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A STUDY OF THE RELATIONSHIP BETWEEN NON-
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SIXTH GRADE ELEMENTARY SCHOOL STUDENTS.

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ALFRED ARTHUR ARTH

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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

A STUDY OF THE RELATIONSHIP BETWEEN NON-COMPLETION
AND INTELLIGENCE EXHIBITED BY SIXTH GRADE
ELEMENTARY SCHOOL STUDENTS

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A STUDY OF THE RELATIONSHIP BETWEEN NON-COMPLETION
AND INTELLIGENCE EXHIBITED BY SIXTH GRADE
ELEMENTARY SCHOOL STUDENTS

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CHAPTER I

INTRODUCTION

Overview

The degree of knowledge accrued about the individual student can be equated to the degree of effectiveness which will be exhibited by the teacher.¹ Absolute knowledge of the student may never be assembled or assessed by any one agency, but if any one organization is to be the vanguard in attempting this process, the educational system must be that one.

Trivia is noun plural being both singular and plural in

¹William B. Ragan, Modern Elementary Curriculum (New York: Holt, Rinehart and Winston, 1966), p. 40.

construction, defined as meaning "unimportant matters."¹ There does not appear to be any information which relates to the effectiveness of the educational task of the teacher that could possibly qualify as trivia.

As long as professional education deals with human entities, then it must do all that is humanly possible to cover the gamut of available information which gives a clearer and more adequate picture of that which is the main concern of education, the student. This major concern of professional education, the student, needs to be understood in totality. "The whole child does indeed come to school; and contrary to the belief that education is a matter of intellectual development alone, he brings with him his physical condition, his emotional problems and his social characteristics."²

Whatever information can be amassed to aid in understanding the "total," or "whole," child must be screened and assessed in light of the necessity of approaching a comprehensive appraisal of the child, so as to enable effective instruc-

¹Webster's Seventh New Collegiate Dictionary (Springfield, Massachusetts: G. & C. Merriam Company, Publishers, 1965), p. 949.

²William B. Ragan and John D. McAulay, Social Studies for Today's Children (New York: Appleton-Century-Crofts, Inc., 1964), p. 31.

tion through conservation of process, error, and effort. Ragan suggests that lack of proficiency in viewing of individual differences is the greatest "peril" to establishing an individualized instructional program.¹

Individual difference in the process of learning must be explored and related to the functions, styles, and demands of the educational system. That learning, which does transpire under the jurisdiction of the schools needs to be accomplished within a structure that provides for the establishment of a balance between adventure and security. Educators need to realize that learning with its instability produced by new knowledge, causes pressures on the student, and that the act of compliance with learning is a choice which the student makes. All those who dare to educate must be capable and willing to recognize the right of the student to choose his entrance point and degree of involvement in the act of learning.

Adventure and Security

The involvement of the student in the learning process is a delicate situation. Involvement in a situation that is not familiar and which has the potentiality of evolving into

¹William B. Ragan, Teaching America's Children (New York: Holt, Rinehart and Winston, 1961), p. 35.

negative or failure results, places the child's self image in jeopardy. The self image, or "ego,"¹ is vulnerable under any indecisive situation.

The child as a student is constantly exposed to the new and unfamiliar in theory and form. The new and unfamiliar provide adventure for the secure and terror for the unstable. The child seeks and needs an organized structured environment.² Learning, by its very nature of change,³ is an instigator of insecurity. The objective of education then appears to be one of attempting to enable the child to strike a balance between security and adventure in the learning situation⁴ and to provide him with essentials to be able to cope with the change that is ever present in learning and society.⁵

The Choice: Completion or Withdrawal

¹Paul Thomas Young, Motivation and Emotion (New York: John Wiley and Sons, Inc., 1961), p. 528.

²A. H. Maslow, Motivation and Personality (New York: Harper & Brothers, Publishers, 1954), pp. 84-87.

³Robert M. Gagne, The Conditions of Learning (New York: Holt, Rinehart and Winston, 1965), 308 pp.

⁴Ragan, Modern Elementary Curriculum, p. 66.

⁵Paul Nash, Andreas M. Kazamias, and Henry J. Perkinson, The Educated Man: Studies in the History of Educational Thought (New York: John Wiley & Sons, Inc., 1965), pp. 312-13.

Erik H. Erikson states that there are "Eight Ages of Man," and one of these ages is that of "Industry vs. Inferiority."¹ During this age, the child is evaluated on the basis of work-production and the manipulation of possessed skills. The results of the evaluation influence: the ability to progress to the next stage and the establishment of self identity. If the results are negative, the identity begins to assume a factor of inferiority. If the results of the evaluation are positive, a strong self image will evolve, enabling him to compete with that competition afforded him. The strong concept of self does not get in the way of the task being attempted. The student with a weak concept of self must be aligning defenses of the self and reducing the necessary energies from the task. When self is not at stake with every issue or event, then problems can be dealt with more effectively and objectively.²

A decision to act will be made rationally in review of the associative factors of the total past. Frederick Lund

¹Erik H. Erikson, "Eight Ages of Man," Readings in Child Behavior and Development, Celia Burns Stendler (New York: Harcourt, Brace and World, Inc., 1964), pp. 242-55.

²Association for Supervision and Curriculum Development 1962 Yearbook Committee, Perceiving, Behaving, Becoming (Washington, D. C.: National Education Association, 1962), p. 52.

states, "Where the balance shall lie, and which reaction tendency shall dominate, will depend on the nature of these associative factors."¹ The student will select that choice which presents the most appealing results; only when both choices are of equal value will there be any difficulty in selection.²

The Act of Withdrawal and the Related Effect
Upon the Assessment and Evaluation of
the Student Within the Context
of Assembled Data

The totality of accumulated information relating to the pupil is reviewed by the concerned educators. The degree of effectiveness in assessing the knowledge is related to the weightedness the educator assigns to the contributing factors. One of the major factors used in this evaluation is the intelligence score or Intelligence Quotient. The numerical value attached to an I.Q. test is seemingly affected by withdrawal. It appears that the evaluation of I.Q. scores is made without apparent notice of such an influential factor.

The question arises as to the evaluation of the action of avoidance, non-completion in relation to intelligence scores.

¹Frederick Lund, Psychology: The Science of Mental Activity (New York: A. G. Seiler, 1927), p. 125.

²Kurt Lewin, A Dynamic Theory of Personality, (New York: McGraw-Hill Book Company, Inc., 1935), p. 123.

Does this action denote a lack of ability, "intelligence," or talent? Or does this action comprise a movement that has been strengthened because of the absence of negative stimulus?¹ Could this act of avoidance, non-completion, prove a capability of assessing "correctly" and acting "correctly" to generalized stimuli?

The Study

Designation of the Study

A study of the relationship between non-completion and intelligence exhibited by sixth grade elementary school students.

Statement of Purpose

It was the purpose of this investigation to study the relationship between non-completion and intelligence. This purpose was pursued by identifying a group of students who qualified as "non-completers" and then comparing their intelligence scorings with those of an equal group of students who qualified as "completers."

Background of Theory and Research

¹B. R. Bugelski, The Psychology of Learning (New York: Henry Holt and Company, 1956), p. 62.

"The reference experiment is the classical one by Bekhterev on conditioned withdrawal responses of hand or foot, in which the electric shock may be avoided by the performance of the conditioned response."¹ Bekhterev's experimentation clearly sets the stage for further study; this can be exhibited by the work of Brogden, Lipman, and Culler, and their pigs.

"...as the findings of Brogden, Lipman, and Culler indicate, a procedure which permits avoidance of shock results in better conditioning than does a procedure permitting only escape from shock."²

Dollard and Miller have also contributed to the understanding of avoidance. Miller's work in relation to human response relates that the act of withdrawal can be said to occur at a point after the "gradients" of success and failure have been in equilibrium, and the weightedness of either dominates.³

The work of Atkinson is very closely akin to the re-

¹Ernest R. Hilgard and Donald G. Marquis, Conditioning and Learning (New York: Appleton-Century-Crofts, Inc., 1940), p. 58.

²O. Hobart Mowrer, Learning Theory and Personality Dynamics (New York: The Ronald Press Company, 1950), p. 88.

³Calvin S. Hall and Gardner Lindzey, Theories of Personality (New York: John Wiley and Sons, Inc., 1957), p. 447.

search of Miller. Atkinson relates to this area in the following: "It is assumed that in addition to a general disposition to seek success, called the achievement motive, there is also a general disposition to avoid failure, called motive to avoid failure."¹ "When this disposition is aroused within a person, as it is aroused whenever it is clear to a person that his performance will be evaluated and failure is a distinct possibility, the result is anxiety and a tendency to withdraw from the situation."²

This act of withdrawal is one of the main reactions that will occur in the face of failure.³ The withdrawal, or "escape pattern," is then reinforced by reduction in anxiety.⁴ This reward in the form of a reduction of anxiety would then reinforce the behavior that leads to it.⁵

¹J. W. Atkinson, An Introduction to Motivation (New York: D. Van Nostrand Company, Inc., 1964), p. 244.

²Idem.

³Herbert Sorenson, Psychology in Education (New York: McGraw-Hill Book Company, 1964), p. 410.

⁴Robert M. W. Travers, Essentials of Learning (New York: The Macmillan Company, 1963), p. 116.

⁵George G. Thompson, Eric F. Gardner, and Francis J. DiVesta, Educational Psychology (New York: Appleton-Century-Crofts, Inc., 1959), p. 255.

Significance of the Problem

Education is intensely involved in the aspects of avoidance conditioning. Review of the literature presents information which aids in the interpretation of this problem, but there appears to be no research which deals with the relationship of avoidance conditioning and intelligence scores at the upper elementary school level. This study was directed at attempting to contribute information which might aid in the illumination of that area of educational concern.

Delimitation of the Problem

The Norman elementary school system complex constituted the basis for area of selection. The selection of subjects for this study was, therefore, limited by the boundaries of that school system. The Norman Public School System is located in the City of Norman, which is positioned in central Oklahoma.

Definition of Terms

Student - The term student is meant to be used as meaning a child of either sex, between the ages of 10 and 13 years of age, enrolled in the participating school system.

Anxiety - This term shall be viewed as meaning a state

of being which exhibits fear of anticipated negative consequences.¹

Avoidance Conditioning - When used in this study, the term avoidance conditioning shall be understood as meaning a personality trait exhibited "...whenever it is clear to a person that his performance will be evaluated and failure is a distinct possibility," resulting in "anxiety and a tendency to withdraw from the situation."²

Instrument I - The term Instrument I shall be interpreted in this study to mean that test constructed by the author consisting of fifty-two pages, designed to elicit degrees of non-completion and/or illustrations of avoidance conditioning.

Legal Stop (L. S.) - The term legal stop shall for the duration of this study be interpreted as meaning that point in Instrument I at which the student disregarded directions and continued to disregard directions from that point on.

Non-Completion - This term shall be interpreted as meaning the act of withdrawing one's attention, interest, and/or physical being from the activity or instrument of assign-

¹Young, p. 566.

²Atkinson, p. 244.

ment before all segments or requests have been completed.

Non-Completor - This term shall be interpreted as meaning that student who acquired an L. S. score of 20 or less on Instrument I, and who had been tentatively selected as a non-completor by the classroom teacher on Form Z.

Completion - This term shall be interpreted as meaning the act of maintaining one's attention, interest, and/or physical being with the activity or instrument of assignment until all segments or requests have been completed.

Completor - This term shall be interpreted as meaning that student who acquired an L. S. score of 30 or more on Instrument I, and who had been tentatively selected as a completor by the classroom teacher on Form Z.

Form Z - This term, Form Z, shall be used to represent the teacher's estimate of a student's completion evaluated in numerical equivalents of the terms seldom, sometimes, and always; and a total score of 16 or less constituted a score identifying a tentatively selected non-completor; and a total score of 24 constituted a score identifying a tentatively selected completor.

Intelligence - The term intelligence shall be interpreted as meaning, "...thinking power or the degree of matur-

ity of the mind"¹ when designated as Intelligence⁽¹⁾ (Otis Quick-Scoring Mental Ability Beta Form Em). The term intelligence shall be interpreted as meaning a degree "...of general intellectual maturity,"² when designated as Intelligence⁽²⁾ (Goodenough Draw a Man Test). The term intelligence shall be interpreted as meaning, "the ability to perceive and understand relationships, such as logical, spatial, verbal, numerical, and recall of associated meanings,"³ when designated as Intelligence⁽³⁾ (California Test of Mental Maturity).

Personality - Personality shall be referred to as meaning "...the dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to his environment."⁴

Psychophysical Systems - When referred to, psychophysi-

¹Arthur S. Otis, Otis Quick-Scoring Mental Ability Tests: Manual of Directions for Beta Test Forms Cm and Dm and New Edition: Forms Em and Fm (Yonkers-on-Hudson, New York: World Book Company, 1954), p. 9.

²Florence L. Goodenough, Measurement of Intelligence by Drawings (New York: Harcourt, Brace & World, Inc., 1926), p. iv.

³Elizabeth T. Sullivan, Willis W. Clark, and Ernest W. Tiegs, Examiner's Manual, California Short-Form Test of Mental Maturity (Monterey, California: California Test Bureau, 1963), p. 5.

⁴Gordon W. Allport, Personality: A Psychological Interpretation (New York: Henry Holt & Company, 1937), p. 48.

cal systems shall be interpreted within the following definition: "The term 'psychophysical' reminds us that personality is neither exclusively mental nor exclusively neural. The term 'system' refers to traits or groups of traits in a latent or active condition."¹

Trait - A trait shall be interpreted in the following frame of reference: "A trait guides the course of behavior, and may often become dynamic and compulsive as well; so may the attitude. Both may be regarded as biophysical in nature."²

Subjects

The subjects of this study were 70 students of sixth grade level; 35 non-completers and 35 completors. The 35 non-completers were randomly selected and provided a numerical counterpart of completors in their respective classrooms. The majority of these subjects were in the 10 to 12 age range.

Assumptions

For the purpose of this study, the following assumptions were applied:

- 1.) That the scores accrued by each student who had

¹Idem.

²Ibid., p. 293.

taken the Otis Quick-Scoring Mental Ability Test Form Em, the Goodenough Draw a Man Test, and the California Test of Mental Maturity were an accurate estimation of that student's intelligence as defined by that test.

2.) That Instrument I exhibited an objective index of student non-completion and completion.

3.) That the 10 point differentiation placed between the L. S. score of the non-completor (20), and the L. S. score of the completor (30) would aid in providing a more discrete identification.

4.) That schools in comparable areas of location are influenced by similar environmental factors and do influence the students involved in the educational program in a relative manner.

5.) That students who had established the trait of avoidance-conditioning had done so in the manner and definition presented by Allport.¹

Hypothesis

This study attempts to support the research hypothesis that there is no significant relationship between non-

¹Idem.

completion and intelligence. This research hypothesis was investigated through the following null hypotheses:

H₀1 - The mean score of the non-completers is not significantly different from the mean score of the completors on the Otis Quick-Scoring Mental Ability Beta Form Em test of intelligence.

H₀2 - The mean score of the non-completers is not significantly different from the mean score of the completors on the Goodenough Draw a Man Test of intelligence.

H₀3 - The mean score of the non-completers is not significantly different from the mean score of the completors on the California Test of Mental Maturity test of intelligence.

H₀4 - There is not a significant relationship between the two identifying instruments constructed by the author: Instrument I, used by the student, and Form Z, used by the teacher.

Instruments

The instruments used in this study are as follows: the Otis Quick-Scoring Mental Ability Test Beta Form Em, 1954; the Goodenough Draw a Man, 1926; the California Test of Mental Maturity, 1946; Instrument I, and Form Z. Because of the nature of this study, it was deemed necessary to use several

measurements of intelligence. Hilgard and Atkinson, and Morgan and King present the idea that verbal comprehension and word fluency factors are of major importance in obtaining scores on intelligence tests.¹ Avoidance conditioning may influence the establishment and maintenance of satisfactory verbal skills. This possible relationship between non-completion and scoring on intelligence tests appears to support the use of three measures of intelligence.

Procedure

The procedure for procuring information transpired in the following manner: (1) The classroom teacher was requested to identify tentative non-completers in the classroom and tentatively classify those non-completers by the use of Form Z. (2) The teacher was then requested to identify an equal number of tentative completors and tentatively classify those completors by the use of Form Z. (3) Instrument I was administered in a group situation to the total number selected by the classroom teacher. (4) Those students who qualified as non-

¹Ernest R. Hilgard and Richard C. Atkinson, Introduction to Psychology (New York: Harcourt, Brace and World, Inc., 1967), p. 428; and Clifford T. Morgan and Richard A. King, Introduction to Psychology (New York: McGraw-Hill Book Company, 1966), p. 428.

completers were extracted from the teacher-suggested candidates. (5) A group of students who qualified as completors were selected in a direct one-to-one relationship from those classes which provided the non-completers. (6) This procedure was continued until a total of thirty-five non-completers and thirty-five completors were accrued. (7) Intelligence scores acquired on the California Test of Mental Maturity were procured for the total group from the records made accessible by the participating school system. (8) The Otis Quick-Scoring Mental Ability Test Beta Form Em and the Goodenough Draw a Man Test were administered by the author in group situations until all seventy students were tested.

Statistics

The desirable statistics for this study comprised: (1) The use of a t test, which is a statistical test of the significance of the difference between means. The level of significance for acceptance or rejection of the null hypothesis was .05. The mean scores obtained by the control group on the Otis Quick-Scoring Mental Ability Beta Form Em, the California Mental Maturity Test, and the Goodenough Draw a Man Test were compared to the mean scores obtained by the non-completion group on the same three tests. (2) The use of a Pearson

product-moment correlation statistic was employed to compare the relationship between the two instruments (i.e., Instrument I and Form Z) used in this study. The level of significance for acceptance or rejection of the null hypothesis was .05.

Justification

It was the hope of the author that the results of this study would provide information influential in relating a possible correlation among non-completion, intelligence, and intelligence testing.

It was further hoped that the results of this study would aid in developing a scrutinization of the present view of non-completion as a dichotomy. This new viewing of non-completion would seemingly present the educator with a more comprehensive picture of the entire child.

It was the ultimate wish of this author that this study might aid in a better understanding of the total child.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter contains ideas and information obtained from reviewing the literature, research, and theoretical assumptions relevant to the study. Specifically, the area of avoidance conditioning is discussed in the first segment in relation to its historical development. The second segment of this chapter relates to material which exhibits ideas, information, and terminology which relates to the initial expansion and clarification of the situation of avoidance conditioning. The third segment is a presentation of major contributions made by experimentation, and a description of these along with the resulting hypothesis concerning the area of avoidance conditioning. The fourth segment is an examination of the research and its parallelism with the field of education. The final segment is a presentation of the factors of intelligence and learning.

Historical Development of Avoidance Conditioning

The term avoidance or avoidance conditioning is dramatically absent from Horace B. English's A Student's Dictionary of Psychological Terms, which has a publication date of 1928.¹ John B. Watson states in his article of 1916 that the "conditioned motor reflex" is familiar to everyone in a general way, but has not gained the attention of American investigators.² Watson explains that the major cause of this gap may be the lack of accessibility of Russian periodicals to American students. Watson then further states, "The German and French translations of Bechterew's Objective Psychology give the method only in the barest outline. Bechterew's summary was the only guide we had in our work at Hopkins."³

The first name that is associated with avoidance-training is that of V. M. Bekhterev.⁴ His contribution is

¹Horace B. English, A Student's Dictionary of Psychological Terms (Yellow Springs, Ohio: The Antioch Press, 1928).

²John B. Watson, "The Place of the Conditioned - Reflex in Psychology," The Psychological Review, XXIII (March, 1916), p. 94.

³Ibid., p. 64.

⁴Because of phonetic differences in language V. M. Bekhterev's name will be found throughout this study with three variations of spelling: V. M. Bekhterev, V. M. Bechterev, and V. M. Bechterew.

called by Hilgard and Marquis the classical one; i.e., "conditioned withdrawal responses of hand or foot in which the electric shock may be avoided by the performance of the conditioned response."¹

Bekhterev apparently did not originate the term avoidance condition, but only the foundation for its development. Bekhterev refers to the reactions that he observed as ones of "defense reflexes."² In his early presentation and classification of avoidance, the term reflex was utilized to describe the complete situation. The study of "reflexes," Bekhterev calls reflexology. He also claims that this "reflexology scheme" must operate within view of a past experience.³ The total of behavior, according to this apparent discoverer of avoidance conditioning, is "on the one hand, of inner, i.e., organic phenomena, and on the other, of external influences, and is directed in both cases towards the maintenance of the general well-being of the organism."⁴ Bekhterev re-

¹Hilgard and Marquis, p. 58.

²V. M. Bekhterev, General Principles of Human Reflexology, Translated by Emma and William Murphy (New York: International, 1932), p. 153.

³Ibid., p. 126.

⁴Ibid., p. 133.

lates that his research was furthered by Dr. Boldriev, who "succeeded in securing artificial inculcation of the salivary secretion association or conditioned reflex, and a communication concerning this appeared a year later 1906 in the Papers of the Society of Russian Physicians."¹ Bekhterev further relates that he made a communication in the spring of 1907 with the Society of Physicians of the Hospital of Nervous Disease and exhibited, on the basis of experiments that he and Dr. Spirtoev made, that it was possible to produce an artificial association-motor reflex in the respiration of a dog.² "A little later circa 1907 the same reflex was produced in my laboratory on a man also (Dr. Anfimov) and then an artificial association-motor reflex was produced in my laboratory by the electrical stimulation of a dog's paw (Dr. V. P. Protopopov) and this experiment essentially improved the methodology of investigation of association-motor reflexes in dogs."³ Bekhterev relates that he felt this series of experiments, and those to follow shortly after, were establishing a new method which made it possible to produce artificial association in men

¹Ibid., pp. 196-97.

²Ibid., p. 197.

³Idem.

and animals.¹

Expansion and Clarification of the Area of
Avoidance Conditioning

Although Pavlov was given the widest scientific recognition, it was V. M. Bekhterev "who pioneered the investigation of overt avoidance behavior, from the conditioned-reflex standpoint."² Mowrer attached the term "behavior" to Bekhterev's "reflex." Mowrer states that this leg reflex (that exhibited by the dogs tested by Bekhterev) may at first observation look like a "pure" situation of reflex conditioning or simple substitution of stimulus; but it needs to be noted that if the leg reflex were only related to the shock alone, this would be another example of pure conditioning. Instead, the shock and buzzer were given simultaneously, and the dog then began to lift his leg "defensively" to the buzzer alone.³ Mowrer presents a noteworthy observation of the total experiment.

...It is now well known that, in a situation of this kind, better learning is usually obtained if the

¹Ibid., p. 198.

²O. H. Mowrer, Learning Theory and Behavior (New York: John Wiley and Sons, Inc., 1960), p. 42.

³Idem.

CS (conditioned stimulus) is followed by the US (or UnCs, for unconditioned stimulus) only in the event that the subject does not respond in the expected way to the CS alone. If such a reaction does occur, the UnCS is omitted, so that the procedure is said to be 'instrumental' in that the conditioned response prevents the occurrence of the noxious unconditioned stimulus. This is to be contrasted with the classical procedure of invariability pairing CS and UnCS.¹

Instrumental is most acceptably described as such "because the organism is learning about some change, which presumably is of an adaptive nature."² Classical is interpreted as meaning that type of experimentation in which no matter what the nature of the conditioned response, there is no change in the procedure. Hilgard and Marquis state, "The reference experiment for classical conditioning is the study of conditioned salivation in dogs."³ Brogden, Lipman, and Culler conducted an avoidance experiment of the instrumental type in 1938. This experiment dealt with guinea pigs and electric shock. (More detailed reference will be made in the segment relating to experiments.) Hilgard and Marquis make reference to this experiment, declaring that the "learning in this situation appears to be based in a real sense on the avoidance of

¹Idem.

²Bugelski, p. 59.

³Hilgard and Marquis, p. 28.

the shock."¹

The power of avoidance conditioning is not questioned at this or any other stage of development, but serious questions as to the mechanics of avoidance conditioning are brought to the forefront. The question of whether avoidance conditioning is adequately named is one of the "mechanical" questions. Some researchers beg the point that this action should be labeled escape. Most researchers agree that the definition of "escape learning" is the learning which takes place when the subject is exposed to the noxious stimulus and then moves "out" or "away" from that stimulus. "Avoidance learning" is then applied to that situation in which the subject has "learned" to escape from the noxious stimulus by the acquisition of some type of behavior.² A question that evolved with the development of literature concerning avoidance conditioning which has not seemingly been resolved is that of how many phases or processes are involved in the procedure. Those who follow the theories of Clark L. Hull tend to state that avoidance conditioning is in direct association with his theory

¹Ibid., p. 58.

²Morgan and King, p. 99.

of "drive reduction" or a single process reaction. E. L. Thorndike would enter into the ranks of "single process" researchers. Thorndike's "Law of Effect" states the following: "When a modifiable connection between a situation and a response is made and is accompanied or followed by a satisfying state of affairs, that connection's strength is increased, when made and accompanied or followed by an annoying state of affairs, its strength is decreased."¹ B. F. Skinner would also be in the ranks of the "single process" researchers in relation to avoidance conditioning. Skinner's positioning would be mainly because of his "S-R" presentation of treating processes and events.

The counter-position of a "two factor or process" explanation is seemingly held by O. H. Mowrer. Mowrer's position is established by his opinion that fear and then reaction take place in the act of avoidance. He states his position thusly:

So our assumption will be that, in the situation under discussion /avoidance learning/ the shock initially produces two more or less concomitant responses, which are radically different: (a) the escape reaction of running (along with a number of other similar

¹J. W. Tilton, An Educational Psychology of Learning (New York: The Macmillan Company, 1951), pp. 45-6.

but ineffective reactions) and (b) the emotional reactions to fear.¹

The position of vanguard of the two factor approach is not as solidly taken as the before-mentioned statement may appear to make it. Bugelski notes this, and states that Mowrer appears to revert to a "Pavlovian" type involvement.² Pavlovian is equated with classical; therefore he inferred that Mowrer's position leans in this direction.

The acknowledgment of the appearance of fear is of vital importance (i.e., as referred to by Mowrer). Mowrer and Lamoreaux's experiment relating to the presence of fear is shown by Mowrer's own reference to their experiment.

As shown by the experiments of Mowrer and Lamoreaux... there is now reason to suppose that living organisms experience satisfaction, not only when they escape from a noxious stimulus, such as an electric shock, which has actually impinged upon them, but also when they avoid such a stimulus and in so doing experience a reduction in the secondary drive of fear.³

Mowrer had previously directed experimentation (1940) that apparently proved to be the grounds for the before-mentioned

¹Mowrer, Learning Theory and Behavior, p. 31.

²Bugelski, p. 66.

³O. H. Mowrer, "On the Dual Nature of Learning - A Re-interpretation of 'Conditioning' and 'Problem-Solving,'" Harvard Educational Review, XVII (Spring, 1947), p. 123.

statement. He states in his summary that "the results indicate that anxiety-reduction is positively correlated with learning, thereby supporting the supposition that it is a reinforcing agent."¹

As avoidance conditioning is more clearly understood, the term "fear" gives way to the term "anxiety" as defined in the Freudian sense. Anxiety, therefore, can be tentatively seen as a vagueness of emotions (fear) dealing with an approaching, or seemingly approaching, of a noxious stimulus.² This state of being is sometimes referred to as effecting a tenseness of the subject involved. Neal E. Miller, in relating his experiment dealing with the "Studies of Fear as an Acquirable Drive" (1948), investigated the assumption that fear could possibly be one of the most important acquirable drives, on the assumption that it can be acquired readily and is a strong drive.³ Miller then presented in his discussion

¹O. H. Mowrer, "Anxiety-Reduction and Learning," Journal of Experimental Psychology, XXVII (July, 1940), p. 515.

²O. H. Mowrer, "A Stimulus - Response Analysis of Anxiety and Its Role as a Reinforcing Agent," Psychological Review, XLVI, 1939, pp. 554-57.

³Neal E. Miller, "Studies of Fear as an Acquirable Drive: I. Fear as Motivation and Fear-Reduction as Reinforcement in the Learning of New Responses," Journal of Experimental Psychology, XXXVIII (February, 1948), p. 89.

a clear support of Mowrer's hypothesis that fear, or anxiety, can play a role in learning very much like that of the primary drive of hunger.¹ Mark A. May reviewed Miller's 1948 experiment just cited and then conducted an experiment to test the assumptions of Miller. May states, "These results indicate quite clearly that the drive value of the buzzer was substantially increased by pairing it with shock."²

The total area of conditioning is neither "basic" nor "simple." It is involved and complicated. Mowrer presents an excellent overview relating the comments of Dunlap, Thorndike, Hunter, Brogden, Lipman, and Culler.³ The consensus of these opinions agrees with the initial statement relating to the complexity of conditioning. This complexity is then multiplied by the exploration and development of the area of avoidance in relation to a conditioned response.

Avoidance conditioning has developed through research and experimentation from the position of origin presented by Bekhterev through the phases of one and two processes, encom-

¹Ibid., p. 97.

²Mark A. May, "Experimentally Acquired Drives," Journal of Experimental Psychology, XXXVIII (February, 1948), p. 73.

³Mowrer, p. 85.

passed the necessity of the presence of anxiety, and proceeded past or over differences in definition of escape and avoidance to a positioning of general acceptability as an act of manipulation which removes the subject from the presence of a noxious stimulus; and this act has been called the learning of avoidance.¹

Related Experimentation Within the Area of
Avoidance Conditioning

V. M. Bekhterev conducted three major contributing experiments in the pioneer days of avoidance conditioning. The first of these was concerned with effecting an electrical shock to the paw of a dog. This initial experiment is the one termed classical by most researchers in the field. The electrical shock experiment was in relation to the investigation being conducted in the area of association-motor reflexes. The second in this series involved a man. This experiment was designed to provide an electrical shock to the area of the sole of the foot. The third in this series was designed to supply an electrical shock to the fingers of a man. In each of these cases a bell accompanied the shock. Bekhterev found through these experiments that once the reflex

¹Travers, p. 81.

had been established, the sudden removal or withdrawal of the extremity would occur when the bell rang, even though there was no electrical stimulus presented to the subject.¹

Brogden, Lipman, and Culler in 1938 published an article which reinforced the formulating notions and hypothesis concerning the area of avoidance conditioning. Their experiment dealt with eight guinea pigs, a rotating animal activity cage, an electrical shock, and a 1000 cycle tone. Four of the eight animals were trained by the methods commonly used:

that is the US (shock) occurs after the CS (1000 cycle tone) has continued just two seconds. The rotator is so devised that the animal, upon turning the cage an inch or more when the sound begins escapes the shock by breaking the high-voltage circuit through a pendulum switch.²

The four guinea pigs that were allowed to escape the punishment were designated Group A. The second four were designated as Group B. Group B was not allowed to escape punishment by reacting. The guinea pigs in Group A required 5 to 13 days and 125, 175, 200, and 325 trials to reach a perfect score. The re-

¹Bekhterev, pp. 196-99, 176-77.

²W. J. Brogden, E. A. Lipman, and E. Culler, "The Role of Incentive in Conditioning and Extinction," American Journal of Psychology, LI, 1938, p. 110.

searchers related the reactions of Group B as follows:

As we see, the members of Group B began precisely as did the other four and gave every preliminary indication of advancing in the same way to full conditioning; but soon the incipient adaptation broke down. The pigs became erratic, rising or falling in random fashion from day to day; by the end of 500 trials, the picture remained still the same.¹

Clark L. Hull relates an experiment with a "lively" albino rat approximately 100 days of age. The equipment used in this experiment consisted of

A black wooden apparatus about two feet long, a foot wide, and a foot high. It has a hinged glass lid which permits clear observation of the interior. The floor of the box consists of small transverse rods of stainless steel placed about a quarter inch apart. Midway between the two ends of the box is a partition consisting of the same type of metal rods similarly arranged but placed vertically.²

The rods are wired so that either compartment can be charged with a weak alternating current. The rat was placed in one compartment, given a pre-determined amount of time, and then shocked. The rat then leaped (after a series of movements) into the other side of the apparatus, and was allowed to stay for a pre-determined amount of time, and then shocked in that

¹Ibid., pp. 110-11.

²Clark L. Hull, Principles of Behavior: An Introduction to Behavior Theory (New York: Appleton-Century-Crofts, Inc., 1943), p. 70.

segment of the compartment. Hull discusses the results in the following manner.

A comparison of the animal's behavior leading to his successive escapes from the charged grid shows clear evidence of learning in that upon the whole time from the onset of the shock to the escape became progressively less, until at the last few trials the leaping reaction followed the onset of the shock almost instantaneously.¹

Hull here appears to show the direct result of avoidance and learning.

John B. Watson in 1916 relates that in an experiment designed to follow that of Bekhterev's, the reflex appeared "more surely and quickly if the subject lay on his back with his leg raised and supported by a padded rod under the knee."² Of seemingly more importance is that Watson relates that he and his associates could not evoke a reflex action by the sounding of a bell alone; but by following Bekhterev's pairing and then bell stimulus alone, the expected response was elicited.³

Mowrer and Lamoreaux conducted an avoidance conditioning experiment which involved twenty-four rats, an electrical

¹Idem.

²Watson, p. 96.

³Ibid., pp. 89-116.

shock charged grid in a box, and a buzzer. Before relating the apparatus and procedure used by Mowrer and Lamoreaux in their experiment, the author wishes to make note of the statement made by the researchers before they proceeded to explain their experiment. "Laboratory avoidance conditioning in human beings is so likely to be complicated by uncontrolled factors that it seemed desirable to employ animal subjects in the present investigations."¹ The rats were divided up into three groups. In Group I the rat was placed in the experimental "box" and left alone for two minutes. At the end of this time a buzzer sounded for one second. The rat had five seconds to get to the other half of the grid or it got shocked until it passed to the opposite side. Group II had the same procedure except with this group the buzzer came on and stayed on until the rat made the appropriate move. Group III was treated the same, except that the buzzer lasted for five seconds after the crossing. "There were thus provided for Groups I, II, and III conditions in which the conditioned stimulus terminated, respectively, before, with, and after the cross-

¹O. H. Mowrer and R. R. Lamoreaux, "Avoidance Conditioning and Signal Duration - A Study of Secondary Motivation and Reward," Psychological Monographs, LIV, Whole No. 247, 1942, p. 7.

ing response, irrespective of whether it occurred as a conditioned or as a unconditioned response."¹ All three groups were exposed to the so-called instrumental conditioning. The researchers concluded that the results of their study confirmed the prediction "that better avoidance conditioning will take place, if the conditioned stimulus, or 'danger signal,' terminates with, rather than either before or after the conditioned response."²

Neal E. Miller's experiment relates to this study in the segment which attempts to show the relationship of fear to learning (i.e., that when fear is established and then suddenly reduced, it will serve as a reinforcement to produce learning).³ The apparatus consisted of a "box" with two compartments, one with a grid floor and one with a smooth, solid floor. The grid compartment was painted white; the smooth floored one was painted black. A shock could be administered through the floor of the grid compartment.

The two compartments were separated by a door which was painted with horizontal black and white stripes. This door was held by a catch operated by

¹Ibid., p. 9.

²Ibid., p. 21.

³Miller, pp. 89-91.

a solenoid and could be caused to drop in any one of three different ways: (a) by the E pushing a button, (b) by the rat moving a little cylindrical wheel made of horizontal rods stretched between bakelite disks and exposed above the right hand half of the door, (c) by a bar projecting $1\frac{1}{4}$ inch from the side of the apparatus in front of the upper left hand corner of the door.¹

The procedure involved five steps dealing with a range of no shock, with the door open, to shock, with the door closed. The experimenter relates that before the shocks were administered, the subjects (white rats) had no preference for either of the two chambers; but that during the training, with the primary drive of pain induced by electrical shock, the animal learned to run out of the white compartment through the open door. The researcher further states that the primary drive of pain was necessary in acquiring the drive and maintaining it.

Miller states:

Therefore, it seems reasonable to conclude that the acquirable drive motivating the learning of the new response of turning the wheel was fear and that a reduction in the strength of this fear was the reinforcing agent. Thus, this experiment confirms Mowrer's hypothesis that fear (or anxiety) can play a role in learning similar to that of a primary drive such as hunger.²

Brown's article of March, 1948, relates experiments similar to

¹Ibid., p. 90.

²Ibid., p. 91.

that of Miller. Because of the relative similarity of experiments, it appears necessary to cite only their respective evaluations. May relates:

These results indicate quite clearly that the drive value of the buzzer was substantially increased by pairing it with shock. According to the Dollard-Miller hypothesis, this gain is due to the fact that the buzzer became conditioned to responses that produce stimuli that have greater drive than the buzzer alone but less than that of shock.¹

Brown summarizes "...It is concluded that shock-motivated avoidance training results in a gradient of avoidance response. The avoidance gradient proved to be reliably steeper than the approach gradient."²

Boren, Sidman, and Herrnstein conducted research at the Walter Reed Army Institute of Research with the basic aim of determining the relationship of avoidance behavior to the intensity of the shock. Apparatus consisted of a metal box with a grid floor. A lever that the rat could push was located in one end of the box.

Since the resistance of a rat during a shock is variable, it is not feasible to measure the shock amperage during an experimental session. In place of the rat, a

¹May, p. 73.

²Judson S. Brown, "Gradients of Approach and Avoidance Responses and Their Relation to Level of Motivation," The Journal of Comparative and Physiological Psychology, XLI (Dec., 1948), p. 464.

39,000-ohm resistor was connected across the output of the shock power supply, and the amperage flowing in the circuit with various settings on the variable auto-transformer was measured. These measurements constituted the definition of 'shock intensity' for this study. The lever pressing behavior of the Ss was automatically recorded by a system of relays, timers and counters.¹

Four white male albino rats were used and given a shock every twenty seconds if they did not respond by pressing the lever. Every lever press on the rats' part delayed the shock twenty seconds. The researchers report that "as the shock increased in intensity, the latency of the escape response decreased, the rate of avoidance responding increased, and the resistance to extinction increased."² This evaluation appears to indicate that avoidance conditioning may be correlated to the severity of the noxious stimuli.

Richard L. Solomon and Lyman C. Wynne conducted an experiment relevant to this study which they identified as "Traumatic Avoidance Learning." Their subjects were dogs (thirty) and their apparatus a shuttle box constructed for dogs. The shuttle box was constructed with plywood sides,

¹John J. Boren, Murray Sidman, and R. J. Herrnstein, "Avoidance, Escape, and Extinction as Functions of Shock Intensity," The Journal of Comparative and Physiological Psychology, LII (August, 1959), p. 420.

²Ibid., p. 423.

two compartments with a guillotine type gate between, a wire mesh top, and a grid floor which could be charged by the experimenters.¹ The researchers summarized with the following:

An experiment in traumatic avoidance is reported in which dogs were trained to avoid a just-subtetanizing shock by responding to a signal which preceded the shock by a period of ten seconds. A shuttle-box jumping response was reinforced as the instrumental avoidance reaction.²

The results of this experiment are reported by the authors in a framework of the two process theory. They also make note that traumatic avoidance learning may differ from ordinary motivated learning.³

Murray Sidman questions in his research and experimentation the necessity for a signal to produce avoidance conditioning. He worked with white rats. His apparatus consisted of a cage with a bar $3\frac{7}{8}$ inches long and $\frac{5}{16}$ of an inch in diameter protruding half into the cage. The cage had a grid floor which could be electrified. "Shocks of a fixed 0.2 seconds duration were given to the animal through a grid floor

¹Richard L. Solomon and Lyman C. Wynne, "Traumatic Avoidance Learning: Acquisition in Normal Dogs," Psychological Monographs: General and Applied, LXVII, 1953, pp. 2-3.

²Ibid., p. 19.

³Ibid., p. 2.

at regular intervals unless the lever was depressed. Each lever depression reset the timer controlling the shock, thus delaying its appearance."¹ Sidman's questioning experiment is reinforced by Russell C. Leaf, who conducted a similar one. He reports, "The major findings of this experiment are that reliable acquisition of Sidman avoidance lever pressing can be produced in 100 percent of an unselected group of rats under appropriate training conditions...."²

H. D. Kimmel and his associates, R. L. Fowler, Frances A. Hill, and R. Baxter, have conducted experimentation relating avoidance conditioning to GSR response. GSR is used to mean galvanic skin response, an electrodermal response which is an electrical reaction on the skin detected by a very sensitive galvanometer. This response correlates with emotion, effort, or strain.³ This response is very difficult to work with. It can seemingly be considered a natural response,

¹Murray Sidman, "Avoidance Conditioning with Brief Shock and No Exteroceptive Warning Signal," Science, CXVIII (August 7, 1953), p. 157.

²Russell C. Leaf, "Acquisition of Sidman Avoidance Responding as a Function of S-S Interval," The Journal of Comparative and Physiological Psychology, LIX, 1965, p. 300.

³Horace B. English and Ava Champney English, A Comprehensive Dictionary of Psychological and Psychoanalytical Terms (New York: Longman's, Green and Company, 1958), pp. 174 and 233.

sometimes called operant behavior.¹ Kimmel and Hill investigated the question "whether or not autonomic responses, such as the GSR or salivation, can be strengthened by being followed by reinforcement with positive or negative incentives."² Their findings indicate this could be possible. In 1962 Fowler and Kimmel made an experiment similar to the one previously mentioned. Their conclusions reinforced that of Kimmel and Hill.³ In 1964 (November) the article "Avoidance Conditioning of the GSR" appeared in the Journal of Experimental Psychology. This article was written by Kimmel and Baxter. It is with this last-mentioned experiment by Kimmel that the present author is mainly concerned. The subjects were thirty-two undergraduate students at the University of Florida. They were assigned conditions in order of their appearance at the experimentors' laboratory. The apparatus used consisted of equipment for measuring the GSR and for producing and delivering the CS and the UCS. "The CS was a 1000-cps.

¹H. D. Kimmel and Frances A. Hill, "Operant Conditioning of the GSR," Psychological Reports, VII (December, 1960), p. 555.

²Idem.

³R. L. Fowler and H. D. Kimmel, "Operant Conditioning of the GSR," Journal of Experimental Psychology, LXIII, 1962, p. 566.

tone of 1 sec. duration. The UCS was an electric shock delivered to the fingertips of the S's left hand."¹ The procedure involved dividing the Ss into two groups of sixteen, each receiving sixteen paired presentations of a one second tone followed four seconds later by a one second shock. The trials were about thirty seconds apart. "Shock omission was contingent upon S's response only in the Experimental group."² The value of this experiment is exhibited by the fact that its results demonstrate that an autonomically mediated response such as the GSR can be conditioned, which apparently indicates the force of avoidance conditioning.³

Research and Theorization That Appears to Closely
Parallel the Activities of Public School
Education and Its Involvement
with Avoidance Conditioning

A. H. Maslow has established a theory of human motivation which encompasses a majority of the ideas related to the inclination to accept the human needs as efforts of behavior. This theory of Maslow's relates the needs in order of import-

¹H. D. Kimmel and R. Baxter, "Avoidance Conditioning of the GSR," Journal of Experimental Psychology, LXVIII (November, 1964), p. 482.

²Idem.

³Ibid., p. 484.

ance to the individual person in the following manner: (1) physiological needs, (2) safety needs, (3) love and belonging needs, (4) esteem needs, (5) self-actualization needs, (6) the desire to know and understand.¹ The safety needs in children are demonstrated by "their avoidance of various forms of perceived danger situations, and their withdrawal from strange and unfamiliar situations that elicit danger and terror reactions."² The reactions of individuals to aversive stimuli can be extensive, but the apparent typical reaction to such stimuli is a form of "escape" behavior.³ This "escape" behavior gives way to avoidance behavior by means of re-enforcement through the reduction of the aversive or noxious stimuli, which may or may not be associated with a neutral stimulus, which has become the "signal" for the before-stated aversive or noxious stimuli.⁴

The elementary school students are often involved in

¹Herbert J. Klausmeier and William Goodwin, Learning and Human Abilities (New York: Harper and Row, Publishers, 1966), p. 425.

²Ibid., p. 426.

³Travers, p. 80.

⁴Gregory A. Kimble, Hilgard and Marquis' Conditioning and Learning, Revision (New York: Appleton-Century-Crofts, Inc., 1961), p. 275.

an evaluation of their performance and behavior. This involvement can seemingly be estimated as an ego involvement.¹ This involvement on the part of the students could have the capabilities of producing the situation of their being evaluated as successes or failures. Assuming the student is given a task to perform which exhibits the possibilities of either success or failure at that task, the student will, according to Miller, have to make a decision as to his inclination to approach or avoid the task presented. The student's decision will be greatly influenced by the evaluation of the stimuli presented. A fearful student, when asked to perform a specific task, has one of two choices. Atkinson lists these choices as either to perform the task or leave the field.²

If the student removes himself from the field, then there is no problem; remaining places the student in a situation of imbalance or lack of homeostasis. Assuming that the task is seen as a noxious stimulus, one that will (from the viewpoint of the student) produce failure and therein ego danger, the student has entered into an "anticipatory state."

¹Marvin A. Iverson and Mary E. Reuder, "Ego Involvement as an Experimental Variable," Psychological Reports, II (June, 1956), p. 147.

²Atkinson, p. 364.

Mowrer states that these "anticipatory states" produce physiological disequilibrium and are consciously experienced as "emotion." It then becomes biologically useful for the living organism to be able to effect or learn those responses which will reduce the noxious stimuli or drive.¹ The Freudian terminology which would be attached to this state of "unbalance" over a noxious stimulus, that of the possibility of failure, would be anxiety.²

John W. Atkinson states, "It is assumed that in addition to a general disposition to seek success, called the achievement motive there is also a general disposition to avoid failure called motive to avoid failure."³ He relates further that all the activities related to the performance of the task which are connected to the possibility of failure are threatening. These actions, according to Atkinson, will be avoided whenever possible. "The threat of failure is conceived as producing a tendency to inhibit the performance of actions which are expected to produce failure."⁴

¹Mowrer, Harvard Educational Review, XVII (Spring, 1947), pp. 116-17.

²Mowrer, Psychological Review, XLVI, 1939, p. 557.

³Atkinson, p. 244.

⁴Ibid., p. 245.

The fear of failure is a learned situation stemming from the experiencing of failure. Sorenson lists three reactions that can be chosen by the person who has experienced this failure. The first, and the one of major concern to this study, is that of "avoiding the situation which has led to failure."¹ Any situation which presents the student with a distinct possibility of failure has been designated as one which will in most cases produce a response of anxiety over that failure possibility. The student will then, as Miller has stated, be forced to choose between task approach and avoidance. The resulting behavior will be in a direct relationship to furthering avoidance of that impending failure, and can be best seen as a solution which best solves the "problem" confronting the student; and that solution will be, according to Eysenck, the avoidance of the anxiety-mediating situation.²

Intelligence and Learning

Discussion of the aspects of and processes involved in intelligence and learning will service no cause in relation

¹Sorenson, p. 410.

²H. J. Eysenck, Handbook of Abnormal Psychology (London: Pitman Medical Publishing Company, Ltd., 1960), p. 264.

to this study. It is felt by the author that the following citations will suffice. "When we try to measure intelligence we seek an indication of capacity for learning and adaption."¹ "...We can give the following practical definition of intelligence: Intelligence is that which an intelligence test measures."² The above statements appear to relate intelligence as something which is and can be tested.

The situation of learning can be related in the following manner.

There is no standard definition of learning that is acceptable to all who use the term, principally because of the breadth of the process that must be defined. According to the most general definitions learning is reflected in changes of behavior that result from training, practice, or 'experience.'³

Perhaps it should be noted that no evidence was found suggesting that avoidance conditioning and intelligence had been dealt with in relation to elementary school children.

¹Warren R. Good, Misconceptions About Intelligence Testing, Test Service Bulletin, No. 79 (New York: Harcourt, Brace and World, Inc., 1954), p. 1.

²Hilgard and Atkinson, Introduction to Psychology, p. 424.

³Yvonne Brackbill (ed.), Infancy and Early Childhood: A Handbook and Guide to Human Development (New York: The Free Press, 1967), p. 207.

CHAPTER III

METHODOLOGY AND ANALYSIS OF DATA

Introduction

Included in this chapter are descriptions of procedures, review of data collected, and statistics used in the study. The procedures are presented in the order of their occurrence; the data is shown for the total of the study group; and each hypothesis is cited with the corresponding statistical test and result.

Procedure, Selection, and Identification of Subjects

The classroom teachers were asked, "Do you have any students who do not complete assigned tasks?" The teachers then rated these tentatively selected non-completers on the items comprising Form Z (see Appendix A). The author totaled the Form Z ratings for the tentatively selected non-completers. A score of 16 or less determined the number of students to be tentatively identified as non-completers. The resulting

number of non-completers determined the number of tentative completors the teachers were asked to tentatively select. The teachers then rated these tentatively selected completors on the items comprising Form Z. The author totaled the Form Z ratings for the tentatively selected completors. A score of 24 determined the number of students to be tentatively identified as completors. This procedure involved 10 classroom teachers who identified 138 students as being either tentative non-completers or tentative completors.

Instrument I (see Appendix B) was administered with accompanying directions (see Appendix C) to 134 students (see Appendix D); 4 students were absent. The students were tested in group situations related to their positioning in participating classrooms. The group testing situations varied from 18 to 54 students in size. The time for completion of Instrument I was 45 clock minutes.

A legal stop (L. S.) score of 20 or less qualified a student as a non-completor. A legal stop (L. S.) score of 30 or more qualified a student as a completor.

Thirty-nine students qualified as non-completers, based on teacher selection, a Form Z score of 16 or less, and an Instrument I score of 20 or less. Forty students qualified as completors, based on teacher selection, a Form Z score

of 24, and an Instrument I score of 30 or more (see Appendix E). A table of random numbers,¹ was used to select those 35 non-completers and those 35 completors who were to participate in the continuation of the study.

At a second meeting the Otis Quick-Scoring Mental Ability Test Beta Form Em was administered in available group situations to those qualified non-completers and completors. Within the same time period the Goodenough Draw a Man Test was administered.

The Otis Quick-Scoring Mental Ability Test Beta Form Em was scored according to prescribed directions by the author. The Goodenough Draw a Man Test was scored by Mrs. Marion Works, with available assistance provided by Dr. P. T. Teska, Professor of Education and Psychology, and Director of Special Education, at the University of Oklahoma. Neither Mrs. Works nor Dr. Teska had any knowledge of the classification of the students in relation to their being non-completers or completors. The absence of some of the Goodenough Draw a Man Test scores is related to a failure on the part of the student to present a body on the figure drawn; this procedure of not

¹Allen L. Edwards, Experimental Design in Psychological Research (New York: Rinehart and Company, Inc., 1950), p. 407.

entering "body-less" scores was recommended by Dr. P. T. Teska.

The California Test of Mental Maturity scores accrued by the students as a result of the regular testing program of the school system were obtained from the existing records of the participating classroom teachers. The absence of the California Test of Mental Maturity scores is related to the recent entry of some of the students into the participating school system or variations in the methods of recording the obtained scores on the part of the participating schools.

All available intelligence test scores were then assembled (see Appendix F). This assembly provided the data necessary for obtaining the mean intelligence scores for both the non-completers and the completors.

Review of Data

Statistical Process - t Test of Means

The obtained test scores, Otis Quick-Scoring Mental Ability Test Beta Form Em, the Goodenough Draw a Man Test, and the California Test of Mental Maturity, were tabulated in mean scores for non-completers and completors. These scores were then compared by a statistical t test relating: the mean score obtained by the non-completers on the Otis Quick-Scoring Mental Ability Test Beta Form Em, to the

mean score obtained by the completors; the mean score obtained by the non-completors on the Goodenough Draw a Man Test to the mean score obtained by the completors; and the mean score obtained by the non-completors on the California Test of Mental Maturity to the mean score obtained by the completors.

TABLE I

Summary of Intelligence Test Scores for
Non-Completors and Completors

	<u>Test</u>					
	<u>Otis Quick-Scoring</u>		<u>Goodenough</u>		<u>C.T.M.M.</u>	
	N	\bar{x}	N	\bar{x}	N	\bar{x}
NON-COMPLETORS	35	106.23	24	101.88	28	108.11
COMPLETORS	35	120.66	26	107.46	28	121.61

TABLE II

Summary of Statistical Comparisons of Non-Completors and Completors on the Otis Quick-Scoring Mental Ability Beta Form Em Test; the Goodenough Draw a Man Test; and the California Test of Mental Maturity

<u>Otis Quick-Scoring</u>	<u>Goodenough</u>	<u>C.T.M.M.</u>
Completors vs. Non-Completors	Completors vs. Non-Completors	Completors vs. Non-Completors
t = -6.65	t = -1.39	t = -5.11
df = 68	df = 48	df = 54
p < .05	p > .05	p < .05

Utilization of this procedure in relation to hypothesis H_01 --the mean score of the non-completers is not significantly different from the mean score of the completors on the Otis Quick-Scoring Mental Ability Test Beta Form Em, test of intelligence --exhibited the production of a t score -6.65 at 68 df. Since the level of significance of a .05 probability at 68 df is 1.996,¹ the null hypothesis (H_01) is rejected.

Utilization of this previously stated comparison of means with the described t test in relation to H_02 --the mean score of the non-completers is not significantly different from the mean score of the completors on the Goodenough Draw a Man Test of intelligence --produced a t score -1.39 at 48 df. This score is not a significant difference, since 1.986 at 48 df is related at .05 probability.² The null hypothesis (H_02) is accepted.

Utilization of the before-mentioned t test of means and the previously stated procedure in relation to H_03 --the mean score of the non-completers is not significantly different from the mean score of the completors on the California Test of Mental Maturity --produced a t score -5.11 at 54 df.

¹Ibid., p. 407.

²Idem.

Since the level of significance of a .05 probability at 54 df is 2.006,¹ the null hypothesis (H_0)³ is rejected.

Statistical Process - Correlation of
Form Z and Instrument I

A Pearson product-moment correlation coefficient² was conducted for the 134 students suggested by the classroom teachers and tested with Instrument I. A correlation coefficient of $r = 0.5393$ at 134 df was found between Form Z scores and Instrument I scores. A positive correlation coefficient of 0.5393 with 134 df is statistically significant at the .05 level. This positive correlation was also statistically significant at the .01 level (Table value .228).³

Since the correlation coefficient can be considered highly significant, this provides for a rejection of the null hypothesis H_0 ⁴--there is not a significant relationship between the two identifying instruments constructed by the author: Instrument I, used by the student, and Form Z, used by the teacher.

¹Idem.

²George H. Weinberg and John A. Schumaker, Statistics (Belmont, California: Wadsworth Publishing Company, Inc., 1965), pp. 259-65.

³Herbert Arkin and Raymond R. Colton, Tables for Statisticians (New York: Barnes and Noble, Inc., 1950), p. 140.

CHAPTER IV

FINDINGS, OBSERVATIONS, DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

In this final chapter, the problem is reviewed within the spectrum of the acquired numerical data. The findings and observations are presented and discussed, then conclusions are made in relation to the total study. Finally, recommendations are made which suggest how related research might be developed from the ideas generated by this study.

Overview

The purpose of this study was to investigate the relationship between non-completion and intelligence. Two forms of identification were used to establish recognition and classification of non-completers and completors. Null hypothesis H_04 --there is not a significant relationship between

the two identifying instruments constructed by the author: Instrument I, used by the student, and Form Z, used by the teacher --was designed to provide for a correlation coefficient between the two identifying instruments. The scores from three separate intelligence tests were used to arrive at three distinct numerical estimates of intelligence for the non-completers and the completors; i.e., Intelligence⁽¹⁾, Intelligence⁽²⁾, and Intelligence⁽³⁾. The mean scores acquired by non-completers on tests of Intelligence⁽¹⁾, Intelligence⁽²⁾, and Intelligence⁽³⁾ were compared by a statistical t test to the mean scores of the completors on the same three tests.

Findings

Scores of significant differences acquired on tests of Intelligence⁽¹⁾ and Intelligence⁽³⁾ do not allow the support of the research hypothesis --that there is no significant relationship between non-completion and intelligence.

The results of a Pearson product-moment correlation produced a coefficient which suggested a significant correlation between the identification instruments, Form Z and Instrument I.

Intelligence⁽¹⁾ mean scores obtained by non-completers and completors as a result of taking the Otis Quick-Scoring

Mental Ability Test Beta Form Em showed a significant difference in mean scores between non-completers and completors.

Intelligence⁽²⁾ mean scores obtained by non-completers and completors as a result of taking the Goodenough Draw a Man Test showed no significant difference in mean scores between non-completers and completors.

Intelligence⁽³⁾ mean scores obtained by non-completers and completors as a result of taking the California Test of Mental Maturity showed a significant difference in mean scores between non-completers and completors.

Discussion of Findings

O. H. Mowrer and R. R. Lamoreaux relate that their experiments in the area of avoidance conditioning are conducted with animals because the use of human beings presents complications and uncontrollable factors.¹ The subjects of this study were sixth grade students; it may be that the ensuing human complications could be responsible for the irregularity of the findings in relation to H_01 , H_02 , and H_03 .

The failure to support the research hypothesis -- that there is no significant relationship between non-completion

¹Mowrer and Lamoreaux, 1942, p. 17.

and intelligence--because of statistically significant different mean scores acquired on Intelligence⁽¹⁾ and Intelligence⁽³⁾ tests, may be directly related to the acquisitions of the trait of avoidance. Further extrapolation in this direction reveals the following questions. Is it possible that withdrawal from assigned tasks and the conditioning of avoidance could so retard the non-completor as to put him in an "unfair" competitive situation on the before-mentioned intelligence test? Could the identified non-completor be influenced by a possible "labeling" by his peers and respected authority figures as a non-completor, and therein react to those role requirements in whatever testing or "working" situation was presented to him? Is it possible that Intelligence⁽¹⁾ and Intelligence⁽³⁾ scores could be rendered invaluable by such a trait as avoidance?

The acceptance of H_0 because of no significant difference between non-completors and completors in relation to Intelligence⁽²⁾ mean scores seemed to indicate that non-completors were not significantly different in their scoring on this test. Is it possible that the trait of withdrawal does not influence the total scoring of Intelligence⁽²⁾? Further extrapolation in this direction presents the following question. Might it be assumed that the absence of verbal



factors involved in the mechanics of the test, Intelligence⁽²⁾ does not "excite" the complete elicitation of non-completion?

The correlation coefficient obtained between Form Z and Instrument I appeared to indicate a significant relationship between these instruments. This relationship seemed to indicate that the teachers have an accurate appraisal of their students in relation to categorization as non-completers and completors. This significant correlation coefficient appeared to also indicate that Instrument I had a notable degree of success in identification of tentatively suggested non-completers and completors.

Observations

During the Instrument I testing situation, the author observed that students who were tentatively identified as non-completers by the teacher through the use of Form Z, appeared to be restless and move about in their seats more than the other students. In some instances, these tentative non-completers voiced loud sighs and sounds of an apparent groaning nature, with accompanying comments about the "stupidity" of the test. It was observed that these students gazed around the testing area and manipulated their pencils in an apparent nervous fashion. This apparent nervous conduct oc-

curred in most cases between five and ten minutes after the test had begun, and then appeared periodically throughout the testing period of forty-five minutes. Some tentative non-completing students exhibited actions of rubbing their hands against their heads and of hitting the palm of the hand against the forehead. Some tentative non-completers were observed staring at the author with a facial expression of an apparent dislike or anger. This facial expression of apparent dislike or anger was, in most cases, followed by sighs of seeming disgust and strong negative emotional feeling.

The breaking of pencils supplied to them was also observed by the author. When this reaction did occur, the author replaced the broken pencil with a "new" one. In most cases, those tentative non-completers who broke a pencil experienced breaking a series of pencils. A number of the tentative non-completers were observed engaging in some form of verbal conversation with their surrounding fellow students. This reaction was observed taking place between five and ten minutes after the testing period began. In the instances where the tester requested the student to observe silence, the occurrence of engaging in conversation was found to appear periodically throughout the total forty-five minute test-

ing period. Tentative non-completers were observed asking questions of the author in relation to the test that did not appear necessary in view of the accompanying directions. Response from the author to these questions was always the same; "You may need to read the directions again to answer that."

The author was not aware of any of the before-mentioned activities being conducted by those students tentatively identified as completors. The activity of these students more closely resembled an apparent continuous involvement with the test, exhibited by a seemingly continuous interaction with the material of the test.

The author observed throughout the Instrument I group testing situations that the numerical composition of the group of tentatively identified non-completers was not apparently similar in relation to sex distribution to that of the group of tentatively identified completors. The total group of 62 tentatively identified non-completers tested was composed of 55 male students and 7 female students. The total group of 72 tentatively selected completors tested was composed of 33 male students and 39 female students.

Discussion of Observations

O. H. Mowrer infers that the living organism needs to

learn or gather a repertoire of responses that will reduce noxious stimuli.¹ The reactions of the non-completers during the Instrument I testing situation did appear to exhibit some of the various "rituals," or methods, acquired by the students to stave off noxious or threatening stimuli.

There appeared to be a strong relationship between the physical actions exhibited by the tentative non-completers and their assumption that Instrument I presented a dangerous or threatening situation which could provide a personal evaluation in relation to "passing" or "failing." The apparent choice of actions on the part of these non-completers seemed to be one of selection of a previously effective method. This selection was apparently made more readily because of the personality traits of these avoidance conditioned students. Some of the selected physical reactions of the tentative non-completers could have been viewed as an attempt at ego defense.

Ego defense could have been the direct cause of the apparent projection of anger on the part of some of those tentative non-completers who exhibited this reaction toward the author after the testing situation had begun. The time afforded formulating and expelling this anger did not appear to leave

¹Mowrer, Harvard Educational Review, pp. 116-17.

very much remaining time in relation to student test interaction. This reaction seemed to have a common element with the total of the viewed actions of the tentative non-completers, that of inhibiting interactions with the testing instrument.

The various degrees of inhibiting actions exhibited by these tentative non-completers in forms of apparent "stalling," "fending," or "wasting" of time appeared to be of that nature of inhibited performance related by Atkinson in his discussion of reactions to threat or failure.¹

Since these reactions of inhibition and non-completion were apparently visible in only the tentative non-completers, it then appeared that these tentative non-completers qualified themselves through reaction to, and accrued scores on Instrument I.

The observations, throughout the Instrument I group testing situations, that the numerical composition of the group of tentatively identified non-completers was not apparently similar in relation to sex distribution to that of the group of tentatively identified completors, appeared to parallel an apparently similar difference of sex distribution exhibited by the total group of non-completers and the total

¹Atkinson, An Introduction to Motivation, p. 245.

group of completors used in this study. The total group of 35 non-completors was composed of 29 male students and 6 female students. The total group of completors was composed of 16 male students and 19 female students.

Conclusions

The data gathered from the study indicates the following:

- 1.) That there appears to be a significant difference in Intelligence⁽¹⁾ and Intelligence⁽³⁾ scores between non-completors and completors.
- 2.) That there appears to be no significant difference in the Intelligence⁽²⁾ scores between non-completors and completors.
- 3.) That the teacher selection of non-completors and completors appears to correlate with the scores obtained on Instrument I.

Recommendations

The inconsistency of statistical results obtained in comparisons of mean intelligence scores and the observed reactions of tentative non-completors appears to provide a basis for the following recommendations:

- 1.) That continued research should be conducted to refine methods of comparison between non-completors and completors.
- 2.) That continued research should be conducted to investigate the validity of the test of Intelligence⁽¹⁾ and the test of Intelligence⁽³⁾

in relation to those students who exhibit the trait of avoidance conditioning.

- 3.) Further, that continued research should be conducted in relation to devising non-verbal and manipulative identification instruments, so as to more clearly identify the avoidance conditioned pupil.
- 4.) That continued research should be conducted in relation to recording and thoroughly interpreting those physical and verbal reactions of avoidance conditioned pupils during their involvement with a threatening test situation.
- 5.) That continued research should be conducted investigating the possible influence of sex in relation to the acquisition of the trait of avoidance conditioning.
- 6.) That continued research should be conducted relating the influence of repeated success to the retention or continuation of the trait of avoidance conditioning.

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APPENDIX A

FORM (Z)

FORM (Z)

Questions for Determining Completion
(for classroom teachers)

SCALE

COMPLETES:

SELDOM 1 Short Term (Daily Work)

_____all parts finished on time

SOMETIMES 2 _____followed directions given group

(1)

_____correct materials used

ALWAYS 3 _____acceptable to class standards

Long Term (Project Work - Reports, etc.)

_____all parts finished on time

_____followed directions given group

(2)

_____correct materials used

_____acceptable to class standards

(3) Over - all evaluation

COMPLETES WORK 3 2 1 DOES NOT

APPENDIX B

INSTRUMENT I

INTRODUCTION

This test has been made to determine your ability in all areas of school subjects.

You will be in competition with students selected from major areas of the United States.

The subject matter which is covered by these questions has been placed at your grade level.

You must read carefully all the directions and be sure to follow the directions exactly. If you have not followed the directions, then the answer cannot be counted as correct.

You need to work as quickly as possible.

(Please read this direction slowly and carefully.)

You may not go on to the next question until you have completely answered, according to the directions, the question that you are working on.

In other words, you must completely finish each question before you can go on to the next.

You will need to work neatly and quickly.

(Please read this direction slowly and carefully.)

You should complete as many problems as you are able to answer. Not all students will complete the same amount of problems. No one is expected to complete the total test. You may stop whenever you wish. You do not have to complete this total test to get a score.

Be sure that you completely understand the directions before you start.

If there is any doubt, raise your hand, and the teacher will help answer your questions.

Section I

Directions: Circle the correct answer.

1. Who discovered America:

1. Lincoln
2. Columbus
3. Gallio
4. Dewey

2. $3 \times 4 =$:

1. 13
2. 11
3. 12
4. 19

3. An animal which can see at night is:

1. A donkey
2. A horse
3. An owl
4. A canary

4. The first president of our country's name is spelled:

1. Washingtín
2. Washington
3. Weshington
4. Wishíngten

5. When cars are made many at a time, this is called:

1. A car pool
2. Mass production

3. Mass building
 4. Total building
6. The opposite of the North Pole would be:
1. East Pole
 2. West Pole
 3. South Pole
7. A round piece of red fruit would be (an, a):
1. Pear
 2. Plum
 3. Apple
 4. Peach
8. The person who is not president of the United States is:
1. Lyndon Johnson
 2. Thomas Hamilton
 3. Walter Reed
 4. Thomas Jones
9. At what temperature does water freeze:
1. 40°
 2. 35°
 3. 32°
 4. 39°
10. The old saying about cats is that "cats have _____ lives."
1. 3
 2. 5
 3. 9
 4. 10

Section II

Directions: Circle the answers which are not correct.

11. $5 \times 63 = :$

1. 325
2. 315
3. 305

12. A country in Central America is:

1. Paraguay
2. Nicaragua
3. Venezuela
4. Canton

13. The element hydrogen is found in:

1. Silver
2. Water
3. Coal
4. Diamonds

14. The word meaning two or twins is spelled:

1. Gimeni
2. Gemini
3. Gemeni
4. Gemene

15. A philosopher of ancient times is:

1. Strauss
2. Van Gough
3. Plato
4. Fulton

16. Cortez was an explorer who discovered:
1. The southern coast of France
 2. The eastern coast of Virginia
 3. The eastern coast of Mexico
 4. The northern coast of Canada
17. The book about the famous black horse "Black Beauty" was written by:
1. Phil Loubser
 2. Shirley Jackson
 3. Mary Pearskill
 4. Anna Sewell
18. The formula used to figure the volume of a cube is:
1. Length times the width plus depth
 2. Length times the depth plus the width
 3. Length times width times depth
 4. Depth times width plus length
19. The term used in map making to explain a line that runs from north to south is longitudinal. The term used to identify a line that runs parallel to the equator is:
1. Agreed by some but not all as litinus
 2. Sometimes called by map makers diagonal
 3. Agreed by all map makers as latitude
 4. Agreed by all map makers but not all people as zero

Section III

Directions for Section III -- In this section you are to copy the correct answers in the space below each series of answers that are given for the questions located above it. Be sure that your handwriting is clear enough so that the complete answers can be understood. Failure to have each word understood could cause loss of scoring of an answer as being correct. This would then mean that the person who is taking the test could upon the decision of the testor lose as much as that weighed question was worth.

20. In Greek legend the gods and goddesses lived in regal splendor on a mountain called Mount Olympus. The leader of this colony of gods and goddesses was:

1. The head god was a small winged man called Mercers
2. The head god was a large man called Hercules the strongest
3. The head god was a bearded one called Zeus
4. The head god was one of power and majesty called Saturn

Answer:

21. When a farmer needs to plow a field and plant it to produce a crop, he can best estimate his production of that field by:

1. First finding the volume of ground to be cultivated, then figuring the seed needed
2. First compute the perimeter and then contemplate the seed that will be needed
3. First find the area of his total field and decide the seed needed to cover that area in square feet
4. First using the total volume of seed and dividing this

volume into the area checking the tonage kinds

Answer:

22. In the study of insects which are called Arthropods, the Arthropod is distinguished from the rest of living organisms by:
1. The fact he lives in the ground and eats without using what we call hands
 2. The fact that his body is divided up into three major sections and his legs will number six
 3. The fact that he is not really a living human organism but cold blooded and below normal length of a living thing
 4. The fact that the Arthropod is not highly developed with a speaking voice and cannot communicate with other animals besides his fellow Arthropods

Answer:

23. In the famous opera, Carman, there is a main character called Carman. She is very fond of a young soldier but in the final act of the opera she decides to like:
1. The major who is better looking than the originally mentioned soldier
 2. The bull fighter who has shown Carman much more attention
 3. The local rich merchant who promised her money
 4. A tall stranger who rides, takes her home on his tall white horse

Answer:

24. In the United States, we have a financial operation which we call capitalism; this operation is best exhibited by:
1. The fact that people in our country have more money than other people in foreign countries
 2. The operation of a free ownership policy which allows the government to buy property for profit
 3. The operation of a stock market centered in New York which allows the private citizens to own large cor-

porations and if need be vote in major decisions by these companies

4. The fact that the people may vote for a president who would do the best possible job in running the country

Answer:

25. The sentence to follow has no apparent subject. "Get out of the room." The subject of this sentence would then be described as:

1. A subject that is cordial as one not needed in this type of sentence
2. A subject that is really in the sentence but hidden or in the word "room"
3. A subject which cannot be associated with sentences and called a rule and word subject
4. A subject that is called because of its absence from the sentence as understood "you"

Answer:

26. The capital of a country is usually the city or placement of a city where the official-state business is transacted; there is a country which has two capitals, this country works very well with two capitals; the country is located in South America. The reason for two capitals given by the people of the country is:

1. The country is so large that all of the people of the country must vote once a year, so they can get two capitals to work
2. The country is so hot that when summer comes, the government officials move to the capital which is in the higher mountains and cooler
3. The country is so long that the weather conditions at one end are different than the weather conditions at the the other end, and while one capital is having snow the other country is having July weather
4. The country is covered with so much grass and trees that the people cannot travel to one capital, so they have two

Answer:

27. If a farmer had a yard he wanted to dig up and put a swimming pool in, he would have to use the formula for area, times the depth to find out how much water he would need to fill his pool.

The formula for area is length times width, this must then be multiplied times depth.

The length of the pool is 30 feet.

The depth of the pool is 20 feet.

The width of the pool is 15' feet.

At 30¢ a cubic foot, how much would it cost to fill the pool half full?

1. The answer is derived by the completion of the area formula and then multiplying by the depth, taking the total and doubling it which gives a cost of \$2,700.00
2. The answer is derived by using only half of the area formula and then taking the depth quantity as a direct ratio of the total cost. This procedure will produce a sum of \$1,320.00
3. The answer is derived by using the area formulas to find a total of the area, then multiplying by the number equated to the depth; this sum is then divided by the total per cubic foot charge establishing an answer of \$2,324.00
4. The answer is derived by using the area formula and then multiply the sum allowed by the quantity specified for the depth, this total is then divided in half, the answer to this process is then multiplied by the sum of thirty cents per cubic foot which will render an answer of \$1,350.00

Answer:

28. When two objects meet at a point of impact these objects will have what research men call a positive correlation of impact forces which can be equated by various means and scales to determine their intensity; this intensity then according to elementary scientific process is:

1. An impact which by designated scale and prescribed stand and approved adjustment in the speed of object one, taken from the speed and proven for object two
2. An impact vehicle by designated scale and prescribed standizations of approved adjustment, combine the velocity of the first object, with the velocity impact of the second object provided these two objects hit in a straight line path
3. An impact which by designated scale and prescribed standization of approved adjustments contributes to the total impacts of both objects; each can be assumed to meet in an angle which will be related to a prescribed oblique
4. An impact which is not designated by any standard of measurement and, therefore, must be subject to judgment of an important person who would then place the too fatal action into a multi-lateral formula and, thereupon, subtract the relative speeds relating this sum to the land quotient

Answer:

29. The country of Vietnam located in the area of China has been in the news almost every day for the past weeks; the exact location of Vietnam is:

1. North of Malaysia, west of the Philippines, east of Madras, India, southeast of Burma and due south of Mongolia
2. North of the Philippines, west of Malaysia, east of Madras, southwest of Burma and due north of Mongolia
3. North of Burma, due east of Malaysia, west of Madras, India, south of the Philippines and east of Mongolia
4. North of the Philippines, south of Burma, west of Madras, India, north of Malaysia and east of Mongolia

Answer:

Section IV

The first five questions in the following section will deal with the material that is presented in the paragraphs which will be placed below. Please read the following paragraph slowly and carefully to get full meaning of the content and material.

New Orleans had friendly white houses that were set very neatly and orderly in rows. The streets were cluttered with carriages taking people to and from businesses and working day activities. The rolling hills of green wavy grass made a sharp line of contrast against the very pale blue sky, that exhibited puffy white clouds that floated like small cotton balls on some unseen string. The air of holiday lightened around this nineteenth century town as it went about its preparation for another successful independence celebration. The sun glittered off of dew drenched blades of grass that bent under the multi-colored drops. Small parts of leaves could be seen darting back and forth over slippery black pebbles that sprouted from between the dark clumps of grass that covered the rolling hills. Small birds were just starting to flutter from small bent branches to larger higher limbs which would afford them a better view of the surrounding countryside for the duration of the coming day. The sounds of dogs barking softly in the distance swept slowly over the small foot path that led to a large over hanging ledge which was completely covered by the early sun, a calm breeze made the small flowers bend ever so slightly as if by the force of an unseen fingertip, such was the small New Orleans town on that holiday morning.

Directions for answering questions number thirty through thirty-five. After having read the story completely so as to be able to hold the total meaning, underline the answers of the follow-

ing questions that are not correct and copy the correct answer on the back of the page.

30. In what area is the town located?

1. The town mentioned in the previous paragraph is located in the general area of the North America continent in the east section close to the Canadian border
2. This town is located in the general area of the Continental Divide, very close to the northwestern section Pacific area and is mainly a sea coast town
3. The town mentioned in the paragraph is located in the general central southeastern United States, which is located in the North American continent
4. The town mentioned is located in the central United States and can be a very lonely place in that area southwest of the Great Lake region just below the Canadian border

31. The clouds mentioned in the paragraph would by their descriptions seems to indicate that the sky that day was by the appearance it presented to the author:

1. A sky of many moods and color which blended in very closely and neatly with the rolling hills that were below
2. A sky which appeared to have strings attached that held up the hilly ragged appearance against the dark blue background
3. A sky that was lighted in color and had the appearance of suspended spheres of white billowy substances which went in contrast to the color of the terra fauna below
4. A sky which was pale, accompanied by dark shadows of gray that leaned over with a sharp extension of rocky hillsides

32. The houses in this town were described by the author of the paragraph read before hand, as setting in neat and orderly rows, the activity that took place between these rows of neat and orderly houses would be described as:

1. An activity which could only be conducted by people with special occupations or clothing, that would

allow them to do such things as clean the roads or set up work shops along side of the roads on the green rolling hills

2. An activity which could be seen as one which encompassed people who were going to and from business and working day activities that might be conducted in such a small town as this that was located in between green rolling hills as were described in the paragraph
 3. An activity which could best be described as one in which the town people had to furnish an inert urge of construction which appears by the description in the paragraph to drive them to completion of traveling task that can only be accomplished by going between the rows of friendly white houses mentioned in the paragraph
33. The holiday that appears to be coming up for the townspeople mentioned in the paragraph located at the beginning of this set of questions, is most closely related to which of the following phases of our United States history:
1. The phase of United States history which deals with our country's fight for natural vs. political borders on our lower Rio Grande territory, which at that point in our United States history was owned and populated by non-Americans
 2. That period of our country's heritage which was concerned with the social right of those of our country who were other than male and then attempt to gain the right to vote and have a voice in our country's future
 3. That period of time at which our country had to work itself into an economic and political position which would allow it to break all ties with its mother nation located on the European continent which had been opposing our being a free and separate country
 4. The phase of United States history which dealt with liberty for the people who had been the first settlers of our country and had been moved to reservations and had positions of lesser importance than they previously had

34. The town described in the paragraph which is located in a position some pages before this question was viewed as being in a certain era or section of time. This period of time could best be described in terms so as to identify it from similar periods which may have preceded it;
1. A period of time which is located for identification between the basic period identifications of the seven-teen hundred and the earlier hundreds
 2. A period of time which is located between the year of eighteen hundred and the nineteen hundreds dating the calendar as is accepted by national American standards
 3. A period of time which is designated by the years that occurred before the date designated by the initials B.C. and then reversed in order to exhibit the years shown by A.D.
 4. A period of time which is that period of time that is shown by the numerals over two thousand that increase in volume and total to an infinity
35. The story which was presented at the beginning of this series of questions would have for its title, if one were to be created from reading the complete story and then formulating a title which would contain all essentials of the over-all concepts, one which would best be expressed as:
1. A small town which cannot set itself for a holiday because the people of this small town are so busy running in the streets that they cannot concentrate on the small puffy clouds in the polished sky
 2. A small town that is set in the rolling green hills of a midwestern town gets ready for a happy new year
 3. A small town gets ready for a holiday and like small towns has as its background puffy white clouds and dark green rolling hills
 4. A small town can't get ready because the holiday is approaching so fast that its peaceful people can't move fast enough to get up and down the quiet streets which are located near the friendly white houses

Directions for Section V

Please read carefully the following paragraphs. When you have finished reading the paragraphs the first time go up to the testor; this is the person who has distributed the original test to you, and request a "note-taking sheet" number 4039721. Be sure to get note-taking sheet number 4039721 because in the second series of this test, which is a complete set of questions that have almost completely reversed sets of directions; a later series of questions in that second series of this test requests that the student request "note-taking sheet" number 4039721.4. This reverse form could very easily jeopardize your accurate scoring because of its reversal in answer formation data. Once you have obtained this "note-taking sheet" 4039721 and not "note-taking sheet" 4039721.4, you as the testee that person taking the test should read, then re-read the paragraph and make distinct notes on the terminology that is being used in the paragraph. Although the terminology is not difficult to understand for any person skilled in this area; you as a testee may find some difficulty relating the terminology to the content of the paragraph, or the paragraph to the terminology whichever might be the case in point. After completion of a detailed series of notes which have been made assimilating the definition of the word with the correct meaning of that word in the context, context meaning how the word is to be used as a word which would have full meaning if that word were completely understood, then proceed to answer the questions stated below the above mentioned previously stated paragraph. The directions for answering the series of questions entail the copying of those answers which are incorrect -- (not correct) on the reverse side of the page on which the questions have been placed. Copy the incorrect answer clearly and precisely, because as was previously stated in questions that have already been completed by you the testee, failure to copy correctly any part or word of the incorrect, in this case, answer will de-

tract from your total score which has weighed value -- proceed carefully and copy slowly so as to ensure the full credit you as a testee are afforded. If additional paper is needed to complete copying of the incorrect answers to obtain full or in this case any credit, request from the "testor," "Incorrect answer -- additional paper answer sheet" -- 104008.7. Note it is extremely important that the correct call number 104008.7 be requested because as was previously stated, a form similar in number which will be scored in an unsimilar manner. Read each of the following questions -- those which follow the paragraph which is listed below -- very carefully and decide completely that answer which seems to be completely correct then be sure to copy clearly the incorrect answers on the back of the testing sheets -- this was previously stated, but because of its urgency for "correctness" if such a word can be assimilated with that results which will be scored as correct, there is a strong need on the part of the testor to repeat only in partial form the main points of the official directions that were previously given to and read by you. If this repeat in final directions is not needed in your individual case then feel free to ignore these last few sentences you have read and proceed carefully and slowly with the reading and re-reading of the following paragraph, which you should find located at the end of these complete directions that you have carefully and slowly read. In case these directions have not been clear, it is advisable that the student re-read slowly taking appropriate notes.

Paragraphs for Section Number V

A description of the Detroit Mark Seven Overhead Loading Ramp

The "Detroit Mark Seven" overhead loading ramp could be considered by the loggers of our vast United States as a boon to their total industry. There is no doubt that the "Markeee," as it is called by those who would be designated as professional "Mark Seven" runners, is the sole reason why logging could, if all factors contained equal weight, raise the present excellent logging industry to new and even better profit and financial success. This profit and financial success would not only benefit those of the immediate industry, but as so often happens, aid in dispersing these new and unknown beforehand expanses of economic increase, to the whole of the country. (Make note of the term "Markeee" and its definition.) The Markeee has in its composite makeup far more advantages than the "Markdee," an earlier model which did not work because of overload in "gear reduction" boxes, gear reduction boxes are those boxes which aid in cutting down the work load of a machine by the use of "spline" gears; "spline" gears are those which are long and thin and which convert power from the "differential" sources, differential meaning that source which could be produced by steam or "hydro" power machines, "hydro" in this case not meaning water as is commonly associated with hydro but atomic machine, the use of this name hydro is kept only because of the extreme cost involved in changing name plates on factory engine room doors. The testee should be sure that the words "Markdee," "gear-reduction," "spline," "differential" and "hydro" have been placed on the note sheet and carefully defined for use in the on-coming questions. The testee needs to take note that from this point on, there will no longer be aids, those cues or helpful notions given to guide and encourage a testee, but rather only quotations and an underline to designate those words which need to be noted

and have accurate definitions. It is not the intention of this testing instrument to cause undue difficulty but only to create an atmosphere that will enable those being tested the full benefit of the whole or total situation.

The markeee has as its principal drive source a "Uratefled" engine, an atomic drive engine which can be contained in a square container only twenty-seven and one-half inches high and twenty-seven and one-half inches wide, this is in contrast to the "Marktee" engine, the very first engine to drive the original "Detroit Mark Seven" overhead loader; this engine had a basic steam "Obliked," obliked being defined as meaning having as steam generating source of basic carbon supplies in various shapes that can commonly be interpreted as a coal heated steam engine. The Marktee had a basic purpose but because of rapidly moving producing quotas could not be held as a permanent industrial producer. This latter fact caused some positive modifications which have held as permanent structure in the Markeee. The positioning of the third level "padrik chute," a long wide steel structure which very closely resembles a child's slide that children would slide on if they were in the area of a park which might have a slide which resembles a padrik, as some logging people have suggested the padrik came first and then the playground designers, those people who make money or have a regular income from designing playgrounds, copies the design and effectiveness for the use of children. This point is not relative to the overall discussion at hand, so it will not be discussed.

The gear reduction box is connected to the uratefled engine by a "Brown Thrash Converter Carrier Belt," a long wide belt which resembles a winding highway when viewed from a positioning which would place the viewer directly behind the "Sky Hawk III Pulley," a Sky Hawk III Pulley is a large rolling cylinder which is at the opposite end of the belt drive system, having four (4) "Downing Eleven Carrier Pulleys" in between them. The Downing Eleven Carrier Pulleys are a new addition to the Markeee. The original pulleys used on the "Markgee," the Markgee was the original experimental model which was constructed of all hand tooled parts, not that the present parts used in the Markeee are not excellent parts, this statement is made only so that positioning of production sequence can be established. The original pulleys as was previously mentioned that were used on the experimental Markgee

were too short in length and had a small circular radius. The improvements of the various years lengthened and widened the pulley cylinders and after extensive "hyperative tests," hyperative tests are those tests conducted in a "Section 409 Lab," a Section 409 Lab is one which conducts metal strain tests; therefore, hyperative tests are those tests conducted in 409 strain labs to determine stress and strain and in this case the testing was hyperative meaning the strain section of the department, hence the code number 409 meaning strain. The "Pinkee Belt," that name given the Brown Thrash Converter Carrier Belt because the only man that had faith in its final production adaptability was Marvin K. Pinkee, is the main movable part of the Markee. Located every sixteen and three-quarter inches on the belt is a "Trip Lag," a Trip Lag is a hole drilled into a belt which is then rimmed by a strong steel plate, so as to reinforce the belt and prevent tearing from strain. Inserted in every trip lag is a "Daywoodie Log Clamp," a Daywoodie Log Clamp is a strong clamp-like device that is used to secure the log to the pinkee belt. The "Woo," that is the name given the Daywoodie Log Clamp by those men who earn their life's substance from working with this type of machinery, is the key part of the Markee. The Woo, in the early days of development was attached to the Trip Lag by a brass U-bolt and copper nuts. This combination was referred to as "Slang Fixing." Production pressure caused log pressure which caused bolt pressure which caused the nut to strip, or tear off all its threads. Constant experimentation and revision created a steel-copper combination which can withstand all, and possibly more if the immediate stress would call for it, the present demands of the present production rate.

Basically then this whole operative machine is a group of pulleys which support a belt that contains clamps that hold logs in place until they are lifted to a slide which propels them into a waiting railroad car.

The whole operation employs four men, all of whom must be trained and in top physical condition to execute their responsibility. All men wishing to work on the Detroit Mark Seven Overhead Loading Ramp must take the "P.K.A.S.F." qualifying exam, this exam is defined as the pre-training knowledge and satisfactory forethought determination exam. Once the prospective candidates have passed the acceptance line on the test they are admitted to the program. The program is called

"P.K.A.T.F.," proper knowledge and satisfactory training facilitation, and consists of a thirty-two week training period, consisting of classes on basic foundation, construction and design of the Markeee. The last six weeks of this program is devoted to on-the-job training with "Agar Type 9 Logs," Agar Type 9 Logs are modifications of the original Agar Type 1 Logs, the field testing necessary and modification try-outs have produced the usable and suitable Agar Type 9, after rejecting type 2, 3, 4, 5, 6, 7 and 8, these logs are made of foam rubber. The difficult manipulation of this machine and need for exact team work can cause mistakes and errors in judgment, these errors in judgment have been the cause of logs slipping off the woo which can cause damage to machine and men. The addition of "Zeldas," Agar Type 9 Logs -- so named Zelda because of the inventor's having a pet dog named Zelda which had puppies on the day the type 9 was developed, has saved many a trainee from injury.

This over-all practice on the Detroit Mark Seven Overhead Loading Ramp may be considered very interesting by the student, but note must be made of the need for complete understanding of terminology and general content. If any part of the previously stated descriptions is not completely clear, please re-read so as to enable the correct selection from the provided alternative answers.

There will be ten questions related to the description of the Detroit Mark Seven Overhead Loading Ramp. Be sure that you as the student taking the test re-read the directions pertaining to this section of the test and completely understand them. The testor, that person administering the test may not aid or interpret any directions for your or to you, however, the case might be. If all the preceding is clear -- proceed with the questionnaire.

36. The development of the Detroit Mark Seven overhead loading ramp took many years to accomplish. The many moving parts caused its design to be extremely involved. Revision of any one part of the machine would, therefore, mean revision of the interrelated counterparts. An example of complex interrelations, even though viewed on a low level position, could be established by a re-examination of the oblied. Within the concept of this process as it could be better called, procedure for accomplishment, can be involved many smaller but still

intricately important sub-parts. Which of the following statements best illustrates a situation which might be anticipated as complex design revision:

1. A recall of the Zeldas being used in the current P.K. A.T.F. program with the intent to revise for better adaptability and usefulness so as to benefit the whole industry. The new design thereupon taking into consideration the formation of perfect impact
 2. A laboratory re-examination of the oblied, with a forwarding of responses to hyperative test conditions. The final product, or as could happen in cases of complete overhaul, partial final product therein reducing the original product by experimentation alone, and having no further need of Lab 409
 3. A recall of the Pinkee for reconstruction with a hard surface coating that would not allow anything to fasten to it, thereupon causing a super friction surface which could be designed to stop friction. This surface would then be designed to add profits and cut waste production time
 4. An on the job alteration of the Padrik, by placement of a pre-designed stud inducer over three-fourths of the total area, that final fourth to be covered by that solution or preparation that would be removed in the normal process of descent
37. The Detroit Mark Seven Overhead Loading Ramp is a machine that has no rival in the industry at this point. Its precision and intricate parts are of such design and workmanship that breakdowns because of mechanical fault are virtually unknown. The only possible reason for "in-hour," or during workday hourly productions as it is sometimes referred to, stoppage is then human error. The aspect of human error then becomes one of the most important problems to users of the Detroit Mark Seven Overhead Loading Ramp, because if this error were removed there would possibly be a machine in a commercial industry which could approach the famed perpetual motion machines that has been talked about by designers since the beginning of time. Although with all due respect to the Markeee, perpetual motion as such must be ruled out by the very presence of differential source, which by all

available definitions is not a continuous trend, but only an expendable working force. Which of the following choices then presents the answer to the question, what is the best way to eliminate human error from the operation of the Markeee.

1. A re-location of the Woo so as to place manual handling into a more mechanical nature, therein causing a reduction of error by means of a removal of substance. The Woo could be located through 409 research on a direct line with the continuing flow of directional material. This process could be tested on a pre-model of the standard Markgee
 2. Increase the passing level for the P.K.A.S.F., and add to the P.K.A.T.F. training course. The higher level could be a direct ratio situation which would be a correlation of the total of all accidents that contain the element error to the number of hours already required therein arriving at a positive factoring situation. The major program increase could be measured by that same number
 3. Double the amount of surface area allowed in the Marktee, so as to afford a more encompassing view for that man stationed near the final staging process. Lower the Zelda strength so as to remove any incident that might be caused by a removal of a Zelda from the Pinkee and replacement of that Zelda on a nearby worker
 4. Relocate the Slang Fittings so as to widen the space available for normal operations, therein reducing the possibility of error by a ratio of reduction of per day per hour log carrying power of each machine. The final loss in production time and expense could be made up from a fund established by monies not used to cover the usual bills associated with repairing those men normally injured
38. Spline size is in direct relationship to the over-all profit made. The general manager of any organization in which a Detroit Seven Overhead Loading Ramp is employed has been well informed of this situation. If this is the case in point, then which of the following selections would best describe why the individual companies do not, that is of their own accord, revamp the gear reduction

and spline size so as to add to their over-all production profit. This situation is not suggested as a recommendation but only as a testing situation, which will, through its solution illustrate a clear understanding of this single phase of a multi-faceted complex operation. The situation needs to be reviewed with the general over-all situation in mind and then acted upon after review of notes and re-reading; after completing this process, select one of the following statements to best illustrate the reason you feel best these organizations do not act upon the spline as the manner prescribed beforehand.

1. The over-all size of the spline involves large bulky machines for removal and most companies could not afford such an expense. The production of such removal equipment would outweigh the total profit
 2. The manufacturing of such a spline is so complex that only those trained and experienced men working full time in that occupation could possibly complete such a product. This factor forces a purchase of prescribed size
 3. The manufacturing of such a gear needs only raw material, but the selection of such raw material takes a trained person and that person would be too expensive. The only other possible factor would mean production of the raw material, which would cost too much anyway
39. The Uratefled has, in relation to the description already discussed, an unlimited potential. The basis for this tremendous potentiality could be seen to be in which of the following reasons? It needs to be noted that a clear relationship of the Markeee, Markdee, and Marktee along with the Markgee be understood. The correlation of this information will aid in construction of a suitable selection, but absence of a formation of a frame of reference will undoubtedly cause a misappropriation of accuracy. The Daywoodie Log Clamp need not be discussed at any length whatsoever, unless the review of component parts aids in the general construct of precepts that could be used in a relative manner to formulate the selection.
1. The potential of the Uratefled has as its basis that research which was conducted on the Markgee model and

its revisions then passed on to the Markdee model. These ramifications produced through constant observations and test and re-test can only produce a finer product and therein a finer sales item

2. The potential of the Uratefled can be related to the length of the P.K.A.T.F. program, for within every mechanical structure there lies a human element of success. The P.K.A.S.F. could also be seen as an equal contribution to success of the over-all project increasing sales and service
 3. The potential of the Uratefled can be directly related to the over-all involvement and experimental research of the Zeldas. The Zeldas are of definite necessity in practice runs such as those conducted in P.K.A.T.F. programs therein allowing more proficiency and experimentation which in the end can only aid to sales and service
 4. The potential of the Uratefled can be indirectly related to the administrative handling of the project analysis. This analysis which started with Brown Thrash Converter Carrier Belts had a very large influence on all other departments. This relationship of success in one department led to greater sales and service for all
40. Development of the Daywoodie Log Clamp contributed to experimentation as with any other part of this fascinating procedure. The Woo has a direct relationship to the Trip Lag. This relationship would be best described by selection of which of the following answers? The point to be kept in mind in this question is the major concern with the phraseology relationship. The major response should be selective, that is to say selective of a response which is of major importance in relation to the rest of the responses. The differential source can be excluded in review so as to allow for more general area exploration.
1. The Woo relates to the Trip Lag in that it sets the Trip Lag aside from the rest of the machine parts. This aside positioning causes the Trip Lag to become a part of demand which by the very sense of the word creates value. The Woo can then be seen in direct relationship to the need caused by its

removal from the general parts category, which is usually what happens

2. The Woo does not influence or have any direct relationship to the original Trip Lag but by its absence of relationship creates a vacuum which pulls the value of the Trip Lag into a cycle of plus and minus value at the same time. This value could be better illustrated by the concept of war being positive in some cases and negative in other cases
 3. The Trip Lag by its reinforcement of the Woo, so as to enable the Woo to carry a full end production, prolongs the life of the Woo therein re-establishing a profit and enhancing the total value of the machine. This relationship could be called one of reinforcement such as aiding in the act by allowing strength by presence in the total over-all picture
 4. The Trip Lag by its relation to the Pinkee enables the Woo to establish a firm association between itself and the Pinkee. This firm relationship cannot be misplaced by the positioning of the Woo or the Pinkee will tear as was originally noted in the Markgee. This relationship is then one of secure association or attachment.
41. The concept of product revamp is ever present in industry. It supplies a means to keep up with the demands of the market by altering the perspective designs that for periods have been effective. It appears then that product revamp could be illustrated throughout the production, sales and service of the Markeee. Select from the following that answer which is not an example of the policy of revamp used in the final production of the Markeee. It must be noted that selection of a correct answer consists of removing as a choice the incorrect one
1. The Hydro as a by-product of the Obliked
 2. The Markeee as a by-product of the Markgee
 3. The Agar Type 9 Log as a by-product of the Agar Type 1 Log
 4. The P.K.A.S.F. as a by-product of the P.K.A.T.F.
42. The "design appearance" of a product is of major concern. This major concern relates to the purchase of items under \$5,000.00. The Markeee will wholesale for \$140,072.00.

With these facts in mind and understanding the definition of "design appearance" to be one of making a product as colorful and well-balanced as is artistically possible, with an over-all general color codes meshing and not clashing, so as to enable quick resale or trading value, then it becomes more evident why the Detroit Mark Seven Overhead Log Loader is painted gray. If the Markeee were to be re-painted and placed in a container so as to enable its workable design to subscribe into a utility class, then which of the following statements that appear below would be true, true in this case denoting that answer which best answers the proposed question in relation to the "facts" presented at this time and at a previous section, that "section" being the original paragraph which had been previously read by the student.

1. The painting and beautifying of the Detroit Mark Seven Overhead Loading Ramp would not be plausible because by definition of the term "design appearance" the value limit is exceeded removing the Markeee from the financial level of the before stated category. This factor would produce only a negative response to any proposal which might be construed to mean anything other than negative. The only conclusion would then be to not paint the Markeee for the above stated reasons
2. The painting of the Detroit Mark Seven Overhead Loading Ramp would be a positive move because the common color of gray is not usually acceptable by businessmen in the West coast area. This failure to accept colors other than those that have usually been observed in that area, would by its very statement make the before stated painting permissible
3. The painting of the Markgee needs to be evaluated as part of the over-all decision. The first paint color, could very easily influence the decision to accept a new design or color in the area or field of investigation. Not permitting the overall painting, that is the total painting of the whole machine referred to in the statement, would then be a measure of the term "design appearance"
4. The color of the paint or type of brush to be used could very well influence the decision and the value of the brushes used could be deducted from the total

cost of the machine. If the cost of the brushes would become high enough, that is to equate a value of that stated as the basic wholesale sum mentioned in the paragraph, then the misuse of the definition of "design appearance" could be abused and justified in the situation that has just been discussed

43. Development of the Markee has had as one of its mainstays, the establishment and conversation of the Brown Thrash Converter Carrier Belt. This Pinkee has been the traditional design that has made the Markee known world over. Recognition by silhouette design has made the Markee one of the best symbols for representation of the logging industry throughout the total world. This symbol can be made by the basic interlocking of a few geometric symbols and attaching this to a colorful background. The Pinkee can, therefore, be called the design-maker of the logging industry. This belt has as its main attraction for artistic appearance the involved structure of Daywoodie Log Clamps. The question entertained here is the following: from the choices listed below, select that one which best describes the working value of the Brown Thrash Converter Carrier Belt as was described in the original statement and combined with that information that has been added by those parts presented in this question. That answer which best describes the combined value of the Brown Thrash Converter Carrier Belt would be then considered the best answer to satisfy the requirement for this part or question of the total test instrument.
1. A belt which winds on the Sky Hawk Mark II pulley system and resembles a country lane in the mid-summer morning after a colorful rain shower has turned it to mud. This loose sloshy movement has been captured on canvas by an artist who felt this symbol could be used for the sale of Care packages
 2. A belt which winds in and out of the Daywoodie Log Clamps causing a glitter of copper and steel plates; this glitter although not the glitter of gold still resembles the value of the original gold. This wearing motion has been captured on plastic so as to symbolize the clothing industry

3. A belt which resembles a winding highway that has been woven over the Sky Hawk III Pulley and is connected to the Uratefled engine. This draping and design has an artistic flavor which has been captured to be the symbol of the logging industry throughout the total world
 4. A belt which winds over and over the Padrik, forming a flavor design of a multi-loop fashion. The belt then weaves in and out of the Sky Hawk I pulley system connecting the Obliked to the gear differential box which has its own location in the over-all plan
44. Laboratory experimental work can be the major factor in the development of any type of machinery. The Markgee is an example of the basics needed to produce the systematic development of an excellent instrument of industrial service. Research and laboratory experimentation are essential in all phases of the development of any product. The question then is which of the following statements best illustrates the excellent caliber of research and experimentation needed to produce a product or type machinery, that will in the long run live up to the expectations created by the designers of the Detroit Mark Seven Overhead Loading Ramp. The essential question is then, to what degree does the before mentioned research exhibit the skill and mastery of technique needed to produce that final product. The possible selections must be viewed with a complete awareness of the total situational atmosphere of scientific theory. That selection which illustrates that atmosphere in a direct relationship to the original paragraph discussing the Markeee will then be that selection which must be selected. Read carefully all the possible selections before making a final correct selection.
1. Laboratory methods are designed that combine a padrik chute design and a Markgee reject experimental gear box, to form a pleasant looking experimental model. This model would have no ultimate usage but could add beauty to the already depleted landscape. This addition would aid sales rates
 2. Laboratory methods and design that are basic procedure for a Section 409 Lab. The improvement of an Obliked therein having a final product, such as seen in the Uratefled. The elimination of Slāng Fixing

- by quality control and complete and accurate record keeping
3. The Zeldas revision toward a heavier more weighty type model because production needs warranted the reduction of safety expenses. A complete lowering of the P.K.A.S.F. line to enable close relatives of the general manager to get into P.K.A.T.F. training program
 4. A complete laboratory revision of existing time schedules, thereby reducing the size of the spline. This process would then create the need for further research because production costs would almost double allowing more money to be spent in the research labs and general exploratory funds
45. After complete re-reading of the original paragraph, consider which of the following selections best indicates the best way to reduce the amount of danger to men needed to run the Detroit Mark Seven Overhead Loading Ramp from the point of view of a safety advisor. This safety advisor would be viewing this question, from a physical safety point of observation. This physical safety point of view is one of protecting the men involved from damage by falling objects from above. The main aspect of safety precaution is to protect men's lives and limbs, the second reason would be to aid in "on-the-job" man hours. "On-the-job" man hours or those spent on the job after those spent off the job because of accident reasons have been subtracted. Please note that the following selections should be viewed with the before stated overview in mind.
1. Place nets over the lower section of the Padrik so as to catch any Zeldas. After experimental conditions have been observed then replace the men with life-like dummies and repeat the experiment to detect the results of the impact on the net held over the before mentioned dummies. The total experimentation research would aid in the final production of an extremely safe machine
 2. Have all the men involved take a physical education training course in speed running and quick jumping. This training would aid in the development of bullet quick reactions so as to place the man in question

far from the landing spot of the falling log. The new or replacement of the physical location of the person involved would aid in muscle tone development and safety therein combining a physical fitness program and a safety program

3. Place a portable canvas chute that has been adequately greased and made extremely slippery. This slippery slide would be placed on a seventy-two degree angle. This angle would allow the clearance of the top supporting rung by exertion of about a thirty-four pound thrust of the feet against a lifting jump pad. Once the person left the chute he would speed out of the path of the falling log
4. Place steel plates over each level of the machine. These steel plates would be placed on a slight angle so as to allow the falling logs to be thrown in a random manner all over the surrounding grounds. The projected speed of these shooting logs would be decreased by covering the surface of the steel plates with a heavy rubber cushioning. This slowing of speed would enable any man passing the machine time to get clear of all the falling logs

Section VI

Questions 46-50 will relate to the following paragraph that is written below.

The term ecology is related to the field of science by the definition of the term "Ecology" as being that one which was abstracted from the Greek "Eco" which means house and "logy" which denotes study of. Science, therefore, defines ecology as the inter-action of all the sciences which would be the study of all living and non-living objects that interact with each other to aid in their own self-preservation and the balance of life. This balance of life can be easily traced to the very beginning of time when life was supposed to begin by all the correct scientific calculations with those instruments that are presently available for scientists to use. This early life was the first exhibition of the term ecology, because of its arrangement this new form of life had a survival characteristic that caused it to be in a circular form, with all the minor parts contributing to the survival of those parts which, at a very early time appeared to be the major factors of life, and have been quoted by scientists to be nearer the top of the hierarchy of life forms. This circular pattern of the little being consumed by the bigger consumers and the consumed having to balance off this loss of population by a more sharply increased population production gave us the first working model of the term ecology, which has at this present point in history been viewed as was previously stated. Ecology then means all those things which will take place within any given designated life cycle and may or may not as the case may be, include inorganic forms of matter. The point would be decided by that location and those factors which would contribute to either the exclusion of inorganic matter or the inclusion of this mentioned inorganic matter in the ecological structure.

Directions for Section VI

Re-read the preceding paragraph carefully, then read all the questions carefully. After you have a "general" idea of the questions being asked, start with question 46 and re-read carefully. Copy the incorrect answer, that which you feel is academically wrong, on the backside of the paper on which the questions and answers have been written, two times. The student should be very careful to copy the answers very carefully both times, to receive full credit. Be sure to re-read the directions if you do not clearly understand the task set before you.

46. Ecology is then best described as:

1. The situation of a farmer trying to decide which of his differential joints he should place on sale in the neighboring town bazaar, because he as a farmer would need only one spare universal joint for repair of his 1904 Ford left-hand drive tractor, and possession of more than one according to his New England heritage proves wasteful
2. The situation of a mailman trying to decide if he should take his son to the fairgrounds to shoot at clay pigeons or to the beach to eat hot dogs. He realizes as a mailman the only way to get to either place would be to walk; so he must, therefore, compute the distance before he starts on his journey, no matter which aspect of it he chooses to venture on
3. The situation of a little old grandmother trying to decide if she should go hunting for rabbit this year with a ten-gauge shot gun or a four-ten shot gun, realizing that because of the lettuce crop failure the amount of available rabbits will be far less than ten years ago. Therefore, her choice of weapons will ultimately determine how many rabbits get away and are then able to reproduce thereupon replenishing the needed supply of rabbits which would aid in the balance of nature
4. The situation of a caveman holding a family meeting to determine if any or all of his people are able by the use of an arm spear to kill enough meat for the tribe. The leader of the tribe through this type

of conversation could accurately determine if any of his clan could or would be able to remove him from his present position of authority by obeying the first law of nature that of the presented opinion that animal life is the preservation of the species by the survival of the fittest

47. Since the term ecology that is referred to in the paragraph at the beginning of this series of questions, is relative to the Greek word house the original term would have been voiced as the "house study." It then appears that the greeks have been incorporated as originators of the term ecology because they have best aided in the definition of a term which exhibits:
1. A study of all of the parts of a working machinery, that machinery being defined as one which can accomplish a given task by the involvement of energies in displacing an unmoved object, that could be of any type used in the area of field of study which is referred to as Botany
 2. A study which is called by the prefix "house," because house best describes the total environment or area of encompassment that is needed to understand only one action that takes place in a myriad of actions that comprise the complete movements of any one creature. That creature is the only object of concern within this working definition. Therefore, the original "eco" would be interpreted not as house but the object in the house
 3. A study which deals with all the necessary aspects of creating or designing a house, that could following the lines of house designs that were designated by the Greeks in their original design. The house section in this definition would then lend itself to the answerable definition by its placement of logical following in relation to the original term house or Greek house
 4. A study which has the interaction of all the scientific processes as its basic underlying premise. This study of interaction of all the sciences is best exemplified by the term "balance" because as is necessary in a well ordered life, a house balance best personifies the state of being in an equilibrium,

which would be that portion of a collection of organisms which interacted for their own basic survival and the survival of all other organisms related to that group or groups in question

48. The initial paragraph dealing with the explanation of the term ecology that is located at the beginning of this series of questions, discussed at great length the term or terms related to the positioning of the ecological cycle, if that term can be used as a synonym to cycle -- that is to roughly assimilate these two scientific words as one and to thereupon agree within most instances that the term cycle and ecology are of equal value at that prescribed time and place, then agreement can be made as to the use of cycle and ecology interchangeable in only this one situation. In an observation of the ecological cycle, using the two words interchangeably, the term ecological pattern would exhibit itself only when:
1. The complete ecological pattern could be observed as one, if it were to be called a pattern, in relation to the accepted parallel discussion to call an ecological complete foundation a cycle, and constructed so that only one phase of the interaction that was previously discussed was left out of the cycle leaving a gap of connection between the consumer and the consumed. This small gap could be adjusted by showing a side effect of added food supply that would be obtained from some outside source other than that which was located in the ecological cycle
 2. The complete ecological pattern could be observed as one which, contrary to what was previously stated by the paragraph which is located at the beginning of this series of questions, is disjointed having no connection to a cycle but by pure definition would just be assimilated to those things that happened outside the realm of the house. The ecological basis then would be one of observation of what went on outside of the cycle, which could or could not be held as equal in meaning in relation to the formation of this theory or type of answer as is herein discussed. The "eco" factor would be the observation of an external pattern outside of that pattern which was at that point of observation taking place within the cycle of ecology

3. The complete ecological pattern could be observed as one which, by its circular formation, that is theoretically circular, form a continuous cycle of events which are uniformly interconnected and joined by a bond which will cause this cycle to continue by establishing itself. This cycle is one in which all consumers and the consumed are in balance, the consumed are aided by mass production of the specie and the consumer is one which aids in the movement and development of the consumed so as to equalize the balance of the complete picture. Therefore, the cycle is one which is neither open nor closed but one which is continuous but could be broken by overload or interaction by some outside force
 4. The complete ecological pattern could be observed as one which, cannot at all be described as any type of cycle, but in reality only a production of smaller units of life which exist independently through singular and sole completion of the necessary process which enable them to survive. This theory is proven by the existence of small animals which do not need the interaction of other larger animals to survive or continue as an organism in the total picture. Therefore, the only relation would be one of existing side by side in the same area. This positioning would be the only association need in this type of theory
49. The initial paragraph discussing ecology as a positioning of life in a scientific structure, also referred to the topic of inorganic versus organic life. Although the paragraph on the ecological factors did not wholly define the term inorganic, it could be understood as an association with the concept of life and not life and would suffice for completion of this series of questions. If as was stated in the initial paragraph, the ecological cycle can exist either with the presence of inorganic structures or without the presence of inorganic structures, it becomes conceivable that the inorganic structures by their admitted lack of necessity must contribute finitely to the ecological system. Their positions in this cycle would then be described as:
1. Inorganic structures as were previously mentioned

would contain part or parts of living forms. These forms must not be an asset by their structure nor do they entrance into the cycle therein producing a negative effect. The sole use, therefore, of these inorganic materials would be assessed as a use which could not be positive but one which could only harm the complete balance of the before mentioned previous stated definition of ecology. The basic concept would then be one of inorganic mostly having only negative influence and that influence having no immediate use to the cycle as was previously described only in a negative way. Lastly, in this explanation lies the underlying definition of a substance not being useful so that by its very presence it then becomes not helpful which rules it out as being in any need position of the over-all general working definition of the first expressed, or rather assumed and then expressed, definition of ecology as being the interaction of all the sciences in a positioning of inorganic or organic nature

2. In organic structures as was previously mentioned, in relation to the total complex of ecology should be viewed, without a complex involvement in other sighted definitions therein being viewed as a position and growing life-like organism. Although inorganic cannot by its definition be defined as "life" it must be considered to grow in size by inorganic reproduction which would be a mitosis of the compositional parts through a cosmic regeneration. This regeneration could, in most cases relate to the definition of ecology which would be related to a process described as a multiplication by division and then associated addition. This factor would be the mainstay of a definition which could be accepted as one in which the above mentioned inorganic structure would grow as the inorganic but not be exactly the same, so that its growth would be natural and not of a positive or negative fact but one of an encouragement through outside interaction with the internal structure. Therefore, the inorganic structures are conceived of as encouragement but not aid, therein allowing by encouragement a growth of the over-all structure
3. Inorganic structure as was previously mentioned in

relation to the total complex of ecology appears to have as its usefulness a complex structure itself in which the ecological process can take place. This structure is a working area which may or may not, according to the direct interaction of those organic substances contained in the cycle contribute to the growth of the total ecological cycle. This inorganic structure forms a working area and/or boundaries which contain and in some cases aid in the development of the complete ecological cycle. This inorganic structure herein described as an aid and guide, or structural containment, can aid in the development of the ecological cycle by its presence and contributory functions but does not, in the "exact" definition of the term, create nourishment but does provide an enclosure which might contain the necessary structures which may or may not be part of a sustaining food chain. This inorganic matter can then be considered a part of the total cycle in that it presents the necessary containment and total enclosure in which the before mentioned ecological cycle may develop or survive. In the case of lack of continuation inorganic interference is not the cause but a break in the referred to "cycle" would be the reason

4. Inorganic structure as was previously mentioned could be conceived as the only contributing factor which allows the ecological cycle to formulate. The inorganic part of the ecology cycle would then be best described as the first and primary situation or basis for the formation of the complete ecology cycle. The over-all situation is one which shows a need for a stabilizing factor, this factor called inorganic, in this instance, contributes all the needed energies that must be compiled with over-all process. Inorganic properties have then as their positioning in the ecology a place of starting, satisfying, and completing all activities that occur within the above mentioned ecological cycle. This cycle can then be best described as a dependent situation which must have as its originator those factors or ingredients which have been best described as a dependent situation which must have as its originator those factors or ingredients which have

been best described as inorganic. Whenever ecology has to begin in a circular motion, at that point inorganic matter in some form or structure must be present or within that area previously described. This completion of location would then be the total requirement, inclusive of what was previously stated, to allow the ecological cycle to evolve

50. In reference to the original paragraph describing the Greek term ecology, ecology is commonly or technically understood as that which can best be described as interaction of all the sciences, therein lies the basis for this present question. As described in the original statement for this question, ecology is a major concern for those people or peoples who are involved in the field of science. Holding as accepted definition ecology that of "the interaction of all the sciences," then which of the following statements best describes how this interaction could, or in some cases of extreme neglect or misinformation would be dislodged or made to break its continuity or cycle. The cycle in question is that which was previously described as a continuous interaction, which in some cases of definition is referred to as that expression -- "the balance of nature." Read the following statements with the intent of extracting from their total number that one which, as was previously stated, would show this interruption or discontinuance, as a selection of that statement which was selected. The totality of all the statements that are to follow needs to be completely understood so as to be able to select and remove that one, and only one in this referred instance, from the common mass. This question may need to be re-read before going into the statements listed below; this act or occurrence with the suggestion, however, it may be viewed, and from whatever situational hierarchy is used to determine decision, will be of sole concern to the testee. It needs to be noted that from the following answers only that one which has within its confines, definition, or construct a working meaning for a discontinuance of the ecological cycle which has already previously been stated, as that of interaction of all the sciences, may be selected; this answer is then underlined and after compilation of this task those answers which could under that circumstance be considered incor-

rect will then not be copied on the back of the page, but that one which has been designated as correct will be copied on the back of the test sheet. It needs to be restated that full credit may only be provided those who fully comply with the totally described directions.

1. A small white rabbit is found near a barn by some farm boys, who were sent out to look for wood. When they pick up the small white rabbit it falls out of their hands and lands on the ground. It no longer hops as quickly and easily as it did before, seemingly because this rabbit has sprained his lower right rear leg joint. The boys then upon realization of this factor pick up the rabbit and take it home with them. In their excitement about the small rabbit they have forgotten about their original task of collecting firewood for their mother's fire. Their forgetting of firewood and their further forgetting to tell their mother that they have forgotten the firewood can be interpreted as an example of breaking the ecological cycle, because thereupon the mother will insist that they replace the small white rabbit in the area of the wood pile and then get about the task of gathering wood which was by relation to the original statement their first intended purpose. The mother's actions, those of insistence of compliance to her wishes of wood gathering then constitute a direct interference with the ecological cycle because her commands interrupted a circular action which by its very construction, that of being in a rounded form, eliminated a completion of an ecological act. That act, of course, in relation to this answer would be called a breaking of the ecological cycle, so, therefore, the cycle being broken by a lack of continuance of a natural act complies with the needed or in this case applied definition of "broken cycle."
2. A small bird is found by four small boys who are out on a cloud study project which has been assigned to them by their sixth grade teacher who has had a science unit on clouds developing for some fourteen weeks and now wishes to finish this unit with the able assistance of the before mentioned four boys. The teacher because of his location in school, that

is of being required by that city school board to remain in school after 3:30 p.m. as an instructor who can give special help to any student who might need this special help, could not possibly know that these four boys who are supposed to be studying the formation of clouds but as could be rightly construed at this point are not because of their pre-occupation with that bird, which was previously mentioned also, so he is, therefore, maintaining a false impression of the whole situation. This false impression then, as was previously described in relation to the boys studying or appearing to study, however, the actual case may be, can be in the light of the foregoing definition described as a cycle break in cognition-- or just a cycle break. This cycle break in relation to the false impression, and in this case not relation to, but substituted instead of, could be equated as an ecological cycle break because that cycle break is in relation to the final end point, one of completion of an understood task or project. The farm boys then illustrate fully and completely by their misuse of time and energy, direct or indirect, potential or actual, that force which could be wasted if the whole concept of ecology were not dealt with in a manner so designed to aid and not deter in its final completion. Herein is a situation of a science teacher, four boys and a lost bird, viewed in the before stated, previously mentioned manner, that by their very interaction prevented, not aided as could be misconstrued by any person not closely assessing the situation, a complete interaction. For total achievement of task, that action is then considered open cycled

3. A small rock is found by fourteen teachers who have been assigned by their local superintendent, not that superintendent which has power over the total state or county as is the case of some officials, but that one which by placing himself in the local district office has by his proximity been accessible to all of those teachers who might have availed themselves to the field trip. The third teacher to view this rock comments to the fifth teacher, who by her very appearance seems to be the only teacher of the group that could have in her two shoulder packs a

book that would place "light" on the rock being discussed. That rock in her possession appears to have a pink and blue strata. The group as a whole before deciding whether or not to replace the rock in its exact location or 2" to 4" further south on the gray slate boulder they found it on, decides that the rock is pink and blue, which by its very nature, that is the immediate nature of the decision, excludes all but the ninth teacher. The ninth teacher who has had some ecology and basic science structure courses, appeals to the total group for a reversal of group discussion on the grounds that pink is a color that cannot be defined in terms of dark or light hues but only as a single pink. The group then places the stone in its original position and starts down the path with a majority of thirteen trying to convince the final member that the color only aids in classification and does not establish the concrete fact. The total actions of this group would then be in keeping with the proposed example of broken cycle because the group discussion was not unified but broken by a color misunderstanding, specifically that of the hue of pink, which led to dissention of all those involved

4. A small lion cub is found by eight young boy scouts on a one-night, all day hiking trip in the midwest mountain range of our United States. The scout master is not at the rear of the column but is leading the group from the front. The small coffee-colored cub has a broken leg which appears to be causing the cub some pain and discomfort. The scout master who is at the front of the hiking line is now called by those eight boys, previously referred to as being in the back of the line, to come and aid them in selecting a suitable process of first aid for the wounded animal. The scout master is sure that the leg "fracture" as he would call it, can be treated by a local veterinarian who he personally knows could do a fine job repairing this type of break, which was originally referred to as a fracture, but now can be, as long as dual terminology is understood, be referred to as a break. The scout master informs those scouters who have gathered around him to observe the coffee-colored lion cub,

that they can be at the doctor's house in less than ten minutes if they take a short-cut through the old apple orchard, which has been unused because of lack of funds for re-establishment of leaf spraying equipment that had been ordered and never paid for because of local unrest with low-flying apple spraying planes. The complete scout troop follows the scout master, who is again in back of the eight boys who found the coffee-colored cub, those other fifty-three boys who comprise the total troop, go on to the house of the doctor previously mentioned. The doctor examines the cub, sets its leg in a micro-plastic cast and then advises the whole group that the cub may not return to the woods because one leg will be shorter than the other

Section VII

Directions: The following questions will be selected from the subject area of mathematics. The processes will be very basic. The student needs to be aware of the separate stages and their interrelationship or dependency on each other. These questions will be in the form of problems. These problems that have been mentioned will be expressed in verbal form so as to make their understanding and final computation easier. The student will need to read the problem very carefully and take notes on the problem. The notes taken on the problems will need to be carefully written so as to enable clear interpretation and deciphering. Read each of the following problems slowly and as may be needed in some acute case more than once. The answers for these problems will be stated as "selection of answers." The student is to read all the selections carefully once, then re-read the total selections possible removing those answers which do not correspond to the answer that the student has constructed and interpreted as being correct. The student is then to draw six lines under the correct answer. After the student has drawn six lines under the correct answer, the next step is to draw three lines under each incorrect answer and copy the correct answer on the back of the page three times. The lines should be drawn clearly and as straight as possible so as to enable a fair decision by that person who is scoring the test. The fair decision would relate to an unfair one in relation to ambiguity of discrimination of a six-line form from a three-line form.

These final five problems will constitute the last part of this test.

51. Seventeen boys were walking down a hill three and three-fourths miles long. On their way they passed a herd of cows that were grazing in a nearby pasture. There were

182 cows in that pasture. The boys continued on their journey and met 7 farmers sitting on a fence, the farmers have a 12 ton truck which gets eight miles to the gallon of gas. The farmers were discussing how much money they had as a total. Two of the farmers had a combined cash total of eight dollars. The other farmers had three dollars apiece. The truck that they owned had no gas in it, but a man would sell the gas at a price of 31¢ a gallon and put it in the truck for them. How many cows could be brought down the hill by truck before the farmers ran out of money? How many gallons of gas would be used up in the process and what would be the total mileage covered by the truck? The truck could carry four cows at a time and the cows were ten miles away from the point where the farmers wanted them. The truck would start from that point.

Selection of answers:

1. 140 cows, 95.6 gallons of gas, 956 total miles
 2. 153 cows, 83.4 gallons of gas, 834 total miles
 3. 148 cows, 74.2 gallons of gas, 742 total miles
 4. 172 cows, 69.7 gallons of gas, 697 total miles
 5. 130 cows, 59.8 gallons of gas, 598 total miles
52. An army cook needs to make a meal for 692 men. He has prepared a menu of chicken, potatoes, carrots, beans and corn, with pudding for dessert. Each man will eat, according to his army cook book, $\frac{1}{2}$ pound of meat, $\frac{1}{4}$ pound of potatoes, $\frac{1}{2}$ pound of carrots, $\frac{1}{10}$ th pound of beans, $\frac{1}{8}$ th pound of corn and $\frac{1}{6}$ th pound of pudding. The government figures its cost of feeding as 10¢ a pound for the total pounds of a meal. This meal will be eaten from paper cups and plates. Each cup will cost the government 2¢ and each plate will cost the government 4¢. Because he has been such a wise cook in the past, he has saved the government \$131.18 in the past four months. What would the cost of the meal be if the cook is allowed to deduct his savings from the total over-all cost? What would the meals cost if only 25¢ hot dogs were served, and finally what would the meal cost without carrots?

Selection of answers:

1. Cost minus savings-\$28.70, hot dog meal-\$173.00, cost of meal without carrots-\$140.52
 2. Cost minus savings-\$23.94, hot dog meal-\$173.00, cost of meal without carrots-\$120.52
 3. Cost minus savings-\$32.80, hot dog meal-\$182.00, cost of meal without carrots-\$172.00
 4. Cost minus savings-\$18.27, hot dog meal-\$184.00, cost of meal without carrots-\$115.38
53. One evening four students met at a local pizza parlor and decided to go on a star study. They started counting at 7:30 p.m. and stopped at 9:00 p.m. that same evening. The object of this study was not to study in the full sense of the word, but to have an activity that would involve stars. After they had finished their experiment they met again the next evening, they thereupon discussed the experimental lesson and asked the following question. How many stars were counted by all students if each student could count 147 stars every minute? How many stars would have been counted if one student stopped at 8:30 p.m. that evening? What would the total have been if two more students had joined the group that evening and six students had counted at that rate which was previously stated?

Selection of answers:

1. Total number by 4 students-80,100, total with one of four stopping at 8:30 p.m.-51,000, total with 6 students counting-120,600
 2. Total number of 4 students-74,190, total with one of four stopping at 8:30 p.m.-63,940, total with 6 students counting 182,900
 3. Total number of 4 students-88,200, total with one of the four stopping at 8:30 p.m.-74,970, total with 6 students counting-132,300
 4. Total number counted by 4 students-93,400, total with one of the four stopping at 8:30 p.m.-79,400, total with 6 students counting-104,790
54. One bright sunny afternoon A and B were walking down the path to school. The school was 14 miles from the main town. The state had a population of 147,298,073 people. The teacher has assigned a project which required that A and B work together. This was what A and B were doing

as they walk to school that bright sunny day. They had been given the assignment of finding out how many people would go on vacation if 22% of the total population of the state could go on vacation at 2-week allotments with time periods of 10 day vacation periods. The question further requests that the students find out how many people would be included in a 7% theater crowd on a Friday evening. The final question asks how many vacation hours would be accrued if half the people took advantage of this idea.

1. Total vacationing people-39,507,204, total in the theater crowd-7,409,206, if only half then-18,509,307
 2. Total vacationing people-28,406,532, total in the theater crowd-8,310,721, if only half then-12,204,406 -
 3. Total vacationing people-30,419,217, total in the theater crowd-9,210,473, if only half then-15,103,906
 4. Total vacationing people-32,405,576, total in the theater crowd-10,310,865, if only half then-16,202,788
55. One rainy day, 92 Boy Scouts went on an all-day hike. They had to carry all their food in packs on their backs. The scout master weighed all the food before they left and he found that they had 1,472 ounces of food and 7,360 ounces of camping equipment. If each scout carries his full share and the scout master walks without any load so as to be able to help anyone who might need aid or assistance then, each scout would have:
1. A food load of 18 ounces and an equipment load of 73 ounces
 2. A food load of 14 ounces and an equipment load of 12 ounces
 3. A food load of 19 ounces and an equipment load of 93 ounces
 4. A food load of 16 ounces and an equipment load of 80 ounces
 5. A food load of 25 ounces and an equipment load of 110 ounces

Incorrect Answer -- Additional Paper Answer Sheet

Number 104008.7

Note-Taking Sheet

Number 4039721

APPENDIX C

ORAL DIRECTIONS FOR INSTRUMENT I

For Instrument I

I will place a test in front of you, face down; you may not touch the test until I tell you to do so. (Put one test in front of each student) Cont.....

You will be taking a test that will put you in competition with selected groups of students from all over the United States.

Please use the pencil that I have given you to take this test.

Part of the test will ask that you write in answers-- you may print or write, whichever you wish.

You will need to work quickly and accurately to pass this test.

You may erase or change any answers that you wish. You may also go back and change any answers that you wish to. You may not get help from other persons or places.

Turn over your test papers. (Wait; check if all over.)

Place your full name and middle initial in the upper right hand corner. Now put your age in years at your last birthday and the number of months since that birthday under your name.

Now we shall read the directions of the first page together. I will read them aloud and you will read them silently.

(Read directions) -- Are there any questions? -- (Wait)

Now you may begin.....

APPENDIX D

Form Z and Legal Stop (L. S.) Scores for the Total
Number of Students Tested

<u>Student</u>	<u>Form Z</u>	<u>Legal Stop (L. S.)</u>
J.J.S.	8	10
D.R.C.	8	20
R.L.M.	8	16
R.W.H.	8	14
M.T.D.	8	13
R.J.N.	8	25
D.A.P.	8	29
E.J.H.	16	10
D.F.L.	16	19
C.A.C.	16	34
D.L.J.	16	11
T.D.A.	24	29
C.O.M.	24	27
D.R.G.	24	31
L.O.D.	24	15
S.O.L.	24	29
R.L.R.	24	34
V.L.M.	24	31
D.J.J.	24	35
A.G.M.	24	12
V.L.R.	24	29
D.D.M	24	12
P.N.W.	24	29
J.L.B.	24	30
C.D.S.	24	34
L.K.S.	24	30
G.N.E.	24	32
B.D.G.	24	11
G.P.G.	24	12
K.A.P.	24	24
D.R.W.	10	11
M.G.J.	10	12
G.A.V.	10	11
D.D.S.	13	16
T.L.G.	8	11
C.W.H.	10	13
J.J.W.	8	29
S.M.C.	16	11
D.S.W.	16	32
J.E.B.	13	30
R.J.C.	12	11
D.W.F.	14	12

(continued)

<u>Student</u>	<u>Form Z</u>	<u>Legal Stop (L. S.)</u>
J.E.G.	13	14
J.R.F.	14	13
R.L.S.	12	12
S.W.W.	16	11
D.W.P.	14	27
G.A.L.	14	15
P.A.D.	16	28
T.S.N.	16	13
L.O.I.	16	11
M.W.W.	14	12
D.P.B.	16	29
V.C.F.	14	28
B.R.F.	16	11
R.E.B.	16	30
R.K.C.	24	13
D.A.P.	24	30
J.G.S.	24	28
R.C.H.	24	28
P.A.G.	24	31
E.K.L.	24	29
S.D.P.	24	30
C.A.J.	24	30
R.R.K.	24	32
C.A.A.	24	32
B.M.M.	24	29
D.M.D.	24	31
J.L.C.	24	30
C.R.M.	24	31
M.E.G.	24	31
S.K.L.	24	31
K.L.B.	24	13
D.J.M.	24	32
S.D.D.	24	30
B.S.D.	24	32
K.S.H.	24 -	33
R.L.B.	24	32
S.L.V.	24	32
B.W.S.	24	29
G.J.N.	24	12
S.J.M.	24	30

(continued)

<u>Student</u>	<u>Form Z</u>	<u>Legal Stop (L. S.)</u>
D.C.W.	24	29
M.M.M.	16	28
R.C.W.	16	27
S.B.W.	8	12
E.M.V.	11	12
S.W.H.	12	31
T.O.G.	8	27
F.W.M.	12	12
R.E.L.	8	15
K.L.K.	12	14
J.R.P.	14	11
J.R.A.	14	30
K.S.M.	20	30
P.S.H.	24	30
S.E.L.	24	28
E.M.C.	24	32
L.L.H.	24	31
M.D.M.	24	28
T.O.H.	24	29
S.L.P.	24	29
R.T.F.	24	31
J.M.J.	24	32
M.J.G.	24	29
M.A.C.	8	14
P.B.K.	8	11
C.V.D.	8	13
M.R.M.	8	29
D.L.H.	8	11
M.G.D.	8	29
T.W.M.	16	11
J.D.L.	16	29
H.O.H.	16	13
K.M.M.	16	31
F.K.H.	16	11
R.O.Z.	8	12
C.Y.W.	8	11
B.B.C.	8	25
P.M.P.	16	29
K.M.W.	24	32
J.G.W.	24	30

(continued)

<u>Student</u>	<u>Form Z</u>	<u>Legal Stop (L. S.)</u>
R.A.S.	24	30
C.A.S.	24	31
M.A.A.	24	30
T.J.K.	24	13
P.O.D.	24	21
B.R.B.	24	32
K.E.H.	24	29
L.O.L.	24	11
M.E.W.	24	30
C.C.H.	24	30
B.L.C.	24	29
M.W.E.	24	32

APPENDIX E

FORM Z REVIEW

Non-Completers

	Selected	Qualified
School 1	11	8
School 2	27	17
School 3	11	5
School 4	<u>16</u>	<u>9</u>
Total	65	39

Completers

	Selected	Qualified
School 1	19	8
School 2	27	18
School 3	11	5
School 4	<u>16</u>	<u>9</u>
Total	73	40

APPENDIX F

Intelligence Scores Received by Non-completers and
Completers on the Otis Quick-Scoring Mental Ability Beta
Form Em Test; the Goodenough Draw a Man Test; and the
California Test of Mental Maturity

NON-COMPLETORS

<u>Student</u>	<u>Otis</u>	<u>Goodenough</u>	<u>C.T.M.M.</u>
J.J.S.	110	94	100
D.R.C.	104	83	105
R.L.M.	91	us*	nsa**
R.W.H.	105	us*	99
M.T.D.	97	102	101
E.J.H.	127	101	126
D.F.L.	102	us*	102
D.L.J.	92	87	113
M.G.J.	107	us*	105
G.A.V.	91	us*	nsa**
D.D.S.	108	us*	nsa**
D.R.W.	101	89	103
C.W.H.	106	94	nsa**
S.M.C.	115	114	123
R.J.C.	102	108	nsa**
J.E.G.	98	76	101
J.R.F.	107	94	106
R.L.S.	109	us*	nsa**
S.W.W.	101	us*	118
G.A.L.	89	us*	88
T.S.N.	122	104	125
L.O.I.	106	us*	102
M.W.W.	90	109	99
B.R.F.	99	us*	109
E.M.V.	118	102	111
F.W.M.	107	96	99
R.E.L.	113	113	nsa**
K.L.K.	114	124	120
J.R.P.	107	126	104
M.A.C.	119	137	122
C.V.D.	119	113	114
D.L.H.	104	99	98
T.W.M.	115	108	111
R.K.H.	104	81	103
C.Y.W.	119	91	120

*us - unscorable

**nsa- no score available

COMPLETORS

<u>Student</u>	<u>Otis</u>	<u>Goodenough</u>	<u>C.T.M.M.</u>
D.R.G.	123	us*	133
R.L.R.	123	119	109
V.L.M.	112	us*	108
D.J.J.	103	94	98
J.L.B.	108	us*	nsa**
C.D.S.	108	us*	123
L.K.S.	135	116	124
G.N.E.	134	97	139
D.A.P.	121	115	125
P.A.G.	119	107	132
S.D.P.	104	110	112
C.A.J.	120	us*	nsa**
R.R.K.	113	100	nsa**
D.M.D.	120	115	123
J.L.C.	110	101	123
C.R.M.	120	us*	126
M.E.G.	119	101	126
S.K.L.	129	102	130
D.J.M.	111	87	nsa**
S.D.D.	124	104	nsa**
B.S.D.	126	102	nsa**
J.S.M.	125	us*	114
B.L.B.	114	us*	nsa**
S.L.V.	121	us*	119
P.S.H.	123	113	117
E.M.C.	132	135	121
L.L.H.	123	127	99
R.T.F.	125	104	129
J.M.J.	130	121	127
K.M.W.	119	123	113
R.A.S.	121	83	126
C.A.S.	125	80	127
B.R.B.	128	98	136
M.E.W.	138	118	121
C.C.H.	117	123	125

*us - unscorable

**nsa- no score available