeographed copy of the chronological age program was given to them. They were instructed to work through the program during that class period. This group was familiar with the computation of chronological age, but not the computation of chronological age by the Stanford-Binet method described earlier. After the class finished the program, at a self-paced rate, they were instructed to keep the program and refer to it when scoring the Stanford-Binet tests they would administer during the semester.

The vocabulary program was administered to the experimental group two weeks after the chronological age program was administered. The procedure used was the same used in administering the chronological age program.

Programing was the primary method used in introducing the method of computing chronological age and defining the vocabulary words to the experimental group. Throughout the remaining portion of the

semester the instructor discussed the students' scoring errors and explained why they were incorrect. During these discussions, learning or at least the opportunity for learning to occur was present. In analyzing the results of this study the combined effect of the programed material and the regular classroom instruction was considered.

The control group consisted of another class enrolled in Individual Intelligence Testing 5H3. The control group had the same instructor as the experimental group. They received no programed materials. The instructor presented the correct procedure for computing chronological age and defining vocabulary words to the control group. This group also had the benefit of discussing the errors they had made in scoring the tests.

Analysis

The student examiners administered twelve Stanford-Binet tests during a nine week period while they were enrolled in the testing course. The data used to test the hypotheses in this experiment consisted of the chronological age computational errors and the vocabulary scoring errors made by the student examiners in scoring the tests they had administered.

A "t" test was used to test the hypothesis that the experimental group would make significantly fewer scoring errors, chronological age errors and vocabulary errors combined, than would the control group. Also a "t" test was used to test the hypotheses that the experimental group would make significantly fewer vocabulary scoring errors than the control group and significantly fewer chronological age scoring errors than the control group.

The "Q" statistic was used to test the hypotheses that no significant difference in the patterns of scoring errors would occur with increasing experience in administering the Stanford-Binet test. The data used was the chronological age and vocabulary errors grouped by blocks of three tests. Each subject administered twelve tests which were grouped in blocks of three for the analyses. All the tests administered by the student examiners were dated; therefore, the sequence of test administration was used as a data grouping procedure. With the data grouped by sequence of test administration into blocks of three tests analyses of variance were computed to determine if experience did affect the pattern of scoring errors of either group.

The hypotheses to be tested are these:

1. There is no significant difference in the experimental group's combined chronological age and vocabulary scoring errors and the control group's combined chronological age and vocabulary scoring errors.

2. There is no significant difference in the experimental group's average number of chronological age scoring errors compared to the control group's average number of chronological age scoring errors.

3. There is no significant difference in the experimental group's average number of vocabulary scoring errors compared to the control group's average number of vocabulary scoring errors.

4. The pattern of the vocabulary scoring errors of the experimental group does not change significantly with increasing experience in administering the Stanford-Binet Intelligence Test.

5. The pattern of the vocabulary scoring errors of the control group does not change significantly with increasing experience in

administering the Stanford-Binet Intelligence Test.

6. The pattern of the chronological age scoring errors of the experimental group does not change significantly with increasing experience in administering the Stanford-Binet Intelligence Test.

7. The pattern of the chronological age scoring errors of the control group does not change significantly with increasing experience in administering the Stanford-Binet Intelligence Test.

CHAPTER IV

RESULTS

The data gathered from the experiment was analyzed using the "t" statistic to test for a difference of mean errors scores and Cochran's "Q" for an analysis of variance technique. The "Q" statistic is an analysis of variance design for a single-factor experiment having repeated measures and data that is considered dichotomous.

The repeated measures design was utilized since, statistically, it allows each subject's error scores to be treated as multiple variables even though they are derived from the same test. Therefore, a test of patterns of error scores can be made utilizing the scoring errors of each subject individually instead of combining them into a group score. The error scores were dichotomous in that the subject made a scoring error in a particular block of tests or he did not make a scoring error in that block of tests.

The raw data used in the analyses is presented in Appendix C. The observed mean scores and the "t" statistics for the experimental and control groups, as calculated from student examiners' scoring errors on the vocabulary and chronological age computations, are presented in Table I. Neither of the "t" tests for vocabulary errors or chronological age errors individually considered showed a significant difference; however, the experimental group had a smaller mean error score than did the control group for both vocabulary test and

TABLE I

ANALYSIS OF OBSERVED MEANS

Source of Data	Means	df	"t"
Total scoring errors			
Experimental group	1.9285	23	1.8120*
Control group	2.7272		
Vocabulary test scoring errors			
Experimental group	.9285	23	.499
Control group	1.182		
Chronological age computation errors			
Experimental group	1.00	23	.809
Control group	1.09		

*.05 level of significance

chronological age errors. When the vocabulary and chronological age errors were totaled and a "t" test computed with the data, it was determined that the experimental group had significantly fewer scoring errors than did the control group.

Table II, representing the experimental group, and Table III, representing the control group, present the results of the analyses of the vocabulary test scoring errors when the errors were grouped by blocks of tests to check for a difference due to increased proficiency in test administration. Neither of the groups had a significant drop in the number of scoring errors after having gained experience in administering the Stanford-Binet Intelligence Test.

Using the chronological age errors made by the experimental group, Table IV presents the results of the analysis of variance test when the errors were grouped by blocks of tests to test for a change in the pattern of scoring errors due to increased proficiency in test administration. Table V gives the results of the same type of analysis with the same grouping of chronological age errors made by the control group. No significant difference was found in either.

TABLE II

ANALYSIS OF VARIANCE OF EXPERIMENTAL GROUP
VOCABULARY SCORING ERRORS

Source of Variation	Adjusted Sum of Squares	Degrees of Freedom	Q
Between people	1.5893		
Within people	7.25		
Blocks of tests	.625	3	
			3.6206
Residual	6.625	39	
Total	8.8393		

TABLE III

ANALYSIS OF VARIANCE OF CONTROL GROUP
VOCABULARY SCORING ERRORS

Source of Variation	Adjusted Sum of Squares	Degrees of Freedom	Q
Between people	3.000		
Within people	5.250		
Blocks of tests	.614	3	
			3.859
Residual	4.636	30	
Total	8.250		

TABLE IV

ANALYSIS OF VARIANCE OF EXPERIMENTAL GROUP
CHRONOLOGICAL AGE SCORING ERRORS

Source of Variation	Adjusted Sum of Squares	Degrees of Freedom	Q
Between people	2.5893		
Within people	6.25		
Blocks of tests	.1964	3	1.3198
Residual	6.0536	39	
Total	8.8393		

TABLE V

ANALYSIS OF VARIANCE OF CONTROL GROUP
CHRONOLOGICAL AGE SCORING ERRORS

Source of Variation	Adjusted Sum of Squares	Degrees of Freedom	Q
Between people	1.4091		
Within people	5.75		
Blocks of tests	.6101	3	
			3.5013
Residual	5.1369	30	
Total	7.1591		

CHAPTER V

DISCUSSION

The finding that the experimental group made significantly fewer scoring errors than did the control group allows the author to reject the major null hypothesis of the experiment. The finding that the programed learning techniques combined with the instructor's presentation resulted in significantly fewer errors than regular classroom instruction alone is contrary to most findings of experiments that utilize programing as the independent variable. Therefore, these results must be viewed carefully. In this experiment the programs were supplemental to regular classroom instruction thus compounding the effects of the program and the instructor. Any significant reduction in scoring errors cannot be attributed to the programs alone.

Another consideration in interpreting these results is the Hawthorne effect. The experimental group did know that they were participating in a study which could have affected the results. It was not feasible, methodologically, to attempt to measure this effect.

Another variable affecting the interpretation of these results is the small sample population. This problem could not be avoided. The study, as done, includes all the students enrolled in the testing course for the academic year, 1964-1965.

In this particular situation the finding of a reduction in errors is important. The subjects in the experiment were learning to

administer the Stanford-Binet Intelligence Test. Since the results of the test may be used to make important decisions about a child, any increase in examiner reliability is beneficial.

The analyses of the results of the individual programs indicate that the combined effect of the programs rather than the programs singly produced the significant difference in the total mean error scores. Neither program, individually, effected a significant reduction of mean error scores in the experimental group.

The results of the analyses of the error scores for the individual programs were not significant. The vocabulary program did not help the student examiners in the experimental group make significantly fewer scoring errors than were made by the control group. Nor did the chronological age program result in the experimental group making significantly fewer scoring errors. In both cases, however, the experimental group did have a smaller mean error score, but the difference was not significant. The change in mean error score for the vocabulary program was from 1.182 for the control group to .9285 for the experimental group. The chronological age program change was from 1.09 to 1.00.

Four hypotheses in this study were tested to determine whether or not the programs would have an effect on the number of scoring errors the student examiner made in relation to his experience in administering and scoring the Stanford-Binet Intelligence Test. Each subject administered twelve tests and these tests were grouped in blocks of three tests to check for the differences that experience might have caused. None of the results from the analysis of variance tests were significant. The "Q" statistic which was utilized as the test statistic

gave a value of 3.6202 for the experimental group on vocabulary scoring errors over the blocks of tests and a value of 3.859 for the control group vocabulary scoring errors over the blocks of tests. These results indicate very little change in either groups' patterns of scoring errors.

The "Q" value for the experimental group's chronological age errors was 1.3198 and the value for the control group was 3.5013. The result tends to indicate that the experimental group made errors in a more consistent pattern than did the control group.

Some of the results from this present study may suggest a different approach to research in programing. The results indicated that neither of the individual programs produced a significant decrease in scoring errors, but the combination of the two error scores did produce a significant finding. Another possible combination of these results might have shown one program giving significant results, the other non-significant results and the combination of the two giving no significant difference. To date, most studies in programing have been designed to test for a total effect from a single program. Intra-program effect has been overlooked. Many studies, utilizing a total course program as the independent variable, check only the total program's effect by administering a single criterion test. This single test would tend to mask the effect of separation sections of the program which might produce a significant increase in learning. Perhaps experimental studies could be designed to test parts of a program as well as the total program. The parts that produced increased learning efficiency could be incorporated into a final program.

A reason for the majority of "no significant difference" findings

in research studies in programed learning may be due to this masking effect by material that could be learned without the use of programed techniques. An interpretation of an analysis of the effects of the two programs in the present study indicates that such a masking effect is possible.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of the present study was to investigate experimentally the effectiveness of using programed learning materials combined with regular classroom instruction at the graduate level of education.

Two programs were written for this experiment. One program consisted of an explanation of the Stanford-Binet method for computing chronological age. The second program utilized as its subject matter the definitions of the words in the vocabulary list of the Stanford-Binet Intelligence Test.

Twenty-five graduate students enrolled in an Individual Intelligence Testing course were used as subjects in this experiment. Fourteen members of the group received both programs during the course. The other group received regular classroom instruction only.

The independent variables were the two programs. The dependent variables were the errors made by the student examiners in scoring the vocabulary tests and in computing chronological ages of the examinees.

The "t" statistic was utilized to test the major null hypothesis, which was that there will be no significant difference between the mean error scores of the experimental and control groups. The "t" statistic also was utilized to test the effect of the individual programs on the scoring errors made by the students. An analysis of variance technique was used to test the hypotheses that there are no significant differences

in the patterns of vocabulary and chronological age scoring errors due to increased proficiency in test administration.

Results were as follows:

1. The total mean error score of the experimental group was significantly lower than the total mean error scores of the control group.

2. No significant difference was found between the two groups' mean error scores as derived from vocabulary scoring errors.

3. No significant difference was found between the two groups' mean error scores as derived from chronological age computation errors.

4. No significant decrease in mean error scores was found in the experimental group's vocabulary scoring errors when the errors were grouped by blocks of three tests to allow for experience gained in the administration of tests during the semester.

5. No significant decrease in mean error scores was found in the control group's vocabulary scoring errors when the errors were grouped by blocks of three tests to allow for experience gained in the administration of tests during the semester.

6. No significant decrease in mean error scores was found in the experimental group's chronological age computation errors when the errors were grouped by blocks of three tests to allow for experience gained in administering the test during the course. This analysis did indicate that the experimental group made chronological age errors in a more consistent pattern than did the control group.

7. No significant decrease in mean error scores was found in the control group's chronological age computation errors when the errors were grouped by blocks of three tests to allow for experience gained in administering the test during the course.

On the basis of these findings the following conclusion was drawn: Programed learning techniques combined with regular classroom instruction had been an effective learning device for the experimental group, and appropriate programed instruction probably would be effective in some other graduate classes.

Recommendations for Further Study

A recommendation would be to utilize three groups instead of two. One group would have "regular" classroom instruction. Another group would have programed materials and "regular" classroom instruction. The third group would receive only programed instruction. With this experimental design more meaningful generalizations about the effects of programed materials on students probably could be made.

A further recommendation would be that experimental programs be written to allow parts of the program as well as the total program to be used to test for increased learning. Parts of the program might be producing significant increases in learning, but this effect might not be found if a statistical analysis of the total program effect is the only analysis utilized.

REFERENCES

Angell, C. W. & Troyer, M. E. A new self-scoring device for improving instruction. Sch. & Soc., 1948, 67, 84-85.

Beck, J. On some methods of programming. In E. Galanter (Ed.) Automatic teaching. New York: Wiley & Sons, Inc., 1959.

Coulson, J. E. & Silberman, H. F. Results of an initial experiment in automated teaching. J. educ. Psychol., 1960, 51, 135-143.

Crowder, N. A. Automatic tutoring by means of intrinsic programming. In E. Galanter (Ed.) Automatic teaching. New York: Wiley & Sons, Inc., 1959.

Cummings, A. & Goldstein, L. S. The effect of overt and covert responding on two kinds of learning tasks. In John P. DeCecco (Ed.) Educational technology. New York: Holt, Rinehart and Winston, Inc., 1964.

Della-Pianna, G. An experimental evaluation of programed learning. J. educ. Res., 1962, 55, 495-498.

Detamble, M. H. & Stolurow, L. M. Stimulus sequence and concept learning. J. exp. Psychol., 1956, 51, 34-40.

Eigen, D. A comparison of three modes of presenting a programed instruction sequence. J. educ. Res., 1962, 55, 453-460.

Eigen, L. D. & Feldhusen, J. F. Interrelationships among attitude, achievement, reading, intelligence, and transfer variables in programed instruction. In John P. DeCecco (Ed.) Educational technology. New York: Holt, Rinehart & Winston, Inc., 1964.

Evans, J. L., Glaser, R. & Homme, L. E. An investigation of "teaching machine" variables using learning programs in symbolic logic. J. educ. Res., 1962, 55, 431-452.

Feldhusen, J. F. & Birt, A. A study of nine methods of programed learning material. J. educ. Res., 1962, 55, 461-466.

Fry, E. B. A study of teaching machine response modes. In A. A. Lumsdaine & R. Glaser (Eds.) Teaching machines and programmed learning. Washington, D. C.: National Education Association, 1960.

Fry, E. B. Teaching machines and programed instruction. New York: McGraw-Hill, Inc., 1963.

Gagne, R. M. The acquisition of knowledge. Psychol. Rev., 1962, 69, 355-365.

Glaser, R., Homme, L. E. & Evans, J. L. An evaluation of textbooks in terms of learning principles. In A. A. Lumsdaine and R. Glaser (Eds.) Teaching machines and programmed learning. Washington, D. C.: National Education Association, 1960.

Goldbeck, R. A. & Campbell, V. N. The effects of response mode and response difficulty on programmed learning. J. educ. Psychol., 1962, 53, 110-118.

Homme, L. E. & Glaser, R. Relationships between the programmed textbook and teaching machines. In E. Galanter (Ed.) Automatic teaching. New York: Wiley & Sons, Inc., 1959.

Jensen, A. Learning ability in retarded, average, and gifted children. Merrill-Palmer quarterly of behavior and development, 1963, 9, 124-140.

Jensen, B. T. An independent-study laboratory using self-scoring tests. J. educ. Res., 1949, 43, 134-137.

Krumboltz, J. D. & Bonanitz, B. The effect of receiving the confirming response in context in programed material. J. educ. Res., 1962, 55, 472-475.

Levin, G. R. & Baker, B. L. Item scrambling in a self-instructional program. J. educ. Psychol., 1963, 54, 138-143.

Little, J. K. Results of use of machines for testing and for drill upon learning in educational psychology. J. exp. Educ., 1934, 3, 45-59.

Lysaught, J. P. & Williams, C. M. A guide to programed instruction. New York: Wiley & Sons, Inc., 1963.

Markle, S. M., Eigen, L. D. & Komaski, P. K. A program primer on programing. Vol. I & II, 2nd edition. New York: The center for programed instruction, Inc., 1961.

McNemar, O. The revision of the stanford-binet scale, an analysis of the standardization data. New York: Houghton Mifflin Co., 1942.

Peterson, J. C. The value of guidance in reading for information. In A. A. Lumsdaine & R. Glaser (Eds.) Teaching machines and programmed learning. Washington, D. C.: National Education Association, 1958.

Pinter, R., Dragositz, A. & Kushner, R. Supplementary guide for the revised stanford-binet scale. Stanford: Stanford University Press, 1958.

Porter, D. A. A critical review of a portion of the literature on teaching devices. Hav. educ. Rev., 1957, 27, 126-147.

Pressey, S. L. A machine for automatic teaching of drill material. Sch. & Soc., 1927, 25, 549-552.

Pressey, S. L. A simple apparatus which gives tests and scores and teaches. Sch. & Soc., 1926, 23, 373-376.

Pressey, S. L. A third and fourth contribution toward the coming "industrial revolution" in education. Sch. & Soc., 1932, 36, 668-672.

Pressey, S. L. Certain major psycho-educational issues appearing in the conference on teaching machines. In E. Galanter (Ed.) Automatic teaching. New York: Wiley & Sons, Inc., 1959.

Pressey, S. L. Development and appraisal of devices and providing immediate automatic scoring of objective tests and concomitant self-instruction. J. Psychol., 1950, 29, 417-447.

Roe, A. A comparison of branching methods for programmed learning. J. educ. Res., 1962, 55, 407-416.

Silberman, H. F., Melaragno, R. J., Coulson, J. E. & Estavan, D. Fixed sequence versus branching autoinstructional methods. J. educ. Psychol., 1961, 52, 166-172.

Silverman, R. E. & Alter, M. Response mode, pacing and motivational effects in teaching machines. A technical report: NAVTRADEVCEN 5-7-3. U. S. Naval Training Device Center, Port Washington, L. I., New York, 1961.

Skinner, B. F. Science of learning and the art of teaching. Hav. educ. Rev., 1954, 24, 86-97.

Skinner, B. F. Teaching machines, Science, 1958, 128, 969-977.

Skinner, B. F. The programming of verbal knowledge. In E. Galanter (Ed.) Automated teaching. New York: Wiley & Sons, Inc., 1959.

Skinner, B. F. & Holland, J. G. The use of teaching machines in college instruction. In A. A. Lumsdaine & R. Glaser (Eds.) Teaching machines and programmed learning. Washington, D. C.: National Education Association, 1960.

Stolurow, L. M. Social impact of programmed instruction: aptitudes and abilities revisited. In John P. DeCecco (Ed.) Educational technology. New York: Holt, Rinehart & Winston, Inc., 1964.

Stolurow, L. M. & Walker, C. C. A comparison of overt and covert responses in programmed learning. J. educ. Res., 1962, 55, 421-429.

Terman, L. M. & Merrill, M. A. Stanford-Binet intelligence scale. Cambridge: Houghton Mifflin Co., 1960.

Winer, B. J. Statistical principles in experimental design. New York: McGraw-Hill, Inc., 1962.

Zeaman, D. Skinner's theory of teaching machines. In E. Galanter (Ed.) Automated teaching. New York: Wiley & Sons, Inc., 1959.

A P P E N D I C E S

PROGRAM LEARNER FOR THE STANFORD-BINET VOCABULARY TEST

In this program over the vocabulary portion of the Stanford-Binet Intelligence test, the basic concepts of the words are to be discussed and examples of responses showing concepts will be given. The examples were chosen because they do show the meanings of the words. This is not to say that there are not other responses that also are correct. The purpose of this program is to convey the different meanings of the words in the vocabulary list and to cover the different categories in which responses will be classified. The words will be given in terms of their use, their description of something, or their place in special categories. Not all words in the Stanford-Binet list fit all three classifications, but it is a useful way to designate the meanings of the words. Some of the words are used as adjectives or verbs. Usually these responses are uncommon, but they will be pointed out in the program. Keep in mind that the assigning of a specific classification to a word is arbitrary. You may feel that a given meaning is more descriptive, while the program states it to be a use. If this occurs, it may be a good sign, because it shows that you are thinking about the words and their meanings. This, not merely assigning classifications to words, is the purpose of the program.

1. The purpose of this vocabulary test is to determine whether or not the subject knows the meaning of the word, not if he can give a completely logical definition.

2. Nearly all of the words in the vocabulary list can be answered by showing a use for the object, giving a description of the object, or the word may fit into a category type response.

3. It will be fairly easy to decide if the person has given a correct u__ for an object. — 3. use

4. The dividing of responses into d_____ or c_____ types will not be as easy. The purpose of dividing the responses into these types is to help you, the examiner, decide if the response is correct and has nothing to do with the quality of the answer. — 4. descriptive category

5. Since this division will not affect the scoring of the answer as to its quality, the examples listed under the types u__, d_____ and c_____ may not be a clear cut choice for the correct classification, but rather the decision may be based on the distinction that the response is more of a description than a c_____, etc. — 5. use description category category

6.	The examiner should remember that any correct answer receives a positive score. The subject does not have to respond with an answer for each classification.	
7.	As a student examiner begins to learn the correct responses to items, he will find it beneficial if he mentally checks to see if the words fall into one of the three areas: u__, d_____ and category.	7. use description
8.	Generally, young children will tend to give a use for the meaning of the word, while adults will give either a d_____ or a c_____ type answer.	8. description
9.	If an examiner is not sure about the subject's answer, that is if he does not know for sure whether or not the subject knows the m_____ of the word, then the examiner can question the subject by saying, "Tell me what you mean."	9. meaning
10.	The purpose of the examiner's q_____ is to help him decide positively whether or not the subject knows the m_____ of the word.	10. question meaning
11.	Remember, an answer is never q_____ to help the subject improve his score.	11. questioned
12.	Throughout this program the vocabulary words will be presented and their meaning discussed as it pertains to a u__, d_____ or a c_____. All responses used are PLUS responses.	12. use description category
13.	ORANGE has two conceptual formats: a fruit and a color. The orange usually is represented as being perfectly round. This last concept may be the easiest for the small child to explain. They could give, "Round like a ball", thus giving an adeauate d_____ of the concept of the word ORANGE.	13. description
14.	"To eat" would be a u__, and "a fruit" would be a c_____ response.	14. use, category
15.	The general use of an orange is that it may be e____.	15. eaten
16.	A descriptive answer could give its c____ or its shape. The more advanced answer would put the orange in the c_____ of fruit.	16. color category

17.	ENVELOPE is a word that has only one conceptual meaning: "that which envelopes, a wrapper." Even though this word has only one concept it may be responded to by giving a u__, d_____ or c_____ type response.	17. use description category
18.	The young child may give a combination of use and description, such as "a piece of paper to mail letters in." The answer, "A piece of paper like a pocket" would be a d_____ only.	18. description
19.	The single word "stationery" would put the word into a special c_____ of paper, which has an implied general usage.	19. category
20.	In general, the use of an envelope would be to enclose something inside it. A description of an envelope would be just that, and finally, a category would be defining the envelope in the special class of paper called s_____.	20. stationery
21.	STRAW has two common meanings: a drinking utensil and a hollow piece of dried grass. Again the distinctions as to use, d_____ and category are useful. Less often, straw is used as an adjective and meanings include: "a trifle", "a color", and "made of straw" which implies weakness.	21. description
22.	Taking the first listed meaning of straw as a use, it is a dr_____ ut_____.	22. drinking utensil
23.	Still referring to the first meaning, a hollow glass tube would be a c_____ type response.	23. category
24.	The second meaning of the word, classified as a use, would involve straw as f___ for animals or as a construction material.	24. food
25.	The d_____ of straw could be very specific such as: "A long hollow, yellow piece of grass", or it could be simply, "Comes out of brooms."	25. description

26.	Dried grass or hay would be a c_____ type answer, showing that it is a particular kind of grass for a special u__.	26. category use
27.	PUDDLE has only one common meaning. A small body of standing liquid. Another, but less common meaning, is the working of a clay mixture to make it impervious to water.	
28.	A description should involve some concept of a small area of liquid, such as: "Spill something on the floor" or "A hole with water in it". The c_____ of puddles generally denotes a special kind of puddle: a mud puddle, rain water in the street or how snow melts on the sidewalk.	28. category
29.	TAP has three common meanings: first, a slight touch of one object to another: second, a fixture to allow you to dispense a liquid; third, a special meaning of blowing taps in the military services. It should be noted that other meanings for TAP are: a type of dance, metal piece on a shoe, an inside pipe threader, and the process of drawing off a liquid. IDENTIFY EACH OF THE FOLLOWING ANSWERS AS TO ___, _____ or _____.	29. use description category
30.	"To put on shoes."	30. use
31.	"What they put in a barrel to empty beer."	31. description or use
32.	"You use it to shut off water in the sink."	32. use
33.	"Light touch."	33. category or description
34.	"You tap someone on the back."	34. description
35.	"A dance."	35. category

36. GOWN has one common meaning: an article of apparel. There are several categories of gowns and special u__ for each c_____. Another but less common meaning is to classify college students collectively, as used in "Town and Gown".	36.	use category
37. There are sleeping gowns, hospital gowns, bridal gowns and party gowns. A child's description of any of these gowns does not have to be elaborate but must denote that the child knows what the object is. Usually, a child will give a combination ___ and _____ response.	37.	use description
38. ROAR is a loud noise and generally the answers of subjects to this word fall into specific age brackets. Young children say, "An animal roars", and they may name an animal. Older subjects may give the answer, "A loud noise" which is a c_____ type answer.	38.	category
39. Seldom will you receive a u__ type answer for this word. Can you think of one?"	39.	use
40. EYELASH, of course, has only one meaning and with the small child it is permissible to ask them to point to it, if you are not sure of their response. Here again use and description are important divisions in answers that will help you to score the response correctly. To score a response p___, the subject must know the m_____ of the word; not give a logical definition.	40.	plus meaning
41. Examples of answers to this word are: "Found at end of eyelid" or "Sticks out from the lid of your eye and keeps dirt from getting into eye". These are both d_____ type answers, while a straight response, "To keep dirt out of your eye" is a u__ classification.	41.	descriptive use
42. MARS is another three-meaning word. Specifically, they are: first, a planet; second, ruins or impairs; third, god of war. MARS like ROAR has few u__ answers. If a person replies that Mars is a candy bar, the examiner should say "yes, and can you tell me what else it means?" Only the standard meaning of the word is scored with a plus.	42.	use

43. Most of the answers for MARS that you will receive will be c_____ type answers.	43. category
44. Generally, the answers pertaining to a planet, the first meaning, will be the only d_____ answers that you will receive.	44. descriptive
45. A ten year old child would be least likely to give you an answer involving the meaning, to ruin or impair, because he ordinarily would not use the word in that context.	
46. JUGGLER has two meanings: that of a person who balances objects both moving and stationary. The other, less common meaning, refers to deceit and could be used to describe a person who "juggles" business books. The _____ type answer will be the one most often received from both children and adults.	46. balancing or descriptive or first
47. Let's take a quick review of the words covered so far: especially the ideas that are given for a response to be scored p___, which must show the meaning of the word and not just be a logical _____ of it.	47. plus definition
48. The words may have more than one meaning and responses will fall into ___, _____ and _____ types of answers.	48. use description category
49. ORANGE has ___ meaning/s. The answer, "A fruit", would be a _____ type answer.	49. two category
50. ENVELOPE has ___ meaning/s. Basically, it is a flat, c_____ c_____ made from paper.	50. one closable container
51. "A piece of paper like a pocket to put papers in" would be a _____ type answer.	51. descriptive

52. STRAW has two common meanings. They are a _____ _____ or a piece _____ _____. Think of a use answer for each meaning.	52. drinking utensil dried grass
53. PUDDLE has ___ common meaning/s. A category type answer would give a specific _____ __ _____.	53. one type of puddle
54. Generally, a category type answer will denote a special ____ of puddle.	54. type or kind
55. TAP has _____ common meaning/s. These meanings are: _ _____ _____, _____ __ _____ _ _____, and _____ __ __ _____ _____.	55. three a light touch, utensil to dispense a liquid, and taps in the military services
56. GOWN has only one common meaning; however there are several _____ of gowns.	56. categories or kinds
57. Three categories of gowns are: _____, _____ and _____.	57. bridal, sleeping hospital, party
58. ROAR has ___ meaning/s. The young child's most common response is: "_____".	58. one "An animal roars"
59. EYELASH has ___ meaning/s. This word has a unique feature in that you ask the child to _____ to his eyelash if you are not sure of his answer. Remember, that if he points to the eyelid or eyebrow, it is a minus response.	59. one point
60. MARS has three meanings. Give a category type answer for each meaning: _____, _____, and _____.	60. a planet to impair god of war

61. JUGGLER has ___ meaning/s. A _____ type answer is the most common one that you will receive.	61. two descriptive or balancing
Now let us resume with the regular vocabulary list.	
62. SCORCH has one meaning: an excess of heat, not enough to destroy, is the basic concept that should be conveyed by the subject. The idea may be expressed in two ways. First, a description of a slight burn or its results. Second, a description of an exceedingly hot day. Practically all of the responses will be of the _____ type. Most of the responses will deal with ironing and scorching. The subject must know that it is some kind of b___ not just that it is done with an iron. Excessive h___ is the concept that must be conveyed.	62. descriptive burn heat
63. LECTURE has only one meaning: a one-sided conversation. This can be divided into two c_____, speeches and reprimands. Speeches can be subdivided into types of speeches and d_____ of where and how the speeches took place. The reprimands are also descriptive type responses and should include the idea of a directive speech rather than an argument.	63. categories descriptions
64. SKILL has only one meaning: a talent or ability to perform a task. Most of the responses you receive for this word will be of the d_____ type.	64. descriptive
65. This word will be hard to divide into ___, _____, or _____ classifications. Generally speaking, a synonym or description will be the most frequent type of response you will receive.	65. use description category
66. In the responses that you will receive for SKILL, you are looking for a description of a person's a_____ or t_____ to perform a task.	66. ability talent

67.	BRUNETTE has one meaning: dark (black or brown) shading of a person's complexion. Here again the d_____ response will be the most common. The idea of darkness of shading is the key to a plus response. The answer should demonstrate the subject's knowledge of the concept of shading of skin or hair coloring; it should not show that he can repeat the word in a correct sentence.	67. descriptive
68.	MUZZLE has four meanings: first, part of a face; second, a cover for an animal's mouth to keep him from biting; third, the hole at the end of a gun barrel; and fourth, the mouth of a thing. The first meaning is a d_____ type response.	68. descriptive
69.	The second meaning will be answered with both ___ and _____ type answers.	69. use descriptive
70.	When testing young children, be sure that they tell you what the muzzle is for not just that it fits over the animal's face. To score a response that uses the third meaning as a p___ response, the concept of the _____ or firing end of the barrel must be clearly made.	70. plus muzzle
71.	HASTE has only one meaning: to hurry. However, this can be stated negatively as well as positively and still be counted as a correct response. An example of this would be, "Not to lose time." Generally, you will receive a synonym or a d_____ type answer for this word. It is difficult to explain speed in a use or category type response.	71. descriptive
72.	PECULIARITY has only one meaning, but is has many synonyms, such as: odd, queer, strange, exception, different and funny. Most of these synonyms have a particular contectual connotation that makes them especially meaningful. The synonym itself is sufficient for a p___ score, but if the subject responds with a d_____ type answer you should be sure that the contectual c_____ agrees with the normal meaning of the word.	72. plus descriptive connotation
73.	An example would be "Differences distinguishing one object from another." By inserting the word not after the word differences the entire m_____ is changed, thus making it a minus response.	73. meaning

74.	PRICELESS has one meaning: the object is too valuable to correspond to any known price scale, or stated in another way, it is invaluable because of the emotional or sentimental value attached to it. Generally, the answers would be d_____ and are on two levels.	74. descriptive
75.	The first level refers to the invaluableness concept, and the second level implies that the object is too expensive to buy. Here again, contectual c_____ is important. The statement, "Something that hasn't a price", has no contectual connotation and must be q_____.	75. connotation questioned
76.	If the subject adds, "More than money can buy" or a similar idea being questioned, then you can be certain that he knows the m_____ of the word.	76. meaning
77.	REGARD has two meanings: to observe or consider something or to refer to, and to have respect or kindly feeling for someone or something. D_____ is again the most common type of answer that you will receive for this word. The first meaning can be divided into looking at something or considering something. The second meaning can be divided into respect for or kindly feeling for someone or something.	77. Description
78.	DISPROPORTIONATE has only one meaning: out of symmetry. This can be expressed in things out of shape or balance. Description will be used generally by the y____ person in answering the question, while synonyms will be used by the o____ person.	78. young older
79.	TOLERATE has one meaning, but three distinct shades or variations. These are best expressed by three synonyms: endure, permit, and patience. To stand something would be to _____.	79. endure
80.	To allow someone to act according to his inclinations would be to _____.	80. permit
81.	And to understand others and their views would be to have _____. With this word, you must be careful of any answer that uses the word TOLERATE in it, because it is a familiar word, but its meaning may not be clear.	81. patience

82.	LOTUS is a plant. In Chinese mythology it is a magical plant. Both d_____ and c_____ type answers must be given for this word. An answer that utilizes flower, blossom or tree to describe the object in question is correct and should be scored a p___.	82. description category plus
83.	SHREWD means alert or cunning. The second meaning is the more common definition and is generally given in a d_____ format. There is only one conceptual meaning here, but it can be stated both positively or negatively, as: "He is too clever to be taken in by the hoax" or "He is ingenious enough to always come out on top in a situation."	83. descriptive
84.	Keep in mind that it is the m_____ of the word that we are after, not a l_____ definition.	84. meaning logical or literal
85.	MOSAIC has four meanings: first, a form of art; second, pertaining to Moses; third, a variety of tile; and fourth, a plant disease characterized by mottling of the foliage. The answer, "A form of art", will usually be given in a d_____ format. This type of answer will more often than not be given by a younger person.	85. descriptive
86.	The older person will be more apt to give you a c_____ type response. The child of 10 or 11 years, if they get this far in the vocabulary list, might give you either the art form response or the Biblical connotation.	86. category
87.	The response, "A variety of tile", would be a c_____ type response.	87. category
88.	STAVE has seven acceptable meanings: One, curved boards making the sides of a barrel; two, a stick of wood used as a weapon; three, a staff or cane; four, a slat; five, a round or a rung; six, a musical term meaning five lines or a word in poetry meaning a metrical portion of a poem; and seven, to fight or ward off. The most generally given responses are the barrel stave or to ward off or fight. The third most common response is the stick or staff. The responses will be varied and some will give a ___ while others will give a _____, such as "a barrel stave". Others will be d_____.	88. use category descriptive

89.	BEWAIL has only one meaning: to lament or mourn. The concept of lamentation must be explicit. An answer that implies crying or states crying must explain why the person is crying. Here the d_____ of crying is not sufficient to score the response as a plus.	89. description
90.	Without the connotation of grief given in the answer, a correct definition of the word B____ will not have been given by the subject.	90. BEWAIL
91.	Its review time again. The next set of frames will ask you to give a definition or identify a definition of a word. Or you may have to state the type of the response. This review will start with the word SCORCH and go through BEWAIL. It would be a good idea to take a few minutes to review those words before going on.	
92.	SCORCH has ___ meaning/s. The basic concept of excessive h___, not enough to destroy, must be implied or stated by the subject.	92. one heat
93.	LECTURE has one meaning but two c_____ of response. These are s_____ and r_____.	93. categories speeches reprimands
94.	SKILL has ___ meaning/s. Generally, the two most commonly used words defining the word are t____ and a_____. Older subjects will probably give you synonyms as answers, while younger subjects will give a more descriptive answer.	94. one talent ability
95.	BRUNETTE has ___ meaning/s. A shade of c____ usually referring to h___ color is the most commonly given correct answer.	95. one, color hair
96.	MUZZLE has ____ meaning/s. With young children you must be sure that they demonstrate a knowledge of the concept that a muzzle is either a part of an animal's ____ or an object to keep an animal from _____.	96. four face biting
97.	If the response refers to the barrel of a gun, it must state or imply the h___ at the end of the barrel to be scored as a correct response.	97. hole

98.	HASTE has ___ meaning/s. The concept of s____ must be stated. This concept can be given in the negative form, as, "Not to lose t___."	98. one speed, time
99.	PECULIARITY has ___ meaning/s. Usually this word will be defined with s_____. What are three synonyms for this word.	99. one, synonym odd, queer strange exception different funny
100.	PRICELESS is a word with ___ meaning/s. Young children frequently will state that the object does not have a p____ on it. This definition does not convey the concept of the object being i_____.	100. one price invaluable
101.	REGARD has ___ meaning/s. One is to o_____ and the other is to have r_____ or k_____ f_____.	101. two, observe regard kindly feeling
102.	DISPROPORTIONATE has ___ meaning/s. It can be expressed by referring to things being out of p_____ or b_____.	102. one proportion balance
103.	TOLERATE has one meaning but three connotations. These are to e_____, to p_____ and to have p_____.	103. endure, permit patience
104.	LOTUS has ___ meaning/s. A correct answer will state that a lotus is a t___ or a f_____.	104. one tree, flower
105.	SHREWD has one meaning. A correct response may imply that a person is alert or c_____. Both synonyms and descriptive type answers frequently are used for this word.	105. cunning
106.	MOSAIC has ____ meaning/s. The most common answer is a description of a form of ___. Two other acceptable types of answers are: one, having to do with the B____; two, a specific variety of t___. It also can be identified as a p____ d_____.	106. four, art Bible, tile plant disease

107. STAVE has seven acceptable meanings. The most common are: a part of a b_____; a stick of wood used as a w_____; or the warding or f_____ off of an enemy. The other responses, though less commonly given, are a round or rung; a musical term meaning five lines or metrical portion of poetry; and a staff or cane.	107.	barrel weapon fighting
108. BEWAIL has one meaning: that of l_____ or mourning. Answers that imply grief are correct, but an answer, "Crying", is not sufficient to be scored as correct.	108.	lamentation

Now we will return to the concluding section of the vocabulary list.

109. OCHRE is a clay paint pigment that varies in color from reddish brown to dark yellow. The answers to this word may include the three classification of responses: ___, _____ and _____. Another acceptable spelling of the word is OCHER, if the subject should ask.	109.	use description category
110. The response, "To make color in oil paints", would be a u__ type response.	110.	use
111. The answer, "It is a clay paint pigment", would be a c_____ type response.	111.	category
112. REPOSE has four meanings: first, a state of tranquility; second, composure; third, to rest; and fourth, to depend. The examiner needs to be careful and put the emphasis on the second syllable of this word when pronouncing it. If you are not careful, your subject may think you mean RE-pose, meaning to pose again. An example of the first correct meaning would be, "peacefulness of mind or body." A person who is poised would be an example of the _____ meaning.	112.	second
113. Another example would be, "The can reposes on the table." This word would be an example of the _____ meaning.	113.	third
114. To depend would be the fourth meaning. You could say, "One idea reposes on the other." This is an uncommon response and usage for the word.		

115.	AMBERGRIS has one meaning: a substance secreted by sperm whales which is used in making perfumes. The answer will be given usually as a ___ of the substance.	115. use
116.	Often not only the use of the substance but also the s_____ will be given. Either of these responses is acceptable and should be scored a p___.	116. source plus
117.	LIMPET is a shell fish. This word takes little explanation. The answer must describe the limpet as a s____, mollusk, or seafood, or the answer is incomplete and incorrect.	117. shell fish
118.	FRUSTRATE has one meaning: to keep someone from reaching a desired goal. The answers to this word usually are d_____ in form. Many times they will be examples of frustration. With that type of example, the examiner must be careful in evaluating the response.	118. descriptive
119.	The basic concept that should be implied or stated in a correct response is the preventing or foiling of a person in his attempt to attain a g___.	119. goal
120.	FLAUNT means to show off proudly or impudently. To define this word, one may need to d_____ the meaning or give an e_____ that demonstrates the meaning of the word. "To wave something in front of everybody vehemently" or "To display saucily" are good examples of flaunting.	120. describe example
121.	For the word FLAUNT, the concept of p____ or i_____ must be shown in the answer if it is to be scored a plus.	121. pride impudence
122.	INCRUSTATION means a hard outer layer or coating. The examiner can expect mostly d_____ type answers to this word. Rust coating, barnacles on a ship's hull, hard cover on the top of snow, and an accumulation covering are all examples of incrustation.	122. descriptive
123.	You undoubtedly have noticed by now that fewer and fewer words fall into our three types of answers: ___, _____ and _____.	123. use, description category

124.	The more advanced the words are, the more a d_____ or descriptive e_____ will adequately convey to the examiner that the subject knows the meaning of the word.	124. description example
125.	Also at this level, the use of s_____ is at a minimum.	125. synonyms
126.	RETROACTIVE has one meaning: having application to or effect on things in the past. Usually, an example will be given to illustrate retroaction. "A pay raise that was passed today by your boss, but will become effective as of last pay day--several days or weeks ago." would be r_____ in effect.	126. retroactive
127.	The fact that the raise becomes effective in the p___ is the key to the correctness of this response.	127. past
128.	PHILANTHROPY has one meaning: desire to help mankind. Here again, a description or e_____ will be utilized by the subject to express his answer. An answer that implies or states that an act is done without thought of repayment is showing knowledge of the word P_____.	128. example PHILANTHROPY
129.	A philanthropic person is one who is willing to h___ or s____ other people without payment.	129. help serve
130.	PISCATORIAL means pertaining to fish. The concept here is that the word is the scientific term used in connection with fish, fishing or fishermen. Anything pertaining to fish would be p_____.	130. piscatorial
131.	MILKSOP means an unmanly man or a sissy. Generally, it is considered to be a man who will not or cannot d____ himself. A descriptive e_____ is the usual answer given for this word.	131. defend example
132.	HARPY has seven meanings: one, a character in Greek mythology; two, a half-bird, half-woman creature; three, creatures who took Ulysses and his men; four, birds or women who prey on humans; five, a rapacious person; six, an extortioner; and seven, a type of eagle. Four of the seven definitions are taken from Greek m_____.	132. mythology

133. Any answers that are from this area should be carefully weighed for correctness of meaning to be sure that the answer is not referring to ANY mythological character.

134. "A person who preys on weaker people, would fit the definitions number ____ and ___. The above answer and "A type of eagle" would be c_____ type answers.

134. five
six
category

135. DEPREDATION has two meanings: plundering and laying waste or a robbery. The important concept in this word is the destruction or runiation of something. A robbery differs from a theft in that a robbery legally implies plunder and action that would result or could result in violence. A theft is classified as an act of stealing an no violence is involved. A correct d_____ e_____ of a raid or crime must show p_____ or r_____ if it is to be considered correct.

135. descriptive
example
plunder
ruination or
robbery

136. PERFUNCTORY has one meaning: done in a routine manner. Personal interest is not involved in the act. An example must state or imply r_____ or lack of i_____ in what is being done. Some examples of this are: "A short curt greeting", "Carelessly done inspection", and "Sort of a habit."

136. routineness
interest

137. ACHROMATIC has two meanings: colorless, or musically without accidentals (a form of musical scale). An example that gives one of the two concepts correctly will have to explain that the work achromatic means an object lacks c____ or that it is a f___ of musical scale which features the sounding of whole tones.

137. color
form

138. CAUSISTRY has one meaning. The solving of special cases of right and wrong in conduct by applying general principles of ethics and deciding how far the circumstances alter the case. Causistry is considered to be a branch of philosophy generally dealing with theology. It is in this area of philosophy that special cases of r____ or w____ are considered. Examples used to answer this question must convey that it is a method of reasoning about right and wrong conduct.

138. right
wrong

139.	HOMUNCULUS has two meanings: a little man or dwarf and a model of a man used to demonstrate anatomy. A correct answer to this word needs to indicate that the subject knows that the word means a s___ man or a manikin.	139. small
140.	SUDORIFIC means causing or increasing sweat. The answer must show that the subject knows that the word has to do with causing a person to s___.	140. sweat
141.	PARTERRE has two meanings: part of a theatre, specifically the lower floor, and a type of terraced flower garden. The answers to this word must be specific to be correct. This does simplify scoring. The l___ floor of a theatre is easy to score as a plus response.	141. lower
142.	And a response that describes a flower garden divided by walkways or a garden that is t_____ would be scored as a correct response.	142. terraced

		WRITE ANSWERS HERE
1.	A correctly figured chronological age is a student's first step in scoring a Stanford-Binet Intelligence test.	
2.	There are two dates necessary for a student to start figuring c_____ a__.	2. chronological age
3.	The first date is the date of the test. The second date is the birthdate of the subject. C_____ a__ refers to the age of the subject.	3. Chronological age
4.	The date of the test is the f____ date put on the record sheet.	4. first
5.	The b_____e of the subject is placed beneath the date of the test.	5. birthdate
6.	The d__ o t__ t__ and the b_____ should be written: year, month in numerals and date.	6. date of the test birthdate
7.	1963 12 13 is read from right to left as 13 December, 1963. 1956 9 11 is read as _____.	7. 11 September, 1956.
8.	In frame 7, 1956 9 11 being the second date is the b_____.	8. birthdate
9.	The d__ o t__ t__ is always written first and the birthdate is written second for two reasons. First, you subtract the birthdate from the date of the test always, and secondly, you need to set a pattern to follow in filling out the answer sheet.	9. date of the test
10.	In s_____ the birthdate from the test date, you may have to borrow 12 months from the year. And you may have to borrow 30 days from the months.	10. subtracting

11.	In borrowing days, we only borrow __ days.	11. 30
12.	In borrowing months, we always borrow __ months.	12. 12
13.	In our sample problem 1963 12 12 you need to borrow 1956 9 11 __ months. The _____ ___ for this subject is _____.	13. 0 months chronological age 7 yr. 3 mo.
14.	In stating the chronological age of the s_____, we only use year and month. The number of months depends on days found after subtraction.	14. subject
15.	In preparing to subtract to find a subject's _____ ___ you should always go to the days first, then the months, and then the years.	15. chronological age
16.	The purpose of checking the d___ first is to see if borrowing of __ days is necessary.	16. days 30
17.	If you must borrow __ days, do so by putting a slash through the month and adding the __ days to the days in the right hand column. Then put the month less 1 above the slash mark.	17. 30 30
18.	In this example you need to borrow __ days. Perform the necessary steps to figure this subject's chronological age 1964 7 12 1944 6 15 20 0 27 This is written as C. A. 20-1.	18. 30
19.	If there are 16 or more days left after subtracting, you then advance the C. A. of the subject to the next _____. 1964 7 12 1944 6 15 20 0 27 This is written as C. A. 20-1.	19. month

20. The subject's _. _. is reported as 20 years 1 month rather than 20 years 0 months, because there were __ or more days left after subtracting.

20. C. A.
16

21. The _. _. of the subject would be:

1964 7 12
1944 6 20

21. C. A.
20 0 22
C. A. 20-1

22. After subtracting the _____ from the ____ __ ___ ____, we are left with years, months, and days.

22. birthdate
date of the test

23. If there are 15 or less days left after subtracting, you then stay with the present month. Ex.

1964 7 12
1944 6 9
20 1 3

C. A. is 20-1

24. The subject in frame 23 has a _. _. of 20 years, 1 month.

24. C. A.

25. His C. A. is reported as 20 years 1 month because there are __ or less days left in the next month after subtracting.

25. 15

26. The C. A. of this subject would be:
1964 7 12, 1944 4 12.

26. C. A. 20-3

27. It is possible that you may not only need to borrow __ days but also __ months as well. Ex.

18
3 ~~6~~ 42
~~1964~~ ~~7~~ ~~12~~
1944 8 15
19 10 27

27. 30
12

28. In this C. A. problem you need to follow the rule in number 15. You go to the ____ first and then to the _____.

28. days months

29. First, add the 30 days to the days listed, then put a _____ through the months and put the months, less one, above.

30. Then if you cannot s_____ the subject's months from the present month, you put a slash through the year and add __ months to the present month.

31. Compute these subjects' _. _.

    a. 1964 7 12, 1944 9 17.
    b. 1964 7 12, 1944 6 11.
    c. 1964 7 12, 1944 5 28.
    d. 1964 1 13, 1959 11 21.

32. There is only one other variation of the _. _. problem, and that is having to borrow no days but __ months.

33. In this instance the same rule applies as before. Start with the _____ first, then move to the months. Put a _____ through the _____ and add 12 months to the present month. Complete subtraction.

34. Here are more examples of _. _. to be computed. Work the problems and then state the correct C. A.

    a. 1964 2 10, 1960 8 9. If incorrect refer to No. 33

    b. 1964 12 15, 1957 12 18. If incorrect refer to No. 28

    c. 1964 10 15, 1952 8 4. If incorrect refer to No. 15.

    d. 1964 4 22, 1936 5 12. If incorrect refer to No. 33.

    e. 1964 5 13, 1959 3 12. If incorrect refer to No. 15

29. slash

30. subtract
    12

31. C. A.

    a. C. A. 19-10
    b. C. A. 20-1
    c. C. A. 20-1
    d. C. A. 4-2

32. C. A.
    12

33. days
    slash month

34. C. A.

    a. 3-6-1
       C. A. 3-6
    b. 6-11-27
       C. A. 7-0
    c. 12-2-11
       C. A. 12-2
    d. 27-11-10
       C. A. 27-11
    e. 5-2-1
       C. A. 5-2

34. (Continued)

f. 1964 6 10, 1946 9 10. If incorrect refer to No. 33.	f. 17-9-0 C. A. 17-9
g. 1964 10 3, 1949 12 4. If incorrect refer to No. 28.	g. 14-9-29 C. A. 14-10

APPENDIX C

RAW SCORES

Experimental Group

Subject Number	Vocabulary Errors	Chronological Age Errors
50	1	4
51	0	0
52	2	1
53	0	0
54	2	2
55	1	1
56	0	0
57	1	0
58	1	0
59	0	1
60	2	0
61	1	2
62	0	1
63	2	2

Control Group

1	1	4
2	3	1
3	0	0
4	3	1
5	0	0
6	0	1
7	1	1
8	0	0
9	0	0
10	3	2
11	2	2

APPENDIX D

ERRORS GROUPED BY BLOCKS OF TESTS

Control Group Chronological Age Errors

	1-3	4-6	7-9	10-12	Total
1	1	1	0	0	2
2	1	0	0	0	1
3	0	0	0	0	0
4	0	1	0	0	1
5	0	0	0	0	0
6	0	1	0	0	1
7	1	0	0	0	1
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	1	1	2
11	1	0	0	0	1
Total	4	3	1	1	9

Appendix D (Continued)

Control Group Vocabulary Errors

	1-3	4-6	7-9	10-12	Total
1	0	1	0	0	1
2	1	1	0	1	3
3	0	0	0	0	0
4	1	0	1	0	2
5	0	0	0	0	0
6	0	0	0	0	0
7	1	0	0	0	1
8	0	0	0	0	0
9	0	0	0	0	0
10	1	0	0	1	2
11	1	0	1	0	2
Total	5	2	2	2	11

Appendix D (Continued)

Experimental Group Chronological Age Errors

	1-3	4-6	7-9	10-12	Total
50	0	0	1	1	2
51	0	0	0	0	0
52	1	0	0	0	1
53	0	0	0	0	0
54	1	0	1	0	2
55	0	1	0	0	1
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	0	0	0	1	1
60	0	0	0	0	0
61	1	0	0	1	2
62	0	0	0	0	0
63	1	1	0	0	2
Total	4	2	2	3	11

Appendix D (Continued)

Experimental Group Vocabulary Errors

	1-3	4-6	7-9	10-12	Total
50	1	0	0	0	1
51	0	0	0	0	0
52	0	1	0	1	2
53	0	0	0	0	0
54	0	0	1	0	1
55	0	0	1	0	1
56	0	0	0	0	0
57	0	0	0	1	1
58	1	0	0	0	1
59	0	0	0	0	0
60	1	0	0	0	1
61	1	0	0	0	1
62	0	0	0	0	0
63	1	0	1	0	2
Total	5	1	3	2	11

VITA

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