

ED 011 968

24

AA 000 087

MELBOURNE HIGH SCHOOL PILOT STUDY.

BY- BESVINICK, SIDNEY L. CRITTENDEN, JOHN  
MIAMI UNIV., CORAL GABLES, FLA.

REPORT NUMBER CRP-S-412

PUB DATE

66

REPORT NUMBER BR-5-8349

EDRS PRICE MF-\$0.09 HC-\$1.76 44P.

DESCRIPTORS- PILOT PROJECTS, COMPARATIVE ANALYSIS,  
\*TRANSITIONAL SCHOOLS, \*TRADITIONAL SCHOOLS, \*HIGH SCHOOLS,  
\*UNGRADED SCHOOLS, \*CONTINUOUS PROGRESS PLAN, STUDENT  
EVALUATION, STUDENT ATTITUDES, ACADEMIC ACHIEVEMENT, ACADEMIC  
ABILITY, SELF CONCEPT, CORAL GABLES, MELBOURNE HIGH SCHOOL,  
WATSON GLASER CRITICAL THINKING APPRAISAL, MARYLAND SELF  
CONCEPT AS A LEARNER SCALE, BELL SCHOOL INVENTORY

TO DETERMINE WHETHER THE GRADUATES OF MELBOURNE HIGH SCHOOL, IN BREVARD COUNTY, FLORIDA, WERE SUFFICIENTLY DIFFERENT FROM GRADUATES OF ANOTHER HIGH SCHOOL IN THE SAME DISTRICT TO WARRANT FURTHER RESEARCH, A PILOT STUDY WAS CONDUCTED. MELBOURNE HAS RECEIVED ACCLAIM FOR ITS NONGRADED, CONTINUOUS PROGRESS, INNOVATIVE CURRICULUM AND FOR THE NUMEROUS AWARDS WON BY ITS STUDENTS. THE STUDY SAMPLE WAS FORMED BY SORTING STUDENTS FROM THE GRADUATING CLASSES OF BOTH SCHOOLS INTO CLOSELY MATCHED PAIRS. ALL PAIRS WERE SUBDIVIDED INTO THREE ABILITY GROUPS. DATA FOR APTITUDE AND ACHIEVEMENT MEASURES WERE OBTAINED FROM THE RESULTS OF TWO STATEWIDE TESTING PROGRAMS, ADMINISTERED BY THE SCHOOLS TO NINTH- AND 12TH-GRADE STUDENTS RESPECTIVELY AS REQUIRED BY THE STATE. THE WATSON-GLASER CRITICAL THINKING APPRAISAL, THE MARYLAND SELF-CONCEPT AS A LEARNER SCALE, AND THE BELL SCHOOL INVENTORY WERE ADMINISTERED TO THE SAMPLE BY THE PROJECT STAFF. TEST RESULTS SHOWED (1) IN NO INSTANCE DID THE COMPARISON SCHOOL MATCHED STUDENTS DO BETTER THAN THE MELBOURNE STUDENTS ON SENIOR ACHIEVEMENT TESTS, (2) WHEN COMPARED BY ABILITY GROUPINGS (LOW, AVERAGE, AND HIGH) THERE WAS NO CLEAR SUPPORT FOR SUPERIORITY OF EITHER SCHOOL, AND (3) STATISTICALLY SIGNIFICANT DIFFERENCES ON THE CRITICAL THINKING TEST WERE FOUND IN ONLY THE AVERAGE ABILITY GROUP. ALTHOUGH MANY STUDENT DIFFERENCES FAVORED MELBOURNE AT ONLY A LOW LEVEL OF SIGNIFICANCE, THE INVESTIGATORS CONCLUDED THAT FURTHER STUDY WAS WARRANTED. (AL)

5-8349

**MELBOURNE HIGH SCHOOL PILOT STUDY**

**Cooperative Research Project No. S-412**

**Sidney L. Besvinick  
Chief Investigator**

**and**

**John Crittenden**

**University of Miami  
Coral Gables, Florida**

**1966**

**The research reported herein was supported  
by the Cooperative Research Program of the  
Office of Education, U.S. Department of  
Health, Education, and Welfare**

AA000087

ED011968

## ACKNOWLEDGMENTS

This study, like so many field investigations, would have been infinitely more difficult if not impossible to accomplish without the assistance of many helpful people. The Brevard County Board of Public Instruction, the Melbourne High School faculty, Dr. B. Frank Brown, and the comparison school which must, regrettably, remain unnamed have all been most cooperative. Schools, records, and offices were made instantly available.

Howard Stoker and John V. McQuitty of the Florida State-Wide Testing Program graciously provided us with the lists of students and their scores for both the 9th and 12th grade programs. George Mouly, Harry Hall, and Michael Stolee of the staff of the University of Miami have given of their knowledge and time to the project. Particularly, we extend our thanks to Elliott Cramer of the University of Miami Biometrics Laboratory who helped us interpret our statistical data.

Last, to Cynthia Wulkan, who served as an editorial conscience as well as typist, we express our gratitude.

Sidney L. Besvinick

John Crittenden

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	iv
PROBLEM ON WHICH THE RESEARCH WAS FOCUSED.....	1
BACKGROUND AND RELATED RESEARCH.....	2
PROCEDURES.....	8
Selection of Comparison School	
The Sample	
Data Sources	
Instruments	
DATA.....	15
Samples and Tests	
Analysis and Tabulated Findings	
SUMMARY.....	20
CONCLUSIONS.....	22
APPENDIX.....	24
Watson-Glaser Critical Thinking Appraisal	
Hugh Bell School Inventory	
University of Maryland Self-Concept as a Learner Questionnaire	

## LIST OF TABLES

Table	Page
1. Classification of Parent Occupations.....	10
2. One Sample T-Test for Matched Pair Differences...	17
3. Two Sample T-Test for Melbourne and Comparison High School Seniors.....	18
4. MANOVA Analysis of the Matched Pair Sample (Tests of Significance with Wilkes Lambda Criterion and Canonical Correlations).....	19
5. MANOVA Analysis of the Total Senior Sample from Melbourne and the Comparison School (Tests of Significance with Wilkes Lambda Criterion and Canonical Correlations).....	19

Problem on Which the Research Was Focused

Since 1957 when Dr. B. Frank Brown assumed the position of principal of Melbourne (Florida) High School, the nation as a whole has heard more and more about the school. There have been National Merit Scholarship finalists, Westinghouse Science Talent Search winners, a Pillsbury Bake-off champion, and many other awards accumulated by the student body. Dr. Brown himself has travelled widely lecturing about Melbourne's program and has written two books about the school. In addition, a steady stream of distinguished educators, psychologists, and interested laymen have visited Melbourne and left singing its praises. There has been, however, no experimental or objectively verifiable evidence that Melbourne High School is any better than any other school.

The purpose of this study was to examine statistically the achievement test and attitudinal inventory scores of Melbourne High School's 1966 graduating class to determine to what extent, if at all, these students differ from a comparable group of seniors graduating from a nearby school. The basic assumption underlying the analysis is that students reflect the program under which they have been taught and that, if Melbourne's students are significantly different according to their scores, it is possible that the dissimilarities are reflections of basic curricular and administrative differences between the schools.

The problem under study may be stated simply. Given the results of selected achievement tests, a critical thinking appraisal, and a student opinion survey, will a sample of Melbourne High School seniors differ sufficiently from a matched sample of seniors from another school to warrant further study of the Melbourne program?

### Background and Related Research

The nongraded movement has its origin in the 19th and 20th century attempts to break the lockstep of the graded organization instituted in the United States in 1848. Such plans as the St. Louis Plan, the Pueblo Plan, the Cambridge Plan, the Portland Plan, the Dalton Plan and the Winnetka Plan were early attempts to allow students to work at their own rate on various units.

The nongraded school.....is designed to implement a theory of continuous student progress. The plan introduced at Western Springs, Illinois in 1934 and since discontinued was the first, apparently, conforming to the modern conception of a nongraded system. A plan begun in Milwaukee in 1942 appears to be the oldest of those now operating. Most of sixteen such centers surveyed in 1955 and of thirty-one surveyed in 1957 started between 1947 and 1950.<sup>1</sup>

This experimentation with nongradedness has occurred with greater frequency in the primary grades. Most of the articles written and studies conducted in the area of the nongraded system of organization have been with the "nongraded primary unit." With very few exceptions the articles written about the nongraded primary unit are highly favorable. The studies of achievement and other factors, such as mental health, tend to favor the nongraded approach. Halliwell,<sup>2</sup> however, in conducting a background study for his investigation, felt that the results drawn from earlier studies were inconclusive. He reported that studies by Provus, Morgan and Stuker, Skapski, Ingram, and Hart found superiority for the nongraded system. On the other hand, studies by Carbone and Koontz reported superiority for the graded system.

---

<sup>1</sup>John I. Goodlad, "Classroom Organization," *ENCYCLOPEDIA OF EDUCATIONAL RESEARCH* (3rd ed.: New York: Macmillan Company, 1960), p.222.

<sup>2</sup>Joseph W. Halliwell, "A Comparison of Pupil Achievement in Graded and Non-graded Primary Classrooms," *THE JOURNAL OF EXPERIMENTAL EDUCATION*, 32 (Fall, 1963), 59-63.

In spite of the inconclusive nature of research in the nongraded primary, the movement toward nongradedness has continued to expand. Dean states that:

In a 1958-59 survey the author found that 18 percent of the urban areas in the United States indicated some degree of involvement with nongraded primary units.....at the present time reports to the Office of Education suggest a rapidly mounting trend toward nongradedness at the elementary school level, particularly in the primary grades, and also some slight increase at the secondary level.<sup>3</sup>

Presently, very few operating plans have been initiated at the secondary level. The problems encountered in establishing nongradedness at the elementary level are reproduced at the secondary level. In addition, because of the complexity of organization and the variety of purpose of the high school, the administrative procedures required to institute nongradedness in the secondary school are very complicated. The procedures that worked in the elementary school are not easily adapted to the secondary school.

It is difficult to determine the extent to which nongradedness has taken hold in the secondary schools. Highly publicized examples of nongradedness on the secondary level exist at the Middletown Secondary School at Middletown, Rhode Island, the Nova School at Ft. Lauderdale, Florida, and Melbourne High School at Melbourne, Florida. In addition to these schools there are other secondary schools in various stages of development in the direction of nongradedness. Schools in Hall County, Georgia, in Hawaii and other areas are following a nongraded plan based on that of Melbourne. However, some schools, termed as nongraded, could be more adequately described as "continuous progress" schools.

A nongraded high school is a school that groups students according to achievement in a particular subject. A learner is thus placed with other

---

<sup>3</sup>Stuart E. Dean, **NONGRADED SCHOOLS**, U.S. Dept. of Health, Education, and Welfare Bulletin No.1, OE-20009 (Washington: U.S. Government Printing Office, July, 1964), p.9.



students who are at approximately the same achievement level and a curriculum is developed that is appropriate for this group. These students, because of their similarities, work together for extended periods of time and progress somewhat as a group. Both social and intellectual benefits accrue by this procedure.

Continuous progress schools, on the other hand, allow students to progress on an individual basis through a sequence of predetermined curricular steps. There is greater individualization and less classroom work in a school which allows students to all move at their own pace.

It is difficult to describe how a typical secondary school operates a nongraded program. However, Brown proposes the following test for measuring the effectiveness of the nongraded organization:

Every nongraded plan should be tested against several propositions: (1) It must make possible an accurate classification of students of near equal achievement (2) it must provide for frequent re-classification so that students are permitted to move forward on an individual basis as fast as they can go (3) it must permit the establishment of individualized goals for each student (4) it must have standards compatible with the varying rates at which students learn.<sup>4</sup>

A person familiar with Melbourne High School's nongraded program will recognize the above test as providing a thumbnail description of the school. The most distinctive idea at this school is that students are respected as individuals, whether they are geniuses or slow learners, and efforts are made to fit them and their studies together. After visiting the school, Dobbin wrote:

The most immediate and startling impression I had of the school generally, an impression that deepened as the day wore on, is that this school is run for the sake of the students-- not to entertain them or to keep them off the streets or to

---

<sup>4</sup>B. Frank Brown, "The Nongraded School," NATIONAL ASSOCIATION OF SECONDARY SCHOOL PRINCIPALS BULLETIN, 47 (May, 1963), 65.

baby-sit them, but to change them intellectually. It is run less for the convenience of the administrators and teachers and janitors than any school I've ever seen.....<sup>5</sup>

Brown does not believe in cutting all students to the same pattern. They have different interests, think differently, grow differently, and therefore need individually tailored programs. It is boring and a waste of time to make a bright student cover the same material and at the same rate as a slow learner. It is equally frustrating and discouraging to the slow student. Instead, each student is encouraged to think or to inquire at his highest level, and maintain a healthy attitude toward both self and school. Melbourne strives to help all of its students to do this by means of its highly publicized nongraded, phase curriculum.

Students in the nongraded school do not go through the academic program as sophomores, juniors, and seniors. Instead, students at Melbourne are tested and interviewed upon entering and, with guidance, are placed on a level or in a phase of a subject. Phase I of a subject is centered around remedial work (practically tutorial); Phase II classes concentrate on basic skills; Phase III is designed for students seeking an average education in a subject; Phase IV is available for students desiring education in considerable depth; Phase V is open to students who are willing to assume responsibility for their own learning and who plan to go far beyond the boundaries of a single course; and Phase Q is for students whose creative talents are well developed in special areas. The last is designed to give thrust in the direction of individual development. Students may research an area in which they are deeply and broadly curious to develop creative powers and knowledge. Melbourne also has Phase X subjects, those non-academic subjects not amenable to student mobility. These subjects are ungraded but unphased.

---

<sup>5</sup>John Dobbin, Educational Testing Service, Memo to the ETS staff concerning his visit to Melbourne High School, March 22, 1963.

The appropriate phase for each student is individually determined in each subject. Thus a student may be in Phase III English, Phase IV social studies and Phase II mathematics. For as many years as he takes a subject, a student does so in the phase for which counseling and testing indicate he is fitted, although at any time he may "phase up" or "phase down" in a subject if all concerned (the student, teachers, counselor, parents) agree that it would be a better placement.

The curricular offerings at Melbourne High School are always in a state of change. If a new program appears to have merit, Melbourne High School is one of the first to investigate it. In addition to offering those subjects normally provided to students, Melbourne has many courses not regularly found in secondary schools. For example, in the field of English a colloquium in American Folklore is offered. In the field of history a rich and varied program is offered, such subjects as Problems of Peace, Asian and African History, Russian History, World Politics and Peace, and International Affairs. In the area of science Melbourne was a leader in adopting the PSSC physics, BSCS biology, BSCS special materials biology for students with reading problems, and adapted Princeton's Time Space and Matter Course for use with Phase I and Phase II secondary school students. Melbourne has readily experimented with advances in the new mathematics including Ball State geometry and SMSG mathematics. In the fine arts area sculpture, history of architecture, humanities, philosophy, and logic are offered. French, Spanish, Russian, Greek, and Latin are offered to language students. Conventional girls' physical education classes have been almost completely replaced with interpretative dance and choreography.

Each student enrolled in Phase Q or "Quest", Melbourne's independent

study program, assumes the responsibility for planning and executing his own highly individualized program of work in a particular area of interest. This willingness to allow a student to work in the area of his own interest results in a wide variety of topics. For example, last year students worked, on an independent basis, on such topics as protozoology, existentialism, endocrinology, German IV, Hebrew I, the laser beam, and civil law.

Brown's philosophy is to encourage students to be creative and to travel intellectually as rapidly as they are able. Each student is unique; his rate of learning differs from that of other students and from subject to subject as well.

Melbourne High School is dedicated to change. As soon as a program is perfected, ways of making it obsolete are sought. A prime example of this philosophy is illustrated in Brown's latest book. After developing the nongraded system of organization to a high level, he has this to say concerning the nongraded secondary school:

The new class organization which offers the most accommodation to individual learning is the innovation utilizing the achievement of students--not age--as the index for setting up classes. Achievement supplants age as the criterion for advancement. For want of a better name, the remodeled arrangement of grouping students was originally called the "nongraded" plan.

This new modus operandi can no longer be properly called a nongraded school. The nongraded school implies a change in school organization with minor curriculum adjustments. In its more sophisticated form, the nongraded school has become the Appropriate Placement school. This is a revolutionary new organization which calls for both a new organization and a corresponding revolution in curriculum.<sup>6</sup>

Many outstanding educators have visited Melbourne High School. They are almost unanimous in their acceptance of the program at this school.

---

<sup>6</sup>B. Frank Brown, THE APPROPRIATE PLACEMENT SCHOOL: A SOPHISTICATED NONGRADED CURRICULUM (West Nyack, N.Y.: Parker Publishing Company, Inc., 1965), p.3.

The increased interest in the nongraded secondary movement creates a need for a model for other schools to emulate. If a nongraded model for secondary school organization is to be developed, it could and may come from Melbourne High School. The significance of this study lies in its subjection of the judgments about Melbourne High School to objective analysis.

### Procedures

#### Selection of Comparison School

The initial design for this study proposed a comparison of 1965-66 seniors from Melbourne High School with 1965-66 seniors from another high school in Brevard County. In addition to Melbourne High School there are eight high schools in the county. Seven of these schools were rejected for comparative purposes for the following reasons:

1. Schools one and two were rejected because of the racial composition of the student body. Melbourne High School is predominantly white while these two schools are predominantly Negro.

2. Schools three and four were rejected because neither of them had been in existence for the required period of time (three years) necessary for participation in the study.

3. Schools five, six, and seven were rejected for two reasons. (a) Approximately 60 percent of the parents in these school areas were employed on federal or federally-connected projects.<sup>7</sup> This percentage indicates a considerably higher degree of pupil mobility than would be indicated by Melbourne's 28 percent. This difference in pupil mobility would make comparison of the schools difficult. (b) An analysis of

---

<sup>7</sup>Percentages are based on Brevard County figures derived from Federal Impact Questionnaires.

building permit activity revealed that the number of new homes in the areas served by these three schools increased 220 percent from 1963 to 1965. On the other hand, the number of permits for new homes in the Melbourne area decreased 230 percent for the same time period.<sup>8</sup> These figures indicate a population stability in the Melbourne area that is not duplicated by the school areas served by these three schools. These variations in population mobility and new home construction from the Melbourne area precluded the use of these schools for the purposes of this study.

The school selected for the comparison school in this study is similar to Melbourne High School in several respects:

- (a) 42 percent of the parents worked for federal or federally connected projects, as compared to 28 percent for the parents in the Melbourne school area.
- (b) The comparison school area parallels the Melbourne school area in the number of permits for new home construction during the period 1963-65.
- (c) Parents' occupations, by classifications, are comparable to occupations reported by parents in the Melbourne school area.

Table I provides a percentage breakdown of parent occupation classification at Melbourne High School and the comparison school.

Other similarities between the two schools have relevance to this study. Four years ago, the comparison school was created by sub-dividing Melbourne High School, thereby providing two schools serving adjacent geographical areas.

---

<sup>8</sup>Report of Brevard Builder's Exchange, Merritt Island, Florida, distributed by The Education and Community Services Branch, Kennedy Space Center, NASA, January 11, 1966.

TABLE 1

CLASSIFICATION OF PARENT OCCUPATIONS

Occupational Classifications	Melbourne	Comparison School
Skilled	33.0	39.8
Professional & Managerial	31.0	24.6
Clerical	14.0	15.0
Sales	10.4	4.0
Civil Service	2.6	3.8
Armed forces	1.4	3.8
Self employed	3.0	2.0
Unskilled	2.6	1.0
Retired	2.4	4.0

In addition to serving similar geographic areas the two schools also operate under similar school organization. The comparison school, along with the other schools in Brevard County (with the exception of Melbourne High School), is committed to Brevard County's "SPACE Plan." The SPACE Plan was designated in 1963 as "Selective Phasing: A Continuous Education." The 1965 "SPACE Curriculum Guidelines" divides the SPACE Plan into three major areas: (1) the grouping of pupils, (2) the grouping of teachers, and (3) the revision of curriculum. Students are grouped into basic, regular, and advanced sections on the basis of similar reading performance.<sup>9</sup> Each school may use appropriate sub-divisions under the three headings listed above. In compliance with the Plan, the comparison school groups students into five phases as does Melbourne. However, this school retains the graded type of organization as compared with Melbourne's nongraded program. The SPACE Plan was implemented very recently and its effects are difficult to identify. The nongraded program at Melbourne has been in continuous operation

<sup>9</sup>"SPACE Curriculum Guidelines" (Brevard County Board of Public Instruction, Titusville, Florida, 1965). (Mimeographed.)

since 1957 and apparently provided the basis for the development of the SPACE Plan.

#### The Sample

The 458 graduating seniors of Melbourne High School and the 389 graduating seniors of the comparison school (1965-66) represented the population from which the sample was drawn. The first step was to identify seniors from the two schools who had been in uninterrupted attendance at the respective schools for grades 10 through 12.

Because socio-economic status, sex, and intellectual capability are generally acknowledged by researchers as factors which influence the data acquired in such studies, students from the two schools were paired according to these characteristics in an attempt to reduce their effect on the sample. Since the occupation of the father is considered to be a reliable indicator of the socio-economic position of the family, it was obtained from school records and used for this purpose. The ninth grade (1962-63) School and College Ability Test score, taken from the ninth grade state-wide testing program results, was used as a measure of intellectual capability. Occupational pairing was essentially one to one. SCAT scores were permitted maximum deviation of ten points between the members of each pair, although in 54 cases the deviation was eight points or less. 62 pairs were identified.

The 62 pairs were sub-divided into three groups according to SCAT scores with 21 pairs in the low group, 20 pairs in the middle group, and 21 pairs in the upper group.

These divisions are comparable to Melbourne's divisions for the five phases in grouping students. The low group corresponds approximately to a combination of Phase 1 (0-20th percentile) and Phase 2 (21-40th percentile).



The middle group corresponds approximately to Phase 3 (40-60th percentile) and the high group contains Phase 4 (60-80th percentile) and Phase 5 (80-99th percentile). The comparison school, although operating a graded structure of organization, does group students into similar phases.

#### Data Sources

The State of Florida operates two statewide testing programs. One of these programs, The Florida Statewide Ninth Grade Testing Program, administers the School and College Ability test and the Metropolitan Achievement Test Battery to all ninth grade students in all the public schools of the state. The Florida Statewide Twelfth Grade testing program administers a test to all graduating seniors. This test is one especially devised for the State of Florida by Educational Testing Service. It consists of an aptitude section and a battery of achievement tests in the same subject matter areas as the Metropolitan test. These subject matter areas are English, mathematics, social studies, and science. The data for aptitude and achievement measures for this study were obtained from the results of these tests.

The Watson-Glaser Critical Thinking Appraisal, the Maryland Self-Concept as a Learner Scale, and the Bell School Inventory were administered to the seniors in both schools during the month of April. (These devices are described more fully in the section entitled "Instruments.") Approximately two hours were required for the administration of these instruments.

Due to a change in the requirements for maintaining attendance records for previous years, attendance information was available for only 47 of the matched pairs. The total number of absences for each student for the 10th, 11th, and the first semester of the 12th year were obtained from his cumulative record and were used in the study.

### Instruments

In addition to the ninth and twelfth grade statewide tests described above, the following instruments were administered:

- (a) The Watson-Glaser Critical Thinking Appraisal is a series of test exercises which require the application of some of the important abilities involved in critical thinking. The test is divided into five subtests: (1) inference, (2) recognition of assumptions, (3) deduction, (4) interpretation and (5) evaluation of arguments. The composite score was used in the study since the subtest reliabilites are moderately low. These subtests can be used to analyze the critical thinking abilities of a class to determine the types of critical thinking training most needed by the group. This test was standardized using 20,312 students in 13 states on the high school level and 5,297 college freshman in 11 states. It has an odd-even split-half reliability of .87 for the 12th grade. It requires a minimum of 55 minutes for administration.<sup>10</sup>
- (b) The Bell School Inventory is an attempt to describe quantitatively the attitude of pupils toward their school. Students who make low scores tend to be well adapted to the school environment; they like their teachers, enjoy their fellow students, and feel that the school is conducted systematically and fairly. Students who make high scores tend to be poorly adapted to the school; they dislike their teachers, think the principal is unfair, and sometimes express a desire to withdraw from school.

---

<sup>10</sup>Goodwin Watson and Edward M. Glaser, "Manual for Watson Glaser Critical Thinking Appraisal" (New York: Harcourt, Brace and World, Incorporated, 1964).

This inventory has a coefficient of reliability of .94 determined by correlating the odd-even items and applying the Spearman-Brown formula. There was a significant agreement between the judgment of teachers and the scores on the inventory with respect to adjustment in the high school in the four high schools used to determine the validity of the instrument. The test requires fifteen minutes for administration.<sup>11</sup>

- (c) The Self-Concept as a Learner Scale was developed by the Bureau of Educational Research and Field Services at the University of Maryland. No information is available concerning the reliability or the validity of the instrument. It is divided into four components which constitute certain dimensions of a student's self concept as a learner. Items within each component are judged in terms of the way an adequate learner would respond. This test can be administered in fifteen minutes.<sup>12</sup>

---

<sup>11</sup>Hugh M. Bell, "Manual for The School Inventory" (Stanford, Calif.: Stanford University Press, 1937).

<sup>12</sup>"Procedure for Analysis of Self-Concept as a Learner Scale" (Bureau of Educational Research and Field Services, University of Maryland, College Park, Maryland, undated). (Mimeographed.)

Data

Samples and Tests

The following samples were used and for each the data were collected as noted:

1. Total school sample for Melbourne High School (n=313), Comparison High School (n=182):
  - a. 9th grade --
    - (1) School College Ability Test
    - (2) Metropolitan Achievement Test Battery
      - (a) Language
      - (b) Mathematics
      - (c) Social Studies
      - (d) Science
  - b. 12th grade --
    - (1) Specially devised ETS Battery
      - (a) Aptitude
      - (b) Language
      - (c) Mathematics
      - (d) Social Studies
      - (e) Science
2. Matched pair sample (n=62 pairs):
  - a. All data noted above
  - b. Watson-Glaser Critical Thinking Appraisal
  - c. Hugh Bell School Inventory
  - d. University of Maryland Self-Concept as a Learner Questionnaire
3. Matched pair sample (n=47 pairs):
  - a. Total absences in high school to date

Analysis and Tabulated Findings

Initially the matched pair sample was subjected to a t-test based on the differences between pairs in each of the areas in which data had been obtained. The probability was found for the low (level), average (level),

and high (level) aptitude pairs (grouped according to ninth grade SCAT scores) and for the total sample (Table 2).

These data were also analyzed (Table 3), to the extent of their availability, for all the students who had been in continuous attendance at Melbourne and the comparison high school since September, 1963. The number of students in aptitude level one at Melbourne was 103, at the comparison school, 63; level two at Melbourne, 93, at the comparison school, 62; level three at Melbourne, 117, at the comparison school, 57. These figures yield a total sample of 313 seniors at Melbourne and 182 at the comparison school.

Since the values obtained by the t-tests did not equate groups for variances which might exist due to differences in ability when the students entered the tenth grade, some form of analysis of covariance was considered advisable. A multivariate analysis of variance (MANOVA) program was used on both the matched pair sample and the total samples from both senior classes. Tables 4 and 5 indicate the result when the data were adjusted for covariance.

TABLE 2  
ONE SAMPLE T-TEST FOR MATCHED PAIR DIFFERENCES

Test	Level 1 (n=21)		Level 2 (n=20)		Level 3 (n=21)		Total Sample (n=62)	
	t	P less than	t	P less than	t	P less than	t	P less than
9th Grade								
Lang.	0.208	0.837	1.349	0.193	0.649	0.524	1.263	0.212
Math.	0.090	0.929	0.038	0.970	0.944	0.356	0.425	0.672
Soc. St.	0.439	0.665	1.666	0.112	0.541	0.594	0.754	0.454
Science	0.390	0.701	0.495	0.626	1.932	<u>0.068</u>	0.760	0.450
12th Grade								
Apt.	1.588	0.128	1.038	0.312	1.320	0.202	1.266	0.210
Lang.	0.686	0.500	2.129	0.047	1.360	0.189	2.326	0.023
Math.	0.560	0.582	1.216	<u>0.239</u>	2.782	0.011	2.422	<u>0.018</u>
Soc. St.	0.096	0.925	1.191	0.248	0.850	<u>0.405</u>	1.095	<u>0.278</u>
Science	0.914	0.372	0.516	0.611	1.539	0.140	1.779	<u>0.080</u>
W-G	0.334	0.742	2.272	0.035	0.900	0.379	1.555	0.125
SCAL	0.082	0.935	1.682	<u>0.109</u>	0.634	0.533	0.658	0.513
Bell	1.292	0.211	0.839	0.401	1.173	0.255	1.968	0.054
Attend.	0.764	0.454	0.792	0.438	0.092	0.928	0.372	<u>0.711</u>

Note: All probabilities underlined once ( ) are significant below the 0.10 level; underlined twice ( ), below the 0.05 level.

TABLE 3

TWO SAMPLE T-TEST FOR MELBOURNE AND COMPARISON  
HIGH SCHOOL SENIORS

Test	Level 1		Level 2		Level 3		Total	
	t	P less than	t	P less than	t	P less than	t	P less than
9th Grade								
Lang.	0.258	0.797	0.624	0.522 <sup>a</sup>	1.170	0.244	1.384	0.167
Math.	1.886	<u>0.058<sup>a</sup></u>	0.942	0.347	1.873	0.063	0.563	0.575 <sup>a</sup>
Soc. St.	0.428	0.669	0.911	0.364	2.138	<u>0.034</u>	0.037	0.970
Science	0.872	0.384	0.809	0.420	0.383	<u>0.702</u>	0.622	0.534
12th Grade								
Apt.	1.847	<u>0.067</u>	0.089	0.930	1.629	0.105	2.043	0.042
Lang.	0.166	0.868	0.871	0.384 <sup>a</sup>	2.567	<u>0.011</u>	2.483	<u>0.013<sup>a</sup></u>
Math.	0.859	0.391	0.408	0.684	0.947	0.345	0.891	<u>0.373</u>
Soc. St.	0.653	0.514	1.365	0.174	1.571	0.118	1.664	0.097
Science	0.484	0.629	1.441	0.149 <sup>a</sup>	1.559	0.121	2.487	<u>0.013<sup>a</sup></u>

Note:

All probabilities underlined once ( ) are significant below the 0.10 level; underlined twice ( ), below the 0.05 level.

<sup>a</sup>Significant difference between variances at the 0.05 level.

TABLE 4

MANOVA ANALYSIS OF THE MATCHED PAIR SAMPLE  
(TESTS OF SIGNIFICANCE WITH WILKES LAMBDA CRITERION  
AND CANONICAL CORRELATIONS)

Test of Roots	F	DF Hyp.	DF Err.	P less than	R
<b>Aptitude Level</b>					
1 through 2	1.812	12.000	92.000	<u>0.057</u>	0.565
2 through 2	0.369	5.000	46.500	<u>0.867</u>	0.195
<b>School</b>					
1 through 2	1.959	6.000	46.000	<u>0.091</u>	0.451

TABLE 5

MANOVA ANALYSIS OF THE TOTAL SENIOR SAMPLE  
FROM MELBOURNE AND THE COMPARISON SCHOOL  
(TESTS OF SIGNIFICANCE WITH WILKES LAMBDA CRITERION AND  
CANONICAL CORRELATIONS)

Test of Roots	F	DF Hyp.	DF Err.	P less than	R
<b>Aptitude Level and School</b>					
1 through 2	1.801	10.000	960.000	<u>0.056</u>	0.166
2 through 2	1.101	4.000	480.500	<u>0.355</u>	0.095
<b>Aptitude Level</b>					
1 through 2	3.517	10.000	960.000	<u>0.001</u>	0.211
2 through 2	3.233	4.000	480.500	<u><u>0.012</u></u>	0.162
<b>School</b>					
1 through 1	1.397	5.000	480.000	0.224	0.120

Note:

All probabilities underlined once (        ) are significant below the 0.10 level; underlined twice (        ), below the 0.05 level.



### Summary

The hypotheses listed in an earlier section of the report have been tested by the data with the following results:

Hypothesis #1 - Selected Melbourne seniors will perform no better on the senior achievement tests than the matched sample.

Melbourne seniors outperformed their matched pairs at better than the 0.05 level in English and mathematics and at better than the 0.10 level in science and on the Bell School Inventory. In no instance did the comparison school matched pairs do better than the Melbourne students.

When the total school sample was used without matching, Melbourne students exceeded the comparison school at the 0.05 level in aptitude, English, and science, and at the 0.10 level in social studies.

Hypothesis #2 - Compared at three levels of intelligence -- low, middle, and high -- selected Melbourne seniors will perform no better on the senior achievement tests than the matched sample at any of the three levels specified.

When considered as individual groupings, the low, average, and high ability portions of the matched pair sample give no clear support for either Melbourne or the comparison school. At the low level (level 1) no scores were significant at better than the 0.10 level. At level 2 the 12th grade English and the Watson-Glaser scores favored Melbourne at better than the 0.05 level. At the high level the mathematics score was significant below the 0.05 level.

At level 1 the difference in means favored the comparison school in four of the nine test analyses; level 2, two; level 3, one; and on a school wide basis, none.

The MANOVA analysis of the matched pair sample, which adjusted for ninth grade differences, showed that the differences in aptitude levels were significant below the 0.10 as were the differences between the schools.

Hypothesis #3 - Comparing SCAT scores from the 9th and 12th grade testing programs, there will be no difference in change for selected Melbourne senior when compared with the matched sample.

Ninth grade SCAT scores cannot be compared with 12th grade aptitude scores because the same test is not used. The matched pair sample and the total school sample were grouped using ninth grade SCAT scores as one of the criteria. In the matched pair group the 12th grade aptitude t-test was not significant at any time below the 0.10 level. The total school sample on the same test was significant below the 0.10 level for level 1 and below the 0.05 level for the total school.

Hypothesis #4 - Selected Melbourne seniors will perform no better on the Watson-Glaser Critical Thinking Appraisal than the matched sample.

Only at level 2 did the Melbourne matched pair sample achieve a level of statistical significance on the Watson-Glaser Critical Thinking Appraisal. The results were significant below the 0.05 level.

Hypothesis #5 - Compared to established norms, Melbourne seniors will perform at or below the expected performance of high school seniors on the Watson-Glaser.

The national norm for high school seniors on the Watson-Glaser is 65. The Melbourne matched pair sample had a mean score of 67. The Melbourne total school mean score was 66.

Hypothesis #6 - The number of absences by year and totally per student will be the same for selected Melbourne seniors and the matched sample.

On the matched pair sample there was no significant difference in the number of absences between the Melbourne seniors and those from the comparison school.

Hypothesis #7 - The attrition rate for tenth grade students who entered Melbourne High School in the fall of 1962 will be comparable to the attrition rate of similar schools in the same county.

It was impossible to test this hypothesis since the Brevard County schools have altered their basis of keeping attendance records and the necessary data were not available.

Hypothesis #8 - Selected Melbourne seniors and the matched sample will regard their schools in the same way on a pupil opinion and attitude inventory.

According to the Bell School Inventory, the total group of Melbourne matched pair students felt better about their school than did the comparison group. The results were significant below the 0.10 level. There were no differences in attitude evidenced by aptitude levels.

The University of Maryland Self-Concept as a Learner scale did not reveal any differences in attitude favoring either group of students.

### Conclusions

There do appear to be differences between the students at Melbourne and the comparison school. Many of these differences are significant only at the 10 percent level but a few are almost at the one percent level, and in practically every case the means do favor Melbourne High School even though they are not statistically significant.

Probably the best way to describe the difference between the two schools is shown in the MANOVA analyses of Table 4 and Table 5. In Table 4 the Melbourne matched pair sample outdid the comparison school below the 0.10 level. In Table 5, when both aptitude level and school were considered in the matrix, Melbourne's sample was significantly better at almost the 0.05 level (0.056).

These results would indicate that any of three further studies may be worthwhile.

- (1) The identification of devices which can more accurately and sensitively reveal the factors which make Melbourne High School a singular secondary school.
- (2) A broad study comparing the graduating seniors from Melbourne with those from other outstanding schools on comparable evaluative instruments.
- (3) An in-depth investigation to determine those factors which have caused Melbourne High School students to be more successful than their peers at other schools.

The purpose of this pilot study was to determine whether Melbourne High School students are sufficiently different from the graduates of another high school, based on test data, to warrant further study of the Melbourne program. It is the opinion of the investigators that such a study is warranted.

**APPENDIX**

**WATSON-GLASER**

# **Critical Thinking Appraisal**

**FORM YM**

**BY GOODWIN WATSON**

*Professor Emeritus of Social Psychology and Education, Teachers College, Columbia University;  
Distinguished Service Professor, Newark State College*

**AND EDWARD M. GLASER**

*Edward Glaser & Associates, Consulting Psychologists, Pasadena*

**DIRECTIONS:** This booklet contains five types of tests designed to find out how well you are able to reason analytically and logically.

Do not turn this page until instructed to do so.

Do not make any marks on this test booklet.

All answers are to be marked on the separate Answer Sheet provided.

If you wish to change an answer, be sure to erase your old answer completely.



Copyright © 1961, 1952, 1951; Published 1964 by Harcourt, Brace & World, Inc., New York.  
All rights reserved. Printed in U.S.A.

## TEST 1: Inference

### DIRECTIONS

An inference is a conclusion which a person draws from certain observed or supposed facts. Thus, from the electric light visible behind the window shades and from the sound of piano music in a house, a person might infer that someone is at home. But this inference may or may not be correct. Possibly the people in the house went out leaving the lights on, and the piano music could be coming from a radio or phonograph they left playing.

In this test, each exercise begins with a statement of facts which you are to regard as true. After each statement of facts you will find several possible inferences — that is, conclusions which some persons might make from the stated facts. Examine each inference separately, and make a decision as to its *degree* of truth or falsity.

For each inference you will find spaces on the Answer Sheet labeled T, PT, ID, PF, and F. For each inference make a mark on the Answer Sheet under the appropriate label as follows:

**T** if you think the inference is definitely *TRUE*; that it properly follows beyond a reasonable doubt from the statement of facts given.

**PT** if, in the light of the facts given, you think the inference is *PROBABLY TRUE*; that there is better than an even chance that it is true.

**ID** if you decide that there are *INSUFFICIENT DATA*, that you cannot tell from the facts given whether the inference is likely to be true or false; if the facts provide no basis for judging one way or the other.

**PF** if, in the light of the facts given, you think the inference is *PROBABLY FALSE*; that there is better than an even chance that it is false.

**F** if you think the inference is definitely *FALSE*; that it is wrong, either because it misinterprets the facts given, or because it contradicts the facts or necessary inferences from those facts.

Sometimes, in deciding whether an inference is probably true or probably false, you will have to use certain commonly accepted knowledge or information which practically every person has. This will be illustrated in the example which follows.

Look at the example in the next column; the correct answers are indicated in the block at the right.

### EXAMPLE

Two hundred eighth-grade students voluntarily attended a recent week-end student forum conference in a Midwestern city. At this conference, the topics of race relations and means of achieving lasting world peace were discussed, since these were the problems the students selected as being most vital in today's world.

1. As a group, the students who attended this conference showed a keener interest in humanitarian or broad social problems than have most eighth-grade students.....
2. The majority of these students were between the ages of 17 and 18.....
3. The students came from all sections of the country.....
4. The students discussed only labor relations problems.....
5. Some eighth-grade students felt that discussion of race relations and means of achieving world peace might be worthwhile.....

TEST 1					
Inference					
	T	PT	ID	PF	F
1		■			
2				■	
3			■		
4					■
5	■				

In the above example, inference 1 is probably true (PT) because (as is common knowledge) most eighth-grade students are not likely to show so much serious concern with broad social problems. It cannot be considered definitely true from the facts given because these facts provide no certain knowledge about the kind and degree of concern with world problems which other eighth-grade students might express. It is also possible that some of these students volunteered mainly because they wanted a week-end outing.

Inference 2 is probably false (PF) because (common knowledge) there are relatively few eighth-grade students in the United States between 17 and 18 years of age.

There is no evidence for inference 3. Thus there are insufficient data (ID) for making a judgment on the matter.

Inference 4 is definitely false (F) because it is given in the statement of facts that the topics of race relations and means of achieving world peace were the problems chosen for discussion.

Inference 5 necessarily follows from the given facts; it therefore is true (T).

In the exercises which follow, more than one of the inferences from a given statement of facts may be true (T), or false (F), or probably true (PT), or probably false (PF), or have insufficient data (ID) to warrant any conclusion. That is, you are to consider each inference by itself.

Make a heavy black mark in the space under the label that you think best describes each inference. If you change an answer, erase thoroughly. Make no extra marks on the Answer Sheet.

**Go ahead with the exercises below.**

An English teacher arranged for the students in one of her regular classes to see the movie *Great Expectations*, while the students in all her other English classes studied the book itself, without seeing the picture. She wanted to know whether movies could be used as effective aids in teaching literature. Tests to check on appreciation and understanding of the story were given immediately after each type of instruction. On all tests the class which saw the movie did better. This class became so interested in the *Great Expectations* story that before the semester was over most of the students in the class chose to read the book, entirely on their own initiative. The teacher felt gratified over her experiment.

1. The tests to measure appreciation and understanding of the story were administered both to the students who saw the picture and to those who only studied the book.
2. The students who were taught with the aid of the motion picture were required to read the book at the beginning of the semester.....
3. No other English teacher who might try a similar experiment with her students would get similar results...
4. The teacher who conducted the study will (if she continues to teach literary appreciation) hereafter use suitable motion pictures as a teaching aid when she is free to do so .....
5. Upon completion of the two forms of instruction, there was no evidence that the class which had seen the movie understood or appreciated *Great Expectations* more than the classes which read the book without first seeing the picture.....
6. Students can learn more about most subjects from motion pictures than they can from books.....

Studies have shown that there is relatively much more tuberculosis among Negroes in the United States than among whites. There is little if any difference, however, in rate of tuberculosis between Negroes and whites who have the same level of income. The average income of whites in the United States is considerably higher than the average income of Negroes.

7. The easiest way to eliminate tuberculosis in the United States would be to raise the general standard of living. . .
8. Persons in high income brackets are in a better position to avoid getting tuberculosis than persons in low income brackets.....
9. There is a lower rate of tuberculosis among Negroes with relatively high incomes than among Negroes with much lower incomes.....
10. Whether Negroes have high incomes or low incomes makes no difference in the likelihood of their having tuberculosis.....

Some time ago a crowd gathered in Middletown, Mississippi, to hear the new president of the local Chamber of Commerce speak. He said, "I am not asking, but demanding, that labor unions now accept their full share of responsibility for civic betterment and community welfare. I am not asking, but demanding, that they join the Chamber of Commerce." The members of the Central Labor Unions who were present applauded enthusiastically. Three months later all the labor unions in Middletown were represented in the Chamber of Commerce. These representatives worked with representatives of other groups on committees, spoke their minds, participated actively in the civic betterment projects, and helped the Chamber reach the goals set in connection with those projects.

11. Both the labor union representatives and the other members of the committees came to recognize one another's viewpoints better through their Chamber of Commerce contacts .....
12. Labor unions' participation in the Middletown Chamber of Commerce greatly reduced worker-management disputes in that town.....
13. The active participation of the labor unions caused many bitter and unresolved controversies at the committee meetings of the Chamber of Commerce.....
14. Most of the union representatives regretted having accepted the invitation to participate in the Chamber of Commerce.....
15. Some of the Chamber of Commerce members came to feel that their president had been unwise in asking the union representatives to join the Chamber.....
16. The new president indicated in his speech that the town's labor unions were not already accepting their full responsibility for civic betterment.....

The first newspaper in America, edited by Ben Harris, appeared in Boston on September 25, 1690, and was banned the same day by Governor Simon Bradstreet. The editor's subsequent long fight to continue his little paper and print what he wished marks an important episode in the continuing struggle to maintain a free press.

17. The editor of the first American newspaper died within a few days after his paper was banned on September 25, 1690.....
18. A copy of the first issue of Ben Harris' newspaper was promptly brought to Governor Bradstreet's attention. . .
19. The editor of this paper wrote articles criticizing Governor Bradstreet.....
20. Ben Harris was a man of persistence in holding to some of his interests or aims.....



## TEST 2: Recognition of Assumptions

### DIRECTIONS

An assumption is something presupposed or taken for granted. When someone states, "I'll graduate in June," he takes for granted or assumes that he will be alive in June, that the school will judge him to be eligible for graduation in June, and similar things.

Below are a number of statements. Each statement is followed by several proposed assumptions. You are to decide for each assumption whether a person, in making the given statement, is really making that assumption — i.e., taking it for granted, justifiably or not.

If you think the given assumption is taken for granted in the statement, make a heavy mark between the dotted lines under "ASSUMPTION MADE" in the proper place on the Answer Sheet. If you think the assumption is *not* necessarily taken for granted in the statement, make a heavy line under "ASSUMPTION NOT MADE" on the Answer Sheet.

Below is an example. The block at the right shows how these items should be marked on the Answer Sheet. If you do not see why the answers marked are right, ask the examiner to explain.

In some cases more than one of the given assumptions is necessarily made; in other cases none of the given assumptions is made.

**EXAMPLE**

**Statement:** "We need to save time in getting there so we'd better go by plane."

**Proposed assumptions:**

1. Going by plane will take less time than going by some other means of transportation. (It is assumed in the statement that the greater speed of a plane over the speeds of other means of transportation will enable the group to reach its destination in less time.) .....
2. There is plane service available to us for at least part of the distance to the destination. (This is necessarily assumed in the statement, since, in order to save time by plane, it must be possible to go by plane.) .....
3. Travel by plane is more convenient than travel by train. (This assumption is not made in the statement — the statement has to do with saving time, and says nothing about convenience or about any other specific mode of travel.) .....

TEST 2	
Assumption	
Made	Not made
1	
2	
3	

**Go ahead with the exercises below.**

**Statement:** "A wise man will save at least twelve dollars each week out of his earnings."

**Proposed assumptions:**

21. No fools have sense enough to save twelve dollars a week.
22. A person needs to be wise in order to save twelve dollars a week.

**Statement:** "Let us immediately build superior armed force and thus keep peace and prosperity."

**Proposed assumptions:**

23. The building of superior armed force guarantees the maintenance of peace and prosperity.
24. Unless we increase our armaments we shall have war immediately.
25. We now have peace and prosperity.

**Statement:** "A wife who is able to save something out of the amount budgeted for household expenses should be permitted to keep this to spend for her personal needs."

**Proposed assumptions:**

26. Some wives have responsibility for managing the money budgeted for household expenses.
27. The budget provides no other way in which the wife can get money for her personal needs.

**Statement:** "The discovery of additional ways of using atomic energy will, in the long run, prove a blessing to mankind."

**Proposed assumptions:**

28. Atomic energy can have numerous uses.
29. The discovery of additional uses for atomic energy will require large long-term investments of money.
30. The present uses of atomic energy are a curse to mankind.

**Statement:** "Zenith is the city to live in — lowest taxes."

**Proposed assumptions:**

31. Efficient management of a city implies lower taxes.
32. An important consideration in deciding where to live is avoidance of high taxes.
33. The majority of the residents in Zenith are content with their present city government.

**Statement:** "Since more and more students plan to go to college, many new college buildings must be constructed."

**Proposed assumptions:**

34. The number of college buildings to be constructed needs to be related to the plans of high school students regarding further education.
35. Existing college buildings are already crowded to capacity.
36. Attendance of students in college requires that buildings be available for them.

## TEST 3: Deduction

### DIRECTIONS

In this test, each exercise consists of two statements (premises) followed by several suggested conclusions. For the purposes of this test, consider the two statements in each exercise as true without exception. Read the first conclusion beneath the statements. If you think it necessarily follows from the statements given, make a heavy black mark between the pair of dotted lines under "CONCLUSION FOLLOWS" in the corresponding blank on the Answer Sheet. If you think it is *not* a necessary conclusion from the given statements, put a heavy black mark under "CONCLUSION DOES NOT FOLLOW," even though you may believe it to be true from your general knowledge.

Likewise, read and judge each of the other conclusions. Try not to let your prejudices influence your judgment — just stick to the given statements (premises) and judge each conclusion as to whether it *necessarily* follows from them.

The word "some" in any of these statements means an indefinite part or quantity of a class of things. "Some" means *at least* a portion, and *perhaps* all of the class. Thus, "Some holidays are rainy" means *at least* one, possibly more than one, and *perhaps* even all holidays are rainy.

Study the example carefully before starting the test.

#### EXAMPLE

Some holidays are rainy. All rainy days are boring. Therefore —

1. No clear days are boring. (The conclusion does not follow. You cannot tell from the statements whether or not clear days are boring. Some may be.).....
2. Some holidays are boring. (The conclusion necessarily follows from the statements, since, according to them, the rainy holidays must be boring.)..
3. Some holidays are not boring. (The conclusion does not follow even though you may know that some holidays are very pleasant.) .....

#### TEST 3

#### Conclusion

	Follows	Does not follow
1		■
2	■	
3		■

**Go ahead with the exercises below.**

All the serious polio cases in a certain city for a given year occurred in children under ten years of age. No one who had received polio vaccine developed a serious case of polio that year. Therefore —

37. Some children under ten years of age had not received polio vaccine.....
38. All those who had received vaccine were over ten years of age.....
39. Some persons under ten years of age had received polio vaccine that year.....

If a person is superstitious, he believes fortunetellers. Some people do not believe fortunetellers. Therefore —

40. If a person is not superstitious, he will not believe fortunetellers.....
41. Some people are not superstitious.....
42. If a person believes fortunetellers, he is superstitious...

Some who favor higher budgets for schools are opposed to compulsory high school attendance for all. Only genuine friends of education are in favor of higher budgets for schools. Therefore —

43. Some genuine friends of education are not in favor of compulsory high school attendance for all.....
44. Some persons who favor compulsory high school attendance are not genuine friends of education.....
45. A person can't oppose compulsory high school attendance for all and be a genuine friend of education.....

Some fanatics are sincere idealists. All fanatics are bores. Therefore —

46. Some sincere idealists are bores.....
47. Some bores are sincere idealists.....
48. No bores are sincere idealists.....
49. If a person is a sincere idealist, he is likely to be a bore..

If a belief is not grounded on conviction, it is likely to give way before the slightest of arguments. Many of our beliefs are not based on conviction, but are carelessly adopted. Therefore —

50. There is a likelihood that we can be easily argued out of many of our beliefs.....
51. Many people have convictions which they hold on to stubbornly .....
52. If a person's belief does change or give way to argument, it was not grounded on conviction in the first place....

All good athletes are in fine physical condition. Some good athletes have poor scholastic records. Therefore—

53. Some persons with poor scholastic records are in fine physical condition.....
54. If a person is in fine physical condition, he will have a poor scholastic record.....
55. Some persons in fine physical condition have poor scholastic records.....
56. Every student who has a good scholastic record and is a good athlete is in fine physical condition.....

All great novels are works of art. All great novels capture our imagination. Therefore —

57. Whatever captures our imagination is a work of art....
58. Some works of art capture our imagination.....
59. Our imagination can be captivated by many different kinds of things.....

No person with a substantial income can avoid paying income tax. Some people with a substantial income dislike paying income tax. Therefore —

60. Some people with a substantial income must do things they dislike.....
61. All people who pay income tax have a substantial income.....

## TEST 4: Interpretation

### DIRECTIONS

Each exercise below consists of a short paragraph followed by several suggested conclusions.

For the purpose of this test assume that everything in the short paragraph is true. The problem is to judge whether or not each of the proposed conclusions logically follows beyond a reasonable doubt from the information given in the paragraph.

If you think that the proposed conclusion follows beyond a reasonable doubt (even though it may not follow absolutely and necessarily), then make a heavy black mark between the appropriate dotted lines under the "CONCLUSION FOLLOWS" column on the Answer Sheet. If you think that the conclusion does *not* follow beyond a reasonable doubt from the facts given, then make a mark under "CONCLUSION DOES NOT FOLLOW."

In some cases more than one of the suggested conclusions may follow; in other cases none of the conclusions may follow.

Here is an example; the block at the right shows how your answers should be marked on the Answer Sheet.

#### EXAMPLE

A study of vocabulary growth in children from eight months to six years shows that the size of spoken vocabulary increases from zero words at age eight months to 2562 words at age six years. Therefore —

1. None of the children in this study had learned to talk by the age of six months. (The conclusion follows beyond a reasonable doubt, since, according to the statement, the size of the spoken vocabulary at eight months was zero words.).....
2. Vocabulary growth is slowest during the period when children are learning to walk. (The conclusion does not follow, as there is no information given which relates growth of vocabulary to walking.).....

TEST 4		
Conclusion		
	Follows	Does not follow
1	█	
2		█

**Go ahead with the exercises below.**

Of the 2,800,000 juniors and seniors in the nation's public high schools during a certain year, only 830,000 were enrolled in science and 660,000 in mathematics courses.

62. Some public high schools did not require science and mathematics for all juniors and seniors during the given year.....
63. One major reason for the fact that about half of that year's high school juniors and seniors did not study science and mathematics is that they took those courses during their freshman and sophomore years.....
64. Some juniors or seniors in the nation's public high schools during the year in question were studying neither science nor mathematics.....

A Los Angeles newspaper made a survey of the number of male and female drivers involved in all automobile accidents in the Los Angeles area during a given period of time. They found that male drivers were involved in 1210 accidents while female drivers were involved in only 920 accidents.

65. If the period studied is typical, more automobile accidents in the Los Angeles area involve male drivers than female drivers.....
66. More men than women drive cars in the Los Angeles area every day.....
67. Teen-age boys are involved in automobile accidents more often than teen-age girls in the Los Angeles area.....

A sociologist surveyed, by means of a mail questionnaire, the attitudes of persons who managed a certain group of hotels and restaurants as to whether they would accept Chinese as guests or customers. He then arranged for a Chinese couple to visit these hotels and restaurants, and subsequently learned from the couple which establishments had actually served them. He found that of the establishments which had served the Chinese couple, over 90 per cent had previously stated they would not serve Chinese.

68. Expressed attitude toward a course of action is not necessarily a reliable indicator of behavior.....
69. Surveys measuring expressed attitudes contribute nothing to the understanding of what people will do in everyday practice.....
70. The majority of the managers of hotels or restaurants which served this couple during their travels had said they would refuse to accept Chinese as guests or customers.....

The history of the last 2000 years shows that wars have become steadily more frequent and more destructive, the twentieth century having the worst record thus far on both these counts.

71. Mankind has not advanced much in the ability to keep peace.....
72. Wars are bound to be more destructive as science provides more powerful weapons.....
73. During the past 300 years, men have engaged in more frequent and more destructive wars than they did in any previous 300-year period since the year 1.....

Usually I fall asleep promptly, but about twice a month I drink coffee in the evening; and whenever I do, I lie awake and toss for hours after I go to bed.

74. My problem is mostly mental; I am overaware of the coffee when I drink it at night, anticipating that it will keep me awake, and therefore it does.....
75. I don't fall asleep promptly after drinking coffee at night because the caffeine in coffee stimulates my nervous system for several hours after drinking it.....
76. Whatever causes me to lie awake and toss at night is associated with my drinking coffee earlier in the evening..

## Test 4: Interpretation

Victims of radiation sickness (resulting, for example, from an atomic explosion) are likely to die of anemia because the blood-building properties of the bone marrow are damaged. In everyday medical practice, X-ray dosages have to be worked out with utmost care to keep the patients from falling prey to radiation sickness. Experimenting on rabbits, Dr. Leon Jacobson found that, when the spleen and appendix were protected with lead, the animals survived what would otherwise have been a fatal overdose of X rays. The undamaged spleen and appendix make enough blood to enable the damaged tissue to recover.

77. In rabbits, when the bone marrow fails in its blood-building function as a result of radiation damage, certain organs, if undamaged, tend to compensate for this failure .....
78. Dr. Jacobson's experiments on rabbits should be tried on a sufficiently large scale with people to see whether the same results would hold true.....
79. In some species of animals, blood can be made by more than one organ.....

A national weekly magazine published some articles criticizing the action of the Catholic Church in matters of health and censorship, and was promptly banned from the high school libraries by the school board of an Eastern city.

80. The majority of the people on that school board were afraid of the power of the Catholic Church.....
81. A majority of the people in that city must have been Catholics.....
82. The magazine should not have published those articles..

---

A report of the U.S. Census during a certain year states that there were approximately 1,656,000 marriages and 264,000 divorces granted in the United States.

83. If the above ratio still holds true, then about six times as many people in the United States get married each year as get divorced.....
84. Getting a divorce is a relatively easy matter in the United States.....
85. The divorce rate in the United States is much too high..

Go on to the next page ►

## TEST 5: Evaluation of Arguments

### DIRECTIONS

In making decisions about important questions, it is desirable to be able to distinguish between arguments that are strong and arguments that are weak, as far as the question at issue is concerned. An argument to be strong must be both important and directly related to the question.

An argument is weak if it is not directly related to the question, even though it may be of great general importance; or if it is of minor importance; or if it is related only to trivial aspects of the question.

Below is a series of questions. Each question is followed by several arguments. For the purpose of this test you are to regard each argument as true. The problem then is to decide whether it is a STRONG or a WEAK argument.

Make a heavy mark on the Answer Sheet under "STRONG" if you think the argument is strong, or under "WEAK" if you think the argument is weak. Judge each argument separately on its own merit; try not to let your personal attitude toward the question influence your evaluation.

In the example, note that the argument is evaluated as to how well it supports the side of the question indicated.

#### EXAMPLE

Should all young men in the United States go to college?

1. Yes; college provides an opportunity for them to learn school songs and cheers. (This would be a silly reason for spending years in college.) . . . . .
2. No; a large per cent of young men do not have enough ability or interest to derive any benefit from college training. (If this is true, as the directions require us to assume, it is a weighty argument against all young men going to college.) . . . . .
3. No; excessive studying permanently warps an individual's personality. (This argument, although of great general importance when accepted as true, is not directly related to the question, because attendance at college does not necessarily require excessive studying.) . . . . .

#### TEST 5

#### Argument

	Strong	Weak
1		■
2	■	
3		■

When the word "should" is used as the first word in any of the following questions, its meaning is "Would the proposed action promote the general welfare of the people in the United States?"

**Go ahead with the exercises below.**

**If otherwise qualified, should married women be eligible for employment as public school teachers in the United States?**

86. No; there are more single women in our country than there are school-teaching jobs. . . . .
87. Yes; women tend to become better teachers after marriage. . . . .
88. No; a mother's first responsibility is to her own children.

**Should the United States government try to keep the public informed of the details of its scientific research programs by publicizing ahead of time the results which are hoped for from experimental tests of new weapons, equipment, devices, etc.?**

89. No; some people become critical of the government when widely publicized projects turn out unsuccessfully.
90. Yes; only a public so informed will give the necessary support for the research and development activities essential to the nation's security. . . . .
91. Yes; the projects are supported by taxes and the general public would like to know how their money is to be spent. . . . .

**Can rich and poor people who happen to oppose each other at law obtain approximately equal justice from the courts when the cases are decided by jury trial?**

92. Yes; lawyers for both sides have the opportunity to question prospective jurors about possible biases. . . . .
93. No; most juries are more sympathetic to poor people in court battles when their opponents are known to be rich, and the jurors' sympathies affect their findings. . . . .
94. No; rich people win their lawsuits against poor people a little more often than poor people win against rich people. . . . .

**Should the United States government take over all the main industries in the country, employ all who want to work, and offer the products at cost price?**

95. No; so much concentration of economic and bureaucratic power in government would undermine our personal and political freedom. . . . .
96. Yes; the government already operates post offices, highways, parks, military forces, public health services, and some other public services. . . . .
97. No; the subsequent elimination of competition and the profit motive would result in much less initiative for production of useful new goods and services. . . . .

**Should groups in this country who are opposed to some of our government's policies be permitted unrestricted freedom of press and speech?**

98. Yes; a democratic state thrives on free and unrestricted discussion, including criticism. . . . .
99. No; the countries opposed to our form of government do not permit the free expression of our point of view in their territory. . . . .
100. No; if given full freedom of press and speech, opposition groups would cause serious internal strife and make our government basically unstable, eventually leading to loss of our democracy. . . . .

*Go back and check your work.*

# THE SCHOOL INVENTORY

By HUGH M. BELL

NAME		SCHOOL
SEX	DATE	SCHOOL CLASS

## DIRECTIONS TO STUDENT

On the following pages you will find a list of questions concerning things about this school which may or may not be satisfactory to you. We should like to know what things about this school you like and what you dislike. *Your answers will be treated with the strictest confidence and in no case will they be used to cause you any embarrassment.* If you will answer these questions honestly and thoughtfully, the school will endeavor to improve the conditions which your answers indicate need improvement.

There are no right or wrong answers. Indicate your answer by drawing a circle around "Yes," "No," or "?" Try to answer all questions either "Yes" or "No." If you are certain that you cannot answer "Yes" or "No," then use the question mark.

There is no time limit, but work rapidly.

SCORE	DESCRIPTION	REMARKS



Copyright 1936 by the Board of Trustees of the Leland Stanford Junior University; renewed 1963 by Hugh M. Bell.

- Yes No ? Do you like all of the subjects you are now taking in this school?
- Yes No ? Have you found the students in this school friendly and willing to "meet you halfway"?
- Yes No ? Do you think this school places too much emphasis upon grades?
- Yes No ? Do you think that too much importance is attached to the possession of money and good clothes in this school?
- Yes No ? Do you find that most of the subjects which you are taking are very interesting?
- Yes No ? Have you found that some of your teachers are easily "upset" over trifles?
- Yes No ? Do you think that the students in this school are "snobbist"?
- Yes No ? Do you think that all of your teachers are "up to date" in their ideas and actions?
- Yes No ? If you were able to do so, would you like to attend some other school than the one you are now attending?
- Yes No ? Do you find that some of your teachers refuse to change their attitude toward you once they have made up their minds that you are "no good"?
- Yes No ? Do you think that your school activities are controlled by too small a group of students?
- Yes No ? Do most of your teachers make their lesson assignments definite and clear?
- Yes No ? Do you feel that some of your teachers hold a "grudge" against you?
- Yes No ? Would you like to take a different group of courses than those in which you are now enrolled?
- Yes No ? Do you think that there are too many social cliques in this school?
- Yes No ? Do you find that some of your teachers are very hard to get acquainted with?
- Yes No ? Is this school providing the kind of preparation that you want for your chosen occupation?
- Yes No ? Do you think that some of your teachers feel that they are superior to their students?
- Yes No ? Do some of your teachers "talk over the heads" of their students?
- Yes No ? Have you been able to get into the school activities in which you are interested?
- Yes No ? Would you like to quit school and go to work?
- Yes No ? Do you think that some of your teachers lack physical strength to do their best work?
- Yes No ? Are some of your teachers nervous and easily excited?
- Yes No ? Does this school provide adequate opportunity for you to meet and make friends?
- Yes No ? Are some of your courses very boring to you?
- Yes No ? Are some of your teachers very sarcastic?
- Yes No ? Do you have difficulty in keeping your mind on what you are studying?
- Yes No ? Do you find that most of your teachers are systematic and orderly in the way they conduct their classes?
- Yes No ? Do you think that some of your teachers are narrow-minded?
- Yes No ? Have you frequently found the ventilation poor in some of your classrooms?
- Yes No ? Do you think that some of the women instructors in this school show favoritism toward boys in their classes?

- Yes No ? Are most of your teachers successful in putting across their subject matter?
- Yes No ? Do you think that some of your teachers expect too much of you?
- Yes No ? Do you find that most of your teachers are very interesting to know personally?
- Yes No ? Do you find that this school tends to make you unhappy?
- Yes No ? Have you experienced considerable difficulty preparing your lessons for your classes?
- Yes No ? Have you found that the speaking voice of some of your teachers is irritating to you?
- Yes No ? Do you think that some of your teachers are lazy?
- Yes No ? Do you find your school work dull and uninteresting?
- Yes No ? Do you think that some of your teachers lack force of character?
- Yes No ? Do you think that the disciplinary cases are handled fairly in this school?
- Yes No ? Do you think that the principal and teachers in this school lack patience when dealing with students?
- Yes No ? Do you think that some of your teachers allow themselves to become too familiar with some students?
- Yes No ? Do you find that some of your teachers hold themselves aloof from the students and do not mix freely?
- Yes No ? Do you think that the principal of this school is too strict with students?
- Yes No ? Have you found that principal and teachers in this school tend to act as if they were always right and you were always wrong?
- Yes No ? Do you find that some of your teachers assign too long lessons?
- Yes No ? Do you think that this school is run as if it were a prison?
- Yes No ? Have you been able to choose the subjects you like in this school?
- Yes No ? Do you think that some of your teachers act as if they were bored with their work?
- Yes No ? Do some of your teachers produce a feeling of fear in you?
- Yes No ? Do you find it rather easy to get well acquainted with your teachers?
- Yes No ? Do you think that your school makes a mistake when it sends home without your permission a report of your scholarship?
- Yes No ? Are you often frightened by the way some of your teachers call on you in class?
- Yes No ? Have some of your teachers criticized you unjustly?
- Yes No ? Do you like the teacher who has been designated as your counselor?
- Yes No ? Do you dislike intensely certain teachers in this school?
- Yes No ? Do you think that some of your teachers show partiality toward certain students?
- Yes No ? Do you think that your teachers require too much work to be done outside the regular class period?
- Yes No ? Do you think that some of the men teachers in this school show partiality toward girls in their classes?
- Yes No ? Do you think that some of your teachers are susceptible to "apple polishing"?



- Yes No ? Do you think that some of your teachers lack a sense of humor?
- Yes No ? Do you think that some of your teachers treat you as if you were a small child?
- Yes No ? Do you feel that most of your teachers have confidence in your ability to succeed?
- Yes No ? Have you found that some of your teachers are very "bossy"?
- Yes No ? Do you find that some of your teachers make you feel as if you did not care whether you learned anything in their classes or not?
- Yes No ? Do you find that all of the teachers in this school are cheerful and pleasant to meet?
- Yes No ? Do you find that some of your classes are very monotonous?
- Yes No ? Do you think that the principal of this school allows the students sufficient opportunity to participate in the administration of the school?
- Yes No ? Do you find that some of your teachers fail to stimulate in you the desire to do your best work?
- Yes No ? Do you find that some of your teachers apparently take delight in making you feel embarrassed before the class?
- Yes No ? Do you have the feeling that some of your teachers dislike their jobs?
- Yes No ? Do you find that your teachers are honest and straightforward in their dealing with you?
- Yes No ? Do you think that some of your teachers show a lack of interest in school activities?
- Yes No ? Do you think that some of your teachers lack enthusiasm for their work?
- Yes No ? Do you find that your teachers are always ready to help you individually with your school work?

---

On the space below please list specific suggestions which you may have for the improvement of your school.

.....

.....

.....

.....

SELF-CONCEPT SCALE

Instructions: These statements are to help you describe yourself. Please answer them as if you were describing yourself to yourself. Do not omit any items! Read each statement carefully. Select one of the following answers, and mark the letter that represents that particular answer on the answer card.

- Answer Key:
- A. Completely False
  - B. Mostly False
  - C. Partly True and Partly False
  - D. Mostly True
  - E. Completely True

Remember describe YOU AS YOU SEE YOURSELF, not as others see you.

- 1. I am usually eager to go to class. \_\_\_\_\_
- 2. I never ask teachers to explain something again. \_\_\_\_\_
- 3. I try to change when I know I'm doing things wrong. \_\_\_\_\_
- 4. I wish I didn't give up as easily as I do. \_\_\_\_\_
- 5. I get the required work done, but I don't do extra work. \_\_\_\_\_
- 6. I would rather do well than poorly in school. \_\_\_\_\_
- 7. Once in a while I put off until tomorrow what I should do today. \_\_\_\_\_
- 8. I become discouraged easily in school. \_\_\_\_\_
- 9. I give up easily in school work. \_\_\_\_\_
- 10. I do things without being told several times. \_\_\_\_\_
- 11. I am satisfied to be just what I am. \_\_\_\_\_
- 12. I like school jobs which give me responsibility. \_\_\_\_\_
- 13. I like to start work on new things. \_\_\_\_\_
- 14. I cannot remember directions for doing things. \_\_\_\_\_
- 15. I do well when I work alone. \_\_\_\_\_
- 16. I am satisfied with my ability to speak before class. \_\_\_\_\_
- 17. I am able to get work done on time. \_\_\_\_\_
- 18. I have difficulty deciding what to study. \_\_\_\_\_
- 19. I sometimes use unfair means to do my school work. \_\_\_\_\_
- 20. I do my share of school work. \_\_\_\_\_
- 21. I give up if I don't understand something. \_\_\_\_\_
- 22. I try to be careful about my work. \_\_\_\_\_

- 23. I get tense when I'm called on in class. \_\_\_\_\_
- 24. I make mistakes because I don't listen. \_\_\_\_\_
- 25. I do things without thinking. \_\_\_\_\_
- 26. I have trouble deciding what is right. \_\_\_\_\_
- 27. I find it hard to remember things. \_\_\_\_\_
- 28. I think clearly about school work. \_\_\_\_\_
- 29. I can't express my ideas in writing very well. \_\_\_\_\_
- 30. I can tell the difference between important and unimportant things in a lesson. \_\_\_\_\_
- 31. I do poorly in tests and homework. \_\_\_\_\_
- 32. I change my mind a lot. \_\_\_\_\_
- 33. I feel good about my school work. \_\_\_\_\_
- 34. I do not understand what is going on in class. \_\_\_\_\_
- 35. I am as smart as I want to be. \_\_\_\_\_
- 36. I solve problems quite easily. \_\_\_\_\_
- 37. I can figure things out for myself. \_\_\_\_\_
- 38. Good grades come easily to me. \_\_\_\_\_
- 39. I know the answer before the rest of the class. \_\_\_\_\_
- 40. I can usually see the sense in other's suggestions. \_\_\_\_\_
- 41. I find it easy to get along with classmates. \_\_\_\_\_
- 42. I enjoy being part of the class without taking the lead. \_\_\_\_\_
- 43. I take an active part in group projects and activities. \_\_\_\_\_
- 44. I try to play fair with my classmates. \_\_\_\_\_
- 45. I try to understand the other fellow's point of view. \_\_\_\_\_
- 46. I am an important person to my classmates. \_\_\_\_\_
- 47. My classmates have no confidence in me. \_\_\_\_\_
- 48. I am not interested in what my classmates do. \_\_\_\_\_
- 49. I find it hard to talk with classmates. \_\_\_\_\_
- 50. I feel left out of things in class. \_\_\_\_\_