INFLUENCE OF SPECIFIC TRAINING ON GRADUATE SCHOOL APTITUDE TEST PERFORMANCE

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The study was undertaken to investigate if a course of instruction, utilizing specific procedures, could be employed to enhance performance on an aptitude test. A punishment procedure involving the removal of a positive reinforcer was instituted within a classroom setting.

Subjects were upperclassmen and graduate students at North Texas State University, Denton, Texas. Requirements of the course were (1) that each subject had to deposit $50.00 and, (2) that each subject had to sign a public agreement which outlined the terms of the course. As stated in the agreement, $10.00 was subtracted from the deposit for every class period missed, and $5.00 was subtracted for each test on which the subject failed to reach criterion. The confiscated funds were distributed according to the decision of a class vote at the end of the course.

Pre- and post-tests were given on the first and last days, respectively. The pre- and post-test forms were administered to an independent sample in order to establish equivalence between the two tests. With N=16, the correlation was +.74 using the Spearman Rank Correlation Coefficient. This correlation suggests a high degree of equivalence, which

makes a significant difference between the subject's pre- and post-test scores reliable. Means and standard deviations were computed for the sample group. The pre-test mean was 445.09, and its standard deviation was 45.56. The post-test mean equaled 430.94, and the standard deviation was 41.97.

Means were computed for the experimental group's pre-test, post-test, and the differences between the two. The pre-test verbal section had a mean of 450.15, and the quantitative was 448.65. On the post-test verbal, 590.75 was the mean, and 575.75 was the mean for the quantitative section. The mean differences between the pre- and post-tests were 150.65 for the verbal, and 121.05 for the quantitative. The difference between the means for the two tests were 140.55 for verbal, and 127.1 for quantitative.

The data from pre- and post-tests were subjected to a *t* test designed for non-independent samples. The reults of this analysis indicate significant differences at the .01 level for the verbal test, and the .02 level for the quantitative test.

This report concludes that the data support the theory that programmed instruction can improve performance on aptitude tests. Also, the punishment procedure involving removal of a positive reinforcer, functioned as an effective incentive program.

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THESIS

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INFLUENCE OF SPECIFIC TRAINING ON GRADUATE SCHOOL APTITUDE TEST PERFORMANCE

Presumably, tests of ability came about when men began to notice that some individuals were more capable of successfully performing tasks and exhibiting skills than were others. Out of this recognition of different amounts of capability, came the desire for methods which could accurately predict how well someone would do in a given situation.

Historically, abilities were believed to be innate; hence, the first aptitude tests (or tests of ability) were meant to measure these innate qualities. A gladiator's success in the arena was predicted by inspecting his muscles, checking his reflexes, and, most important, measuring his speed. Phrenology (Boring, 1929), for instance, relied on different bumps on the head as predictors. Tests of this nature were used as selectors until the nineteenth century, when the field of psychology began to take a scientific look at tests of ability.

In the first half of the nineteenth century, Jean Esquirol and Edouard Seguin (Esquirol, 1838; Seguin, 1907) became interested in differentiating between mental deficiency and mental disease. While Esquirol made the distinction between mental deficiency and mental illness, both men tried to "establish psychological criteria upon which to base

differentiations among levels of mental deficiency" (Freeman, 1962, p. 5). Esquirol tried to distinguish mentally deficient individuals according to physical measurements, especially the size and shape of the skull (Esquirol, 1838). However, not until Alfred Binet (1916) developed the first test of intelligence--i. e., test of ability to learn--was there an effective means of differentiating the three levels of mental deficiency: moron, imbecile, and idiot. Binet's test was the first formal aptitude test. And it was based on the philosophy that the ability to learn appears to be innate (Freeman, 1962).

Alfred Binet (Binet, 1916) developed the first practical test of intelligence. This test was the first formal aptitude test. And it was based on the philosophy that the ability to learn, which is the basic component of the concept of intelligence, appears to be innate (Boring, 1929).

Achievement tests were developed as an outgrowth of education. These tests were designed to measure the amount of retention of a specified subject matter. Teachers had to have some means of evaluation in order to predict how well their pupils would perform on related materials. At first, evaluation was made strictly by observation. But then as the subject matter became more detailed and precise, and class size increased, the evaluations became more formalized (Torgerson, 1954). Tests evolved from simple oral quizzes to highly sophisticated measures,

such as the General Educational Development (G. E. D.) of the United States Armed Forces Institute (Cronbach, 1949).

Aptitude tests began as predictors, or selection devices, based on real life situations, whereas achievement tests were developed to measure what people specifically learned through various forms of training. As these tests are used today, their purposes blend, so that the distinction present at the time of their origin, has all but diminished.

There is an essential difference between achievement tests and aptitude tests. An achievement test measures the abilities which a student has acquired as a result of some specific amount of formal instruction, while an aptitude test measures that which a student presumably has learned as a result of some non-specific, unidentified, less formal trainig. In the purest sense, aptitude tests do not rely on any type of learning. So it would seem that aptitude is believed to be innate, while achievement is believed to be related to experience. Although it is not formally acknowledged, this distinction between aptitude and achievement tests is treated by some professionals as though it does exist. By merely categorizing tests of ability into two types, the distinction is made.

However, the tests themselves deny that there is both innate and acquired ability: by their very nature, tests cannot be independent of experience. The ability to read, comprehend, and respond at a given rate and proficiency level, is a basic prerequisite of both achievement and

aptitude tests. Cronbach states that "when a prediction study is made, it is assumed that all cases included in a particular correlation have been given similar treatment in all stages of the study. They must have the same training, the same incentive, and the same type of grading" (Cronbach, 1949, p. 259). In other words, it is assumed then that all persons taking an aptitude test have reached the same level of achievement. If this is the case, how can a measure of knowledge be valid if a person knows a fact, but misses an item due to verbal difficulties (Cronbach, 1949)--i. e., because he has not reached a level of achievement equal to that of his norm group? It appears that the only assumption to be made concerning these tests, is that all tests are tests of achievement.

Aptitude and achievement tests were developed as a means of accurate prediction. It would appear that prediction is needed in all human affairs (Stuit, 1949). This is especially true in the field of education. As increased numbers of applicants for graduate training meet the reality of limited training staff and facilities, the need for dependable prediction methods of academic success becomes imperative.

Traditionally, undergraduate grade-point averages have served as the predictive index. As Lannholm, et al. point out, however, "course grades seldom have high reliability, may reflect different qualities, and are usually restricted in range. They have serious limitations for use as criteria

in validity studies" (Lannholm, Marco, & Schrader, 1968, p. 4). Bloom and Peters found that "in addition to variations in grading standards, there are real differences in the demands of different courses and curricula. Such differences make the use of over-all criteria, such as grade-point average, indaequate" (Bloom & Peters, 1961, p. 26).

This general distrust of grade-point average as an accurate predictor has resulted in a significant increase in the number of graduate schools requiring applicants to submit scores on various aptitude tests, in addition to other required information (Lannholm, Marco, & Schrader, 1968; Cureton, Cureton, & Bishop, 1949; Hyman, 1957). These tests are designed to predict academic achievement.

The assumption underlying use of selection devices, is that they bear a predictive relationship to the graduate school's criteria of success--i. e., grade-point average, preliminary examination, and faculty ratings of students. This assumption has been tested in a number of studies, and generally, the correlations have been statistically significant, though predictively weak (Robertson & Nielson, 1961).

One such selection device is the Graduate Record Examination (GRE), a test published by the Educational Testing Service, Princeton, New Jersey. This test is divided into two parts: (1) a general aptitude test, which is divided into verbal and quantitative sections,

and (2) an advanced test, which is an achievement test over some certain subject matter.

In the fall of 1970, a form of inquiry was sent to approximately 328 institutions. Each of these institutions had received substantial numbers of GRE score reports in recent years. Of the 328 institutions, 288 completed the forms. Of these 288, 247 reported that "one or more departments requires or recommends that all applicants for admission to graduate study submit scores on one or more of the Graduate Record Examinations" (Lannholm, 1968, p. 5).

Although widely used as predictive indexes, achievement and aptitude tests are seldom, if ever, highly effective predictors. "Anyone who keeps careful score, knows that the information available is always incomplete, and that the predictions are always subject to error" (Lindvall, 1967, p. 9).

Given that prediction is needed in human affairs, it would be indeed unfortunate to continue using achievement and aptitude tests at their current low level of efficiency. For over forty years, the level and precision of aptitude test correlations have remained the same, even after repeated attempts at refining these predictive indexes (Bloom & Peters, 1961). At this time, it seems reasonable to assume that perhaps a different approach to the prediction problem is needed.

In assessing the past work of researchers in the field of prediction, two questions must be answered: (1) have the researchers stated the prediction problem correctly, and (2) have the researchers utilized the most effective means to attain prediction?

In answering the first of these questions, a survey of the literarure reveals that different aspects of the problem have been correctly stated by several researchers. Stuit, et al. state that "the problem in prediction research is to determine those factors which are related to successful performance in an activity, so that knowledge of these relationships may be used to forecast a particular individual's chances for success, prior to his engaging in that activity" (Stuit, Dickson, Jordan, & Schloerb, 1949, p. 2). Bloom and Peters see a limitation in prediction in that "there is much evidence to show that college success is, in part, a function of qualities or attributes not directly related to intellectual ability" (Bloom & Peters, 1961, p. 26). And Lavin notes yet another aspect of the problem:

> A student's grade is more than something that characterizes him as does his score on a personality inventory or an intelligence test; that is, it is not simply a personal characteristic or a trait. Rather, a grade should be viewed as a function of the interaction between student and teacher. In short, it is one index of this social relationship. So considered, it is clear that if we want to predict a grade, we must know something not only about the student, but about the teacher as well (Lavin, 1965, p. 21).

All of the preceeding statements are correct in regard to the various aspects of the problems of prediction--i.e., determining the factors related to success, recognizing qualities other than intellectual abilities, and noting the significance of the teacher-student relationship; however, none of the researchers utilized the most effective means to obtain prediction. Stuit, et al. (1949) maintain that individuals comprising a group differ among themselves in ability. Rather, they should have noted their sameness in regard to methods of instruction. The author is in accord with Bloom and Peters in that academic success is in some part, a function of qualities or attributes not related to intellectual ability. However, the manner in which the material was taught makes the difference, and not "motivation, interest, study habits, personality, and social adjustment," as Bloom and Peters contend (Bloom & Peters, 1961, p. 24). Lavin (1965) is accurate in noting the importance of the role of the teacher. The teacher is not to be considered as a subjective grader, though, but rather the means by which deadlines are set and contingencies are placed on students' behavior.

Achievement and aptitude tests are effective in telling where a person is, relative to his norm group. They tell where a person is, but in no way can they without provision predict his future attainment. There is no way to talk about what people may or may not do unless the methods of instruction are studied as well.

Various methods can be applied to classroom instruction. Behavior modification is a technique which brings about desired change in behavior through the manipulation of a subject and/or external environmental conditions. Operant conditioning is a technique of behavior modification which provides reinforcement, immediately following desired behavior. If reinforcement follows a behavior, a person is likely to repeat the behavior. This concept was developed by Skinner (1948). Ayllon and Azrin incorporated this theory into a "token economy" at a mental institution, and found that this procedure was effective in maintaining desired performance. In this "token economy," subjects received tokens for reinforcement, which could be cashed in for "privacy, recreational opportunities, leave from the ward, social interaction with staff, devotional opportunities, and commissary items" (Ayllon & Azrin, 1968, p. 225). A "token economy" could be instigated in a classroom situation by designating a set number of tokens for each level of proficiency desired.

Another technique which could be applied to the classroom, is a type of punishment procedure employing the removal of a positive reinforcer. By definition, a punishment procedure reduces the rate of response. Since the contingent removal of a positive reinforcer results in reduction of response rate, it can be termed a punisher.

This type of punishment procedure is distinguished from extinction, in that the organism determines when the

reinforcer will be removed. In extinction, the experimenter decides when the reinforcer will no longer be present, whereas, in the punishment procedure, the organism emits a response which has the immediate and direct effect of removing the already present reinforcer (Whaley & Malott, 1969).

Using a punishment procedure involving the removal of a positive reinforcer, the following purposes were set forth:

(1) To determine if a course of instruction utilizing specific procedures could be employed to enhance performance on an aptitude test that was comparable in various ways to a similar test employed by countless universities for entrance into graduate school.

(2) To see if the incentive program employed was a reasonable method in this situation.

Before the proposed experiment is introduced, studies dealing with various predictors of academic success will be reviewed.

Much research has been done regarding prediction of success in college. In contrast, very little research has been done on predicting academic success at the graduate school level. Research that has been done is, at best, disappointing. Studies report either conflicting, or insignificant results. Possibly, an explanation for these disappointing results is that the ideal criterion for success has not yet been identified. Perhaps scholastic

achievement is not the ultimate, but rather the intermediate, criterion for graduate success (Jenson, 1953).

Many studies which have been done do not differentiate their subjects according to majors. Perhaps, studying the determinants of performance within curricular groups would be more appropriate. Lavin (1965) feels that this failure is one of the reasons for the lack of precision in predictions of performance. Another researcher has labeled as unrealistic, the research designed to predict scholastic success of "general" graduate students (Jenson, 1953). Stuit, et al. (1949) found a probable reason for prediction variability to be the inability to obtain all factors, personal and situational, which are necessary to predict how an individual will adjust at some future time.

Citing various studies, Webb (1956) and Weber, Brink, and Gilliland (1942) found that their predictors and criteria fit together in some fashion. Webb's study could not totally confirm or reject his hypothesis concerning the prediction of achievement. Weber et al. had a correlation of +.61 between undergraduate grades and graduate grades. However, the group used was highly homogeneous, which undoubtedly affected the significance of the correlation. They also found that graduate averages only slightly correlated with intelligent quotient scores, and practically no relationship between the number of semester hours in a major field and graduate average existed. Weber, et al. went on to say that, in considering the reliability of

of scholastic averages, it must be assumed that the underlying abilities remain the same from term to term, and that the same abilities are required for success in each term.

Webb (1951) conducted a study in which the predictors were the Cooperative General Culture Test (CGCT), the Cooperative English Test (CET), and undergraduate average. Correlations between a criterion based upon graduate grades were obtained by dividing the number of satisfactory grades by the total number of grades obtained. These correlations and the predictors were computed for the education and non-education students. In addition, faculty ratings of over-all achievement were correlated with the predictors for each of the departments. In most cases, the correlations between predictors and grades, and predictors and ratings were significant. However, in most cases, the correlations were too low to be of much predictive value.

Cureton, Cureton, and Bishop (1949) studied the Miller's Analogies Test (MAT) and found that the chances are about nineteen to one that its validity for predicting average ratings is above .28, and that its validity for predicting grade-point average is above .45. They also found that there is one chance in twenty that these validities may be as high as .75 and .82, respectively.

The correlation between the MAT and scholastic achievement for Ph.D. level psychology students at the University of Pittsburgh, was .16. The MAT was found to retain

discriminative ability even within a highly select group due, to a common variance with other "verbal paper-and-pencil" tests. But when more "non-verbal" variables are employed, the MAT fails as a reliable predictor for the Ph.D. population (Hyman, 1957).

Cook (1942) did a study in a College of Education. In predicting graduate school success, he used a battery of tests consisting of the MAT, the Educational Information and Application Test, the Cooperative Survey Test in Mathematics, and the Cooperative Survey Test. Criteria of success were numerical scores of students in various graduate courses, and numerical scores on graduate comprehensive examination, administered to both M.A. and Ph.D. candidates, at the end of their course work in the fields of educational psychology, educational administration, secondary education, and elementary education. Of all the tests administered, the Educational Test yielded the best over-all measure of prediction. It's median correlation with numerical grades in statistics and measurement courses was .70; in elementary education and secondary education it was .53. It's correlation with scores on the comprehensive examination was .60. Probably the reason for these high correlations is that the author of the study constructed the Education Test. The test was constructed to measure general information background in education and ability to make applications of educational theory to described situations. The content

of the examination was selected from undergraduate courses in educational psychology.

Some researchers found that, in using the MAT with more specific criteria--e.g., research capacity, and grades in certain types of courses--the correlations have been quite low (Webb, 1951; Stuit, et al., 1949).

A study was done to test the Graduate Record Examination (GRE) as a predictor of the success of Purdue Research Foundation Fellows. The criteria of the study were faculty ratings and grade-point average. The study demonstrated a vague relationship between the verbal test scores on the GRE and success, as measured by faculty ratings (King & Beslo, 1960). Law (1960), on the other hand, found significant multiple R's between his criterion and the GRE-Verbal, GRE-Quantitative, and GRE-Achievement Tests, in his study of forty-six doctoral students.

One study used forty-one graduate students to see how well the GRE did in relation to their university's Background Examination. The results indicated very small predictive validities for the parts of the GRE studied. Consequently, it was decided not to use the GRE in place of the Background Examination (Michael, Jones, & Gibbons, 1960). And Peterson (1943) found that statistically derived predictions were far more accurate in predicting scholastic success than subjective appraisal based on undergraduate grade-point average and GRE scores.

Robertson and Nielsen (1961) did a study which verified a previous study's contention that the correlation between the mean GRE score and faculty ratings in graduate school was statistically significant, though predictively weak, from a practical point of view. Grade-point average and the GRE were used as predictors. It was found that the only way in which these predictors were related was that the GRE-Verbal score correlated significantly with grade-point average in psychology. Correlations were computed between mean academic ratings and (1) GRE-Vervbal, (2) GRE-Quantitative, and (3) mean GRE scores. The correlation between academic ratings and Quantitative scores was .20. The correlation between ratings and Verbal scores was .27. The correlation between ratings and mean GRE scores was .29--this was the only significant correlation of the three, and it was significant only at the .05 level of confidence. Faculty ratings were correlated with various aspects of the last two years of undergraduate study, psychology courses, and math-science courses. Only grade-point average in math-science courses correlated significantly with staff ratings.

Lannholm et al. conducted a study for the Educational Testing Service (ETS) to determine the validity of the GRE as a predictor of academic success. One major limitation in this study, was that the groups tested were relatively small. The consequences of this are that results based on a small number of observations are "subject to large

fluctuations and offer an insecure basis for generalizations" (Lannholm, et al., 1968, p. 84). In this study, twenty-two groups were tested. The results of this study do not seem to corroborate the validity of the GRE. The tone of the results was characterized by such phrases as "modest degree of relationship," "reasonably in accord with expectations," "neither undergraduate grade-point average nor GRE Aptitude Test scores showed any consistent validity," "little reason to believe that either undergraduate grade-point average or Aptitude Test scores are effective in predicting success within this group," "erratic findings," and "inconclusive." The authors of the study were quick to say that "prediction of success in graduate work is exceedingly difficult" (Lannholm, et al., 1968, pp. 35-92).

Method

Subjects

Potential qualified subjects, those that were either upperclassmen or graduate students, were apprised of a new course which could increase their scores on the Graduate Record Examination (GRE). This was accomplished via bulletin board announcements and word of mouth. Twenty-two subjects attended the first meeting of the new course. Upon completion of the course, only thirteen subjects remained.

Terms of the agreement

At the first class meeting, subjects were required to deliver to the author a deposit of $50.00 in cash or by

check. They were also required to sign a public commitment (see Appendix), the provisions of which are as follows:

(1) That for each of the two regularly scheduled classes, failure to attend will result in the deduction of $10.00 from the original $50.00. Subsequent amounts will be subtracted for each class missed, until none of the deposit remains.

(2) That upon taking and failing to achieve criterion on a test over homework assignments, $5.00 will be deducted from the deposit.

(3) That at the end of the course, all funds not encumbered under stipulations of #1 or #2 above, will be returned to the donor.

The course would not exceed two calendar months.

The confiscated money was to be held in a fund, the disposition of which was to be decided by the majority of the class at the end of the course. The above terms are similar in theory to those used in an earlier study by Tighe and Elliott (1967).

Procedure

The course was arranged in such a way that all instruction covered material similar to the subject matter contained in the GRE. The course was divided into verbal and quantitative sections, in order to maintain parallelism with the actual examination. Even the daily quizzes were designated into verbal and quantitative sections. The

completion of the course was scheduled to immediately precede a GRE test date. This was done to insure maximum practice before the examination.

At the first class meeting, the deposits were given to the author, the agreements were signed, and the fundamentals of the course were discussed. The class was to meet two hours nightly, two nights a week, for no longer than two calender months. At each meeting, excluding the first and last ones, a test was administered over the previous class assignment, and a new assignment was given for the following class period. The assignments for each class consisted of fifty vocabulary words taken from Vis-Ed English Vocabulary Cards, as well as several problems over a specific aspect of the quantitative material. The daily tests were composed of questions of a quantitative nature, as well as questions concerning prescribed vocabulary words (see Appendix). Subjects were required to rank within the upper tenth percentile on both the quantitative and the vocabulary sections of the tests. No tests were given over material that was not explicitly assigned beforehand. If there was ever any doubt about the lucidity of an assignment, the $5.00 penalty was not imposed for that particular test.

Pre- and post-tests (see Appendix for excerpts) were administered on the first and last days of the course, respectively. These tests were designed to be quite similar

to the actual GRE. On the days that these tests were given, it was necessary to extend the class period in order to include the full time required for taking the test. The pre- and post-test forms were administered to an independent sample in order to establish the equivalence of the two forms. This sample consisted of upper classmen psychology students.

The actual class period was divided so that one hour was designated for the daily test and the other hour for instruction. During the first weeks of the course, the instruction hour was used for reviewing aspects of arithmetic--e.g., profit and loss, taxation, geometry, distance problems, and work problems. Supplemental hand-out sheets were distributed with the arithmetic instruction in order to insure the availability of home-study material. During the latter part of the course, subjects could either remain in the classroom during the instruction period for special tutoring on the mathematics, or go to the testing room for practice on analogies, synonyms, antonyms, sentence completions, and reading comprehension problems. Practice was afforded by Mycom units programmed for this purpose.

The Mycom teaching units were manufactured by the Mycom Corporation of Fort Worth, Texas. These machines are designed to provide a variable-option, multiple-choice format. Options may vary from three to six, and a maximum of 100 questions may be accomodated. A dozen or more separate logic settings vitiate memorization of sequences.

Questions are presented to the student on prepared forms which are comparable to traditional multiple choice test questions. The correct option has been arranged to coincide with a particular logic sequence.

Options are selected by turning a dial corresponding to numbers or letters on the test forms. A button is pressed after selection. If the selection is correct, a green light is energized, an increment of one unit registered in the "items correct" counter, and the machine is ready for the student to begin the next question. Pushing the button after an incorrect selection energizes a red light and no count is registered in the "items correct" counter. Before moving on to the next question, the student must dial the correct answer, and be apprised of this by pressing the button which results in the green, or "correct," light. These students are not only tested on their grasp of the information, but are also forced to discover the correct answer before continuing on with the program.

The only practice for the vocabulary words was provided by the daily tests over the Vis-Ed English Vocabulary Cards and the Mycom units.

During the last three weeks of the course, the testing room remained open outside of class time in order to allow maximum practice on the verbal portion of the course. The decision to leave the room open was arrived at by a class vote.

Results

As previously stated, the class originally consisted of twenty-two participants, thirteen of which completed the course. Figure 1 of the appendix illustrates the number of daily withdrawals over the data period. The majority of withdrawals occurred during the first three days and only one withdrawal occurred subsequently. Subjects voluntarily withdrew for various reasons, the main ones being loss of money and insufficient time for class preparation.

Absences were recorded and are reported in the appendix in Figure 2. The mean number of absences per data day was 1.1. Reasons for absences always appeared legitimate--i. e., they were due to either family trouble, sickness, or unavoidable emergencies. In view of this, one excused absence was allowed, even though no provisions were made for excused absences in the agreement. The allowance of one excused absence was not made public to the class. Only after a subject had explained his absence, was he informed of the change in the agreement. If an absence was excused, the subject was required to make up the test which he missed. As always, he was to obtain 90% accuracy or forfeit $5.00. This was done in order to insure that subjects would not miss class merely because they were not prepared to take their regularly scheduled, daily test. It seems of some interest to note that only two people were absent more than once. Of these

two, one withdrew from the course, and the other could not attend because of hospitalization.

In the appendix, Figure 3 depicts the number of dollars forfeited per data day. A sum total of $280.00 was confiscated from the class. Reasons for forfeiture of money were unexcused absences or failure to reach the criterion of accuracy. Before a subject was allowed to withdraw from the course, he was required to clear all fines which he had incurred. As stated in the agreement, a class vote dictated the manner in which the confiscated funds were dispersed. This was not enacted, however, until the end of the course. The vote provided that each subject donate $5.00 for supplies, plus $5.00 to the instructor of the course. The remaining $40.00 was returned to each individual.

The pre- and post-test forms were administered to an independent sample in order to establish equivalence between the two forms. The Spearman Rank Correlation Coefficient was used to compute correlation between these tests administered to the independent sample. With $N=16$, the correlation was +.74. Table 1 lists the ranks of the scores of the two tests. This correlation suggests a moderately high degree of equivalence between the two tests. Since this is the case, a significant difference between the subjects' pre- and post-test scores would necessarily suggest reliability between the two tests.

TABLE 1

Ranks of Scores on Pre- and Post-tests
Administered to an
Independent Sample

Subjects	Pre-test	Post-test	Differences
1	9	6	3
2	10.5	9	1.5
3	12.5	12	.5
4	16	15	1
5	10.5	7.5	3
6	6.5	10	-3.5
7	12.5	16	-4.5
8	14	13.5	.5
9	8	7.5	1.5
10	15	13.5	2.5
11	3.5	3	.5
12	3.5	4	- .5
13	1	2	-1
14	5	5	0
15	6.5	1	5.5
16	2	11	-9

Table 2 illustrates the means and standard deviations of the independent sample's test scores.

TABLE 2

Means and Standard Deviations for
Pre- and Post-test Scores of
the Independent Sample

Test	Mean	Standard Deviation	t
Pre-	445.09	44.56	.99
Post-	430.94	41.94	

As can be seen in Table 2, t was not significant, meaning that the difference obtained between the pre- and post-test scores did not exceed alpha probability. Combining this data with the correlation of +.74, the two test forms can be judged highly reliable.

Means were also computed for the experimental group's pre-test, post-test, and the differences between the two. Table 3 lists the test scores and the means. The verbal section of the tests is symbolized by the letter V, and the quantitative, by the letter Q.

TABLE 3

Summary of Experimental Group
Pre- and Post-test
Scores and Means

	Pre-test		Post-test		Difference	
Subjects	V	Q	V	Q	V	Q
1	560.5	432.5	656.5	798	96	365.5
2	560.5	552.5	576.5	783	16	230.5
3	294	392.5	496.5	576.5	202.5	184
4	488.5	472.5	496.5	496.5	8	24
5	432.5	432.5	656.5	452.5	224	20
6	294	200	488.5	392.5	194.5	192.5
7	448.5	294	584.5	294	136	0
8	704.5	773	778	843	74.5	70
9	294	488.5	448.5	576.5	254.5	88
10	424.5	448.5	725	544.5	300.5	96
Mean	450.1	448.6	590.7	575.7	150.6	121.1

As can be seen from the Table, the means of the post-test scores were considerably higher than those of the pre-test.

The data from pre- and post-tests were subjected to a *t* test designed for non-independent samples. The results of this analysis are presented in Table 4.

TABLE 4

Summary of *t* for Experimental Group Pre- and Post-test Verbal and Quantitative Sections

Statistic	Verbal	Quantitative
t	4.63*	3.22**

*P=.01
**P=.02

df=8

Table 4 indicates significant differences at the .01 level for the verbal test, and .02 level for the quantitative test.

Discussion

Studies involving the GRE as an accurate predictor of academic success in graduate school have found that the test does not correlate well, if at all, with academic success. A study by King and Beslo (1960) demonstrated a slight relationship between verbal GRE test scores and success, as measured by faculty ratings. However, no relationship between GRE scores and grade-point average was found.

In studies where the mean GRE scores and faculty ratings in graduate school were statistically significant, the correlation has been predictively weak (Robertson & Nielsen, 1961). Due to its poor predictive validity, other predictive measures have been employed in lieu of the GRE (Michael, Jones, & Gibbons, 1960; Peterson, 1943).

The publishers of the GRE, the Educational Testing Service (ETS), authorized a study concerned with the predictive validity of the test. Eight psychology departments participated in the study. Of these, only one group yielded reasonably high validity coefficients, and this one was based on combined weighting, including grade-point average. The coefficients for the verbal test for the eight groups ranged from -.27 to .35, and those for the quantitative ranged from -.24 to .45. The median coefficients for the eight groups were .12 for verbal, and .30 for quantitative (Lannholm, et al., 1968).

The inefficiency of the GRE as a valid predictor of academic success becomes apparent from these studies. Not only is the GRE a poor predictor of success in graduate school, it is also a poor predictor of success after completion of school.

Martson did a study involving post Ph.D. success. The criterion of success was the number of publications produced by each subject. "The overall Pearson rs for the weighted mean number of publications per year with combined V and Q

GRE scores were -.05 for the clinical Ph.D.s and .18 for the nonclinical Ph.D.s. The point-biserial r for clinical Ph.D.s was .02; for nonclinical Ph.D.s .24" (Martson, 1971, p. 654).

So as the literature points out, the GRE is not correlated with success either within school or in the professional world. Even if the GRE did correlate, it is not an aptitude test, as the present study illustrates.

Since aptitude is presumably related to a non-specific, unidentified training, a course of instruction, such as the design of the present study, should not have any effect on changing aptitude test scores. However, as can be seen in Table 3, the verbal post-test increased 140.6 over the pre-test mean, and the quantitative increased 127.1 over the pre-test. Table 4 illustrates the highly significant t for verbal and quantitative sections of the pre- and post-tests.

So it is that the GRE does not necessarily selcet the most capable students, but on the contrary, its sole function appears to be that of systematic elimination. "We hang on to the quantitative elegance of a test having national norms and in so doing fail in our obligation to seek out better instruments. We must set up a national data pool on all applicants, with maximum encouragement to all departments to submit new forms of selection procedures for analysis. It is time we cleaned our own house of the technical errors many of us are paid to correct in others" (Martson, 1971, p.654).

APPENDIX

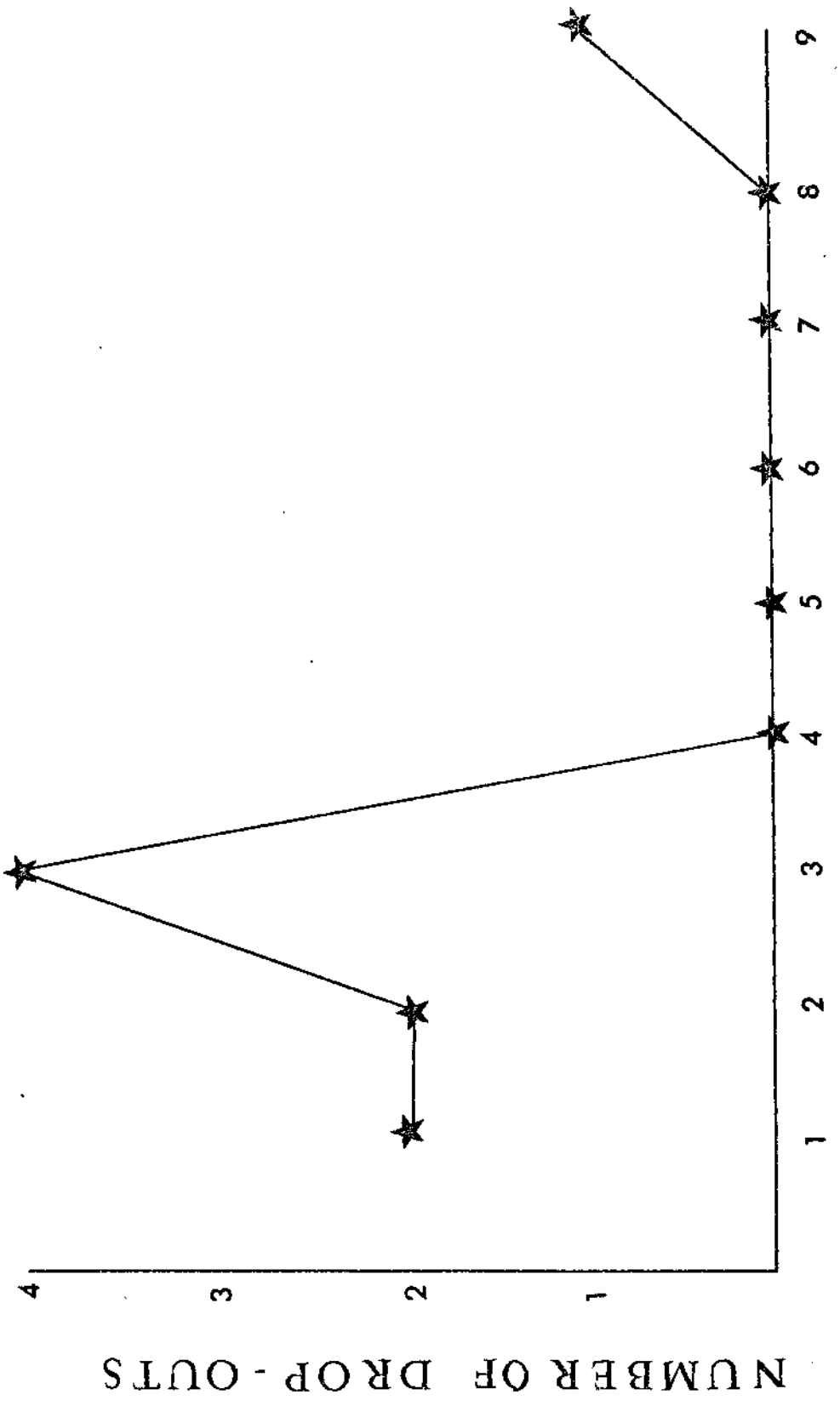

Figure 1--Number of daily withdrawals

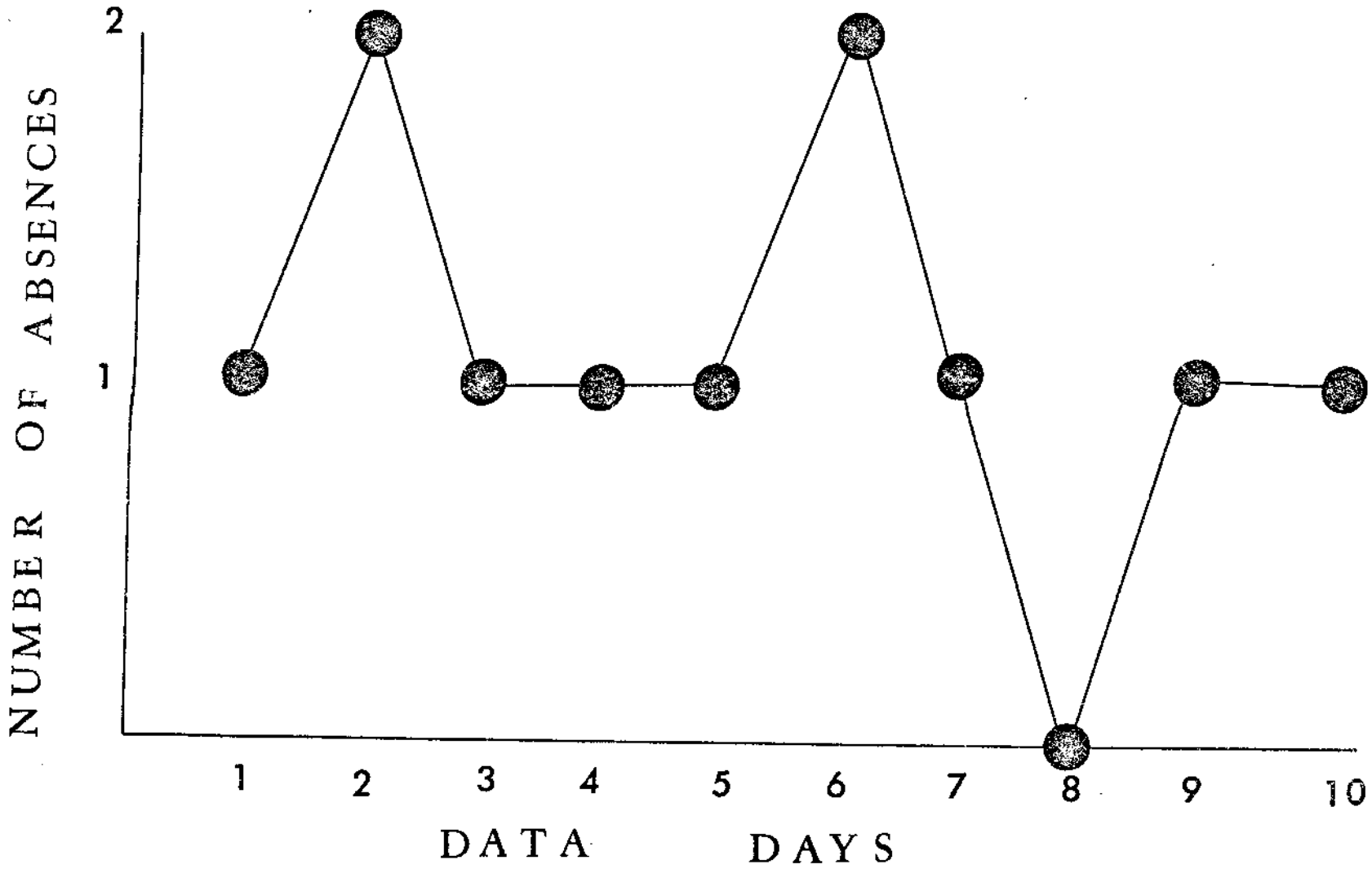

Figure 2--Number of absences

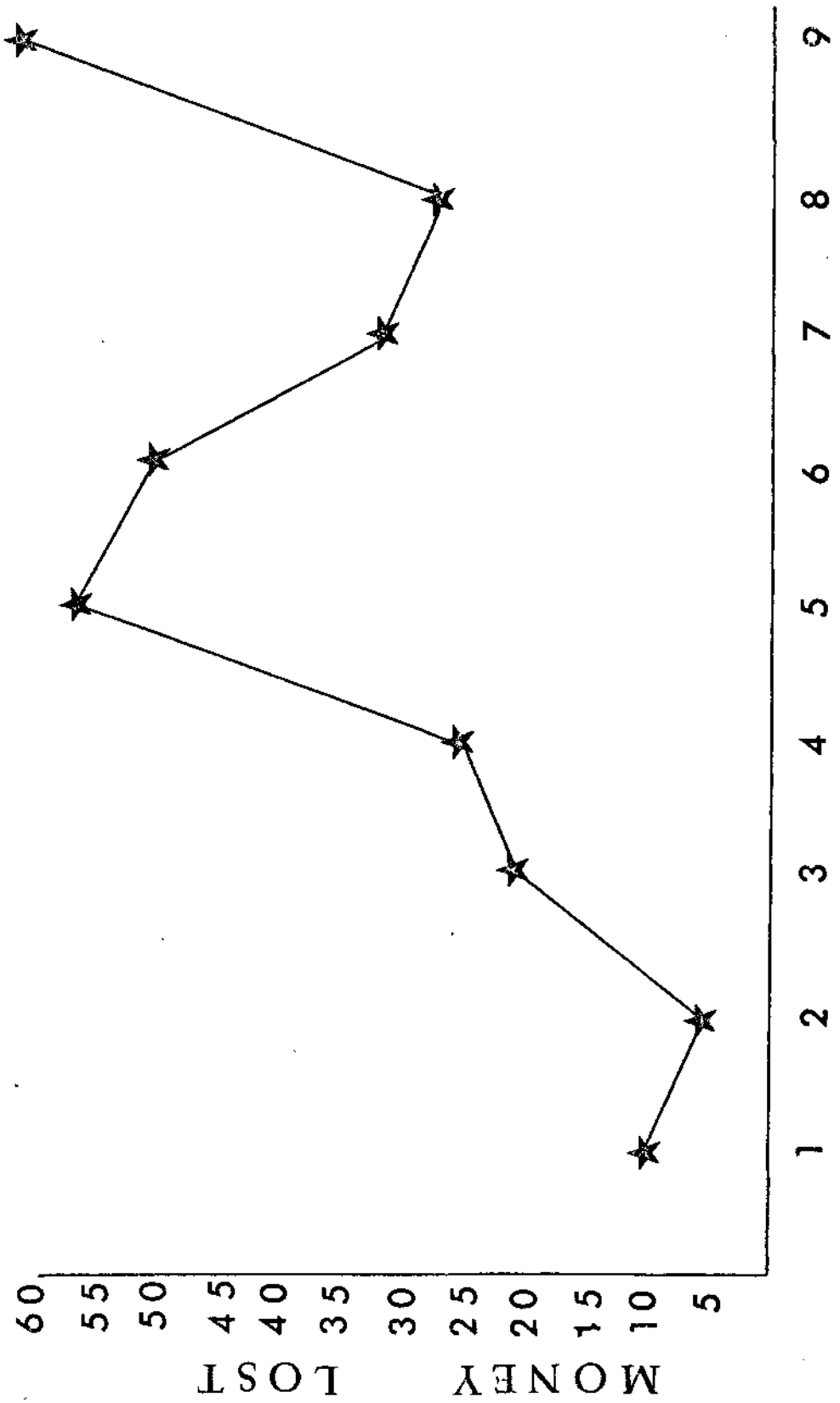

Figure 3--Daily amounts of money lost

AGREEMENT

Upon entering this course of instruction henceforth known as the GRE Improvement Program, I agree:

1. To deliver a deposit to _____ of $50.00 in cash or check.

2. That for each of the two weekly regularly scheduled classes I fail to attend, $10.00 will be deducted from the original $50.00. Subsequent amounts will be subtracted for each class missed until none of the deposit remains.

3. That upon taking and failing to achieve criterion on a test over homework assignments, $5.00 will be deducted from the deposit.

4. At the end of the course all funds not encumbered under stipulation of #2 or #3 above, will be returned to the undersigned student. The course will not exceed two calender months beginning _____.

It is agreeable that the funds confiscated by _____ for failure to attend or for failure to pass each test to criterion, will be accumulated from all participants and placed in a holding fund. The final disposition of these funds will be decided by a majority of the class membership at the end of the course.

_____
SIGNED

_____
VERIFIED

_____
DATE

SAMPLE DAILY QUIZ

1. What is the final selling price of a $25 item after successive discounts of 20% and 30%?
(A) $11 (B) $12.50 (C) $14.50 (D) $19 (E) $14

2. Article A originally sells for $100. Article B sells for $100. Successive discounts of 30% and 20% are given on article A. Successive discounts of 40% and 10% are given on article B. What is the difference between the two discounts?
(A) nothing (B) $2 (C) $20 (D) 20% (E) none of these

3. What is the difference in cost to a purchaser between an article listed at $500 less 10% and 20% and one listed at $490 less 20%?
(A) $18 (B) $42 (C) $58 (D) $48 (E) none of these

4. The net profits of the ABC company dropped from 35 million dollars in 1961 to 28 million dollars in 1962. What per cent decrease does this represent?
(A) 7% (B) 20% (C) 25% (D) 80% (E) none of these

5. A dealer paid 72¢ for a fountain pen listed at 90¢. What was the discount allowed him?
(A) 5% (B) 2% (C) 8% (D) 20% (E) none of these

6. A furniture dealer has put a chair on sale with sucessive discounts of 25% and 10% off of the original price of $60. How much will it cost to buy the chair?
(A) $13.50 (B) $21 (C) $39 (D) $40.50 (E) $32

7. A certain radio costs a merchant $72. At what price must he sell it if he is to make a 20% profit on the selling price?
(A) $86.40 (B) $90 (C) $92 (D) $144 (E) none of these

8. Find the interest on $480 at 3½% for 2 months and 15 days.
(A) $2.50 (B) $3.50 (C) $3.25 (D) $4

9. A house costs $10,000. Incidental expenses and taxes amount to $360 a year. What rent per month must the owner receive to clear 6% of his investment?
(A) $60 (B) $65 (C) $80 (D) $85

10. Mr. B borrowed $600 and at the end of 9 years and 6 months returned $856.50. What is the rate of per cent?
(A) 4½% (B) 5% (C) 6% (D) 7%

Define the following:

1. condiment _____
2. cognomen _____
3. coagulate _____
4. chronic _____
5. charlaton _____
6. clandestine _____
7. clement _____
8. commiserate _____
9. coalesce _____
10. concordance _____
11. chromatic _____
12. commuted _____
13. concurred _____
14. circumlocution _____
15. choreography _____
16. colander _____
17. compunction _____
18. commensurate _____
19. chaotic _____
20. comely _____
21. communal _____
22. cloister _____
23. celibacy _____
24. coercion _____

Give the appropriate word. Spell correctly.

1. external, outward, not inherent _____
2. erased, wiped off _____
3. to flay, censure scathingly, cuff _____
4. to go with as an escort _____
5. scanty in amount, small, little _____
6. with objectionable parts taken out _____
7. characterized by wit, exciting laughter _____
8. wearing away, changing by slow disintegration _____
9. a bursting forth or out, as of lava from a volcano _____
10. former, heretofore, at one time _____
11. substitution of a mild or more pleant term for a seemingly offensive one _____
12. pleasant sound, pleasing to the ear _____
13. origin or derivation of words,word study _____
14. to use selfishly _____
15. having to do with sexual love _____
16. true substance, prime character _____
17. freed from evil spirits _____
18. suitable or fit, advantageous _____
19. offering an example, pattern, type _____
20. try, attempt, to make an effort to do _____
21. evenness of mind, calm temper _____
22. a passage taken from a book or record _____
23. face of a building, front of anything _____
24. not prepared, spur of the moment _____

Graduate Record Examination

Aptitude Test

(Sample #2)

SECTION ONE

(25 minutes)

Directions: Each of the following questions consists of a pair of capitalized words having a certain relation to each other, followed by five lettered pairs of words. Choose the pair of words that are related to each other in the same way as the pair of capitalized words. Then blacken the space on your answer sheet containing the letter of the pair you have chosen.

1. ARGUMENT : DEBATE ::
   (A) philosophy : psychology
   (B) challenge : opponent
   (C) violence : peace
   (D) individual : group
   (E) fight : contest

2. GRASS : LETTUCE ::
   (A) truck : station wagon
   (B) onion : flower
   (C) snow : milk
   (D) farm : garden
   (E) agriculture : planter

3. SODIUM : SALT ::
   (A) soda : solution
   (B) molecule : atom
   (C) oxygen : water
   (D) chemistry : biochemistry
   (E) analysis : synthesis

4. DAM : WATER ::
   (A) over : under
   (B) embargo : trade
   (C) curse : H_2O
   (D) beaver : fish
   (E) river : stream

5. ALLAY : PAIN ::
   (A) damp : noise
   (B) retard : progress
   (C) regain : consciousness
   (D) fray : edge
   (E) soothe : nerves

6. LATENT : LATE ::
   (A) crude : callous
   (B) potential : tardy
   (C) natty : nettled
   (D) obvious : concealed
   (E) decorous : deceased

7. CALIBER : RIFLE ::
   (A) reputation : blast
   (B) compass : bore
   (C) army : navy
   (D) gauge : rails
   (E) cavalry : infantry

8. CHOP : MINCE ::
   (A) fry : bake
   (B) meat : cake
   (C) axe : mallet
   (D) Washington : Lincoln
   (E) stir : beat

9. PECCADILLO : CRIME ::

(A) district attorney : criminal
(B) David : Goliath
(C) armadillo : bone
(D) bushel : peck
(E) sheriff : jail

10. WOOD : PAPER ::

(A) steel : iron
(B) chair : wall
(C) cut : clip
(D) fireplace : lighter
(E) forest : fire

Directions: Select from the lettered words below that word which is most nearly opposite in meaning to the first word.

11. REFRACTORY

(A) refreshing
(B) burdensome
(C) privileged
(D) manageable
(E) upright

12. ADROIT

(A) deterred
(B) skillful
(C) tricky
(D) right
(E) awkward

13. PALLIATE

(A) invigorate
(B) detract
(C) distract
(D) aid
(E) hinder

14. CONSONANT

(A) insuperable
(B) disagreeing
(C) nonexistent
(D) phonetic
(E) abundant

15. SENTENTIOUS

(A) wordy
(B) insensitive
(C) concise
(D) oral
(E) calm

16. FECUND

(A) sinister
(B) pure
(C) young
(D) barren
(E) beneficial

17. FORTUITOUS

(A) unfortunate
(B) stupid
(C) designed
(D) fearful
(E) pious

18. SATURNINE

(A) earthy
(B) cheerful
(C) choleric
(D) maudlin
(E) honest

19. FRANGIBLE

(A) argumentative
(B) docile
(C) insincere
(D) sturdy
(E) inedible

20. LETHARGY

(A) acidity
(B) prodigy
(C) rigidity
(D) alertness
(E) corpulence

53. Today, we who read Latin return far more often to the exuberance of Apuleius than to the carefully molded _____ of Cicero.

(A) literature
(B) redundancies
(C) objects
(D) piracies
(E) platitudes

54. If the process of decision-making was _____ a half-century or more ago, consider how it has become _____ since.

(A) dedicated . . . simplified
(B) complicated . . . compounded
(C) revived . . . encouraged
(D) imbedded . . . obvious
(E) enhanced . . . improved

55. Scientists should have choice as to what areas they explore, and certainly have the _____ right and obligations as _____ to influence what use is made of their discoveries.

(A) impeccable . . . teachers
(B) inescapable . . . philosophers
(C) definitive . . . recorders
(D) divine . . . lecturers
(E) ethical . . . humanists

56. Under the contest rules, the award goes to an undergraduate college student who has collected a _____ personal library.

(A) distinguished
(B) well-managed
(C) modified
(D) precise
(E) stocked

57. The consequences of the establishment of the colonies were a rapid and careless _____ of natural resources, and _____ human suffering.

(A) depletion . . . appalling
(B) cancellation . . . remarkable
(C) disappearance . . . planned
(D) development . . . unfailing
(E) disintegration . . . compelled

58. The Crusades can be seen as the first great collective military _____ in which all Europe participated.

(A) embarrassment
(B) compilation
(C) review
(D) drawing board
(E) enterprise

59. The first essential in building a missile submarine is the _____ of literally millions of parts.

(A) application
(B) reassembling
(C) integration
(D) infiltration
(E) assignment

60. The _____ researchers had heard that kind of talk often before, but what came next _____ them.

(A) avid . . . encouraged
(B) asinine . . . revived
(C) studious . . . involved
(D) assembled . . . jolted
(E) fatigued . . . enervated

End of Section One.
After 25 Minutes, Stop Work on Section One.
Go Directly to Section Two.

The spring wind is raw and the mud still frosted with ice, yet the husky young engineer takes pride in this barren, rocky landscape and points out a mineral that glitters throughout the black earth.

All that glitters is not gold. But in this case, it is something better—iron ore, in billion-ton quantities.

"When you wash the kiddies in the bath tub," the engineer brags, "the water leaves an iron scum around the side. The lake shores here are black."

These riches have led in the last 15 years to the investment of more than a billion dollars to produce iron ore for the steel mills of the United States, Canada and Europe.

In western Labrador and in Quebec's North Shore region—a rounded wasteland of frozen lakes and scrub spruce populated mostly by bear and moose—two railroads, four town sites and four big iron mining projects have been developed.

The newest are the town of Wabush, population 1,700 and the $300 million Wabush Mines venture, now being tuned up for full-scale operations this summer. The location is in Labrador, a part of Newfoundland.

The Wabush project is in two parts. Several miles from the town, a large hill of low-grade ore is being blasted apart, and the ore is being hauled by a fleet of noisy 55-ton trucks and dumped into giant crushers.

The ore is crushed, classified and ground and then the iron particles extracted and concentrated. What began as hematite with 37 per cent iron content becomes high-grade concentrate with 66 per cent iron.

The concentrates are then hauled by rail 225 miles south of Pointe Noire, Quebec, which has been built by Wabush interests on the St. Lawrence River near the busy little port of Sett-Ilse. Some of the ore is shipped to Europe as concentrates, but most is further upgraded to pebble-sized pellets at a tidewater plant.

Annual production of the Wabush projects is to exceed 5 million tons of concentrates and pellets, rising to more than 10 million before 1970.

Pickands, Mather & Co. of Cleveland is the managing agent of the project, and 10 iron and steel companies share the ownership and the output. The largest owners are two Hamilton, Ont., producers, the Steel Company of Canada with 23 per cent, and Dominion Foundries and Steel, Ltd., 15 per cent.

Other owners are Youngstown Sheet and Tube, Inland Steel, Pittsburgh Steel, Interlake Iron and Picklands, Mather, all of the United States; Finsider of Italy, and Hoesch & Mannesmann of West Germany.

The property is leased from the Canadian Javelin Corporation, which collects production royalties. Reserves are said to be more than a billion tons of raw ore.

About 600 persons are now working in the mine and mill here, and another 150 are employed by the company at the town site.

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94. The original investment of the Labrador project was approximately
    (A) $15 million
    (B) $⅓ billion
    (C) $5 million
    (D) $1 million
    (E) $½ million

95. The annual Wabush production is 5 million tons of
    (A) iron ore
    (B) upgraded iron
    (C) hematite
    (D) crushed iron
    (E) iron combined with hematite

96. It is likely that the following three companies control at least 40% of the Wabush stock:
    (A) Dominion Foundries and Steel, Ltd.—Picklands, Mather & Co.—Finsider of Italy
    (B) Canadian Javelin Corp.—Interlake Iron —Picklands, Mather & Co.
    (C) Hoesch & Mannesmann—Dominion Foundries and Steel, Ltd.—Steel Co. of Canada
    (D) Steel Co. of Canada—Youngstown Sheet and Tube—Inland Steel
    (E) Picklands, Mather & Co.—Interlake Iron —Hoesch & Mannesmann

97. The writer who covered this story probably had the background of a
    (A) physicist
    (B) mathematician
    (C) chemist
    (D) geologist
    (E) biologist

SECTION THREE

(75 minutes)

Directions: Choose the correct answer from the lettered choices. Use available space which you have on the page for your scratch-work.

DO YOUR FIGURING HERE

1. Which of the following fractions is more than ¾?

   (A) $^{35}/_{71}$
   (B) $^{13}/_{20}$
   (C) $^{71}/_{101}$
   (D) $^{19}/_{24}$
   (E) $^{15}/_{20}$

2. If $820 + R + S - 610 = 342$, and if $R = 2S$, Then $S =$

   (A) 44
   (B) 48
   (C) 132
   (D) 184
   (E) 192

3. What is the cost, in dollars, to carpet a room x yards long and y yards wide, if the carpet costs two dollars per square foot?

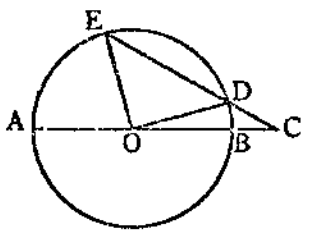
   (A) xy
   (B) 2xy
   (C) 3xy
   (D) 6xy
   (E) 18xy

4. If $7M = 3M - 20$, then $M + 7 =$

   (A) 0
   (B) 2
   (C) 5
   (D) 12
   (E) 17

5. In circle O below, AB is a diameter, angle BOD contains 15° and angle EOA contains 85°. Find the number of degrees in angle ECA.

   (A) 15
   (B) 35
   (C) 50
   (D) 70
   (E) 85



GO ON TO THE NEXT PAGE

Graduate Record Examination

Aptitude Test

(Sample #3)

SECTION ONE
(25 minutes)

Directions: Each of the following questions consists of a pair of capitalized words having a certain relation to each other, followed by five lettered pairs of words. Choose the pair of words that are related to each other in the same way as the pair of capitalized words. Then blacken the space on your answer sheet containing the letter of the pair you have chosen.

1. JAIL : CRIME ::
   (A) judge : criminal
   (B) freedom : bird
   (C) prison : thief
   (D) cemetery : death
   (E) victim : intruder

2. DESCRIPTION : CHARACTERIZATION ::
   (A) novel : narration
   (B) biographer : author
   (C) artist : writer
   (D) composition : argumentation
   (E) picture : portrait

3. MUMBLE : TALK ::
   (A) orate : speak
   (B) scrawl : write
   (C) bumble : buzz
   (D) yell : shout
   (E) mumbo : jumbo

4. HYBRID : THOROUGHBRED ::
   (A) steel : iron
   (B) fruit : tree
   (C) stallion : mare
   (D) highbrow : lowbrow
   (E) superficiality : thoroughness

5. FRAGILE : CRACK ::
   (A) potent : enervate
   (B) irreducible : reduce
   (C) frangible : strengthen
   (D) odorous : spray
   (E) pliable : bend

6. FULLBACK : FIELD ::
   (A) halfback : infield
   (B) baseball : stadium
   (C) boxer : ring
   (D) medal : winner
   (E) helmet : pad

7. HYDRO : WATER ::
   (A) helio : sun
   (B) Reno : divorce
   (C) canto : score
   (D) hydrophobia : dog
   (E) Hires : root beer

8. 3 : 3's ::
   (A) three : six
   (B) trio : quartet
   (C) singular : possessive
   (D) salmon : salmon
   (E) number : letter

Directions: Select from the lettered word or pair of words, the word or words which best complete the meaning of the statement as a whole.

21. Boston's traditional swanboat rides provide a restful _____ from the city's summer heat, as they cruise the _____ waters of the Public Garden.

(A) picnic . . . colorful
(B) relief . . . turbid
(C) hiatus . . . vapid
(D) respite . . . placid
(E) amnesty . . . gay

22. All countries in the region, who are also UN members, are _____ to join.

(A) embraced
(B) eligible
(C) prohibited
(D) tantamount
(E) organized

23. An Australian woman _____ has discovered a way to boost the seed yield of pastureland.

(A) agronomist
(B) psychoanalyst
(C) astrophysicist
(D) phrenologist
(E) bioscopist

24. It is usually a good thing when a discussion is taken firmly by the hand and led down from the heights of _____ to the level ground of hard _____.

(A) ridiculousness . . . sublimity
(B) mountaintops . . . meadowland
(C) audacity . . . sincerity
(D) fantasy . . . fact
(E) speculation . . . reality

25. Electronic eavesdropping technology has become so _____ that the comparatively little law on the subject has become as _____ as the horse and buggy.

(A) repulsive . . . fictitious
(B) omnivorous . . . ridiculous
(C) sophisticated . . . outmoded
(D) clandestine . . . entangled
(E) popular . . . homey

26. Basic research provides the _____ fund of scientific knowledge on which the applied researchers draw to give society a rich rate of interest.

(A) depleted
(B) endowed
(C) capital
(D) deterred
(E) realistic

27. He _____ his speech heavily with jargon of the trade.

(A) retards
(B) brakes
(C) disburses
(D) inflates
(E) lards

28. It really looked as if the outclassed Portuguese were about to make as _____ an exit from the _____ as had the Italians.

(A) ignominious . . . competition
(B) differential . . . forum
(C) emphatic . . . cavern
(D) surreptitious . . . vista
(E) opportune . . . palladium

29. The growing of cereals on a large scale was the first stage in a revolution that was to replace a food-gathering _____-existence by an urban civilization based on agriculture.

(A) paternal
(B) herbivorous
(C) sedulous
(D) nomadic
(E) urbane

30. But a _____ wind built up during the race, and shortly most of the summertime boats turned to and went home.

(A) infamous
(B) helpless
(C) snarling
(D) ravishing
(E) vacillating

43. STRINGENT

(A) habitable
(B) uncorruptible
(C) inert
(D) shrill
(E) flexible

44. PRAGMATIC

(A) angry
(B) quixotic
(C) colorful
(D) pungent
(E) deceitful

45. TRUCULENT

(A) portable
(B) moral
(C) belittling
(D) tame
(E) fanatical

46. CURSORY

(A) silent
(B) thorough
(C) quiet
(D) puritanical
(E) optimistic

47. LOLL

(A) grip
(B) revel
(C) tense
(D) fall
(E) relax

48. EXIGENT

(A) indigent
(B) dull
(C) slow
(D) ridiculous
(E) unimportant

49. VISCID

(A) kindly
(B) straight
(C) scanty
(D) hard
(E) dark

50. CUDGEL

(A) lavish
(B) caress
(C) liberate
(D) excavate
(E) seclude

Directions: Select from the lettered word or pair of words, the word or words which best complete the meaning of the statement as a whole.

51. To be director of the most important, largest, and surely richest art museum in the country demands _____ concentration and strong personal _____.

(A) continued . . . antipathy
(B) invaluable . . . attachment
(C) hectic . . . interposition
(D) unseemly . . . charm
(E) unflagging . . . involvement

52. The novel, describing the experiences of a man who is brought back from the dead by a new scientific technique, is a _____ on doctors, research foundations, and many _____ of contemporary society.

(A) treatise . . . remorses
(B) satire . . . foibles
(C) dossier . . . infallibilities
(D) criticism . . . nostalgias
(E) capsule . . . validities

53. The sales of Jules Verne's books continue to _____ like a runaway balloon.

(A) flit
(B) advance
(C) revive
(D) soar
(E) leap

It is a measure of how far the Keynesian revolution has proceeded that the central thesis of "The General Theory" now sounds rather commonplace. Until it appeared, economists, in the classical (or non-socialist) tradition, had assumed that the economy, if left to itself, would find its equilibrium at full employment. Increases or decreases in wages and in interest rates would occur as necessary to bring about this pleasant result. If men were unemployed, their wages would fall in relation to prices. With lower wages and wider margins, it would be profitable to employ those from whose toil an adequate return could not previously have been made. It followed that steps to keep wages at artificially high levels, such as might result from the ill-considered efforts by unions, would cause unemployment. Such efforts were deemed to be the principal cause of unemployment.

Movements in interest rates played a complementary role by insuring that all income would ultimately be spent. Thus, were people to decide for some reason to increase their savings, the interest rates on the now more abundant supply of loanable funds would fall. This, in turn, would lead to increased investment. The added outlays for investment goods would offset the diminished outlays by the more frugal consumers. In this fashion, changes in consumer spending or in investment decisions were kept from causing any change in total spending that would lead to unemployment.

Keynes argued that neither wage movements nor changes in the rate of interest had, necessarily, any such agreeable effect. He focused attention on the total of purchasing power in the economy—what freshmen are now taught to call aggregate demand. Wage reductions might not increase employment; in conjunction with other changes, they might merely reduce this aggregate demand. And he held that interest was not the price that was paid to people to save but the price they got for exchanging holdings of cash, or its equivalent, their normal preference in assets, for less liquid forms of investment. And it was difficult to reduce interest beyond a certain level. Accordingly, if people sought to save more, this wouldn't necessarily mean lower interest rates and a resulting increase in investment. Instead, the total demand for goods might fall, along with employment and also investment, until savings were brought back into line with investment by the pressure of hardship which had reduced saving in favor of consumption. The economy would find its equilibrium not at full employment but with an unspecified amount of unemployment.

Out of this diagnosis came the remedy. It was to bring aggregate demand back up to the level where all willing workers were employed, and this could be accomplished by supplementing private expenditure with public expenditure. This should be the policy wherever intentions to save exceeded intentions to invest. Since public spending would not perform this offsetting role if there were compensating taxation (which is a form of saving), the public spending should be financed by borrowing—by incurring a deficit. So far as Keynes can be condensed into a few paragraphs, this is it. "The General Theory" is more difficult. There are nearly 400 pages, some of them of fascinating obscurity.

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81. "The General Theory" is

(A) partly fiction—partly nonfiction
(B) hard to comprehend
(C) dated
(D) guilty of several misstatements of fact
(E) very specific

82. Keynes emphasized that

(A) unemployment was largely caused by high wages
(B) interest rate fluctuations were desirable
(C) lowering salaries would eventually create more jobs
(D) the government should go into debt, if necessary, to provide jobs
(E) an internal laissez-faire policy is advantageous

83. The writer's attitude toward the Keynesian economic philosophy seems to be

(A) antagonistic
(B) questioning
(C) favorable
(D) mocking
(E) bombastic

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DO YOUR FIGURING HERE

5. A boy receives grades of 91, 88, 86, and 78 in four of his major subjects. What must he receive in his fifth major subject in order to average 85?

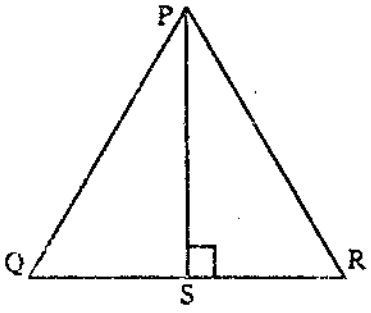
(A) 86
(B) 85
(C) 84
(D) 83
(E) 82

6. If a steel bar is 0.39 feet long, its length in *inches* is

(A) less than 4
(B) between 4 and 4½
(C) between 4½ and 5
(D) between 5 and 6
(E) more than 6

7. In the figure, PS is perpendicular to QR. If PQ = PR = 26 and PS = 24, then QR =

(A) 14
(B) 16
(C) 18
(D) 20
(E) 22



8. If $x = 0$, for what value of y is the following equation valid?
$5x^3 + 7x^2 - (4y + 13)x - 7y + 15 = 0$

(A) $-2\frac{1}{7}$
(B) 0
(C) $+2\frac{1}{7}$
(D) $1\frac{3}{7}$
(E) $3\frac{1}{2}$

9. A man spends $81 in buying some shirts and ties. If the shirts cost $7 each and the ties cost $3 each, what is the ratio of shirts to ties purchased?

(A) 5:3
(B) 4:3
(C) 5:2
(D) 4:1
(E) 3:2

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