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A COMPARATIVE STUDY BETWEEN EGO-INVOLVEMENT AND GROUP IDENTIFICATION AS MOTIVATING FACTORS ON PERFORMANCE

by Brother Hugh

Thesis presented to the Faculty of Arts of the University of Ottawa through the Institute of Psychology as partial fulfillment of the requirements for the degree of Master of Arts.

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TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

One of the most challenging problems confronting educators today, and more particularly those on the elementary and high school level, is the case of the student possessing adequate mental ability and suitable aptitude yet failing to attain the academic standard expected of him by his teachers. Not infrequently has it been suggested that faulty or inadequate motivation is responsible for such an unfortunate situation.

Of importance are the efforts made by those in responsible positions of school administration through various testing devices to properly classify the members of a student body; of importance, too, is the task of the teacher one of whose main duties is to assure academic success through proper use of the requisite type and amount of motivation.

While scores of authors and investigators have written voluminously and experimented extensively on various aspects of motivation, yet it is the purpose of the present research to limit the scope of the field to a comparative study between ego-involvement and group identification as motivating factors on performance in scholastic endeavors.

In his main study the investigator has observed three matched groups of high school students in their reaction to three different settings; in the secondary studies an effort

has been made to indicate in broad lines how boys and girls of certain academic groups have been affected by two types of motivation.

In the opening chapter of the report the significant role of motivation in education is indicated, and the two types of motivation used in this study are defined and discussed. A critical and complete survey of the previous literature follows.

Chapter II describes the Attention Test, the instrument of the research, together with the population used in the study.

The third chapter discusses the circumstances governing the administration of the tests particularly the conditions of control both in the trial run and in the final testing.

An analysis of the data thus obtained is attempted in the fourth chapter with a view of throwing a little light on the studies mentioned above. Numerous tables have been drawn up to assist in this presentation and interpretation.

Finally a summary of the conclusions and a few suggestion for further research have been offered.

It is hoped that this study may assist in some way in improving the academic standard of some of our students.

CHAPTER I

MOTIVATION

1.- Its Nature and Importance.

At the very outset of this study it is essential to indicate briefly the nature and importance of the general topic of motivation, to define and explain the two principal terms under discussion in the investigation, and to present a review of the more significant works of research that have lead up to and inspired the present effort.

While many authors have variously defined motivational psychology, an acceptable definition is given by P.T. Young. This author has defined motivational psychology as "the study of all conditions which arouse and regulate the behavior of organisms"[1].

No one doubts that the conduct of every individual is determined by fears, purposes, rewards, and similar factors. All behavior is motivated. That psychology may be successful in its effort to guide and predict human activity, a knowledge of these various motivational forces is important. Necessarily, the effort to attempt to single out and explain

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1 P.T. Young, Motivation of Behavior, New York, Wiley, 1936, p. 45.

the multiplicity of motivational factors affecting man's behavior is a very lengthy and involved study. The present study has limited its scope to two behavior determinants that have been receiving much attention in recent years. It is the aim of the present study to indicate the comparative influence of two types of motivation, ego-involvement and group identification, upon high school students under certain controlled conditions.

2.- Ego-involvement.

Ego-involvement or ego-striving has been defined by Sherif and Cantril as "the individual's effort to place himself in those constellations of human relationships that represent for him desirable values, that will make his status or position secure"[2]. Since great individual differences are always present, just how any particular individual will react to goals set before him will depend to an extent upon the specific values he has learned to esteem. But when one is involved then his thinking and his behavior are altered. To an extent the individual becomes another person and his conduct changes during this period of ego-involvement. Each person living in a particular culture gradually acquires

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2 M. Sherif and H. Cantril, The Psychology of Ego-Involvements, New York, Wiley, 1947, p. 115.

certain attitudes towards the various institutions he comes in contact with. He holds certain attitudes towards the religious ideals of the times, towards the political and social practices of the environment he lives in, towards the type of entertainment presented for his leisure hours, and so forth. About each of these institutions he discovers that there are features that he accepts or rejects. It is the sum of all these attitudes that form the individual's constellation of human relationships. To him they represent values of various natures, and to the extent that they are obtained is the ego-striving or ego-involvement rewarded. The experimental work of various authorities in this field of study convinces us of this. Let us recall briefly a few of these studies.

In her extensive work on the level of aspiration Pauline Sears used three groups to show that the excellence of their academic performance was greatly influenced by the extent of ego-involvement[3]. Three settings were used in the experiment: for the first group there was a neutral setting; for the second group there was a success-conditioned setting; for the third group there was a failure-conditioned setting. In the group with the success-conditioned setting the children were highly praised for their effort irrespective of the

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3 P.S. Sears, Levels of Aspiration in Academically Successful and Unsuccessful Children, Journal of Abnormal and Social Psychology, Vol. 35, 1940, p. 498-536.

results achieved in the tests. In the failure-conditioned setting the children were told that their performance was much inferior to that expected of them. Her observation was that experimentally induced success greatly improved the standard of achievement of the children, and that experimentally induced failure brought about a condition of insecurity and consequently the level of academic performance dropped. Sears summed up the results of the study by stating that:

> The culture pressure to excel and to keep the performance improving, plus the cognizance of the position of the self relative to social norms, seem to account for most of the results obtained in the present investigation.[4]

Saul Rosenzweig in his experimental work in the study of repression used two groups in a recall situation[5]. One group was aroused in a personal way and the other was in a relatively neutral situation. According to the experimental method employed the subjects were asked to recall tasks they had been assigned, only half of which they had been allowed to complete. It was his observation that those who had become personally involved remembered more finished tasks,

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4 P.S. Sears, Op. cit., p. 528.

5 S. Rosenzweig, An Experimental Study of "Repression" with Special Reference to Need-persistent and Ego-defensive Reactions to Frustration, in Journal of Experimental Psychology, Vol. 35, 1943, p. 64-74.

whereas those who had not become personally involved remembered more unfinished tasks.

Working in the area of retention and recall, T. G. Alper has experimented to show that the extent of retention and recall are considerably different for subjects who are or are not ego-involved[6]. In her study she points out very clearly that the three classical laws of learning can be said to hold only when there is no ego-involvement. Commenting upon this research work, Sherif and Cantril have this observation to make:

> Alper concludes that ego-involved performances go beyond Ebbinghaus' three laws, whereas Bruner states that his results go beyond Weber's law. Variations in other psychological functions (such as "social perception") are being obtained which go beyond classical laws in those fields.[7]

In the experimental work just mentioned, the authors wish to state that the evidence they gathered showed clearly that the degree of accomplishment is constantly higher when the subjects are ego-involved than when there is the absence of any motivational determinant. This increased performance, then, explains "going beyond".

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6 T.G. Alper, Task-orientation vs. Ego-orientation in Learning and Retention, in American Journal of Psychology, Vol. 59, 1946, p. 236-248.

7 M. Sherif and H. Cantril, Op. cit., p. 129.

G.S. Klein and N. Schoenfeld performed experiments to show that unless the subjects are ego-involved they will show no level of aspiration nor set a goal or standard for their achievement[8]. They observed in part that when their subjects were in a neutral non-ego-involving atmosphere, the confidence they had in their ability to perform various tasks depended almost entirely upon the nature and difficulty of the tasks themselves, whereas in the definitely ego-involving situations a generality of confidence appeared. The fact that the subjects exerted greater effort in the second part of the experiment indicated that they were personally involved.

Selective forgetting was the field studied by R. W. Wallen to show the affect of ego-involvement[9]. A list of adjectives on which the subjects made self-evaluations was used. Later the subjects were divided into two even groups. The members of one group were informed that some acquaintance had rated the adjectives in a particular manner. Bogus ratings were likewise given to members of the second group, but in this case it was stated that the ratings were those

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8 G.S. Klein and N. Schoenfeld, The Influence of Ego-involvement on Confidence, in Journal of Abnormal and Social Psychology, Vol. 36, 1941, p. 249-258.

9 R.W. Wallen, Ego-involvement as a Determinant of Selective Forgetting, in Journal of Abnormal and Social Psychology, Vol. 37, 1942, p. 20-39.

of unidentified people. The experimenter observed that when there was an agreement in the ratings by the subject and the acquaintance the incidence of recall was considerably greater than it was when no such tendency occurred. In analyzing his findings, R.W. Wallen stated: "the difference in instructions for the two groups can be cogently interpreted only in ego terms"[10], and further that: "some assumption regarding the ego is needed in interpreting our results"[11].

In his experimental work, R.R. Holt[12] found that, if his subjects had any ego-involvement needed to perform the task, the estimates thus made of their performances were determined less by the situational variables than when there was little ego-involvement. H.B. Lewis[13] performed an experiment in which 14 subjects were given some tasks to do. Co-workers offered assistance to the subjects in the doing of these tasks. In some cases the co-worker completed the task for the individual; in other cases the subject himself finished the task. The experimenters concluded from their observations that ego-involvement is not absolutely necessary for the

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10 R.W. Wallen, Op. cit., p. 36.

11 R.W. Wallen, Op. cit., p. 36.

12 R.R. Holt, Effects of Ego-involvement upon Levels of Aspiration, in Psychiatry: in Journal of Biological and Pathological Interpersonal Relations, Vol. 3, 1945, p. 299-317.

13 H.B. Lewis, An Experimental Study of the Ego at Work, in Journal of Experimental Psychology, Vol. 34, 1944, p. 113-126.

feeling of satisfaction in completing tasks; motivation coming from the demands of the situation bring adequate satisfaction. F.J. Shaw and A. Spooner[14] performed an experiment in which 45 adjectives were given to 17 subjects. With a specified person in mind each subject checked the list of adjectives. Bogus ratings were made by the experimenters, and in 23 out of the 45 cases selections had been changed according to a prearranged scheme. These new ratings were presented to the subjects as genuine one week later. In this case the experimenters read the adjectives back to the subjects. When one more week had passed the subjects were asked to recall the adjectives they indicated on the first trial. Results showed that recall was greater in the cases where the adjective was the one they originally gave.

Other similar studies have been conducted to demonstrate that the learning situations are differently organized and produce improved results when the subjects are ego-involved.

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14 F.J. Shaw and A. Spooner, Selective Forgetting When the Subject is not Ego-involved, in Journal of Experimental Psychology, Vol. 35, 1945, p. 242-247.

3.- Group Identification.

It has been pointed out that variations in the behavior of individuals may frequently be explained by the nature and degree of ego-involvement. Group identifications and group allegiances likewise direct individuals into behavior that differs from that of society at large. First let us endeavor to define group identification, and then let us examine the experimental evidence to see to what extent the performance and general status of individuals is affected by association with reference or membership groups.

Group identification may be defined as the individual's effort or striving:

> to anchor himself with some reference group that will give him general status or with some particular membership group in which the ego can be anchored more specifically.[15]

Referring particularly to the increased influence of age mates during adolescence, C.B. Zachry makes this observation about group identification: "In the desire to be liked by his own group, the adolescent usually does his best to conform to its standards, even at considerable cost to himself"[16].

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15 M. Sherif and H. Cantril, Op. cit., p. 99.

16 C.B. Zachry, Emotion and Conduct in Adolescents, New York, Appleton-Century, 1941, p. 355.

To determine to what extent American people think in terms of group identification, H. Cantril conducted a nation-wide survey[17]. Each member of this sample of American adult population was asked two questions: "Which income group in our country do you feel that you are a member of - the middle income group, the upper income group, or the lower income group?" and "To what social group in this country do you feel you belong - middle class, or upper, or lower?" Of the 3,000 people interviewed only 3 per cent failed to identify themselves with one of the economic and social classes. It appears from this study that people readily consider themselves members of a group.

V.M. Sims performed a number of experiments to determine the relative influence of two types of motivation on improvement[18]. He took three sections with equal initial ability and treated each in a different manner. Members of the first section, which was the control group, were urged to improve in the daily test, but no information concerning the results was divulged, and no motivational factors were used. In the group-motivation section two equivalent groups

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17 H. Cantril, Identification with Social and Economic Class, in Journal of Abnormal and Social Psychology, Vol. 38, 1943, p. 74-80.

18 V.M. Sims, The Relative Influence of Two Types of Motivation on Improvement, in Journal of Educational Psychology, Vol. 19, 1928, p. 480-484.

were formed, and they competed against each other. This section was aided by the record of the scores and progress of the tests. In the third section, the individual-motivation section, the members were paired off and information concerning the progress of the partner was indicated. The investigator observed that all members in the three classes made progress, and that the greatest progress was made by members of the third section.

J.B. Maller investigated along similar lines to show that members working for a personal gain did much more effective work than those did who worked for social gain[19].

That the institution of the group has a great influence on the conduct and activities of the members even when the aims of the group are not too praiseworthy, W.F. Whyte's studies leave little doubt. Reporting on his work he states: "I found that in every group there was a hierarchical structure of social relations binding the individuals to one another and that the groups were also related hierarchically to one another"[20].

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19 J.B. Maller, Cooperation and Competition, an Experimental Study in Motivation, in Columbia University Contributions to Education, No. 384, New York, Columbia University Press, 1929, p. x-176.

20 W.F. Whyte, Corner Boys: A Study of Clique Behavior, in American Journal of Sociology, Vol. 46, 1941, p. 647-664.

That the particular social and economic group that an individual belongs to determines his perception is quite clearly indicated by a number of interesting experiments performed by J.S. Bruner and associates[21]. Using coins as stimuli, experiments were performed first with children and then with adults of widely differing social and economic levels. As a result of these experiments the investigators concluded, "For both groups the greater the value of the coin the greater the constant error of overestimation"[22], and that these results "suggest principles going beyond Weber's Law and Hollingworth's central tendency effect"[23].

Numerous other investigators have made similar studies particularly in the sphere of the level of aspiration to indicate that the effort that individuals are prepared to make and the adjustment they are prepared to undergo for improved results are determined to an extent by the groups to which these individuals are associated or to which they aspire to have membership. Frequently it has been found that although the demands made by these groups on individuals are beyond normal requirements, yet because of group allegiance the individuals are prepared to conform to the standard set by

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21 J.S. Bruner, et al., Social Value and Need as Organising Factors in Perception, in American Psychologist, Vol. 1, 1946, p. 241.

22 J.S. Bruner, et al., Op. cit., p. 241.

23 J.S. Bruner, et al., Op. cit., p. 241.

the group. In their experimental work, Gould and Lewis[24] demonstrated quite clearly that performance scores can be improved and aspiration levels can be greatly influenced by telling the subject beforehand the scores made by a certain social group on the same tests. In general, if the social group were of a higher level than that of the subject both the scores would improve and the level of aspiration would rise. Hertzman and Festinger[25] administered synonym and information tests to 20 male college students. Performance scores, aspiration estimates and difference scores between performance and aspiration were obtained. The subjects were then informed of the average performance and average estimate of a fictitious group of 50 fellow students. The performance level of the fictitious group was indicated as equal to the subject's own performance, while the estimates of the group were in the direction opposite to that of the subject. On re-testing it was found that the difference score of the subjects while remaining slightly positive were reliably reduced in magnitude. Preston and Bayton[26] administered tests in symbol-digits,

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24 R. Gould, and H.B. Lewis, An Experimental Investigation of Changes in the Meaning of Level of Aspiration, in Journal of Experimental Psychology, Vol. 27, 1940, p. 422-438.

25 M. Hertzman and L. Festinger, Shifts in Explicit Goals in a Level of Aspiration Experiment, in Journal of Experimental Psychology, Vol. 27, 1940, p. 439-452.

26 M.G. Preston and J.A. Bayton, Differential Effect of a Social Variable Upon Three Levels of Aspiration, in Journal of Experimental Psychology, Vol. 29, 1941, p. 351-369.

cancellation, and addition to 30 Negro college men. Thirty control subjects were likewise tested and told their results were the same as Negro students in three other colleges. The first group had been told their results were the same as those made by whites. Before the retesting was done, the subjects were asked to predict their minimum, maximum and actual performance. It was found that the reliability of results was very high, and that the results of the subjects were not particularly influencedby being compared to another race.

4.- The Present Study.

For the past few pages the investigator has endeavored to define and illustrate the significant terms of ego-involvement and group identification. Some of the more relevant experimental studies in connection with these two psychological concepts have been briefly reviewed and discussed. It is the aim of the present study to investigate further these two concepts. Performing the experiment under controlled conditions, the investigator endeavors to observe the influence of these two motivational factors upon high school students of boys and girls in their performance of three simple tasks presented in a manner somewhat different from that usually expected. Speaking of the term ego-involvement, M. Sherif

and H. Cantril make the following assertion, "The expression 'ego-involvements' and its derivatives have come into use in psychology during the past decade"[27].

The second chapter of this study deals with a discussion of the nature of the test employed to carry out the experimental work together with the selection of the subjects for the investigation.

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27 M. Sherif and H. Cantril, The Psychology of Ego-involvements, New York, Wiley, 1947, p. 2.

CHAPTER II

THE INSTRUMENT OF RESEARCH AND THE POPULATION

1.- The Attention Test.

To establish a comparison between the relative influences of the two different motivational determinants, the investigator selected an attention test to be the instrument of research. The attention test decided upon was the Brother Philip Attention Test[1]. As indicated in the manual that accompanies the test, "This test is designed to measure the ability to concentrate one's attention"[2]. The attention test consists of five sub-tests. For the present study only the first three sub-tests were used because in a personal letter from the author of the test dated January 15, 1952, "For an experimental study such as you have outlined for me the first three sub-tests would prove adequate to achieve your purpose without materially affecting the results".

Each sub-test consists of a number of problems to be done mentally according to definite time limits. Each subject is supplied with a printed answer form similar to the specimen shown in Appendix 2 of the present study.

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1 Brother R. Philip, F.S.C., Measurement of Attention, published doctoral thesis, in Studies in Psychology and Psychiatry, of the Catholic University of America, Vol. 2, No. 1, 1928, p. xi-81.

2 Brother R. Philip, F.S.C., Op. cit., p. 70.

The three sub-tests that comprise the attention test are: Number Span, Multiplication, Alphabet. A brief explanatory note about each of these sub-tests follows.

The Number Span consists of twenty-four problems. For each problem the examiner reads aloud a series of figures with letters among them. When the examiner gives the signal "Mark!" the subject writes down the figures in the proper sequence. The problems increase in difficulty from one figure to be remembered to nine. For scoring the test one mark is assigned each problem entirely correct.

The Multiplication consists of fifteen problems. There is a time limit to each problem. The problems vary in difficulty from the multiplication of a two-digit number by a one-digit number to the multiplication of a four-digit number by a one-digit number. All work is done mentally. For scoring this test one mark is assigned to each digit properly placed in the answer.

The Alphabet consists of fifteen problems. There is a time limit to each problem. The examiner indicates a letter in the alphabet. He then names one, two, three or four digits. The subject writes down the letters that follow in the sequence indicated by the digits. For the scoring of this test there is one mark assigned to each letter of the alphabet that is placed in the proper order.

There are A and B equated forms of the test.

2.- The Population.

For the present experimental study subjects were chosen from three high schools in Montreal. For the preliminary trial testing the students were chosen from The Cardinal Newman High School (Boys), and St. Dominic's Academy (Girls). For the final testing the subjects were selected from The Thomas D'Arcy McGee High School (Girls and Boys). The boys were selected from first and fourth year high school, whereas the girls were selected from first year high school alone.

For the primary study the entire population was divided into three matched groups, each group having an equal number of first year high boys, first year high girls, and fourth year high boys. The sub-groups were matched according to chronological age and also I.Q. as indicated in Tables I and II. To match the groups according to I.Q. the Henmon-Nelson Tests of Mental Ability were employed[2]. In the process of establishing the three matched groups it was found necessary to reject the efforts of 11 subjects because the instructions were not followed, and five copies were rejected because they interfered with the matching of the three groups.

Care was taken to see that the students were so selected that they represented the same social and economic

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2 V.A.C. Henmon and M.J. Nelson, The Henmon-Nelson Tests of Mental Ability, Houghton Mifflin, 1929.

TABLE I.- Population for the Trial Run.

Matched group[1]	Number of students[2]	Total age in years	Total I.Q.
A	28	413.67	3059
B	28	413.67	3059
C	28	413.67	3059

1 For the matched groups:
A Group with indifferent setting;
B Group with group identification setting;
C Group with the ego-involvement setting.
2 Students taken from Cardinal Newman High School, Montreal, and St. Dominic's High School, Montreal.

TABLE II.- Population for the Final Testing.

Matched group[1]	Number of students[2]	Total age in years	Total I.Q.
A	105	6504.34	11412
B	105	6504.34	11412
C	105	6504.34	11412

1 For the matched groups:
A Group with indifferent setting;
B Group with group identification setting;
C Group with ego-involvement setting.
2 Students taken from D'Arcy McGee High School, Montreal.

level. The two schools used for the trial testing are located in the same section of the city. For the final testing the subjects were selected from a school having both girls and boys.

The choosing of pupils from the grades indicated was determined from studies conducted by F. Goodenough. This author makes this observation of the basis of standard studies in America:

> Girls, on the average, earn their most highly feminine score on the M-F test when they are in the eighth grade; boys make their most masculine score during the third year of high school. Roughly, these periods correspond to the usual age at the attainment of puberty.[3]

The academic years referred to above have their counterpart in grades first and fourth high respectively in the school system in vogue in Montreal. The selection of these academic years enables the investigator to make the primary study in the three settings and at the same time suggest possibilities for further study.

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3 F.L. Goodenough, Developmental Psychology, New York, Appleton-Century, 1945, p. 486.

CHAPTER III

THE ADMINISTERING OF THE TESTS

1.- The Three Settings.

In the previous chapter we have discussed the instrument of research together with the population to be used. We shall now go on to describe the administering of the tests by examining the formulations for the three settings, the conditions of control employed, the trial run, and lastly the final testing.

Previous to the actual administering of the attention tests, there was read to each group a formulation. The assumption was made that if a strong effort were made to have conditions as nearly uniform as possible in all the experimentation, the differences in test scores on performance would be attributable then to the influence of the motivational formulation. The investigator felt that whereas several studies had demonstrated that an increase in motivation was accompanied by increased learning of new material, an increase in motivation need not necessarily bring about improved performance of some academic skill.

Necessarily, these formulations must have present in them such elements as would conform to the definitions discussed in the first chapter of the present study. To test

the efficacy of these formulations, they were first used on the trial subjects, and then with slight modifications they were used on the final experimental group. The final drafts of the three formulations are to be found in Appendix 3 of the present study.

Group A, the control group, was given the first formulation. The subjects in this group were simply told, "Today we are going to do a few short tests. Get ready!"

Group B listened to the second formulation, the one for the group identification setting. In this case an effort was made to establish a certain esprit de corps among the members of the group, to convince them that their effort as individuals would contribute to prove the superiority of their group over the other competing groups. To help the subjects acquire this common spirit it was mentioned in the formulation that the group attaining the highest average would have its name (not the names of the individuals composing it) prominently displayed in the school bulletin board. For the final testing the group reward was changed to having the name of the winning group published in the school paper. The idea of group was mentioned ten times in the two-minute motivation talk.

Group C was given the third formulation before performing the tests. For the subjects in this group, an effort was made to ego-involve them by the use of enhanced motivation.

The subjects were reminded that they were striving for success for themselves; that their success during their school days as well as in later life depended upon their ability to focus their attention on the problems facing them. The reward, (or perhaps the penalty), offered to the individuals forming this third group was that the results of the present test would be made available to the principal and that he may pass them on in letters of reference and so forth as he sees fit or that he may use them as a basis for determining the extent to which extra-curricular activities may be engaged in. The length of this talk as well as the number of times the motivational appeal was stressed were the same as those of the previous talk.

Briefly, these are the formulations used in the present experimental study. The two questions which the experimenter asked then were: Will a change in the type of motivation improve the performance of the subjects in this type of attention test, and if so, to what extent? And, which particular group or groups are mostly influenced by the types of motivational stimuli used?

2.- Conditions of Control.

That the data resulting from the testing might have a reasonable degree of reliability and validity, particular care was taken to have conditions as nearly uniform as possible in all the experimentation. The time of day, the amount of time given, and the initial practice of every subject were closely the same. As previously indicated the groups were matched for age and intellectual quotient. Therefore many sources of spurious correlation were eliminated. In the following few paragraphs, however, are mentioned a few precautionary measures taken to assure reasonable standardization of the conditions governing the administering of the tests.

After considerable practising, both the formulations and the attention tests themselves were put on tapes, and a tape recording machine was used throughout the experiment. The voice used was one not familiar to the subjects performing the tests. A stop watch was used for determining the time limits of the problems in the Multiplication and Alphabet tests. The necessary introductory directives explaining the nature of the test together with the use of the blackboard were reduced to a minimum.

Care was taken to alert the teachers of the pupils being tested about the nature of this comparative study, and that a judicious silence on their part was important.

Since all the calculations performed by the subjects were mental, it was found necessary to have the students hold their pencil in the air when not actually being used in recording an answer to a particular problem. No repetitions of questions were allowed.

Both Form A and Form B of the attention test were utilized. The scoring of the tests was done conformably to the directions indicated in the manual[1]. The scoring was checked by a fellow-teacher to guard against mechanical error.

These include a few of the necessary precautionary measures to be followed in conducting an experimental study of this nature. Needless to say, the cooperation of the teachers and the students was encouraging.

3.- The Trial Runs.

It is standard procedure in an experimental study of this nature to conduct trial runs not only to test the power and efficacy of the formulations, but also to observe what mechanical difficulties may present themselves in the

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1 Brother R. Philip, F.S.C., Measurement of Attention, published doctoral thesis, in Studies in Psychology and Psychiatry, of the Catholic University of America, Vol. 2, No. 1, 1928, p. 77.

administering of the attention tests. The trial runs were conducted in different institutions from that of the final testing. The results are recorded in Table III of the present study. No major modifications in the experimental design were found necessary, but some minor changes were implemented in the final testing. Briefly indicated in the following paragraphs are some changes that it was found advisable to make.

Two criticisms could be leveled at the formulations. First, the formulations for the group identification and for the ego-involvement were found to be somewhat lengthy. This was indicated by the fact that the subjects seemed to become distracted after about two-thirds of the statement had been given. The time of these formulations then was reduced from the original three minutes to two minutes. Secondly, in the text of these formulations there were five words or phrases that were not readily grasped by the subjects. This was made apparent by a discussion with the students after the testing had been completed. These words or phrases were promptly eliminated from the text, and in their place were substituted expressions more readily understood by the subjects.

The volume of the recorder had to be moderated and the speed had to be adjusted according to the time limits set down in the manual. In one instance the results were rendered useless due to the oversight of leaving part of the alphabet

TABLE III.- General Frequency Distribution of the Results of the Trial Runs.

Intervals	Frequency by Group			Totals
	A	B	C	
105-109			1	1
100-104			1	1
95-99			1	1
90-94	1	1	3	5
85-89		1		1
80-84	3	1	3	7
75-79	1	1	5	7
70-74	1		1	2
65-69	2	5	3	10
60-64	6	5	1	12
55-59	3	6	5	14
50-54	4	3	3	10
45-49	4	1	1	6
40-44	2	3		5
35-39		1		1
30-34	1			1
Number	28	28	28	84
Mean	59.85	60.40	72.70	66.30
Sigma	13.90	12.95	16.35	15.65
σ_M	2.67	2.49	3.14	3.01

on the blackboard exposed to the students. It was found advisable to allow much more time for an adequate explanation of the Alphabet test which the subjects found quite complicated; this was clearly revealed to be the case by the results.

Briefly, these are some of the difficulties encountered in the administering of the attention tests in the trial runs. Adjustment was promptly made to remedy the difficulties in preparation for the final testing.

4.- The Final Testing.

There was a considerable time interval between the trial runs and the final testing. This afforded an opportunity to implement the various modifications found necessary in the trial runs, and also to prepare matched groups from the larger population as indicated in the early part of this study. The formulations finally adopted were the ones that appear in Appendix 3. The results of the final testing are recorded in Table IV.

It is the purpose of the following chapter to analyze and to try to interpret the data indicated in Table IV.

TABLE IV.- General Frequency Distribution of the Results of the Final Motivation Testing.

Intervals	Frequency by Group A[1]	B[2]	C[3]	Totals
105-109			3	3
100-104	1	1	7	9
95-99	1	1	7	9
90-94	4	7	6	17
85-89	6	7	10	23
80-84	7	6	8	21
75-79	7	8	8	23
70-74	10	9	9	28
65-69	8	9	8	25
60-64	9	9	7	25
55-59	7	5	7	19
50-54	8	9	9	26
45-49	9	8	9	26
40-44	6	10	5	21
35-39	12	10	2	24
30-34	7	3		10
25-29	3	3		6
N	105	105	105	315
Mean	59.57	61.59	71.62	64.50
Sigma	19.05	19.08	19.20	19.90
σ_M	1.85	1.86	1.87	1.12

1 Group with the indifferent setting.
2 Group with the group identification setting.
3 Group with the ego-involvement setting.

CHAPTER IV

ANALYSIS OF THE DATA

1.- Precautionary Remarks.

We have discussed at some length the administering of the attention tests, both to the trial populations and to the final groups, under certain conditions of control, according to the three motivational settings. This final chapter will deal with the analysis and interpretation of the data that have been collected. An effort will be made to analyze the data for the primary study, and then some general indications concerning the secondary studies will follow.

Precautions in interpretation are, of course, mandatory. One basic consideration to be borne in mind is that since both the instructions and the tests were given by the group method, not the individual method, the findings must be interpreted on the basis of the group not of the individual. In other words, we shall note that the ego-involvement affects the members of the group. The data do not permit us to determine how it affects each individual. Some subjects may have been more affected by group identification than by ego-involvement. But, as we shall see, we may infer that ego-involvement was more effective, but we are not justified in concluding that all individuals would be influenced in this way.

For the major study we shall make reference to Table VI; for the secondary studies, to Table VII. Table V deals only with the trial runs.

2.- The Primary Study.

Table IV shows the means for the three groups were 59.57, 61.59, and 71.62 respectively, i.e. out of a total of 123 responses, Group A answered correctly on an average of 59.57 times; Group B, 61.59 times; and Group C, an average of 71.62 times.

When "t" scores were computed between the means of the three groups, differences beyond the 1% level of confidence were found between Groups A and C (4.58), and Groups B and C (3.80). No significant difference however was found between Groups A and B (.77). (See Table VI). The abbreviated form of the "t" score was used with the intention of making any necessary corrections. The effect of using the abbreviated form instead of the complete one is that it is smaller than it should be. For the "t" scores 4.58 and 3.80, they are already large enough for significance. Increasing their size would only increase their significance. For the "t" score of .78, it is so small that in doubling or trebling it would not bring it up to significance.

While it must be admitted that these differences are small, however the superior performance of Group C could have

TABLE V.- "t" Scores Calculated from the Three Academic Groups in the Trial Run.

Motivation Group	A[1]	B[2]	C[3]
A[1]		.08	3.12
B[2]	.08		3.07
C[3]	3.12	3.07	

1 Group of students in the indifferent setting.
2 Group of students in the group identification setting.
3 Group of students in the ego-involvement setting.

TABLE VI.- "t" Scores Calculated from the Three Academic Groups in the Final Testing.

Motivation Group	A^1	B^2	C^3
A^1		.77	4.58
B^2	.77		3.80
C^3	4.58	3.80	

1 Group of students in the indifferent setting.
2 Group of students in the group identification setting.
3 Group of students in the ego-involvement setting.

come about less than one time in 100, had chance factors alone been operating.

Since the experimental design of matched groups was utilized, we must make the assumption that the groups did not differ significantly on any variable affecting the measured response. The fact that the groups were matched for age and intelligence quotient validates this assumption.

Let us then assume that the groups were initially equal on all variables affecting the initial response. It is necessary then to account for two phenomena: the failure of the group identification motivational talk to bring about improved performance in Group B, and the average gain of 3.81 points by subjects of Group C.

The fact that there was no difference between Groups A and B indicates that there is no difference in performance on the attention tests given under conditions of group identification and ordinary testing conditions; or that there was no difference in degree of motivation of the two groups. Three possible explanations might be advanced to account for the similar performance of these two groups:

1. The ideas presented in the motivation talk may not have been acceptable to members of Group B. This would have the affect of equalizing the motivation level of Groups A and B.

2. Members of Group C may have been at an already high level of motivation to which little could be added. This, again, would have had the affect of equalizing motivation of these two groups.

3. In order for performance to be improved, it is not sufficient to speak in terms of the group and what advantages might accrue to it, but there must already be present within the group some elements that unite the members. It appears, therefore, that the sense of group membership was not strongly experienced.

Credence is given to this last point of view when the performance of Group C is taken into consideration. If we accept the view that motivation in Group B is equivalent to that of Group A, then we might attribute the average gain of 3.81 in Group C to the fact that the motivational talk to Group C was such as to evoke a powerful reason for sustained effort. It was observed that the test proved particularly affective in determining concentrated attention beyond the normal requirements when the more difficult problems were confronted. It was especially towards the end of the attention tests that this became apparent.

Although it must be admitted that the differences between the groups were slight whether enhanced motivation was given or not, yet the implications are rather clear. Since, in routine classroom procedure, knowledge is imparted

to a great extent through group instruction, one might presume that group identification is necessarily the most affective way of obtaining improved performance. This need not be the case. On the other hand it is encouraging to feel that ego-involvement when used under certain conditions has the affect of making for improved performance.

We might ask, 1) How permanent are the affects of ego-involvement? Are we merely observing a temporary adjustment of students to conditions favorable solely to their own interests rather than to the developing of improved attention habits? 2) Might not group identification if used under different conditions prove just as effective and have more enduring results? Supplementary studies would have to be undertaken to arrive at a satisfactory understanding of these problems.

3.- The Secondary Studies.

Percentage increase figures were calculated to show the general tendency of the secondary studies. From Table VII it is observed that of the three academic groups performing the attention tests, the boys of first year high school were more influenced by the group identification statement than were the other two academic groups; likewise, the performance of this same academic group showed greater improvement after the ego-involvement. Further research would have to be undertaken to evaluate the significance of these general observations.

TABLE VII.- Percentage Increase Attained by the Three Academic Groups in the Three Motivational Settings, in the Final Testing.

Academic Group	A[1]	B[2]	C[3]
First year high school (boys)	5.31	24.91	18.61
First year high school (girls)	2.45	21.53	18.63
Fourth year high school (boys)	2.11	20.30	17.81

1 Percentage increase of the results from the indifferent setting to the group identification setting.
2 Percentage increase of the results from the indifferent setting to the ego-involvement setting.
3 Percentage increase of the results from the group identification setting to the ego-involvement setting.

CONCLUSION

To determine to what extent high school pupils were influenced by two different types of motivation, attention tests were administered under three settings: the first setting was the indifferent one, the second the group identification, and the third ego-involvement.

After the tests had been administered, "t" scores were computed with results as follows: a "t" score of .77 was found between the group with the indifferent setting and the group with the group identification; a "t" score of 3.8 was found between the group with the group identification and the group with the ego-involvement type of motivation; a "t" score of 4.58 was found between the group with the indifferent setting and the one with the ego-involvement. In the last two cases the scores are significant.

Precautions in the interpretation of the results are mandatory. Since both instructions and tests were given by the group method, not the individual method, the findings must be interpreted on the basis of the group, not the individual. The data do not permit us to determine to what extent the motivational factor affected each individual.

The low "t" score between the group with the indifferent setting and the one with the group identification form of motivation might appear surprising, and may be accounted

for as follows: first, it is possible that the motivating elements composing the statement in the group-identification were not acceptable to the students; secondly, perhaps the members of the indifferent setting group were already at a high level of motivation, but there is no reason to suspect that this was the case, particularly when we consider the superiority of the ego-involvement group over the other two.

The tests proved particularly effective in determining concentrated attention beyond the normal requirements, especially when the more difficult problems were faced. This was observed when the end of the test became apparent.

For the secondary studies, percentage increase figures were calculated. The following observations were made: the boys of first year high school were more influenced than either the first year high school girls or fourth year high school boys by the group identification statement; this same group was also most effected by the ego-involvement statement; the fourth year high school boys were least effected by the group identification statement. However, for the secondary studies, these figures are just indications, and further studies would have to be undertaken before the full significance of these findings and the accompanying interpretation is substantiated or refuted.

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APPENDIX I

Specimen of

The HENMON-NELSON TESTS OF MENTAL ABILITY

Form C

Patented March 19, 1929. Also Licensed under U.S. Patent 1,586,628

Edited by Frank L. Clapp, Professor of Education
University of Wisconsin

THE HENMON-NELSON TESTS OF MENTAL ABILITY — Form C

High School Intelligence Tests . Grades 7-12

By V. A. C. Henmon, Ph.D., Professor of Psychology and Director of Educational Guidance, University of Wisconsin, and M. J. Nelson, Ph.D., Dean of the Faculty, Iowa State Teachers College, Cedar Falls, Iowa

Date October 15, 1953 Pupil Lee Hanna
Date of birth June 13, 1938 Age 15 Grade 4-13 Score 63 I.Q. 116 M.A. 17-10

DIRECTIONS TO THE STUDENT: The three Practice Exercises in the next column at the right are given so that you may see how to do the test. Read each one carefully and mark the answer that you think is right.

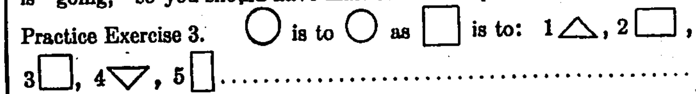
5 blue 1 2 3 4 5

You are to mark in the square which has the same number as does the word that tells what it is boys like to play. This word is "ball." You make a mark like this X in the square that contains the 1, because the number of the word "ball" is 1.

Practice Exercise 2. I am ...... down town. A word for the blank is: 1 able, 2 see, 3 country, 4 going, 5 color 1 2 3 4 5

Mark in the square that you think should be marked. The right word is "going," so you should have marked in the square numbered 4.

Practice Exercise 3.



The answer, of course, is number 3, since a circle is to a smaller circle as a square is to a smaller square.

If you find that you have made a mistake and marked in the wrong square, do not erase, but simply draw a circle around it and then mark in the right square.

Boston : New York . Chicago **HOUGHTON MIFFLIN COMPANY** Dallas . Atlanta : San Francisco

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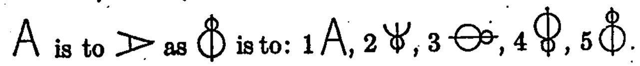
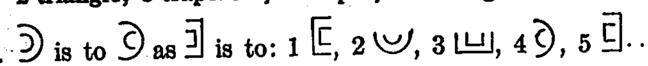
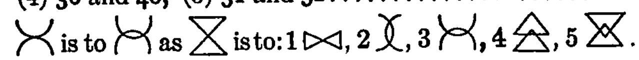
1. We all .... that he accompany us. A word for the blank is: 1 afflicted, 2 insisted, 3 referred, 4 vanished, 5 compared 1 2 3 4 5
2. If the letters r u t a n a l were arranged properly, they would spell: 1 nocturnal, 2 lantern, 3 rational, 4 talent, 5 natural 1 2 3 4 5
3. 1, 3, 5, 7, ..., ..., 13. What two numbers should be on the dotted lines? (1) 8 and 10, (2) 10 and 12, (3) 11 and 12, (4) 9 and 11, (5) 9 and 10 .... 1 2 3 4 5
4. Which word does not belong with the others? 1 cornet, 2 trombone, 3 clarinet, 4 band, 5 oboe 1 2 3 4 5
5. Which word does not belong with the others? 1 river, 2 beach, 3 lake, 4 brook, 5 ocean 1 2 3 4 5
6. 
7. 1, 7, 13, 19, ..., ..., 37. What two numbers should be on the dotted lines? (1) 27 and 33, (2) 25 and 31, (3) 24 and 30, (4) 26 and 29, (5) 28 and 35 .... 1 2 3 4 5
8. If the letters l e t e r a were arranged properly, they would spell: 1 later, 2 elated, 3 rattle, 4 elevate, 5 relate 1 2 3 4 5
9. Which word does not belong with the others? 1 square, 2 triangle, 3 trapezoid, 4 ellipse, 5 rectangle 1 2 3 4 5
10. 
11. 4, 8, 12, 16, 20, 24, ..., ... What two numbers should come next? (1) 25 and 26, (2) 26 and 28, (3) 28 and 32, (4) 28 and 24, (5) 20 and 16 .... 1 2 3 4 5
12. floated sky clouds great across masses blue of the If these words were arranged to make a good sentence, what would be the word after "masses"? 1 blue, 2 of, 3 the, 4 sky, 5 floated 1 2 3 4 5

20. Which word does not belong with the others? 1 house, 2 factory, 3 residence, 4 home, 5 dwelling place 1 2 3 4 5
21. The outline is too vague to .... the shape. A word for the blank is: 1 summon, 2 resist, 3 indicate, 4 cause, 5 ordain 1 2 3 4 5
22. 2, 9, 16, 23, 30, ..., ... What two numbers should come next? (1) 35 and 42, (2) 39 and 46, (3) 37 and 44, (4) 36 and 40, (5) 31 and 32 .... 1 2 3 4 5
23. 
24. Poem is to poet as portrait is to: 1 sculptor, 2 architect, 3 painter, 4 musician, 5 historian 1 2 3 4 5
25. If the letters s t r e p d i n e were arranged properly, they would spell: 1 presented, 2 depressed, 3 prescind, 4 president, 5 dispenser 1 2 3 4 5
26. Observe is to watch as demonstrate is to: 1 illustrate, 2 proof, 3 demonstration, 4 work, 5 discern 1 2 3 4 5
27. 43, 37, 31, ..., ..., 13. What two numbers should be on the dotted lines? (1) 27 and 21, (2) 25 and 19, (3) 26 and 20, (4) 25 and 24, (5) 24 and 18 .... 1 2 3 4 5
28. My father's son's sister may be my daughter's .... 1 uncle, 2 aunt, 3 cousin, 4 grandmother, 5 niece 1 2 3 4 5
29. Listless means: 1 systematic, 2 accurate, 3 loathsome, 4 enthusiastic, 5 indifferent 1 2 3 4 5
30. Sorrow is to weeping as joy is to: 1 crying, 2 happiness, 3 laughter, 4 tears, 5 success 1 2 3 4 5
31. The daughter of my uncle has a brother. My father is her brother's .... 1 grandfather, 2 great-uncle, 3 cousin, 4 uncle, 5 nephew 1 2 3 4 5
32. Ignorance is to fear as knowledge is to: 1 regret, 2 assurance, 3 superstition, 4 intelligence, 5 hope 1 2 3 4 5
33. The ranks were .... by desertions. A word for

Pupil: Lee Han — Date: October 15, 1953 — Age: 15 — Date of birth: June 13 1938 — Grade: 4-13 — Teacher: Brother Lenell — School: D'Arcy McGee

2. If the letters ... were arranged properly, they would spell: 1 nocturnal, 2 lantern, 3 rational, 4 talent, 5 natural 1 2 3 4 5

3. 1, 3, 5, 7, . . ., . . ., 13. What two numbers should be on the dotted lines? (1) 8 and 10, (2) 10 and 12, (3) 11 and 12, (4) 9 and 11, (5) 9 and 10 . . . . . 1 2 3 4 5

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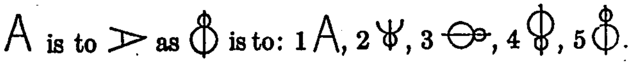
5. Which word does not belong with the others? 1 river, 2 beach, 3 lake, 4 brook, 5 ocean 1 2 3 4 5

6.  1 2 3 4 5

7. 1, 7, 13, 19, . . ., . . ., 37. What two numbers should be on the dotted lines? (1) 27 and 33, (2) 25 and 31, (3) 24 and 30, (4) 26 and 29, (5) 28 and 35 . . . . . 1 2 3 4 5

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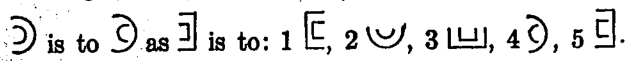
10.  1 2 3 4 5

11. 4, 8, 12, 16, 20, 24, . . ., ... What two numbers should come next? (1) 25 and 26, (2) 26 and 28, (3) 28 and 32, (4) 28 and 24, (5) 20 and 16 . . . . . 1 2 3 4 5

12. floated sky clouds great across masses blue of the If these words were arranged to make a good sentence, what would be the word after "masses"? 1 blue, 2 of, 3 the, 4 sky, 5 floated 1 2 3 4 5

13. Good is to bad as often is to: 1 seldom, 2 happen, ...

14. If the letters n u r e g o s e were arranged properly, they would spell: 1 regiment, 2 nitrogens, 3 generous, 4 renegades, 5 surgeon 1 2 3 4 5

15. "Strike while the iron is hot" means about the same as: 1 "Haste makes waste," 2 "Better late than never," 3 "Take advantage when the opportunity presents itself," 4 "Might makes right," 5 "True gold fears no fire." 1 2 3 4 5

16. 19, 19, 16, 16, 13, 13, . . ., ... What two numbers should come next? (1) 9 and 9, (2) 11 and 9, (3) 10 and 10, (4) 12 and 12, (5) 13 and 8 . . . . . 1 2 3 4 5

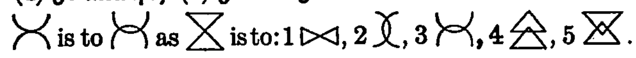
17. If the letters t a r a m n l e were arranged properly, they would spell: 1 terminate, 2 material, 3 natural, 4 lantern, 5 maternal 1 2 3 4 5

18. In settling the dispute they finally agreed on a: 1 contention, 2 convoy, 3 cynic, 4 precinct, 5 compromise. 1 2 3 4 5

19. My mother's niece is my brother's . . . . 1 aunt, 2 nephew, 3 cousin, 4 sister, 5 niece 1 2 3 4 5

... 4 cause, 5 ordain 1 2 3 4 5

22. 2, 9, 16, 23, 30, . . ., ... What two numbers should come next? (1) 35 and 42, (2) 39 and 46, (3) 37 and 44, (4) 36 and 40, (5) 31 and 32 . . . . . 1 2 3 4 5

23.  1 2 3 4 5

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27. 43, 37, 31, . . ., . . ., 13. What two numbers should be on the dotted lines? (1) 27 and 21, (2) 25 and 19, (3) 26 and 20, (4) 25 and 24, (5) 24 and 18 . . . . . 1 2 3 4 5

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29. Listless means: 1 systematic, 2 accurate, 3 loathsome, 4 enthusiastic, 5 indifferent 1 2 3 4 5

30. Sorrow is to weeping as joy is to: 1 crying, 2 happiness, 3 laughter, 4 tears, 5 success 1 2 3 4 5

31. The daughter of my uncle has a brother. My father is her brother's . . . . 1 grandfather, 2 great-uncle, 3 cousin, 4 uncle, 5 nephew 1 2 3 4 5

32. Ignorance is to fear as knowledge is to: 1 regret, 2 assurance, 3 superstition, 4 intelligence, 5 hope 1 2 3 4 5

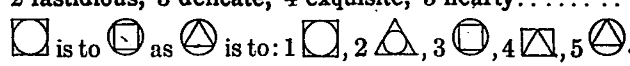
33. The ranks were . . . . by desertions. A word for the blank is: 1 depleted, 2 accustomed, 3 arranged, ...

34. 729, 243, 81, 27, . . ., ... What two numbers should come next? (1) 9 and 3, (2) 26 and 25, (3) 20 and 13, (4) 19 and 11, (5) 9 and 7 . . . . . 1 2 3 4 5

35. To aggravate is to: 1 irritate, 2 amass, 3 applaud, 4 release, 5 supplant 1 2 3 4 5

36. A deputy is: 1 a commission, 2 a voting district, 3 an agent, 4 an argument, 5 a uniform 1 2 3 4 5

37. Which word does not belong with the others? 1 dainty, 2 fastidious, 3 delicate, 4 exquisite, 5 hearty 1 2 3 4 5

38.  1 2 3 4 5

39. 22, 25, 27, 30, 32, 35, 37, . . ., ... What two numbers should come next? (1) 42 and 45, (2) 41 and 44, (3) 45 and 47, (4) 40 and 42, (5) 39 and 42 . . . . . 1 2 3 4 5

40. "An ounce of prevention is worth a pound of cure" means about the same as: 1 "Don't cry over spilt milk," 2 "A miss is as good as a mile," 3 "Discretion is the better part of valor," 4 "Don't cross a bridge until you come to it," 5 "A stitch in time saves nine." 1 2 3 4 5

Do not open the Answer Booklet.

2 involved, 3 entangled, 4 expeditious, 5 complicated.. [1] [2] [3] [X] [5]

42. Club is to member as hand is to: 1 arm, 2 feel, 3 finger, 4 body, 5 work..... [1] [2] [X] [4] [5]

43. Astronomy is divided into three departments of theory, ..., and computation. A word for the blank is: 1 observation, 2 stars, 3 machines, 4 telescopes, 5 astronomers..... [X] [2] [3] [4] [5]

44. A half dollar is equal to 2 quarters or 5 dimes. A half dozen quarters are equal to how many dimes? (1) 30, (2) 12, (3) 15, (4) 100, (5) 150..... [X] [2] [3] [4] [5]

45. A commendable person is: 1 beginning, 2 talkative, 3 praiseworthy, 4 formidable, 5 important..... [1] [2] [X] [4] [5]

46.  is to  as  is to: 1  , 2  , 3  , 4  , 5  ..... [1] [2] [X] [4] [5]

47. 10, 7, 9, 6, 8, 5, 7, 4... What number should come next? (1) 6, (2) 8, (3) 10, (4) 4, (5) 5..... [1] [2] [3] [X] [5]

48. Vague is the opposite of: 1 ambitious, 2 poor, 3 opaque, 4 definite, 5 insincere..... [1] [2] [3] [X] [5]

49.  is to  as  is to: 1  , 2  , 3  , 4  , 5  [1] [2] [3] [X] [5]

50. Concentrate is the opposite of: 1 think, 2 taste, 3 owe, 4 rebuild, 5 disperse..... [1] [2] [3] [4] [X]

51. An arbitrator is one who: 1 hesitates, 2 intervenes, 3 teases, 4 votes, 5 arrests..... [X] [2] [3] [4] [5]

52. A demure person is always: 1 modest, 2 buoyant, 3 intelligent, 4 ill, 5 dependable..... [1] [2] [3] [4] [5]

53. 8, 4, 2, 1, 1/2, ..., ... What two numbers should come next? (1) 1/4 and 1/6, (2) 1/3 and 1/4, (3) 1 and 1/2, (4) 1/4 and 1/8, (5) 2/3 and 3/4..... [1] [2] [3] [X] [5]

54.  is to  as  is to: 1  , 2  , 3  , 4  , 5  ..... [X] [2] [3] [4] [5]

55. From a class of 20, 15 per cent of the pupils were absent one day. How many were present? (1) 15, (2) 17, (3) 3, (4) 7, (5) 5..... [1] [X] [3] [4] [5]

56. 3, 9, 12, 36, 39, 117, ..., ... What two numbers should come next? (1) 120 and 360, (2) 120 and 234, (3) 234 and 236, (4) 351 and 354, (5) 121 and 363..... [1] [2] [3] [4] [5]

57. "Still waters run deep" means about the same as: 1 "Water is the best of all things," 2 "After rain comes sunshine," 3 "Rashness is not valor," 4 "The more understanding the fewer words," 5 "He that seeks finds." [1] [2] [X] [4] [5]

58. to and should we ourselves clear definite language accustom If these words were arranged to make a good

65. A desert always has: 1 a lack of vegetation, 2 an oasis, 3 nomads, 4 camels, 5 palm trees..... [X] [2] [3] [4] [5]

66. How many pints are there in 1 gallon and 1½ quarts? (1) 7, (2) 9, (3) 11, (4) 15, (5) 19..... [1] [2] [X] [4] [5]

67. 74, 63, 52, ..., ..., 19. What two numbers should be placed on the dotted lines? (1) 41 and 29, (2) 41 and 30, (3) 42 and 31, (4) 43 and 32, (5) 39 and 28..... [1] [X] [3] [4] [5]

68. A palette is used by: 1 carpenters, 2 artists, 3 musicians, 4 lawyers, 5 doctors..... [1] [X] [3] [4] [5]

69. Disapproval is to censure as approval is to: 1 success, 2 favorite, 3 commend, 4 reprehend, 5 satisfaction.... [1] [2] [3] [4] [5]

70. 625, 125, 25, 5, ... What number should come next? (1) 1, (2) 2, (3) 3, (4) 4, (5) 0..... [X] [2] [3] [4] [5]

71. Vivacious means about the same as: 1 intelligent, 2 animated, 3 sarcastic, 4 courageous, 5 moody ..... [1] [2] [3] [X] [5]

72. On a true-false test a boy missed 4 questions, but had an accuracy of 75% How many questions did he answer correctly? (1) 30, (2) 16, (3) 12, (4) 9, (5) 8.... [1] [2] [X] [4] [5]

73. Discreet means: 1 wasteful, 2 attentive, 3 continuous, 4 remorseful, 5 prudent..... [1] [2] [3] [4] [X]

74. Square is to cube as circle is to: 1 sphere, 2 ellipse, 3 oval, 4 rectangle, 5 curve..... [X] [2] [3] [4] [5]

75.  is to  as  is to: 1  , 2  , 3  , 4  , 5  ..... [1] [X] [3] [4] [5]

76. A terse style of writing is: 1 emotional, 2 mechanical, 3 unsatisfactory, 4 concise, 5 ironical ..... [1] [2] [3] [4] [5]

77. A craven is a: 1 bird, 2 fish, 3 vase, 4 coward, 5 desire [1] [2] [3] [4] [X]

78. newspapers delicacy reticence want there of in the and is a If these words were arranged to make a good sentence, what would be the word after "a"? 1 want, 2 newspapers, 3 delicacy, 4 reticence, 5 there..... [1] [2] [3] [4] [5]

79. More is to much as elder is to: 1 old, 2 most, 3 older, 4 very much, 5 eldest..... [1] [2] [3] [4] [5]

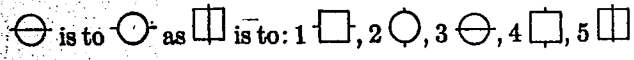
80. A person who has ability along many lines is said to be: 1 ambiguous, 2 deceitful, 3 contrary, 4 versatile, 5 depressed..... [1] [2] [3] [X] [5]

81. 5, 10, 12, 24, 26, 52, ..., ... What two numbers should come next? (1) 54 and 104, (2) 54 and 56, (3) 53 and 55, (4) 104 and 106, (5) 54 and 108..... [1] [2] [3] [4] [X]

82. In a spelling test a girl had 18 words right, giving her an accuracy of 75%. How many words did she *miss*? (1) 8, (2) 6, (3) 3, (4) 4, (5) 9..... [1] [2] [3] [4] [5]

83. "A smooth sea never made a skilful mariner" means

48. Vague is the opposite of: 1 ambitious, 2 poor, 3 opaque, 4 definite, 5 insincere

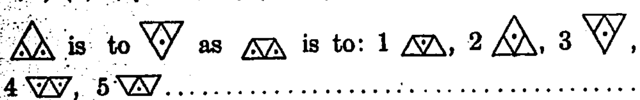
49. 

50. Concentrate is the opposite of: 1 think, 2 taste, 3 owe, 4 rebuild, 5 disperse

51. An arbitrator is one who: 1 hesitates, 2 intervenes, 3 teases, 4 votes, 5 arrests

52. A demure person is always: 1 modest, 2 buoyant, 3 intelligent, 4 ill, 5 dependable

53. 8, 4, 2, 1, 1/2, . . ., . . . What two numbers should come next? (1) 1/4 and 1/6, (2) 1/3 and 1/4, (3) 1 and 1/2, (4) 1/4 and 1/8, (5) 2/3 and 3/4

54. 

55. From a class of 20, 15 per cent of the pupils were absent one day. How many were present? (1) 15, (2) 17, (3) 3, (4) 7, (5) 5

56. 3, 9, 12, 36, 39, 117, . . ., . . . What two numbers should come next? (1) 120 and 360, (2) 120 and 234, (3) 234 and 236, (4) 351 and 354, (5) 121 and 363

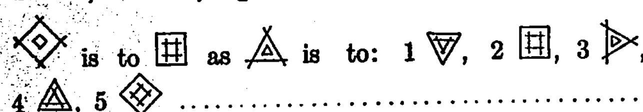
57. "Still waters run deep" means about the same as: 1 "Water is the best of all things," 2 "After rain comes sunshine," 3 "Rashness is not valor," 4 "The more understanding the fewer words," 5 "He that seeks finds."

58. to and should we ourselves clear definite language accustom If these words were arranged to make a good sentence, what would be the first letter of the word after

59. Water is twice as heavy as a certain kind of wood. Iron is 14 times as heavy as the wood. Iron is how many times as heavy as water? (1) 7, (2) 12, (3) 14, (4) 16, (5) 28

60. Pride is to victory as humility is to: 1 defeat, 2 modesty, 3 achievement, 4 conceit, 5 violence

61. The niece of my daughter's grandmother is my . . . . : 1 aunt, 2 cousin, 3 grandchild, 4 daughter, 5 sister

62. 

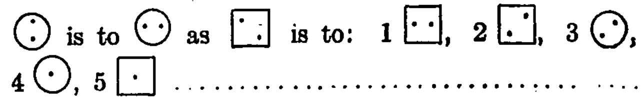
63. meaning picture artist's look the his in for If these words were arranged to make a good sentence, what would be the first word in the sentence? 1 meaning, 2 his, 3 artist's, 4 picture, 5 look

64. "They'll ride a free horse to death" means about the same as: 1 "Money is the root of all evil," 2 "All lay loads on the willing one," 3 "Time is money," 4 "Experience is a dear teacher," 5 "Rashness is not valor."

Go on to the next column without stopping.

73. Discreet means: 1 wasteful, 2 attentive, 3 continuous, 4 remorseful, 5 prudent

74. Square is to cube as circle is to: 1 sphere, 2 ellipse, 3 oval, 4 rectangle, 5 curve

75. 

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79. More is to much as elder is to: 1 old, 2 most, 3 older, 4 very much, 5 eldest

80. A person who has ability along many lines is said to be: 1 ambiguous, 2 deceitful, 3 contrary, 4 versatile, 5 depressed

81. 5, 10, 12, 24, 26, 52, . . ., . . . What two numbers should come next? (1) 54 and 104, (2) 54 and 56, (3) 53 and 55, (4) 104 and 106, (5) 54 and 108

82. In a spelling test a girl had 18 words right, giving her an accuracy of 75%. How many words did she *miss*? (1) 8, (2) 6, (3) 3, (4) 4, (5) 9

83. "A smooth sea never made a skilful mariner" means about the same as: . . . 4 "Trust your sail when the wind is fair," 5 "A rolling stone gathers no moss."

84. 7, 5, 8, 6, 9, 7, 10, ... What number should come next? (1) 7, (2) 10, (3) 8, (4) 11, (5) 5

85. Make a cross in the square that contains the number which is as much greater than 3 as 4 is less than 6

86. A vestige is a: 1 gift, 2 garment, 3 presentiment, 4 release, 5 trace

87. Humble is the opposite of: 1 reticent, 2 brave, 3 arrogant, 4 eloquent, 5 reserved

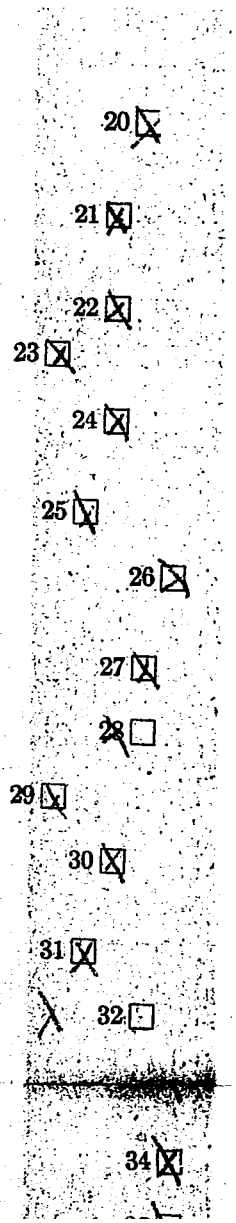
88. To vilify means to: 1 slander, 2 clarify, 3 anger, 4 rectify, 5 augment

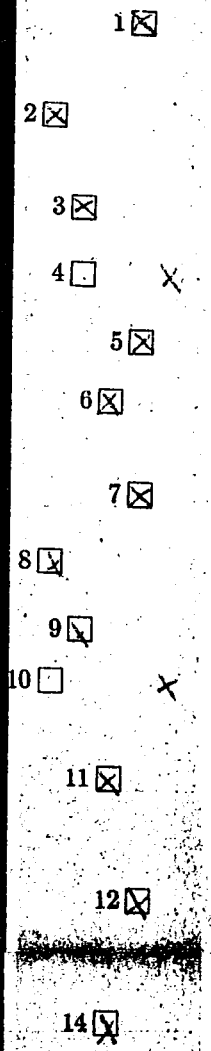
89. A book of the New Testament is: 1 Proverbs, 2 Genesis, 3 Deuteronomy, 4 Corinthians, 5 Job

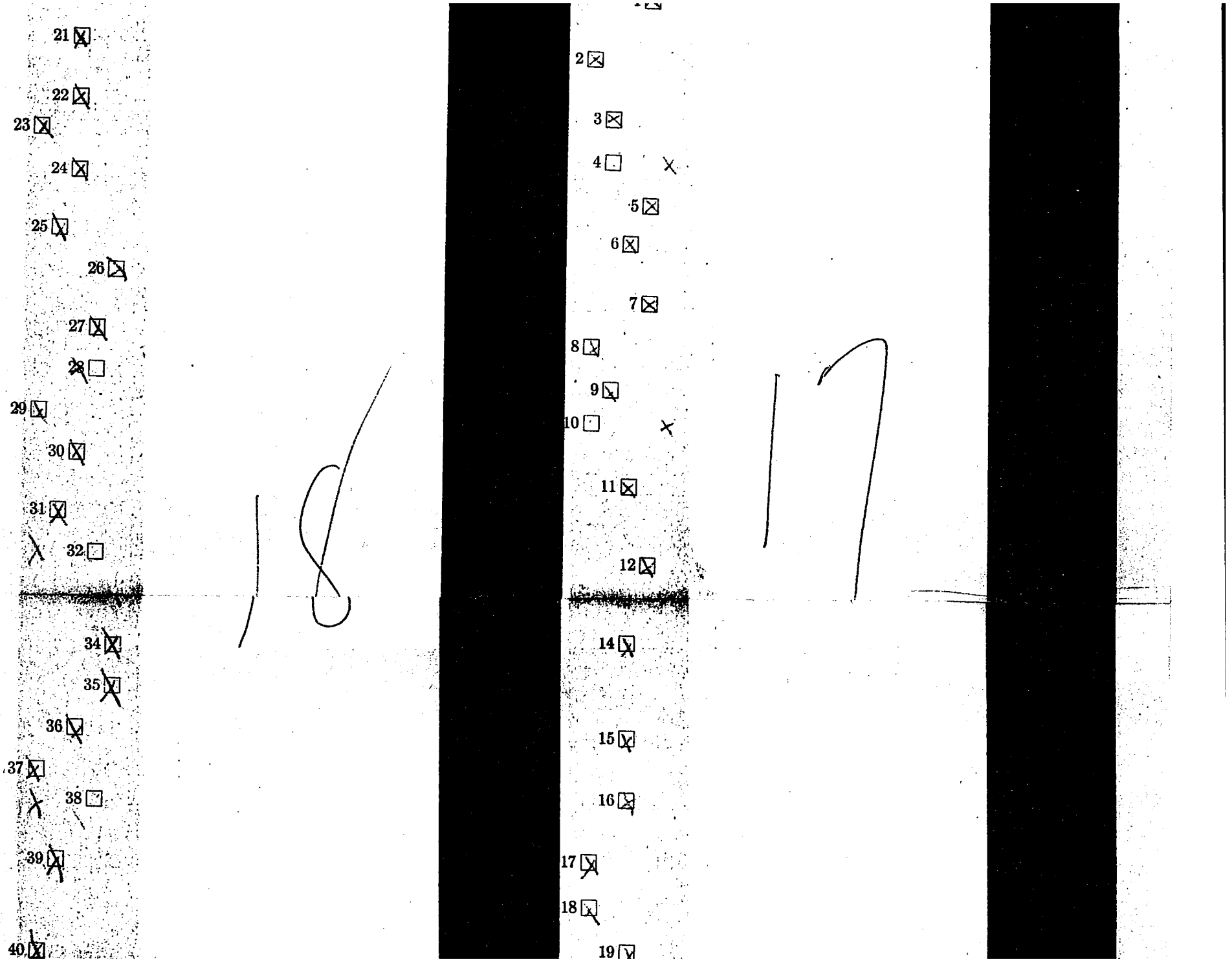
90. Ambiguous is the opposite of: 1 definite, 2 small, 3 genuine, 4 enigmatic, 5 perpetual

The End. Look back over your work.

To find the score, count the squares that are marked out, omitting those that are circled.



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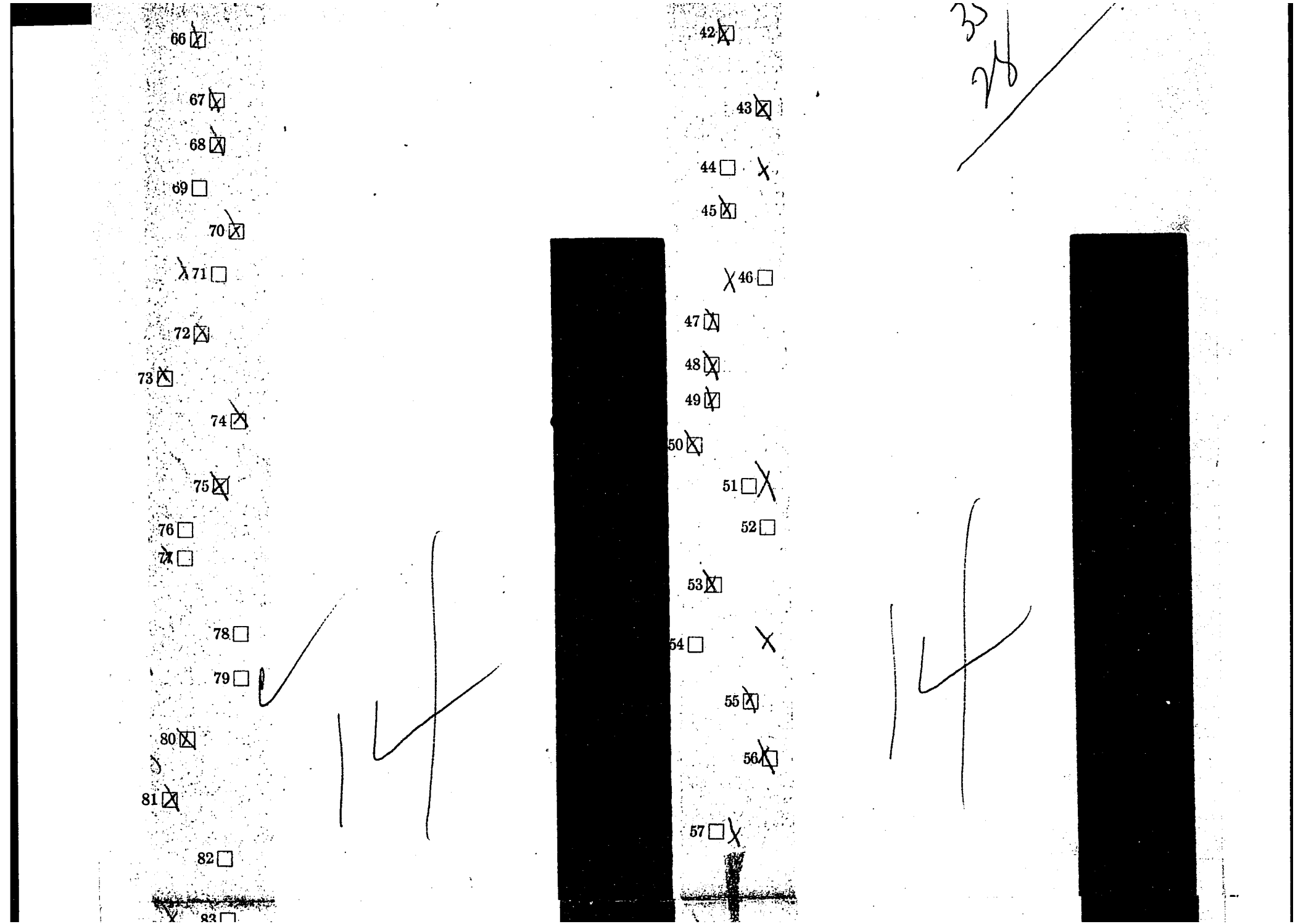
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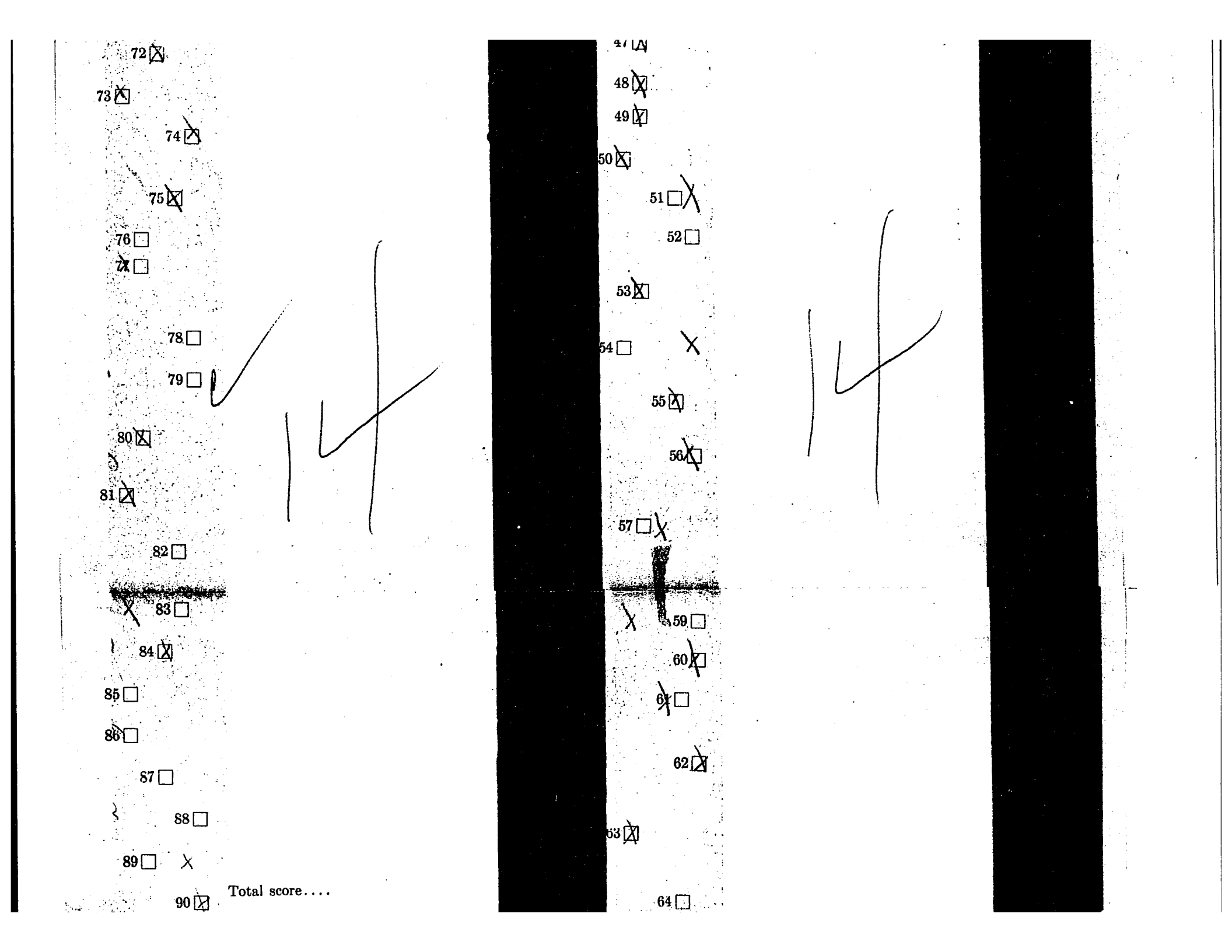
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APPENDIX II

Specimen of

The ATTENTION TEST

Form A

[illegible] FORM FOR THE ADAPTATION OF THE [illegible] GIVEN TO PUPILS OF THE THOMAS D'ARCY McGEE MEMORIAL HIGH [illegible] IN CONJUNCTION WITH EXPERIMENTAL WORK ON MOTIVATION

Name: LeBlanc (Family) Maurice A. (Christian) Date: December 4, 195[illegible]

PRACTICE EXERCISES

I. Number Span		II. Multiplication		III. Alphabet	
1) f9n	9	1) 23 x 4	92	1) d8	g
2) x7j	7	2) 42 x 3	126	2) n3	p
3) w6f4x	~~64~~ 64	3) 68 x 9	612	3) h35	kp

THE TEST

Number Span		Multiplication	Alphabet
5 ✓	13) 96485 ✓	1) 84 2	1) e 1
2 ✓	14) 35629 ✓	2) 73 1	2) r 1
8 ✓	15) 29748 ✓	3) 64	3) w 1
73 ✓	16) 23596	4) 258 1	4) jr 2
96 ✓	17) 745926 ✓	5) 753	5) ko 2
58 ✓	18) 628374 ✓	6) 768 3	6) ty 2
649 ✓	19) 359467	7) 3902 3	7) dhk 3
463 ✓	20) 743265	8) 4172 2	8) lns 3
837 ✓	21) 9386274 ✓	9) 3755	9) suy 3
3925 ✓	22) 2867934	10) 1582 1	10) gjoq 4
2653 ✓	23) 83945762	11) 2675	11) losu 4
8374 ✓	24) 738264925 ✓	12) 2742	12) npux 4
12 ✓	7	13) 68364 3	13) jlqtx 5

APPENDIX III

FORMULATIONS

For the Three Settings

Today we are going to do a few short tests. Get ready!

Seldom are you given an opportunity to compare yourselves with others in a situation that is related to school work. But today you are being given that very opportunity. Short tests are being administered to nine groups in competition with each other, and you form one of the nine groups. The other groups in this competition are being taken from _____ year and _____ year. Consequently, as you are doing these tests, frequently call to mind that each time you give a correct answer, you help your group that much more in its effort to establish its superiority over the other eight. The other groups are being duly informed of this arrangement. The name of the winning group will be listed in the next issue of the school paper. Loyalty to the group is an admirable virtue, and this occasion will give you a golden opportunity of putting your loyalty to the test. Remember that your companions are counting heavily on you to put forth your best effort. Prove that your group is outstanding, and that you are a worthy member of it. Do your best to make this group the envy of the school.

Today you are going to do a series of short tests to find out just how great your powers of concentration are. Many people share the opinion that your personal success both in school as well as in later life depends to a great measure upon the extent to which you have developed this ability of concentrating your attention on the problems that face you. The goals that you set for yourselves will see their realization only if you allow no other factors of minor importance to divide your attention. Like the majority of people you are most anxious to have your personal efforts crowned with success. Your ability to give your undivided attention to the problems confronting you will assure you of such success. Since those who employ others are fully aware of this, it is my intention to make available to your principal the results of these short tests, that he (or she) may, in turn, conveniently pass them on in letters of recommendation and the like, to the firm that is considering employing you. May I encourage you, for your own good, to do your very best on these tests that your chances of personal success may be the greater.

APPENDIX IV

Raw Data

TABLE VIII.- Raw Data Consisting of Scores Made by First Year High School Boys on the Attention Test.

Group A[1]		Group B[2]		Group C[3]	
90	55	93	58	103	68
89	52	93	56	103	66
87	51	90	54	100	64
84	49	88	53	98	63
83	46	86	49	96	59
81	45	85	49	95	59
78	43	81	46	91	56
77	40	81	44	91	54
75	39	78	42	88	52
72	38	76	42	86	52
71	37	74	40	84	50
69	37	73	40	83	50
66	36	69	39	79	49
65	35	69	39	79	49
63	33	66	36	76	46
61	32	65	36	75	45
60	32	63	35	73	44
57	31	61	35	71	43

1 Group with the indifferent setting.
2 Group with the group identification setting.
3 Group with the ego-involvement setting.

TABLE IX.- Raw Data Consisting of Scores Made by First Year High School Girls on the Attention Test.

Group A[1]		Group B[2]		Group C[3]	
91	55	93	56	103	67
88	54	90	54	101	66
86	53	87	54	98	66
85	51	86	53	98	64
82	49	84	50	94	61
80	48	82	49	93	61
79	45	80	47	91	57
76	43	77	45	89	56
74	42	76	43	86	54
73	39	75	40	86	52
70	37	71	39	82	49
68	36	69	38	81	49
67	33	69	34	79	45
64	31	66	32	77	44
62	30	63	32	74	42
61	27	62	29	74	40
59	26	61	27	71	38
58	25	60	25	71	36

1 Group with the indifferent setting.
2 Group with the group identification setting.
3 Group with the ego-involvement setting.

TABLE X.- Raw Data Consisting of Scores Made by Fourth Year High School Boys on the Attention Test.

Group A[1]		Group B[2]		Group C[3]	
100	66	102	68	109	80
96	64	98	66	109	77
93	63	94	64	107	77
91	60	92	61	104	73
87	58	89	60	101	72
84	57	86	59	97	70
82	54	83	55	96	68
78	52	79	53	91	65
75	51	77	53	89	65
73	48	75	50	86	61
72	46	73	47	86	60
71	45	72	46	85	58
70	42	72	44	85	54
70	41	72	43	84	54
69	39	70	40	84	52
69	38	70	39	83	49
	38		39		48

1 Group with the indifferent setting.
2 Group with the group identification setting.
3 Group with the ego-involvement setting.

APPENDIX V

AN ABSTRACT OF

A COMPARATIVE STUDY BETWEEN
EGO-INVOLVEMENT AND GROUP IDENTIFICATION
AS MOTIVATING FACTORS ON PERFORMANCE

AN ABSTRACT OF

A Comparative Study Between Ego-Involvement and Group Identification as Motivating Factors on Performance[1]

Of the numerous motivational variables that influence human behavior, the present investigation has endeavored to limit the scope of study to ego-involvement and group identification.

To determine to what extent ego-involvement and group identification are effective motivational determinants, attention tests were administered under conditions of control to three groups of high school students matched according to age and I.Q. One group was put in an indifferent setting; a second group was put in a group identification setting; a third group was put in an ego-involvement setting. Formulations containing essential elements of the motivational factors were given to the students prior to testing.

"t" scores were computed and revealed the following: a "t" score of .77 was found between the group with the indifferent setting and the group with the group identification; a "t" score of 3.8 was found between the group with

---

1 Brother Hugh, A Comparative Study Between Group Identification and Ego-Involvement as Motivating Factors on Performance, M.A. thesis presented to the Institute of Psychology of the University of Ottawa, Ottawa, 1954, vii-62 p.

the group identification and the group with the ego-involvement type of motivation; a "t" score of 4.58 was found between the group with the indifferent setting and the one with the ego-involvement. In the last two scores the difference was significant.

An effort is made to account for these differences.

Suggestions for further study are made for academic groups and the two sexes.