A Study of the Effect of Private Test Interpretations on the Self-Understanding of Students' Abilities as Measured by the General Aptitude Test Battery

Thomas Sullivan
Western Kentucky University

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A STUDY OF THE EFFECT OF PRIVATE TEST INTERPRETATIONS ON THE SELF-UNDERSTANDING OF STUDENTS' ABILITIES AS MEASURED BY THE GENERAL APTITUDE TEST BATTERY

A Project

Presented to

the Faculty of the Department of Counselor Education

Western Kentucky University

Bowling Green, Kentucky

In Partial Fulfillment

of the Requirements for the

Educational Specialist Degree

by

Thomas G. Sullivan

July, 1973
A STUDY OF THE EFFECT OF PRIVATE TEST INTERPRETATIONS ON THE SELF-UNDERSTANDING OF STUDENTS' ABILITIES AS MEASURED BY THE GENERAL APTITUDE TEST BATTERY

Director of Project

Dean of the Graduate College

Approved

Date

Approved

Date
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CHAPTER I

INTRODUCTION

Background of the Problem

Historically, the major concern of educators has been to assist each student to develop his potential. The schools have concentrated on facilitating the development of students in the following areas: social, emotional, intellectual, and vocational abilities.

In 1900, 80 percent of the high school graduates went on to college and completed a degree. Today, seventy-three years later, 60 percent go to college and only 17 percent complete a B.A. degree.1 Today, the pendulum of concern is swinging towards increased emphasis on facilitating the vocational development of each student. A societal attitude, still prevalent today, evolved that saw the college degree as the best and surest route to occupational success. This resulted in considerable emphasis being placed on intellectual, social, and emotional development. "When only one-third can try and less than one-sixth attain what more than nine-tenths regard as the optimal

1Kenneth B. Hoyt et al., Career Education--What it is and how to do it (Utah: Olympus Publishing Co., 1972), pp. 22-29.
pattern of education as preparation for work, \(^2\) it is inevitable that the majority must be dissatisfied with their lot. \(^2\) 'When 83 percent of the total population is regarded as second class citizen, \(^3\) it is easy to understand the unrest in our country today. The problem comes into focus more clearly when we realize that vocational schools can only accommodate 25 percent of our population—leaving 75 percent to either go to college, quit school, enter the service, or enter the labor force as unskilled. \(^4\) Another fact is that four out of every ten students quit school before they can acquire a marketable skill—thus, usually becoming a burden to society. \(^5\)

The role of work in man's life is becoming a major concern both to society and professional educators. Terms, such as career awareness, career orientation, exploration, and preparation are being introduced as a result of recent interest in career education. The preparation of each student to enter the world of work or into higher education training is a goal of many current educational programs. The individual and his possible life career is the main focus of attention.

With industrialization in the United States today demanding more skilled workers and technicians at an ever rapidly increasing rate, the importance of career planning becomes even more so important. Since

\(^2\) Ibid.
\(^3\) Ibid.
\(^4\) Ibid., p. 35.
\(^5\) Ibid., p. 27.
Service occupations are expanding and are expected to increase, predictions for the future indicate an expected decrease in the need for semi-skilled workers. Unskilled workers are being replaced at an increasing rate by automation. Increased complexity in all job categories in the future seems to be a reasonable expectation.

The role of woman in the world of work is rapidly changing. Reduction of family size, increase in life expectancy, increase in educational level, and a more liberal attitude towards women who work are resulting in unprecedent numbers of women entering the labor force. This new trend was brought about by many factors but mainly by World War II and the shortage of men. By 1975, it is expected that women will account for about 36 percent of all workers, with about 50 percent of all the women between the ages of twenty and twenty-four in the labor force. 6

A critical problem of jobs for young people still exists. With racial discrimination being overcome, there still remains a large group of culturally deprived and educationally disadvantaged youth that will require additional preparation for gainful employment. The decline in the number of unskilled jobs, the effect of automation, under-utilization of workers--especially among minority and disadvantaged groups, women in the labor force, and continued urbanization all point

out the complexity of the world of work that students will be preparing for and entering.

Guidance people who have traditionally been individual-oriented are being pressured more than ever before to provide the kind of assistance which facilitates each student's development.

Guidance philosophy recognizes the existence of differential abilities of individuals and a need for self-understanding of their abilities. A primary guidance objective is to assist each student to make and to accept the responsibility for making his own decisions. A realistic self-understanding of a person's adequacy to perform certain tasks is needed by each student if he is to be equipped to make the choices he will have to make.

The idea of a student's self-understanding/self-concept is an ever present concern of counselors at all stages of the student's development. Perhaps no other single factor contributes so substantially to a student's success or failure than his self-concept. The theory and study of self-concept is one of widespread discussion, not only in the field of guidance but also in other areas. The implication and study of self-concept proves to be both purposeful and meaningful, not only for the counselor but even more importantly to the student.

The current emphasis by school counselors is on meeting the vocational development and career planning needs of youth in the schools. The General Aptitude Test Battery is being used by many schools at the tenth grade level to assist students in preparation for their future.
Students who will be enrolling in vocational courses are forced to decide by the end of the tenth grade if they will enroll in vocational training and which training they will pursue. Making this decision at the tenth grade--approximately ages fourteen through sixteen--calls for maturity beyond that normally expected or found at this level. Thus, students make these decisions without sufficient information about themselves and the options available to them.

The lower high school grade level is a very important developmental stage at which students are being faced with a need to make earlier and wiser choices about the options available to them.

Earlier educational-vocational counseling is being provided to assist the student in developing a better understanding of the world of work and in integrating the two so that effective decisions can be made. As an aid to students, counselors are attempting to provide them with better information about themselves, about training opportunities and requirements, and information relative to objective probabilities of success in the various program options. This is resulting in a widespread use of the General Aptitude Test Battery in secondary schools to aid in identification of special skills, in selection and placement, and as a guidance and counseling tool.

**Purpose of the Study**

The purpose of the study was to investigate the relative effectiveness of individual test interpretations upon increased
Self-understanding of special abilities as measured by the General Aptitude Test Battery.

A procedure was developed to improve use of aptitude tests with tenth grade students. Group and individual guidance activities were provided which were designed: (1) to orient students to test-taking, (2) to facilitate recall of the test experience, (3) to assist students in understanding the purpose for which the test was given, (4) to describe the students' performance in meaningful terms, (5) to obtain the students' reactions, and (6) to help students relate the information to future goals.

Objectives of the Study

1. Try out and evaluate the effectiveness of a procedure or treatment for improving use and interpretation of aptitude tests.

2. Evaluate use of self-estimates and test-estimates as a means of increasing self-understanding of abilities.

3. Establish a procedure that could be used by other schools and with other instruments.

Statement of the Problem

If a student is to be equipped to make the choices he will be faced to make as he matures, he should have a realistic self-understanding of his ability or his adequacy to perform certain tasks.
A generally recommended use of tests is in assisting students to make decisions about themselves. To assist the student in making the choices he must make, interpretations of tests are commonly conducted to bring about increased self-understanding.

Some research studies indicate no growth in self-understanding from test interpretations. Others reveal the opposite. The fact that no growth in self-understanding takes place in several studies points out and identifies an existing problem which suggests a need for careful study of the effectiveness of the procedures being used regarding tests.

The specific problem investigated in this study was the effect of test interpretation on increased knowledge of one's special abilities.

The investigation was limited to the study of nine abilities defined and measured by the General Aptitude Test Battery.

The following related questions were explored:

1. Do tenth grade students have a realistic understanding of their special abilities?

2. What effect does a private interpretation of tests by a trained counselor have on increased self-knowledge of these abilities?

3. Do students have a better understanding of certain types of abilities than others, e.g., cognitive, perceptual, manipulative?
4. Do students tend to over or underestimate their abilities?

Limitations of the Study

The sample and type of instrument used present certain limitations. The sample is a selected group of students who voluntarily requested a private interpretation of their test results. The test interpretation is limited to nine abilities measured by a specific aptitude test. Generalization of findings cannot be made except within the restrictions of these limitations; however, findings may present implications suggesting the need for the same approach with other schools using other types of tests in addition to aptitude.

The definitions of terms used in the study present certain limitations. As used in the study, the terms are defined as follows:

**Self-Understanding** - The knowledge the student has of his relative standing among his grade group.

**Self-Estimate** - The student's indication of his present understanding of his score on the Test Interpretation Form.

**Test-Estimate** - The actual scores obtained from the sub-tests of the nine abilities measured by the General Aptitude Test Battery.

**Aptitude or Abilities** - The nine abilities as defined and measured by the General Aptitude Test Battery in Chapter III, Procedures and Methodology.
An additional limitation should be noted which arises from using a comparison of congruence of self-estimates and test-estimates as a measure of increased self-knowledge. One can only assume that a learning of test scores indicates integration of that learning into behavior. The method does not make it possible to determine how much the change reflects integration of information and how much is immediate recall.

Summary

This chapter has presented a general discussion of the background of the problem; purpose; general objectives of the study; and the specific problem, to evaluate the use of self-estimate and test-estimate as a means of facilitating increased student self-understanding of their abilities as measured and defined by the General Aptitude Test Battery. Limitations and definitions of terms are included.
CHAPTER II

REVIEW OF RELATED LITERATURE

The literature concerning self-understanding is not only vast but equally confusing. Psychologists use the same term to mean different things and mean different things when they use the same term. The vast amount of literature that pertains to self-understanding has been accumulating from at least the time of Homeric writings. Most contemporary theorists define self-understanding as either a group of psychological processes which govern behavior and adjustment or as an organized collection of the attitudes and feelings a person has about himself.

Research conducted by Super,^7 Roe,^8 Holland,^9 Ginzberg and his associates,^10 Hoppock,^11 Tiedeman,^12 and many others point out


the developmental nature of career development, the complexity of
the vocational choice process, the importance of providing career
information, the need for assisting students in self-evaluation, the
effect of the total personality development on later choice, and the
effect of external factors beyond the student's control on the choice
he makes.

A common problem encountered by secondary school
counselors is that of the student who does not have realistic self-
understanding and is therefore unable to make wise choices.

This study is concerned with developing and trying out a
procedure for improving test interpretations to enhance growth in
self-understanding of students regarding their abilities. The review
is limited to studies related to the nature of the problem presented.
Areas covered in this review will deal with past and present research
on the potential and use of the General Aptitude Test Battery as a
measure of differential abilities, effectiveness of test interpretations,
use of graphic devices, and improving interpretations and the use of
tests.

A generally accepted use of tests is in assisting school personnel
in making decisions about students. A generally recommended use of
tests is in assisting students to make decisions about themselves.

11R. Hoppock, Occupational Information (New York: McGraw-

12David V. Tiedeman, "Decisions and Vocational Development:
A Paradigm and Its Implications," Personnel and Guidance Journal,
In Kentucky most of the school districts have to some extent developed a standardized testing program. The regular or basic testing program in most of these districts consists of tests of mental ability and tests of achievement. Many districts have included the well-known areas of testing for guidance purposes, aptitude, and interest tests.

Effective September, 1967, the Kentucky Department of Education entered into an agreement with the Kentucky State Employment Service which made it possible for secondary school personnel to administer the General Aptitude Test Battery at grades nine through twelve, at more than one grade level, to the entire class or to a selected group or groups within classes.  

Since there is a common feeling existing that there is a need for more educational and vocational counseling at the ninth and tenth grade level, many schools have included the General Aptitude Test Battery in the regular school testing program. The test is not intended to be used in the same way with ninth graders as it is now used with twelfth graders and adults. Primary uses recommended are that of assisting the student to grow in self-understanding and to stimulate the student to begin early occupational exploration.

Ashley described the situation existing in Kentucky in the following way:

A situation exists in the State which can be characterized as: (1) recognition on the part of educators of the increasing need to emphasize the vocational aspects of guidance at all secondary grade levels, (2) availability of a formerly restricted test, except for 12th graders and adults, that has shown occupational significance for relating human attributes to significant bodies of occupational significance for relating human attributes to significant bodies of occupational data, (3) increased use of a test at the ninth and tenth grade that was originally developed and standardized on adults and whose use has primarily been with the same group, (4) simultaneous use of the same battery by agencies outside the school with adults for placement in training programs and on-the-job which tends to stimulate school users to attempt to use it in the same way, (5) increasing awareness that the test cannot be used in the same way with seniors and adults as it is with ninth and tenth graders, and (6) concern of users that the test be properly utilized at all levels.¹⁴

Proper utilization will depend upon the school counselor's comprehension of the Battery's potential and his ability to translate his understanding into use.

In Kentucky's program of vocational education many courses are offered in the area vocational school and extension centers. The course offerings have definite training objectives of preparation for specific occupations. Occupational norms are available for many of the occupations for which students are being trained. Valuable data are available to counsel with students planning to enter training for a specific occupation. The counselor may use the General Aptitude Test

¹⁴Ibid., p. 18.
Battery to assist a student in long-range career planning and self-exploration in occupational terms by studying specific occupations for which he could reasonably expect to qualify.

The General Aptitude Test Battery has been recommended for use in vocational guidance and counseling by many authors. Super pointed out in 1953 the need for using tests with occupational significance in counseling students at the time they enter high school making reference to the General Aptitude Test Battery in the following statement:

I am quite impressed with both the technical problems and the practical importance of the administration of tests, such as the General Aptitude Test Battery, to youngsters when they are about the ninth grade level. This is a choice point. This is where curricula are chosen. The decision may be changed later, but at least a preliminary decision as to the type of curriculum is made and these curricular choices are, after all, pre-occupational, whether they are choices of the academic curriculum which is pre-professional or the commercial curriculum which is pre-business or the technical curriculum which is pre-trade. Obviously it is to the advantage of the student and of the school to have data that helps the youngster to choose a curriculum which is oriented toward the type of work and the way of life that he is going to enter or that he may enter eventually.\textsuperscript{15}

In 1957, Super made the following statement relating to the potential usefulness of the General Aptitude Test Battery:

Two multi-factor batteries may be judged to be ready for use in counseling. These are the Differential Aptitude Test for which educational norms are available

and the General Aptitude Test Battery for which occupational norms and predictive data are on hand. In both instances considerable caution is called for an interpretation for the validity data in the first case are confused and conflicting, and in the second they are limited and much less adequate than they seem prior to careful study of their nature.  

Super, discussing desirable characteristics of a test or battery to be used in counseling states:

Tests for use in counseling should describe a person so that we can see him as he is at the time of testing; they should predict what he will be like and what he will do at some future data; and they should be relatively timeless; and they should, like the people they test, be multi-potential.

Bauernfeind states, "Basically, the multiple aptitude tests provide a wider view of the individual and his unique intellectual capabilities." He compares it to overlapping nets in a stream, each providing some unique coverage to catch occasional, off-course fish to maximize his catch.

The General Aptitude Test Battery drops nine nets into the educational stream. It consists of twelve tests, including seven paper and pencil tests which can be machine scored, one paper and pencil test

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17 Ibid.

which must be hand scored, and four apparatus tests using a pegboard and a finger dexterity board. A complete description of each test is included in another section.

Writing about the General Aptitude Test Battery, Cronbach states:

The General Aptitude Test Battery is designed with an efficiency that has never been exceeded. . . . The procedures are simple enough to allow trustworthy administration of the tests by relatively untrained testers to subjects who have limited education or poor command of English.¹⁹

Hoyt stated in 1963:

The extensive amount of research conducted with reference to the General Aptitude Test Battery makes it evident that it is possible to develop aptitude measures which differentiate students heading toward occupations similar to those we have described as specialty oriented students and will, at least to some degree, serve as valid predictors of probable ability to successfully perform some occupational tasks.²⁰

Adams, in 1969, states, "The General Aptitude Test Battery constitutes a comprehensive system of interrelated concepts, and to a greater degree than any other multiple aptitude test battery presently available, by design and measurement, has been able to relate human attributes to culturally significant systems of occupational data and information."²¹


Test experiences could be planned well in advance of the time a student will be making a decision, allowing him freedom to consider, evaluate, and assimilate new information learned about himself and the possible relevance this information has to his goals and the choices open to him. The greatest advantage may be achieved when the test experience is planned as part of a number of experiences designed to help students exercise personal responsibility in making choices.

Some of the possible ways in which the General Aptitude Test Battery may be used by school counselors to help students are as follows:

Help students develop greater self-understanding. Test results can be used to help answer the question, "What am I like?" Frequently students, if given the opportunity, will during the test interpretation be able to relate their test performance to actual personal experiences and activities involving special abilities they may have.

Help students develop an understanding of their possible aptitude strengths. Students are usually aware of their verbal and numerical abilities as a result of school experiences. They may not, however, have a clear idea of other abilities they may possess or the implications these abilities may have for vocational choice.

Help students relate test performance to educational and vocational information. The educational and occupational norms developed using the General Aptitude Test Battery can be related to student test scores. Information presented to students in this way may take on personal significance, helping to broaden their occupational understanding and interests.

Provide students with information explaining how aptitudes relate to probable success in various vocational training programs. Performance on aptitude tests can be related to success in vocational programs by administering the General Aptitude Test Battery to students prior to course selection and then comparing test results at the completion
of training to some objective measure of success. This data, refined yearly, can be used to provide students, who may be following in the program, with additional information about the vocational courses they may be considering.

Help students formulate tentative vocational goals and plans. Stability of vocational choice seems to relate to the degree a person understands his unique abilities and aspirations and can relate this understanding to clearly defined alternatives or choices. Using the General Aptitude Test Battery may be one means of helping students develop greater self-understanding and knowledge of the world of work. This experience may help provide students with a better basis for formulating personal goals and making educational and vocational plans.  

Authorities support the readiness, usefulness, and need for instruments such as the General Aptitude Test Battery, and the procedure employed in this study uses activities designed to provide the kinds of help suggested by Adams and investigates their effectiveness.

Effect of Test Interpretation on Self-Understanding

Johnson investigated the extent that unrealistic self-appraisal exists before counseling and the degree that knowledge of oneself increases as a result of counseling. Findings and implications from the investigation include: (1) vocational counseling significantly increased accuracy of self-knowledge, (2) the increase in self-knowledge through counseling was maintained to a high degree during a thirty-day follow-up period, (3) individual counseling appears to be an effective form of learning situation in terms of the extent to which new knowledge is retained, and (4) results comparing intelligence, interests, and personality
suggested to the investigator that counseling may increase self-
knowledge of relatively objective factors such as aptitudes more than
that of subjective factors.  

In Johnson's suggestions for further research he states, "It
might be hypothesized, for instance, that counseling would increase
knowledge of special aptitudes such as manual dexterity and spatial
visualization even more than it does knowledge of intelligence, interests,
and personality."

Wright, comparing individual and multiple counseling for test
interpretation interviews, concluded that test interpretation interviews
contribute to a student's better understanding of himself. In the
same study, using a counselee satisfaction criterion, results indicated
that a counselee need not feel completely satisfied with or highly
positive about counseling in order to benefit from the experience.

Studies by Belovsky, McMasters, Shorr, and Singer consisted
of testing twelfth graders accompanied by individual interpretation for
one group and by group interpretation for the other. Using realism of

\[23\text{D. G. Johnson, "Effect of Vocational Counseling on Self-}

\[24\text{Ibid., pp. 335-336.}

\[25\text{Wayne E. Wright, "A Comparison of Individual and Multiple}
Counseling for Test Interpretation Interviews," } \textit{Journal of Counseling}

\[26\text{Ibid., p. 133.}\]
vocational choice as a criterion, they found that chance could account for the slight differences noted between the two groups (58 percent vs. 57 percent made a realistic choice). 27

Singer and Stefflre analyzed the technique of "self-estimate" in the evaluation of counseling attempting to determine whether the individual's self-estimate deviates less from his actual score after counseling than it did before. Students were twice asked to estimate their degree of interest in six fields measured by the occupational Interest Inventory. They found that tests of significance between standard deviations can provide helpful clues when the mean discrepancy scores are highly similar. 28

Lallas used the self-estimate comparing three methods of interpretation of achievement test results, an individual interview, a group interpretation, and a combination of group and individual interpretation. The results supported the hypothesis that counseling effects change in self-perception. The most effective means of counseling were the individual and the group interpretation with a follow-up interview. 29


Froehlich and Moser reported a study designed to explore pupils' memory of test scores after counseling. The objective of the study was to gain insight into pupil learning of test information. The study provided evidence that pupils tend to generalize their reported ranks on the several sub-tests of the Differential Aptitude Test in terms of their rank on the verbal test. It also contradicted the general belief among counselors that it is easier for high ranking pupils to understand and accept test evidence if one assumes that accuracy of report is closely related to understanding and acceptance. The students made estimates of how well they performed and were encouraged to request further assistance. In a follow-up fifteen months later, students were asked to redraw their profiles. "The resulting correlations between actual and remembered scores were then calculated and found to be statistically significant, but low enough to indicate marked differences between actual and recalled test percentiles."^31

Lister and Ohlsen investigated the extent to which test interpretation through counseling improved the self-understanding of students in grades five, seven, nine, and eleven. They studied effects of orientation to testing on students' motivation for learning test information, accuracy

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^31 Ibid.
of self-estimates, and relationship between motivation and accuracy of self-estimates. At all grade levels interpretation was associated with increased accuracy of self-estimates of achievement, intelligence, and interests. While a significant decline in accuracy was noted over a two-month follow-up period, a net increase was noted for the period covered by the study.

Use of Graphic Devices

Currently test publishers are producing a number of graphic devices to assist test-users in understanding test data and to help them interpret results to students. Some test publishers have introduced the idea of test bands to help test-interpreters take cognizance of measurement errors. The profile with test score bands makes it easy for the test-interpreter to take account of measurement errors and to help a student see the relationship between various scores. It also makes it relatively easy for him to communicate which differences between scores are significant.32

"Test publishers who provide profiles with test bands use the standard error of measurement to lay off a percentile band on either side of specific scores. Such bands can also be computed by a test-interpreter who uses the rating scale. He follows these steps: (a) obtains either the standard error of measurement or data for computing

it from the publisher (computed on the basis of raw scores), and
(b) converts this figure into percentile bands for each of the
following parts of the scale: one for the middle 50 percent; another
for the two 15 percent parts on either side of the middle; and still
another for the 10 percent at each extreme. Since the raw score
differences between percentiles gradually increases as one moves
away from the mean in either direction, one must take account of
this fact in computing estimated percentile bands for each of the five
parts of the scale. 33

According to Singer, one of the foremost problems in measuring
the extent to which counseling is successful has been to utilize the
technique of self-estimate. "The self-estimate technique involves the
client's judgement of his position compared with others on various
factors and may also be referred to as self-rating, self-knowledge, or
self-evaluation." 34

Tipton states, "The majority of studies evaluating the effectiveness
of test interpretations have used self-reports or self-estimates as
measuring instruments. Typically this method involves a measurement
which is calculated by taking the difference between discrepancies in
pre and post test-estimates and actual test scores. The greater the

33 Ibid., p. 276.
34 Singer and Steffire, op. cit.
gain in congruence between self-estimate and test-estimate, the more effective the test interpretation is considered to be. "35

The self-estimate test form is a graphic device which has several purposes: for possible motivation of students to request information about themselves by stimulating their interests in seeing the comparison with actual data, to provide the counselor with data about students whose self- and test-estimates relationship indicate unrealistic self-evaluation, and to provide background data for future appraisal of the effectiveness of test interpretation and test interpretation procedures being used. Also, the self-estimate could possibly stimulate more student participation in the interview leading to obtaining more student reaction to the data being presented.

Recommendation for Improving Interpretations

Ohlsen states, "The fact is that, all too often, conscientious workers interpret test scores but fail to improve students' understandings of themselves."36 Several recommendations are listed which suggest a need for treatment being provided in this study.

The following recommendations are made by Ohlsen relating to interpretations of test scores:

1. Orientation for acceptance and use of test results should precede testing.


36 Ohlsen, op. cit., p. 256.
2. Until someone is qualified to use and interpret a test, that test should not be given.

3. Tests and test scores should be released to only those persons who are qualified to use and interpret the tests.

4. Test scores should be interpreted to only appropriate individuals, e.g., students and their parents or legal guardians. In all instances, the pupils' scores should be interpreted within a setting in which unauthorized persons cannot listen in on the interpretation or see the results.

5. Inasmuch as test scores are often misinterpreted by laymen, scores should be interpreted for pupils and parents, not merely distributed to them. Furthermore, scores should be interpreted when pupils or their parents request information. Unless there is a genuine felt need for information, the odds are against an increase in self-understanding on the part of the pupil or understanding on the part of the parent or even against the acceptance by the parent of information about his child.

6. Before interpreting a test, a teacher or counselor should familiarize himself with the non-test data available on the student. During the test interpretation
he also should encourage the pupil to supplement the test results with non-test data.

7. A test-interpreter should encourage student participation in interpreting test scores. To help a student recall what a test, or a part of a battery, was like, the teacher or counselor can describe it in nontechnical language, and he will usually find that it is helpful to show the student sample items from the test, before encouraging the student to estimate how well he did on it. If the counselor is to do this successfully, it is obvious that he must know the student and be thoroughly familiar with the tests in order to communicate accurate information to the student.

8. The test-interpreter must be very sensitive to cues which suggest that the student does not comprehend the information which is being given him.

9. The student should be encouraged to react to the test results—to raise questions or to comment on how he feels about the way the test or tests describe him. When he feels that interpreted remarks are appropriate, he will often respond to data quite spontaneously—telling how pleased he is with some scores or how he does not like or cannot accept others. For the test-interpreter it is
important that he detect these feelings and that he be able
to respond to them. Helping a student examine these
feelings increases the chances for helping him under-
stand and accept himself as he is.

10. There is no justification for arguing with a student about
his test scores. Moreover, little can be accomplished
by either defending a test or criticizing it. What test-
interpreters should do is explain how the results may
be used by the student to understand himself and to
make certain predictions, and with what certainty. 37

Wysong has outlined definite phases that might be included in a
test interpretation interview. This was not a suggestion that the inter-
view should follow a certain prescribed structure, but did seem to
indicate that if the student is provided assistance in (1) recalling his
test experiences, (2) understanding the purpose of testing, (3) describing
his test performance, (4) obtaining his reactions, and (5) relating the
information to guidance goals, that a meaningful learning experience will
be the result. 38

Materials were developed by Ashley for use with ninth and tenth
graders to precede a private interpretation. The approach used in the

37 Ohlsen, op. cit., pp. 254-256.

38 H. Eugene Wysong, The Test Interpretation Interviews, Ojio
Guidance News and Views (Largo: Careers), Professional Report No. 96.
treatment is based on the following assumptions:

1. Interpretation of test scores to students can assist them to grow in self-understanding.

2. A change in self-image will result from increased self-understanding on the part of the student.

3. Wiser choices are made by students who have a realistic self-image.

4. If a student has a realistic self-image of his capacities, his self-estimate regarding this trait will to a large extent be congruent with his test-estimate. 39

Summary

This review of the literature has emphasized the potential of the General Aptitude Test Battery for use with secondary school students, need for counselor concentration on assisting students in the area of self-understanding, previous research in the area of test interpretations, and self-estimate approaches to evaluate growth in self-understanding. Recommendations cited by Ohlsen, Wysong, and others substantiate the need for a study of this nature.

39 J. W. Ashley, A Field Trial and Analysis of Selected Occupational Guidance Activities with Counselor In-Service Education, Project No. L97820-01, Center for Career and Vocational Teacher Education, College of Education, Western Kentucky University, 1972.
CHAPTER III

PROCEDURES AND METHODOLOGY

The primary objective of this investigation was to study the effect of private interpretations on increased self-understanding of tenth graders of their abilities as defined and measured by the General Aptitude Test Battery. An increase in congruence of self-estimates and test-estimates after a private interpretation was to be used as an indication that increased self-understanding had taken place.

Hypothesis

Based on empirical evidence, the following hypothesis will be tested. There will be no difference in the pre- and post-measure of tenth grade students in the self-understanding of their abilities as measured by the General Aptitude Test Battery.

Definition of the Sample

The sample being studied consists of two independent groups of tenth graders from Allen County High School. The school consisted of grades nine through twelve with a population of 663 students. Group one includes fifty-four students from the tenth grade class who attended a group interpretation session, completed a self-estimate of their abilities, and later requested a private interpretation and another self-estimate.
Group two includes twenty-nine students who completed both pre and post self-estimates and the group interpretation session but did not request a private interpretation.

The General Aptitude Test Battery

Instrument

The General Aptitude Test Battery was used as a measure of the differential abilities of the students. This Battery was developed by the United States Employment Service to determine the occupational aptitudes of persons interested in entering the labor market. The edition being released to schools is the B-1002-B. It is composed of twelve tests selected because they are good measures of nine aptitudes found to be important for successful performance in a wide variety of occupations.

The test as described below is made up of the following twelve sub-tests. Description of the sub-tests is adapted from the Manual for the General Aptitude Test Battery.40

Paper and Pencil Sub-Tests

Part 1  - Name Comparison

This sub-test measures clerical perception. The examinee inspects two columns of names and determines whether they are similar or different.

Part 2  -  Computation

This sub-test includes a number of arithmetic exercises which require the addition, subtraction, multiplication, and division of whole numbers. The aptitude measured is numerical aptitude.

Part 3  -  Three-Dimensional Space

Four drawings of three-dimensional objects are evaluated to determine which one can be made from the stimulus figure which is pictured as a flat piece of metal to be either bent or rolled or both. This sub-test measures intelligence and spatial aptitude.

Part 4  -  Vocabulary

The examinee must decide which two of four words in a set have the same or opposite meanings. This sub-test is a measure of intelligence and verbal aptitude.

Part 5  -  Tool Matching

This sub-test consists of a series of exercises containing four black and white drawings of simple shop tools and a stimulus. The examinee must decide which of the four is shaded like the stimulus drawing. The aptitude measured is form perception.

Part 6  -  Arithmetic Reasoning

The examinee must solve a number of arithmetic exercises expressed verbally. The sub-test measures intelligence and numerical aptitude.
Part 7 - Form Matching

This sub-test consists of two groups of variously shaped line drawings. The examinee indicates which figure in the second group is exactly the same size and shape as each figure in the first group. The aptitude measured is form perception.

Part 8 - Mark Making

The examinee is requested to make three pencil marks, two vertical and one horizontal beneath them, in a series of squares as rapidly as possible. The aptitude measured by the sub-test is motor coordination.

Apparatus Tests

Part 9 - Place

This sub-test makes use of a rectangular wooden board divided into two sections, each containing forty-eight holes. The upper section contains forty-eight cylindrical wooden pegs. The examinee moves the pegs from the upper part of the board to the lower corresponding part as rapidly as possible in the time allowed, moving two pegs simultaneously. This performance is done three times and represents a measure of manual dexterity.

Part 10 - Turn

The same equipment is used as in Part 9. A peg is removed from a hole, turned over so that the opposite end is up, and returned to the same hole. This is performed as rapidly as
possible in the time allotted for three trials. The sub-test is a measure of manual dexterity.

Part 11 - Assemble

This sub-test makes use of a small rectangular board containing fifty holes and a supply of small metal rivets and washers. The examinee takes a small metal rivet from a hole in the upper part of the board with his preferred hand, removes a washer on the rivet, and inserts the assembled piece into the corresponding hole in the lower part of the board using only the preferred hand. The examinee has only one trial and must work as rapidly as possible in the time allowed. The sub-test is a measure of finger dexterity.

Part 12 - Disassemble

The examinee returns the rivets to corresponding holes at the top of the finger dexterity board; with the other hand slides the washer to the bottom of the board and places the washer on the rod as rapidly as possible. The sub-test is a measure of finger dexterity.

The definitions of the aptitudes measured as reported in the Guide to the Use of the General Aptitude Test Battery are:41

Aptitude (G) - Intelligence

The ability to "catch on" or understand instructions and underlying principles; the ability to reason and make judgements. Closely related to doing well in school.

41Ibid., p. 15.
Aptitude (V) - Verbal Aptitude

The ability to understand meaning of words and ideas associated with them, and to use them effectively. The ability to comprehend language, to understand relationships between words, and to understand meanings of whole sentences and paragraphs. The ability to present information or ideas clearly.

Aptitude (N) - Numerical Aptitude

The ability to perform arithmetic operations quickly and accurately.

Aptitude (S) - Spatial Aptitude

The ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relationship resulting from the movement of objects in space.

Aptitude (P) - Form Perception

The ability to perceive pertinent detail in objects or in pictorial or graphic material. The ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Aptitude (Q) - Clerical Perception

The ability to perceive pertinent detail in verbal or tabular material. The ability to observe differences
in copy to proofread words and numbers and to avoid perceptual errors in arithmetic computation.

**Aptitude (K) - Motor Coordination**

The ability to coordinate eyes and hands or fingers rapidly or accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly. Probably related to reaction time.

**Aptitude (F) - Finger Dexterity**

The ability to move the fingers and to manipulate small objects with the fingers rapidly or accurately.

**Aptitude (M) - Manual Dexterity**

The ability to move the hands easily and skillfully in placing and turning motions.

The test may either be hand or machine scored. Raw scores are converted to aptitude scores which are standard scores. The average raw score of the general working population is a standard score of 100 with a sigma of 20. Norms are expressed in terms of percentile rank and occupational aptitude patterns consisting of minimum cutting scores established for each of the three key aptitudes required by a family of similar occupations.

**Procedure**

Wysong recommends that if a meaningful learning experience is to result from a test interpretation, the following steps should be included:
(1) recalling his test experiences, (2) understanding the purpose of testing, (3) describing his test performance, (4) obtaining his reactions, and (5) relating the information to guidance goals. The procedure used in this study incorporated the above steps.

A group guidance session was conducted with all tenth graders. A set of transparencies developed by Ashley was used to give a general discussion of the General Aptitude Test Battery, why it was used, and the type of scores that would be reported upon request. The use of the self-estimate test form was explained after each of the special abilities were discussed, and examples of the types of test questions which made up the different sub-tests were presented to help students recall the test experience.

A bulletin, "Understanding Aptitudes" (Appendix A) was given to each student during the group guidance session. Students were instructed to remove the last page from the bulletin and complete the test interpretation form, an estimate of their understanding of their relative standing compared with other tenth graders.

The bulletin was designed to provide orientation for acceptance and use of their results, to assist students in recalling the test experience and understand the purpose for testing of aptitudes. It was hoped that the bulletin and group session would motivate students to seek a private interpretation of their results which would permit the counselors to

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42 Wysong, op. cit.

43 Ashley, op. cit.
describe the student's test performance, obtain his reactions, and assist him to relate the results to future goals.

Students were informed that their actual test results would be interpreted on a private basis if they desired. They were encouraged to complete the bulletin prior to requesting an interpretation and bring it with them to the interview.

**Individual Counseling**

Individual counseling sessions were set up in the office next door to the counselors' office. Students were encouraged to stop by any time that they had an opportunity for a private test interpretation. Since the first period each day was a free period that started at 7:50 a.m. and concluded at 8:30 a.m., many students took advantage of this time to receive their test interpretations. It was found that it took about fifteen to twenty minutes on an average to interpret their scores.

Fifty-four students received a private interpretation on a self-referral basis. These individual interpretations were conducted by trained and certified guidance personnel from Western Kentucky University. During these interpretations the self-estimate test form was used as their scores were reported. Each of the special abilities were defined and explained to the students.

**Obtaining the Data**

All tenth graders were administered the General Aptitude Test Battery, and the obtained score at the time of testing was used as the
test-estimate in the study. The scores were collected for those students requesting a private interpretation at the time of the individual interview. Scores of students not requesting a private interview were collected after the school term.

The self-estimate used as a pre-estimate was collected during the group interpretation session. The post-estimate was collected prior to the end of school—three to four weeks later.

**Treatment of the Data**

Processing of the data was completed at the computer services center at Western Kentucky University.

To assess the effects of test interpretations on the self-understanding of abilities several measures were used:

1. The means of the pre-estimate, test-estimate, and post-estimate were computed. Significance of the difference between means were evaluated by the F-ratio as a means of accepting or rejecting the null hypothesis.

2. The Pearson product-moment (r) correlation-coefficient was calculated to determine the relationship between the pre-estimate and actual scores and the post-estimate and actual scores. The relationships between the two sets of scores, before and after treatment, were studied from the change in relationship (r's) after test interpretation. The significance of each coefficient for each set of scores was determined (r = 0). It is hypothesized that if
a gain in self-understanding results from a test interpretation, estimates and actual scores will be more congruent than on the pre-estimate and a higher relationship will result on the post-measure. To evaluate this an alternate hypothesis $r_2 > r_1$ will be tested for each ability with the F-ratio using the .05 level of significance and a one-tail test. Each correlation coefficient will be tested for significance ($r = 0$).

3. Additional inspection of data will be completed for each ability to determine the number of students under and over estimating their abilities.

The following formulas were used to test for significance:

1. Test the hypothesis that $r = 0$. If $z$ is greater than $±1.96$, then $r$ is significant at the .05 level using a two-tailed test.

2. Test the difference between $r$'s for each ability.

$$t_{dr} = (r_2 - r_1) \sqrt{\frac{(N-3)(1+r_2 r_3)}{2(1-r_2^2)(1-r_1^2)(1-r_1^2 - r_2^2)}}$$

3. The significance of the difference between the means of each ability for the two groups will be evaluated by the F-ratio, analysis for repeated measures design.

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Summary

This chapter has presented a discussion of the hypothesis, definition of the sample, instrument, procedure, individual counseling, obtaining the data, and treatment of the data. The next chapter will discuss the analysis of the data and implication.
CHAPTER IV

ANALYSIS OF THE DATA

This investigation was developed around the following suppositions:

1. Interpreting aptitude test scores to secondary school students should result in increased self-understanding of their abilities.

2. Comparing self-estimates and test-estimates is a usable procedure for assessing the extent of self-understanding of their abilities.

3. If increased self-understanding results, the student's self-estimate and score obtained at the time of testing will be more congruent after the test interpretation.

This chapter will attempt to present statistical material concerning the comparison of pre and post self-estimates with actual scores for two groups of tenth grade students. Group one includes those students who voluntarily requested a private test interpretation. Group two represents a group of students in the same school who were provided the same group activities but did not follow up to request their results.
Statistical terms will be defined, an analysis of the data will be presented, and an interpretation of the findings will be reported.

**Statistical Terms**

The following statistical terms are relevant to the statistical procedure developed for this investigation:

**Mean** - A measure of central tendency commonly referred to as the "average."

**Correlation-Coefficient** - A measure of the relationship or "going togetherness" of two or more variables. The Pearson product-moment coefficient is used in this study to supply information about the extent of relationship between pre, post, and obtained test scores. This relationship is indicated by a two-decimal number ranging from .00 to 1.00. The number can be either negative or positive.

**Significance Level** - The statistical significance level is a point marked significant when the spread between two samples signifies a degree of difference which is acceptable to the problem. In this investigation the level of significance will be .05; that is, a difference of this magnitude could not have happened by chance in ninety-five of one-hundred trials. The significance of the difference in the means was evaluated by the F-ratio, and the significance of the difference in the correlation-coefficients were determined by the t-test for repeated measures.
Procedures Employed

Frequency distributions were developed for groups in the sample. Means, standard deviations, correlation-coefficients, standard errors, and standard errors of the differences were computed. Additional tabulation of data was performed manually to determine the number and percent of students under and over estimating their actual scores.

The significance of the difference of the means and correlation-coefficients were computed to determine if scores were more congruent after the test interpretation. The statistical computations were made by an IBM computer number 370/155.

Data for samples of fifty-four students requesting private interpretation and twenty-nine students who did not seek private interpretation were treated. The self-estimate and test-estimate form used a scale of 0-100 which was treated as interval data. The assumption of interval data was made because of the manner in which the form was explained to the students. There is no reason to believe that students will see a ranking of 100 typical students in any other way than equal intervals on a scale.

The results were studied from the standpoint of group means, standard deviations, and correlation-coefficients. If self-estimates are more similar to actual scores after a test interpretation, this is indicative of increased self-understanding. Also, increased self-understanding on the part of students can be seen if a higher
relationship exists between estimated and actual scores after the test interpretation. Additional tabulation of data to determine the number of students who under and over estimated their scores was completed.

Tables 1 and 2 list the number of students in each group for the nine abilities. Students underestimated their actual score to a considerable extent in both groups on both the pre- and post-estimate. Inspection of the tables shows a decrease in the number underestimating and a corresponding increase in the number overestimating in Group one, those receiving the test interpretation. Comparison of pre and post for the group not receiving test interpretation indicates the tendency to underestimate remained the same.

**TABLE 1**

**NUMBER OF STUDENTS RECEIVING TEST INTERPRETATIONS UNDER AND OVER ESTIMATED THEIR SCORES ON PRE-AND POST-ESTIMATES FOR EACH ABILITY**

(N = 54)

<table>
<thead>
<tr>
<th>Abilities</th>
<th>Number Underestimating</th>
<th></th>
<th>Number Overestimating</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>G</td>
<td>37</td>
<td>31</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>V</td>
<td>38</td>
<td>30</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>N</td>
<td>44</td>
<td>36</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>S</td>
<td>39</td>
<td>30</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>P</td>
<td>48</td>
<td>44</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Q</td>
<td>49</td>
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<td>3</td>
<td>6</td>
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<tr>
<td>K</td>
<td>49</td>
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<td>10</td>
</tr>
<tr>
<td>F</td>
<td>40</td>
<td>34</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>M</td>
<td>36</td>
<td>29</td>
<td>13</td>
<td>19</td>
</tr>
</tbody>
</table>
Tables 3 and 4 list the results of the group means and standard deviations.

Students on the pre-estimate of abilities do not have an accurate understanding of their abilities as measured by congruence of self-estimates and test-estimates. Each of the means for the pre-estimate of the nine abilities was below the actual mean. The actual means varied for the separate abilities in both groups. For this particular sample Form Perception, Motor Coordination, and Clerical Perception group means were very high, approximately thirty points higher than the pre-estimate. This difference was reduced ten points after test interpretation indicating the increase expected, yet still approximately
TABLE 3
MEANS AND STANDARD DEVIATIONS INDICATING EXTENT OF CONGRUENCY BETWEEN GENERAL APTITUDE TEST BATTERY, PRE, POST, AND OBTAINED SCORES FOR THOSE RECEIVING TEST INTERPRETATIONS (N = 54)

<table>
<thead>
<tr>
<th>Abilities</th>
<th>Means</th>
<th>F-Ratio</th>
<th>Standard Deviations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Estimate</td>
<td>Test-Estimate</td>
<td>Post-Estimate</td>
</tr>
<tr>
<td>G</td>
<td>55.56</td>
<td>65.72</td>
<td>62.17</td>
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<td>51.11</td>
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<td>61.83</td>
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<td>60.82</td>
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</table>

*P < .05
TABLE 4
MEANS AND STANDARD DEVIATIONS INDICATING EXTENT OF CONGRUENCY BETWEEN
GENERAL APTITUDE TEST BATTERY, PRE, POST, AND OBTAINED SCORES
FOR THOSE NOT RECEIVING TEST INTERPRETATIONS
(N = 29)

<table>
<thead>
<tr>
<th>Abilities</th>
<th>Means</th>
<th>F-Ratio</th>
<th>Standard Deviations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Test-Estimate</td>
<td>Post-Estimate</td>
</tr>
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<td>80.59</td>
<td>56.90</td>
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<tr>
<td>Q</td>
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Comparison of means for the group of students who did not
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Inspection of the standard deviations in Group one shows more similarity
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It was assumed that if students have a realistic understanding of
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Growth in self-understanding was assessed by comparing means and standard deviations on a pre and post basis. The significance of the difference between pre and post was evaluated by the F-ratio. The significance of the correlation-coefficients was evaluated by the t-test for repeated measures. Significance was tested at the .05 level of confidence.

**Findings**

1. Students in both groups were unrealistic in their self-understandings of special abilities as defined by the General Aptitude Test Battery and measured by congruence of self- and test-estimates on a pre-estimate. This was evidenced by a significant difference in group means of pre-estimate and actual test scores.

2. There is an obvious tendency for students who request interpretation and those who do not make self-referral to underestimate their scores on each of the abilities.

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<th>Means</th>
<th>F-Ratio</th>
<th>Standard Deviations</th>
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<td>Post-Estimate</td>
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2. There is an obvious tendency for students who request interpretation and those who do not make self-referral to underestimate their scores on each of the abilities.

3. After a private interpretation there was a significant gain in self-understanding for each ability as evidenced by a significant difference in the pre-estimate means and post-estimate means. The null hypothesis that no gain would result from test interpretation was rejected for each ability on this basis.
4. No gain was noted for the group of students who did not receive the test interpretation in seven of the nine abilities.

5. Inspection of tabular data seemed to point out that student estimates are similar for the nine abilities although the means were considerably higher for the perceptual abilities.

6. The means for the group receiving interpretation are still lower than the actual means after the interpretation. These were significantly different in six of the nine abilities, or means were congruent for three abilities after an individual test interpretation.

7. A significant, positive relationship between pre and actual scores was evident for groups requesting test interpretation for six of the nine abilities and three of the nine abilities for the other group. This would indicate a more unrealistic self-understanding for students who do not make a self-referral.

8. A higher relationship between the post and actual scores resulted after the test interpretation, indicating scores were more congruent than before the interpretation. This difference was significant for six of nine abilities for the group receiving interpretation and not significant for either ability for those not requesting interpretation.
Conclusions, Implications, and Recommendations

Certain conclusions, implications, and/or recommendations can be drawn from the findings reported in this study:

1. Students are unrealistic in their self-understanding of their special abilities as defined in the study, and counselors can facilitate growth in self-understanding by test interpretations.

2. A large majority of the students tend to underestimate their abilities when using the self-estimate approach both before and after the interpretation. This could present implications for counselors working with students in the area of self-concept development. Additional study of the type of students under and over estimating should be completed.

3. The use of self-estimates seems to be a usable approach for use with students as well as evaluating the effectiveness of the interpretation. The user should remain aware that there is no guarantee that information is integrated into the self-concept system but may represent immediate recall.

4. The procedure employed represents an approach which could be easily replicated by school counselors desiring to test the effectiveness of their interpretations. Additional
research in this area should be conducted as much of
the counselor's time is spent in this capacity.

5. There seems to be a difference in self-understanding of
students who request an interpretation and those who do
not in terms of relationships studied. It would seem
that the students who need the help most are the ones
who do not seek help. Counselors need to determine
activities which motivate this type of student to seek
interpretation.
APPENDIX A

UNDERSTANDING APTITUDES
UNDERSTANDING APTITUDES

by Wayne Ashley
Center for Career and Vocational Teacher Education
Western Kentucky University
UNIT II

WHAT ARE MY APPTITUDES?

Everyone can do some things better than others. You know about many things you can do at the present. This unit is designed to assist you to begin building an understanding of your strengths and weaknesses in terms of the nine skills measured by the test battery. This set of tests was given to all sophomores as a part of the regular school testing program and when properly used can help in your vocational development of career planning.

WHAT IS AN APPTITUDE?

An aptitude is a special ability. This may be the ability to do arithmetic operations quickly and accurately or the ability to move your hands easily and skillfully. Your nine aptitudes were determined from the number of questions you correctly answered on each of twelve subtests.

There are certain things you should keep in mind as you think about your score on each aptitude. First it represents the best you could do in the time allowed on the items and problems you were asked to complete. If for any reason you did not do your best such as; becoming ill,
not working up to par,

or just plain "goofing off",

the score does not give an accurate estimate of your abilities and you should discuss this with your counselor.
Maybe a better way to say this is, "If it takes you eight minutes in a race to run a mile when you could have run it in less time, neither you nor the people watching the race would have a good estimate of how fast you could run."

Check below the appropriate statement that best describes how you usually perform when taking tests given by the school counselor.

- In my opinion I usually perform to the best of my ability until time is called.
- In my opinion I work steadily when taking standardized tests, but not to the best of my ability.
- In my opinion I become confused, skip around and guess at many of the questions on standardized tests.
- I usually do not attach much importance to taking tests of this nature and in my opinion the score is not accurate.

If you checked 2, 3, or 4, you should discuss the purpose for which the test is being given and how it relates to you and your future plans with your counselor prior to taking the test.
The following definitions describe the nine aptitudes measured by the battery. Each of the nine skills is identified by a letter.

G. - General Learning Ability. The ability to catch on or understand instructions. The ability to reason and make judgements.

It gives an estimate designed to help answer the question, How easily do I learn compared with others? This particular ability was determined from three of the twelve sub-tests.

V. - Verbal Aptitude. The ability to understand meaning of words and use them effectively. The ability to understand language, relationships, between words and meanings of sentences and paragraphs. A high score indicates that it is easier for you to understand and use words than for others.
An example of the items measuring verbal ability that you were asked to respond to is choosing from four words the two which were similar or opposite in meaning and marking the correct answer on an answer sheet.

**CHOOSE THE TWO WORDS THAT ARE SIMILAR OR OPPOSITE IN MEANING**

A. dreary  B. loyal  C. ancient  D. disloyal  ANSWER b-d

Here is a line marked in equal units from one through nine. Indicate by marking an X on the line how difficult this particular sub-test was for you. A mark near the one would mean it was very difficult. If the sub-test was, in your opinion, of about average difficulty make an X above the five. Use the same procedure for indicating the level of difficulty of the other sub-tests as they are described. Write any questions, or comments regarding your reactions to the test in the space provided below the line for later discussion with the school counselor if you desire more information.

**VOCABULARY**

![Vocabulary Scale]

Difficult 1 2 3 4 5 6 7 8 9  Easy

Comments -
Numerical Aptitude. The ability to do arithmetic operations quickly and accurately.

A low score could point out reasons mathematics had been difficult for you in school. As you grow older this knowledge about yourself could be used with other information to help you decide on entering an occupation requiring this skill, on future high school course offerings, or even a college major.

This aptitude was measured by two sub-tests, Arithmetic Reasoning and Arithmetic Computation. After reading the examples, check on the numbered line how difficult these two sections were for you to complete.

**ARITHMETIC REASONING**

Example - A piece 1 1/2 feet long is cut off a board 4 1/2 feet long. How long is the rest of the board. Answer ___ 3
ARITHMETIC COMPUTATION

This sub-test requires the ability to add; multiply, subtract and divide.

\[
\begin{align*}
2 & \times 2 \\
\frac{4}{5} & + 1 \\
\frac{7}{3} & - \frac{3}{4} \\
\end{align*}
\]

Easy

Difficult

Comments -
S. - Spatial Ability. The ability to think visually of geometric forms and to understand the two-dimensional picturing of three dimensional objects.

This ability has been found to contribute to the success of draftsmen and along with Form Perception (described below) is needed by dentists, engineers, and machinists.

Example: What figure could be made from the flat piece of metal by either bending, or rolling, or both?
P. - Form Perception. The ability to see pertinent details in objects or in pictorial or graphic material. The ability to make visual comparisons and discriminations and see slight differences in shadings of figures on widths and lengths of lines.

The following are examples of items used to measure this ability.

FORM MATCHING - Matching figures that are exactly the same size and shape.
TOOL MATCHING - Finding the lettered figure which is exactly the same as the numbered figure.

Comments -
Q. **Clerical Perception.** The ability to see pertinent detail in verbal or tabular material.

This ability would aid you in seeing differences in copy, in proof-reading words and numbers and avoiding errors in arithmetic computation. Skill in this area should assist you to do well in high school and college and in many occupations such as; clerk, typist, secretarial and related work, nursing, X-ray, and related services and many others.

Example: Comparing names.

If the names were exactly the same, you were asked to mark the S on an answer sheet or if the names were different, in any way, to mark the D. The following were sample exercises you were given the opportunity to practice on before starting the sub-test.

<table>
<thead>
<tr>
<th>S</th>
<th>D</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Long and Co.</td>
<td>Long, Inc.</td>
<td>0 0</td>
</tr>
<tr>
<td>Johnson and Smith</td>
<td>Johnson and Smith</td>
<td>0 0</td>
</tr>
<tr>
<td>Armstrong F.C.</td>
<td>Armstrong F.G.</td>
<td>0 0</td>
</tr>
<tr>
<td>National Agency</td>
<td>Nat'l Agency</td>
<td>0 0</td>
</tr>
<tr>
<td>Fox Inc.</td>
<td>Fox Icn.</td>
<td>0 0</td>
</tr>
<tr>
<td>George Gorman</td>
<td>George Gorman</td>
<td>0 0</td>
</tr>
</tbody>
</table>

Difficult 1 2 3 4 5 6 7 8 9 Easy

Comments -
K. - Motor Coordination. The ability to rapidly and accurately coordinate eyes, hands, and fingers in making precise movements with speed. Ability to make movements accurately and swiftly.

Example: Making lines in squares.

Difficult

1 2 3 4 5 6 7 8 9

Easy

Comments -
F. - Finger Dexterity. The ability to move the fingers and manipulate small objects with the fingers.

This ability was measured by asking you to assemble and disassemble small washers and rivets and move them to another part of the board.

Difficult  1  2  3  4  5  6  7  8  9  Easy

Comments -
M. - Manual Dexterity. The ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions.

This ability was measured by moving pegs from the top part of a pegboard to the lower part using both hands and by turning a peg and placing it in the same hole using one hand only.
Understanding Your Score

You have completed the section of this unit designed to help you recall the types of test items you were asked to respond to on each part of the test. Also an opportunity was provided for you to indicate your opinion regarding the difficulty of each sub-test.

The scores can be reported in several ways: how you compare with others, percent of students who score as you do, or in terms of occupational patterns based on the scores of workers in a broad field of work.
Unit III discusses use of your scores in terms of Occupational Patterns. It is designed to assist you in studying or exploring occupations.

For example, if you wanted to relate your skills to those recommended for success in a job such as auto mechanic, this test can help you to a certain extent. It does not say you can or cannot be an auto mechanic but can indicate that you have skills other mechanics have found needed to be successful on the job.

The counselor will interpret your score privately to you upon request.
At this time the counselor will discuss with you how your score compares with others and how these skills relate to performance on the job.

You may want to discuss at the same time how you feel about the results of the test and clear up and questions or comments that you have listed in the section just completed.

If you do not understand the meaning of the different abilities measured by the battery, turn back to the first of this unit and read again the definitions and sample questions from each sub-test. List your comments or remarks and bring this bulletin with you when you request interpretation of your scores.

There are certain points to keep in mind as you look at any test score.

1. A score is only a reflection of how well you did on a set of items at a particular time. Therefore, it is only an estimate of your ability to perform the skill being measured.

2. Its accuracy is affected by how hard you tried. If you did not do the best you could do in the time allowed, the score is inaccurate.

3. If you took the test again, the score would probably be a little higher or lower due to several factors. Therefore, the best estimate of your ability might be a few points above or below the score you actually made on the day you took the test. The counselor will discuss this with you. An important point to note is that a test score can give an estimate of your ability to perform a certain skill, but it is not exact enough to use as the only factor in making future decisions. A simpler way to say this might be, you cannot say, "My scores are similar to those made by engineers; therefore, I should be an engineer." It may be used as an indicator of your ability to perform in certain jobs but should be considered along with other factors in your future planning.
4. Your scores reflect how well you did on nine special jobs and there are many other skills you possess. For example, you may be able to jump higher,

run faster,

lift more,

or sing better than many other students.
You know about many things you can do already. In the spaces below list some of the things you can do as well, or better, than other students.


At the same time there are probably certain things you do not do as well as other students. List in the spaces below some of these.


Recognition of these should not be cause for alarm, but awareness that we can't do everything equally well can help in future planning.

On the last page of this Unit is a form designed to give you an opportunity to estimate how you scored in each of the nine abilities. This estimate, after a private interpretation interview, will provide you with a comparison of how well you actually scored with how well you think you scored on each skill.

The first step is to work through an example before going on to the Test Interpretation Form.
Here is a line marked off with parts numbered one through nine.

<p>| | | | | | | | | | |</p>
<table>
<thead>
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</thead>
<tbody>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

This line is similar to the scale used to reflect your opinion of the difficulty of each test. This time it is designed to indicate how you think your abilities compare with others on a nine point scale. The heavy vertical line in the middle represents the average or the point where most students score on the scale. Students' scores which are the lowest would be located at a point near the one. Points 2, 3, and 4 represent below average. Highest scores would be near the nine or above with 6, 7, and 8 representing above average. The scale is designed to enable you to determine the percent of students scoring at or below each of the nine points. If you multiply the number below the line by 10, the product represents the percent of students that score at or below this point. At the right is a blank space where you may want to convert your estimate to a percent.

Below is a sample for numerical ability. The definition representing the average score is, I understand and do math as easily as most. An (X) has been placed above the eight in the sample. A statement regarding this number would be, "My estimate for numerical ability score is that I score equal to or better than 80 percent of students taking this test."

<table>
<thead>
<tr>
<th>Numerical Ability</th>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>I understand and do math as easily as most.</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Estimate ___</td>
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<tr>
<td>Actual ___</td>
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</tr>
</tbody>
</table>

Remove the Self Estimate Test Form from the bulletin. To obtain the maximum benefits from studying your scores, the following steps should be followed.

1. For each of the nine abilities make an (X) or a checkmark above the number on the line where you estimate your score would be located. To help you decide consider how difficult the sub-test was for you when taking the test. If you do not remember this sub-test or definition for the ability, go back to the first of the unit and review the part that discusses this ability.

2. Multiply the number below the checkmark by ten and record this product in the blank space after the word, "Estimate". This represents your idea of how easy this test was for you compared to other students.
3. Complete the scale estimate for each of the nine abilities and give to the counselor.

4. Arrange for a private interview with the counselor for an interpretation of your actual score.

5. Discuss your scores with the counselor to aid you in understanding your abilities and how they relate to future plans and occupational exploration.

6. After the interview, complete Unit III, Occupational Exploration and Career Planning.

If you do not want information regarding your test results, put your name at the top in the space provided on the Test Interpretation Form, and return the blank form to the counselor. This will help in scheduling the time for conferences if he knows the number of 10th graders desiring interpretation.
SUMMARY

This unit was designed to:

(a) help you understand the purpose for which the test was used.

(b) help you remember the type of questions you were asked to complete.

(c) define the skills that the test measured.

(d) give you an opportunity to compare the difficulty of the sub-tests for you as well as list your questions or comments to discuss later with the counselor.

(e) help you to better understand what a test score represents.

(f) provide an opportunity for you to estimate how well you scored on the test and arrange for a private interpretation to help you better understand the special abilities measured by the test.

-) to help you see the need to relate your abilities to future goals.
UNIT TEST

As a check on your understanding of this unit, complete the following items and check your answers with the correct ones listed at the end of the test.

Circle the correct answer.

1. The aptitude test was administered to all tenth graders to;
   a. help the student understand his abilities
   b. help the teacher better understand the students
   c. assist the counselor in working with the student in future planning
   d. all of the above
   e. none of the above.

2. An aptitude test represents a measure of;
   a. interests
   b. what I have learned in school
   c. special abilities
   d. all of the above
   e. none of the above.

3. Circle the statements below about test scores which are true.
   a. A score is a means of describing how well you did on a test.
   b. A test score gives an estimate of certain abilities.
   c. The best estimate of how well you can perform will probably be somewhat lower or higher than your actual score.
   d. A test score can tell you the type occupation you should follow.
   e. A test score is inaccurate if you did not do your best when taking the test.
   f. Many future decisions can be based on information from a score.
   g. A test score can aid you in better understanding your abilities.
   h. A low score could point out reasons some subjects in school are difficult for you.
4. Circle the letter of the correct response indicating how many abilities the test you took was designed to measure.

a. 7  
b. 12  
c. 9  
d. 1  
e. none.

5. Proper understanding of the results from the aptitude test can help you in choosing

a. future high school courses,  
b. vocational courses at the vocational school,  
c. occupations to explore or study,  
d. all of the above  
e. none of the above.

Correct answers:
1. d  2. c  3. a, b, c, e, g, h  4. c  5. d

My score is ______.

Perfect score is ______.

If you did not get 7 or above, go back and re-read the introduction and unit again.
<table>
<thead>
<tr>
<th>Ability</th>
<th>Estimate</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Learning</td>
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<td></td>
</tr>
<tr>
<td>Ability</td>
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<tr>
<td>Verbal Ability</td>
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<tr>
<td>Ability</td>
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<tr>
<td>Numerical Ability</td>
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<td>Ability</td>
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<tr>
<td>Spatial Ability</td>
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<td>Ability</td>
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<tr>
<td>Form Perception</td>
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<tr>
<td>Ability</td>
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<tr>
<td>Clerical Perception</td>
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<tr>
<td>Ability</td>
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<tr>
<td>Motor Coordination</td>
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<tr>
<td>Ability</td>
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<tr>
<td>Finger Dexterity</td>
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<tr>
<td>Ability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual Dexterity</td>
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</table>
A Short Time Ago You Took The
GENERAL APTITUDE TEST BATTERY

This test was administered to help you understand some of your special abilities and relate them to the study of occupations.
A better understanding of your ABILITIES is important in career planning because success in an occupation is dependent upon the ability to perform the tasks required on the job. Knowing more about your abilities as you decide on a career can help answer the question;

**CAN I DO THE THINGS THIS JOB REQUIRES?**
The test you took was made up of 12 sub-tests designed to measure:

- General Ability
- Verbal Aptitude
- Numerical Aptitude
- Spatial Aptitude
- Form Perception
- Clerical Perception
- Motor Coordination
- Finger Dexterity
- Manual Dexterity

[Drawings and images depicting various sub-tests and tasks related to the abilities listed.]
VERBAL APTITUDE

The ability to understand meaning of words and use them effectively.
EXAMPLE - A piece 1 1/2 feet long is cut off a board 4 1/2 feet long. How long is the rest of the board. Answer 3
NUMERICAL ABILITY

The ability to do arithmetic operations quickly and accurately.
CLERICAL PERCEPTION. The ability to see pertinent detail in verbal or tabular material.
SPATIAL ABILITY

The ability to think visually of geometric forms and to understand the two-dimensional picturing of three dimensional objects.

EXAMPLE - What figure could be made from the flat piece of metal by either bending, or rolling, or both?
FORM PERCEPTION

The ability to see pertinent details in objects or in pictorial or graphic material. The ability to make visual comparisons and discriminations and see slight differences in shadings of figures on widths and lengths of lines.

FORM MATCHING - Matching figures that are exactly the same size and shape.
TOOL MATCHING

Finding the lettered figure which is exactly the same as the numbered figure.
MOTOR COORDINATION

The ability to rapidly and accurately coordinate eyes, hands, and fingers in making precise movements with speed. Ability to make movements accurately and swiftly.

EXAMPLE - Making lines in squares.
MANUAL DEXTERITY

The ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions.
FINGER DEXTERITY

The ability to move the fingers and manipulate small objects with the fingers.
There are certain points to keep in mind as you think about your test scores.

The score is only an estimate of your ability to perform a certain skill based on how you answered a set of items at a particular time.

If you took the test again, the score would probably be a little higher or lower due to several factors.

The score is inaccurate if you did not do the best you could do in the time allowed.

The score may be used as an indicator of your ability to perform in certain jobs but should be considered along with other factors in your future planning.
Your results on each of the aptitudes are reported on a student profile in terms of:

How your score compares with others

and

Occupational Aptitude Patterns
PERCENTILE RANKS

Your scores will be reported in terms of how your abilities compare with those of a typical ONE HUNDRED other students like you. If your score on finger dexterity was 60, this would mean

40 students have higher finger dexterity scores than I do.

MY SCORE 60

59 students have lower finger dexterity scores than I do.
Occupations may be classified into groups based on the ability to perform certain skills that are judged to be needed in the particular types of work. These are called

**OCCUPATIONAL APTITUDE PATTERNS**

**Example - Auto Mechanic**

*Let Me See?*  
*Eenie Meenie Minie Mo-*  
*That's the One*

**Manual Dexterity**

**Numerical**

**Spatial**
SAMPLE OF JOBS IN OCCUPATIONAL APTITUDE PATTERN #1.

Architect

Systems Analyst
(Business Electronic Data Processing)

General Practitioner
(Medical Service)

Civil Engineer
SAMPLE JOB IN OCCUPATIONAL APTITUDE PATTERN #2
SECONDARY SCHOOL TEACHER

General Ability - The ability to "catch on", understand instructions, reason and make judgements.

Clerical Perceptions - The ability to perceive pertinent detail in verbal or tabular material, observe differences in copy, proofread words or numbers, etc.

Verbal Aptitude - The ability to understand meaning of words and use them effectively.

Numerical Aptitude - The ability to perform arithmetic operations quickly and accurately.
Results are reported for 62 patterns on the basis of your scores being equal to or above a minimum score needed in the pattern.

Three letters are used to indicate how you scored.

H - Your scores are better than those of workers judged to be satisfactory in the occupations in the pattern.

M - Your scores are close to those of workers judged to be satisfactory in the occupations.

L - Your scores are similar to or below those of workers found to be unsatisfactory in the occupation.

About 1200 occupations are included in the 62 patterns. The Dictionary of Occupational Titles lists about 26,000.
In addition to abilities, there are many other factors that should be considered in career planning.

**Personal traits**

**Economic factors**

**Interests**

**Acquired skills**

**Physical capacity**

**Leisure activities**

**Social factors**
When studying occupations several factors should be considered in addition to aptitudes needed to perform on the job.
If you desire information about how you scored on the APTITUDE test, the counselor will interpret your results privately.
BIBLIOGRAPHY


Ashley, J. W. A Field Trial and Analysis of Selected Occupational Guidance Activities with Counselor In-Service Education, Project No. L97820-01, Center for Career and Vocational Teacher Education, College of Education, Western Kentucky University, 1972.


