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AUTHOR Edge, Donald  
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## ABSTRACT

Test results are summarized for the second year of the New Jersey College Basic Skills Placement Test administered to 47,728 entering freshmen in the fall of 1979. Performance is categorized into one of three groups: appears proficient in basic skills tested; demonstrates proficiency in some (but not all) of the areas tested; and demonstrates a lack of proficiency serious enough to initiate a clear need for remediation. Data are presented for the total state and for type of institution (two-year colleges, state colleges, New Jersey Institute of Technology, and Rutgers University) for the following tests: reading comprehension, sentence structure, logical relationships, essay, composition, total English, computation, and elementary algebra. Tables are also presented containing student background data. Three conclusions are reached: (1) a substantial proportion of New Jersey students entering college are not proficient in the basic verbal and mathematical skills necessary to perform college-level work; (2) deficiencies are present at both two-year and four-year institutions; and (3) the level of proficiency required to complete three years of high school instruction in English and mathematics is considerably lower than the proficiency expected of entering freshmen. Some comparisons to the previous year's results are made. (GDC)

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225 WEST STATE STREET  
P. O. BOX 1293  
TRENTON, NEW JERSEY 08625

MEMORANDUM

December 6, 1979

TO: T. Edward Hollander, Chancellor  
FROM: Donald Edge, Director *DE*  
Basic Skills Council  
SUBJECT: Report of the New Jersey Basic Skills Council

I am pleased to submit to you for your consideration and transmittal to the Board of Higher Education the annual report of the Basic Skills Council on the results of the New Jersey College Basic Skills Placement Test which was administered to 47,725 freshmen entering New Jersey public colleges and universities and three independent colleges in the fall of 1979.

Attachment

cc: Basic Skills Council

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M E M O R A N D U M

December 10, 1979

TO: Members, Board of Higher Education  
FROM: T. Edward Hollander, Chancellor  
SUBJECT: Report of the New Jersey Basic Skills Council

I submit herewith the report of the New Jersey Basic Skills Council on the basic skills test results of freshmen entering New Jersey public colleges and universities in the fall of 1979.

This is the second annual basic skills report, and it represents a significant part of Board mandated efforts to identify and improve the basic skills proficiencies of New Jersey students.

The report indicates that we must maintain our basic skills efforts at the collegiate level since those who entered our colleges and universities this fall performed essentially the same on the exams as did the group who entered a year ago. Such results are not surprising, given the depth of the problem as previously identified and given the understanding that the efforts spearheaded by the Department of Education cannot have narrowed the achievement gap in only one year.

A few points bear mention. First is that the Basic Skills Council has changed the format of its report. No longer do they break out the scores into two groups (those acceptable and those not) but into three groups (those clearly needing remediation, those who appear not to need it, and those who may or may not need it depending on the mission and standards of the institution that they are attending). This new approach reflects the understanding that the colleges themselves can best determine which students in the middle group require remediation in order to meet the academic requirements of the institution.

Second, a sizable portion of the students who took the test are aware that their basic skills need improvement. While relatively small proportions indicated that they believe themselves to be below average in mathematical ability (13%) and written expression (5%), greater proportions said that they wanted help to improve their skills - 37% in mathematics, 24% in writing, 15% in reading, and 33% in study skills. This can only be interpreted positively since it clearly indicates that those students are, themselves, not satisfied with their own levels of achievement.

Finally, since comparison across the various higher education sectors is inevitable, it should be noted that the basic skills problem seems to cut across all socioeconomic levels and is found among students at all of our institutions. However, as one might assume, Rutgers students perform the best over-all on the tests and NJIT students have the highest scores in mathematics. State college students scored below those two institutions but higher than community college students. Given the missions of each sector, we would not have expected otherwise. The proportions in each sector who are receiving remedial instruction will be the focus of a subsequent report by the Council, as will a report arraying performance on the tests by high school.

This report and the statewide testing program represent the commitment of the Basic Skills Council members, members of the advisory committees, campus test administrators, test essay readers, and others, all of whom have shared their professional experience and have given of their time to strengthen the statewide assessment program. I am confident that I speak for the entire higher education community when I thank and commend them for their extraordinary contribution.

Report to the Board of Higher  
Education on the Results  
of the New Jersey College  
Basic Skills Placement Testing  
April 4, 1979 - September 22, 1979

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December 21, 1979

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## PROLOGUE

In the following report, the Basic Skills Council presents the results of the New Jersey College Basic Skills Placement Test which was administered to 47,725 students entering New Jersey public colleges and universities and three independent colleges in the fall of 1979. This report is a response to the Board of Higher Education's mandate that the Basic Skills Council assess the skills proficiency of each matriculated freshman student in all New Jersey public institutions of higher education in order to give the colleges and the Board an accurate and complete picture of the extent of the basic skills problem in New Jersey colleges, and to help students meet the academic requirements of the colleges in which they are enrolled.

At the national level little is being done to determine the extent or the cause of declining basic skills proficiencies. In New Jersey, however, plans are being made and action has been taken to improve skills and reinstate academic standards and requirements. While certain organizations have tended to avoid or downplay the issue, New Jersey has faced the problem squarely as a matter of statewide policy. The Boards of Education and Higher Education have endorsed a basic skills policy paper that calls for a far-reaching effort to improve New Jersey students' basic skills proficiencies at all educational levels, and outlines activities that can be undertaken either individually or jointly by the two Boards and the two Departments.

Both the Department of Higher Education's New Jersey College Basic Skills Placement Test (NJCBSPT) and the Department of Education's Minimum Basic Skills Tests (MBS) provide information concerning the nature and scope of the problem in order to help students meet the academic standards of the schools and colleges in which they are enrolled. The testing information also helps institutions to better understand their students' needs so that they can provide effective programs to meet those needs, and helps schools and public bodies to allocate resources where they are most needed.

As expected, this year's NJCBSPT test results are similar to last year's in almost every respect. The results reveal the magnitude and pervasiveness of a basic skills problem which cannot and will not be solved in one year. We must intensify our efforts at all levels to insure that improvement does occur, although it may be several years before measurable improvement is observed. We cannot allow our resolve to waiver during this transitional period.

The answer to the basic skills problem lies not in stopping tests or suppressing results. The answer lies in doing whatever is necessary to ensure that young Americans acquire the basic skills that are the mark of solid preparation for college, work, and citizenship.

With this goal of solid preparation in mind, the Council this year has changed the format in which test results are reported. The 1978 report divided students into two groups--those scoring above the mean on each section of the test, and those scoring below the mean. To provide a more useful interpretation, this year's report tabulates the results on the basis of three groups: those who appear proficient in the basic skills tested, those who demonstrate proficiency in some but not all of the areas tested, and those who demonstrate a lack of proficiency so serious as to indicate a clear need for remediation.

The Council is acutely sensitive to the fact that the different college sectors have different missions and standards, and that there are different missions and standards within each college sector. The middle category of students tested--those who demonstrated proficiency in some but not all of the basic skills areas tested--covers a broad range. Many of the individuals whose scores fall into this range will need remedial assistance at the colleges they attend; others may be ready to undertake the regular curriculum in programs offered by their colleges. The presence of a large "uncertain" category reflects the Council's belief that it is only the faculties of individual colleges who can make the judgements necessary to ensure that these students will indeed be placed in courses commensurate with their needs and abilities.

The Council reaffirms its belief that while basic skills testing and remediation are not a long-range responsibility of higher education, at this stage in history they are essential if we are to provide an opportunity for New Jersey students to achieve full participation in college, in work, in the community, and in American society.

## SUMMARY

This report presents the results of the New Jersey College Basic Skills Placement Test which was administered to 47,725 students entering New Jersey public colleges and universities and three independent colleges in the fall of 1979. A similar report was issued in the fall of 1978; while more students were tested in 1979, there is no significant change in the self-reported student information or in the testing results. (Appendices D-K contain 1978 and 1979 comparative tables; the results are summarized on page 7.)

The data contained in the present report support the following conclusions:

1. A substantial proportion of the students entering colleges in New Jersey are not proficient in the basic verbal and mathematical skills and are thereby hindered from doing college-level work in a broad variety of disciplines.
2. The problem of basic skills deficiencies is present at all colleges, both two-year and four-year. No college escapes the need to provide remedial/developmental instruction in reading, writing, and mathematics.
3. Of the students tested, the great majority received three or more years of instruction in English and mathematics in high school, and 70% graduated from high school within the last two years. Apparently the level of proficiency required to complete these high school courses successfully is considerably lower than the proficiency expected of entering college freshmen.

According to information supplied by the students taking the test, the vast majority perceive themselves as average or above average in the basic skills (comparable figures from the 1978 test results are included in parentheses):

---92% of the students tested studied English for three or more years in high school (93%);

---72% studied mathematics for three or more years in high school (71%);

---93% consider themselves average or above in writing ability (92%);

---85% consider themselves average or above in mathematical ability (84%).

Yet, based upon the test results, the Basic Skills Council concludes that a substantial proportion of the students tested are not proficient in these basic skills:

- 32% lack proficiency in verbal skills (30%);
- 47% lack proficiency in computation (45%);
- 61% lack proficiency in elementary algebra (60%);

and

- 43% lack proficiency in some fundamental verbal skills (46%);
- 23% lack proficiency in some fundamental skills in computation (27%);
- 28% lack proficiency in some fundamental skills in elementary algebra (31%);

and

- 25% appear to be proficient in verbal skills (24%);
- 30% appear to be proficient in computation (28%);
- 11% appear to be proficient in elementary algebra (9%).

---

At later dates the Council will submit reports on the test results by sending high schools and on college placement and remediation. Under a procedure approved by the Board of Higher Education, we will make public the high school results 60 days after the individual high schools have had the opportunity to study the results and to report to their local boards. As in the past, the Council will also report on the placement of students at the colleges, the extent of the remedial/developmental effort in New Jersey colleges, and the Council's recommendations for improving the basic skills proficiencies of those skills deficient students entering New Jersey institutions of higher education.

## INTRODUCTION

The New Jersey College Basic Skills Placement Test has been taken by more than 100,000 students in the less than two years that have passed since the first test administration in May, 1978. Last fall the Basic Skills Council reported to the Board of Higher Education on the test results of 42,984 freshmen (Report, November 1978); in the spring the Council reported on 11,078 students entering in mid-year (Report, May 1979); this report presents the test results of 47,725 freshmen who entered college this fall.

On the basis of the fall 1979 results, the Council reasserts last year's finding that an unacceptably large proportion of the students currently entering New Jersey colleges are not proficient in reading or writing or quantitative reasoning at levels that, without remediation, will permit them to benefit from the intellectual experience that colleges offer.

We remind the Board that our use of the term "basic skills" refers to those skills of thought and communication that an individual needs in order to take advantage of the opportunities offered by a college education. In previous reports to the Board we said:

By 'basic skills' the Council means the tools of intellectual discourse used in common by participating members of all academic communities. These tools are the language of words and the language of mathematics. Students need these tools to extract information, to exercise and develop the critical faculties of the mind, and to express thoughts clearly and coherently. Without them learning is impaired, communication is imprecise, understanding is impossible. A test of 'basic skills,' therefore, is a test to determine whether an individual has developed the practical working skills of verbal and mathematical literacy needed to take advantage of the learning opportunities that colleges provide.

To define 'basic skills' in this way is not to deny the validity of other modes of communication--within the artistic realm of discourse, for instance, the language of music, motion, image, color, light, and texture express a universe of perceptions, feelings, and emotions which cannot be expressed adequately by words and numbers and logic alone. Nor is the Council's definition of the 'basic skills' inimical to the value of diversity. We are, to the contrary, exceedingly sensitive to the differences between colleges: differences in their students, differences in their curricula and pedagogical philosophies, differences in their missions. But in one respect all colleges are identical: their ultimate purpose is to foster learning. The Council asserts unequivocally that the 'basic skills' of reading, writing, and mathematics are a prerequisite to learning at the college level. If the possession of these skills is 'standardization,' we believe that standardization in this sense is good.

The Council emphasizes its conviction that a testing program contributes substantially to students' potential for success in college, work, and citizenship. We know of no better way to help students succeed than to begin by identifying those who need special assistance and placing them in courses specifically designed to improve skills in reading, writing, and mathematics. Placement in special courses not only offers these students a real opportunity to survive and prosper in college; it also permits a college to maintain academic standards that benefit all students. While colleges can and should continue to admit a broad range of students, they must also maintain appropriate academic standards if the policy of open access is to present a real opportunity for self-improvement, upward mobility, participatory citizenship, and personal fulfillment.

Finally, the Council reaffirms its belief that remedial instruction in the basic skills, while important and necessary under present circumstances, should remain a responsibility of colleges and universities only so long as large numbers of recent high school graduates arrive at college under-prepared in the basic skills. It is our sincere hope that the need for remedial instruction in college will diminish, and we are making efforts to work with school systems to improve education at all levels. Until these efforts bear fruit, however, the Council will continue to urge that colleges provide effective remedial programs for all students who require such assistance to enable them to participate and compete successfully in collegiate programs. To do otherwise would be to overlook the potential of thousands of citizens and would, in our judgement, constitute a failure on the part of higher education to live up to its responsibilities to society under present conditions.

## PURPOSES OF THE TEST

In order to interpret the information presented in this report it is important to understand what the New Jersey College Basic Skills Placement Test (NJCBSPT) is designed to do, and what it is not intended to do. The test is an assessment of proficiency in the basic skills of the English language and mathematics. The test results are presented here in order to provide the Board of Higher Education with a comprehensive view of the state of preparation in basic skills of students entering New Jersey colleges.

The individual test results and item analyses reported to each college indicate specific strengths and weaknesses of individual students in reading, writing, and mathematics. The test and the reporting structure were designed to help colleges answer the question whether students have developed those fundamental skills that they will need in order to participate effectively in a collegiate program of study. This information assists the colleges in placing students in appropriate first-year courses; at the same time it can be used by colleges to design remedial courses tailored to the specific needs of their students. In addition, the test results provide colleges and high schools with data they need to improve coordination between their programs and thereby to work together more effectively to strengthen the entire educational system.

The test is not an admissions test; it is not used in making admissions decisions. Indeed, by resolution of the Board of Higher Education, the test can be administered only after students have been admitted to the college of their choice. Nor is the test an aptitude test, an intelligence test, or a predictor of success in college. The test is an assessment of skills proficiencies; the results should therefore be used only for purposes of advisement, placement, and curriculum development.

The NJCBSPT is unlike most other standardized tests. Because it is intended to indicate whether a student can enter college classes without a severe handicap in reading, writing, or mathematics, the test is designed to discriminate best at the lower end of the score range. Moreover, it was constructed at a difficulty level judged by experienced New Jersey faculty members and testing experts to be appropriate for the purpose of identifying students who probably need remedial/developmental assistance. The test does not attempt to rank order students with good to excellent skills proficiencies, but merely identifies them as a group separate from students with moderate to serious skills deficiencies.

Each institution sets its own academic standards and makes its own decisions regarding student placement. Faculty members at each college determine placement in remedial/developmental courses after reviewing NJCBSPT scores and other indicators of a student's basic skills proficiency and considering this placement information in the context of the student's curriculum requirements and the college's academic standards. The Basic Skills Council recognizes each college's individuality and therefore does not recommend cut-off scores. Cut-off scores used for determining placement vary among colleges; each spring the Basic Skills Council reports to the Board the cut-off scores which colleges have used in placing their students.

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DESCRIPTION OF THE NEW JERSEY COLLEGE  
BASIC SKILLS PLACEMENT TEST

Reading and Writing Test

The test used this year is essentially the same as last year's test of reading and writing. The results of the first year's testing were analyzed by committees of New Jersey college faculty and by the professional staff of Educational Testing Service. After careful review by the Reading and Writing Advisory Committee and by the Tests and Measurements Advisory Committee, certain items were deleted and replaced with items that had been pre-tested in colleges throughout the State and then subjected to item analysis to determine appropriateness. The present version of the test, in the opinion of all who worked on its development, assesses the proficiencies of entering college freshmen in the basic skills of reading and writing, and can help to determine whether individual students will profit from placement in courses designed to strengthen these skills. No attempt was made to test spoken language.

The reading and writing test is comprised of three multiple-choice sections and an essay. The first multiple-choice section contains forty items consisting of short reading passages on which questions test students' ability to understand main ideas, comprehend direct statements, and draw inferences. The second multiple-choice section consists of thirty-five items which measure students' ability to write standard English sentences; this section also tests the ability to use coordination and subordination appropriately, and to place modifiers appropriately. The final multiple-choice section on reading and writing consists of fifty items which are designed to measure students' ability to see relationships among words, among sentences, and among ideas; this ability is required of both the good reader and the good writer. This final multiple-choice section tests the ability to categorize ideas, use appropriate connectives, make analogies, and recognize principles of organization. The essay section of the test asks the students to write a twenty-minute essay on an assigned topic that has been selected from a dozen essay topics that were field-tested in colleges throughout the State. Each essay is read by at least two different readers who score holistically under controlled conditions in statewide essay reading sessions.

Mathematics Test

The mathematics portion of the test consists of a thirty-item section on computation and a thirty-item section on elementary algebra. This test of basic computational skills and the fundamentals of elementary algebra contains items from last year's test along with certain new items that were pre-tested at two- and four-year colleges across the State and in selected New Jersey high schools. The items were carefully analyzed by the Mathematics Advisory Committee, the Tests and Measurements Advisory Committee, the professional staff of Educational Testing Service, and the Basic Skills Council. In the judgement of those who developed it, this test is well designed to assess the levels of proficiency in basic computational skills and elementary algebra of students entering college, and will clearly identify students who would need assistance in the basic skills of computation and elementary algebra.



## RESULTS OF THE TESTING PROGRAM

April 4, 1979 - September 22, 1979

### Profile of Students Tested

For the first semester of the academic year 1979-80, 47,725 entering freshmen were tested at all the public two-year colleges, all the state colleges, thirteen undergraduate units of Rutgers University, and the New Jersey Institute of Technology. Three independent colleges also participated in the testing program; the data on the 657 students from these colleges are included in the statewide totals, but are not reported as a separate sector. The students tested include both those who were regularly admitted and those who were admitted through special admission programs.

According to self-reported data, of the students tested:

- 81% indicated they would enroll as full-time students;
- 18% indicated they would enroll as part-time students;
- 63% graduated from high school in 1979;
- 33% graduated from high school before 1979;
- 3% either did not graduate from high school or earned a G.E.D. certificate;
- 92% studied English for three or more years in high school;
- 72% studied mathematics for three or more years in high school;
- 5% considered themselves below average in written expression ability in comparison with others in their age group;
- 43% considered themselves average in written expression;
- 49% considered themselves above average in written expression;
- 13% considered themselves below average in mathematical ability in comparison with others in their age group;
- 45% considered themselves average in mathematical ability;
- 41% considered themselves above average in mathematical ability.

Appendix C summarizes the entering freshman profile data aggregated both by college sector and statewide for fall 1979 and fall 1978.

Summary of the Data

Except for the Essay score, which is reported as the sum of the readers' scores, all scores on the NJCBSPT are reported as scaled scores. The score scale runs from 35 to 95, with a mean of 65 and a standard deviation of 10. The Council chose this particular scale because its numerical range is different from that used for reporting scores on any other test. These scaled scores are not percentages, and should never be confused with scores expressed as percentages. Reporting the test results as scaled scores ensures that the scores will be comparable from year to year. Thus, the test results will not vary each year because of changes in the form of the test or because of changes in the composition of the group of students tested each year. The Board and the Council will have comparable baseline data for each year of testing. A more detailed discussion of the NJCBSPT score scale is contained in Appendix A.

The table on page 7 presents the test data for each sector of the higher education system and a statewide summary covering all students tested. When examining the results, one must remember that the sectors have widely varying academic missions and that individual colleges have different standards for admission. Thus the test results should, and do, reveal differences among sectors.

These data are summaries based upon the performance of all students who took the test in each sector. As such they are not intended to indicate anything about the specific strengths and weaknesses of individual students within a sector. However, Appendices D-K, which give the distribution of scores on each section of the test, do indicate certain distinctions among the sectors. Students entering NJIT achieved the highest mean scores in computation and elementary algebra, while students entering Rutgers University achieved the highest mean scores in the verbal sections of the test. However, substantial numbers of individual students in both institutions achieved scores below the statewide mean in these areas. Students entering the state colleges achieved the next highest mean scores on the verbal and mathematical sections of the test. Although the students entering the community colleges achieved mean scores below the statewide means, it should be noted that substantial numbers of individual students entering these colleges achieved scores above the statewide means. Appendix L compares mean scaled scores among students who studied English and Mathematics in high school from one to four years.

Institutional Interpretation of Test Scores

The scores which decide whether students are placed into remedial/developmental courses (often called cut-off scores) can only be chosen by the faculty at each institution. The cut-off scores used by the faculty of a college should be appropriate to the curriculum of the college and the academic standards which students are expected to achieve. Therefore, the scores used to place students in remedial/developmental courses will differ among colleges.

MEAN RAW AND SCALED SCORES: SECTORS AND STATE TOTALS

	Two-Year Colleges		State Colleges		NJIT		Rutgers University		State Total	
	Mean Raw Score	Mean Scaled Score	Mean Raw Score	Mean Scaled Score	Mean Raw Score	Mean Scaled Score	Mean Raw Score	Mean Scaled Score	Mean Raw Score	Mean Scaled Score
reading comprehension (40 items)	28	61	32	66	34	70	34	70	30	64
	29	62	31	66	34	69	34	70	31	65
sentence structure (35 items)	23	61	27	67	28	70	29	71	25	64
	23	61	26	66	27	69	28	70	25	64
logical relationships (50 items)	37	61	41	66	43	69	44	70	39	64
	37	62	40	66	42	69	43	70	39	65
essay raw score only, 0-8)	4.7		5.2		5.3		5.7		5.0	
	4.8		5.3		5.3		5.7		5.1	
composition (scaled score only)		61		67		69		71		65
		61		66		68		71		64
total English (scaled score only)		61		67		70		71		64
		61		66		69		71		64
computation (30 items)	18	61	22	66	27	75	25	72	20	64
	19	60	22	66	27	74	25	71	21	64
elementary algebra (30 items)	11	61	15	67	25	81	21	75	14	65
	11	61	15	67	24	79	20	74	14	65

11,487  
10,840

650  
690

7,700  
7,322

47,725  
42,984

students in 2-year and 4-year private colleges

NOTE: Comparisons from year to year can only be made with respect to scale scores. Raw scores are included only as an indication of what the scale scores mean in terms of percentages of correct responses. For a complete examination of scaled scores...

## INTERPRETING THE RESULTS OF THE TESTING PROGRAM

Based upon its understanding of the content and difficulty level of the test, and upon the recommendations of its advisory committees, the Council offers the following general propositions to assist in understanding the test results data presented in this report. We begin by offering a caveat against ascribing a precision that does not exist in interpreting test scores.

### Verbal Skills

In the Council's judgement, all students with essay scores of 2 or 3, and those students with an essay score of 4 but less than 80% correct on any of the three relatively easy multiple-choice tests, are seriously deficient in their use of the written language and will certainly need remedial assistance. An essay score of 2 or 3 indicates pronounced weaknesses in writing: in these essays the message is not always clear, the idea is either not developed or not logical, and the conventions of the written language are usually not observed. An essay score of 4, together with less than 80% correct on one or more of the multiple-choice tests, indicates a need for help in following the conventions of the written language, and in developing and comprehending an idea in a coherent manner.

Many students exhibit a pattern of performance that must be reviewed more carefully, since they probably require some assistance in one or more areas, according to the requirements and standards of the individual colleges. Students in this category either did not demonstrate proficiency in one or more areas, or exhibited a marked discrepancy among scores--for example, a high essay score and a low sentence structure score is a pattern that bears examination. Essay scores of 4 or 5 together with multiple-choice scores above 80% are "average" in that the essays tend to lack depth and coherence, and despite the multiple-choice scores, the writing samples exhibit flaws in structure and/or language conventions. An essay score of 5 combined with scores of less than 80% correct on one or more of the multiple-choice tests indicates at best a marginal performance; both the essay and the scores should be reviewed locally. Essay scores of 6, 7, 8, and less than 80% correct on any one of the relatively easy multiple-choice tests are discrepant patterns, since these essay scores indicate a range from above average to excellent, and the multiple-choice scores appear to contradict the essay scores. Discrepant scores demand careful review.

Students with essay scores of 6, 7, 8, and 80% correct on all three multiple-choice tests seem to be proficient in the basic skills of reading and writing. The writers of these essays have control of both the language and the structures they are using: generally speaking, they can comprehend a relatively mature idea and develop it in standard English.

## Computation

A scaled score of 64 or below (20 or fewer questions correct out of 30 on the 1979 test) indicates pronounced weaknesses in dealing with certain computational operations and in particular with problems involving percentages and decimals. Declining scores indicate progressively greater difficulty with operations involving fractions.

The range of scaled scores from 65 to 72 (21 to 25 questions correct) indicates greater familiarity with elementary computation but still shows definite weaknesses in particular skills. The particular weaknesses of an individual student can be identified only by examining individual item responses.

Students who achieve a scaled score of at least 73 (26 questions correct) seem to be proficient in the elementary computational skills measured by this test.

## Elementary Algebra

Students who achieve a scaled score of 65 or below (14 or fewer questions correct out of 30 on the 1979 test) definitely lack an understanding of elementary algebra. Such students may possess a smattering of knowledge but have difficulty with a wide variety of elementary operations, and are not able in general to perform sustained operations involving a succession of simple steps. Students in this category probably need to restudy elementary algebra from the beginning.

The particular difficulties of students who score in the scale range from 67 to 81 (15 to 25 questions correct) vary. They have some misconceptions, have some trouble dealing with equations involving letters rather than numbers, and probably cannot handle sustained operations well. The type of assistance or course work such students may require will depend on each student's background and can be determined by careful examination of the particular patterns of item responses.

Students who achieve a scaled score of 83 and above (26 or more questions correct) seem to have no widespread weaknesses in performing elementary algebraic operations. They probably can do simple sustained operations. The test does not extend far enough in difficulty level to determine whether students scoring in this highest range are able to complete a complex succession of simple operations.

## Implications

The following generalizations are intended to help the Board to interpret the meaning of the aggregated score results. As the graphs and tables in the appendices show, there is a significant need for remediation among entering college students, whether we apply the general interpretation of scores outlined above, or whether we refer to the standards reported by the colleges and set forth in a report to the Board in May of this year.

The Council believes that large numbers of entering college students are not proficient in the basic skills. Of the 47,725 students tested, at least 15,051 students or 32% lack proficiency in the verbal skills tested; 22,185 or 47% lack proficiency in computation; 29,114 or 61% lack proficiency in elementary algebra.

There is a second category of students whose test results are not clear indicators of proficiency: while some of these students may be able to perform well in first-year college courses, in the Council's opinion many may not, and colleges must examine their academic standards and placement systems carefully before assuming that these students are prepared in the basic skills. Of the 47,725 students tested, 20,311 or 43% lack proficiency in some areas of the verbal skills tested; 11,178 or 23% lack proficiency in some areas of computation; 13,263 or 28% lack proficiency in some areas of elementary algebra.

In the third category are those students who appear to be proficient in the basic skills. Of the 47,725 students tested, 12,135 or 25% appear to be proficient in the verbal skills tested; 14,362 or 30% appear to be proficient in computation; 5,348 or 11% appear to be proficient in elementary algebra.

COMPARISON OF 1979 and 1978 TEST RESULTS

1979 1978	Lack Proficiency		
	Lack Proficiency	Lack Proficiency In Some Areas	Appear To Be Proficient
Verbal	15,051 (32%) 12,763 (30%)	20,311 (43%) 19,845 (46%)	12,135 (25%) 10,214 (24%)
Computation	22,185 (47%) 19,356 (45%)	11,178 (23%) 11,711 (27%)	14,362 (30%) 11,915 (28%)
Elementary Algebra	29,114 (61%) 25,779 (60%)	13,263 (28%) 13,331 (31%)	5,348 (11%) 3,872 (9%)

## HIGH SCHOOL SCORE REPORTS

The New Jersey College Basic Skills Placement Test scores will be aggregated, formatted, and reported for each New Jersey high school from which ten or more graduates took the test. There will be two reports--a confidential report to the individual high schools, and a Department of Higher Education report which will list aggregated data for each high school and which will be furnished on request.

It is the position of the Board of Higher Education that public and legislative support for raising standards and improving basic skills performance can be maintained by continuing to publicize the aggregated results of the New Jersey College Basic Skills Placement Test in accordance with the following practice:

Report individual high school results of this test to the high schools themselves and require that they inform their boards in public session within 60 days of the actual results of this test, and at the same time, of their specific plans to make curricular and other changes based on the results of this particular test and of other appropriate standardized measures of student performance. After the 60 day period, the Department of Higher Education will release the scores upon request. ("Improving Basic Skills Proficiencies," p. 4, endorsed by the Board of Higher Education at its meeting on July 20, 1979, and by the Board of Education at its meeting on October 3, 1979).

The Council believes that the aggregated test results data can be useful to high schools in much the same way that they are useful to colleges: the data can be used to examine curricula and requirements and standards. These data can also provide the basis for communication between high schools and colleges so that they may begin cooperative efforts to develop students' basic skills proficiencies at an earlier stage.

## CONCERNS OF THE COUNCIL

1. Colleges need to refer to the appropriate test scores and other pertinent information in assessing or confirming basic skills proficiencies. The Scholastic Aptitude Test (SAT) is not designed to assess basic skills proficiencies, and except at the extreme ranges, SAT scores are not indicative of proficiency in reading, writing, and mathematics. The Department of Education's Minimum Basic Skills Test (MBS) is an indicator only of minimum basic skills at certain grade levels: the MBS scores should not be construed as indicators of college preparedness in basic skills.
2. The Council believes that there is a need for concerted efforts within the high schools to improve students' proficiencies in the basic skills of reading, writing, and mathematics. A study of the 102,000 New Jersey College Basic Skills Placement Test results shows clearly a correlation between test scores and the number of years that a subject was studied in high school (see Appendix L), and the Council supports the Board of Higher Education's call for statewide high school graduation requirements. The Council believes that basic skills should be emphasized in all courses at every educational level. In addition, substantive writing and mathematics courses should be required in all high schools.
3. The analysis of test score results by sector and college carries the inherent danger of misinterpretation: some may conclude wrongly that a large remedial program is a mark of low academic standards. Nothing could be further from the truth. Basic skills testing and remediation are a function of a college's academic standards: they are evidence of a commitment to quality education according to each college's mission and standards. The Council is concerned, on the other hand, that programs at some colleges may not be adequate in size or structure to accommodate all those students who require remedial/developmental assistance; this matter will be treated in a subsequent report.



## Appendix A

NEW JERSEY COLLEGE BASIC SKILLS PLACEMENT TEST SCORE SCALE,  
SCORE DISTRIBUTIONS, AND RELIABILITY

1. The Score Scale

Scores on the NJCBSPT are reported on a scale that originally had a standard deviation of 10. This is a unique scale chosen by the Council because it is not used for reporting the scores on any other test. The Council chose to report the test scores as scaled scores for three reasons. First, since different sections of the test have different numbers of questions, scaled scores allow a comparison of how a student performed on each section of the test. For example, without scaled scores we would have difficulty understanding whether 25 of 35 questions correct on one section of the test is comparable to answering 39 of 50 questions correct on another section. Second, scaled scores allow the reporting of scores that otherwise could not be reported. For example, the scaled scores for three sections of the test can be combined to produce a scaled score that gives a measure of a student's ability in a broad skills area. This procedure is used in reporting a scaled score for Composition on the NJCBSPT. By combining the scaled scores for the Sentence Structure and Logical Relationships sections with the readers' scores on the Essay section of the test, a single scaled score which reflects the student's total performance on all three of these sections can be reported. Such a score measures a student's ability in composition better than any of the individual scores by themselves. The same is true with respect to the Total English score which permits us to compare a student's performance on the entire verbal test with his or her performance on those sections of the test which cover more specific skills areas. Such information should prove useful in determining whether a student needs remedial/developmental assistance. By using scaled scores, these two composite scores, Composition and Total English, can be placed on the same scale as the test scores that constitute them. Without scaled scores, it would be difficult to compare scores on the tests with the composite scores. Third, scaled scores will allow the Board of Higher Education, the Council, and the colleges to compare the results of the test from year to year. Without scaled scores, which are equated from form-to-form of the test, such a comparison becomes impossible.

2. The Score Distributions

When using test scores, it might be useful to think of them as something like thermometer readings. All thermometers measure temperature. However, some thermometers are designed to measure temperatures as low as  $-400^{\circ}\text{F}$  while others measure temperatures only as low as  $-50^{\circ}\text{F}$ . Each thermometer is designed to measure temperature and provide reasonably accurate measurements over a certain range. Each thermometer thus measures appropriately for its purpose but along a different range on the temperature scale.

This analogy is useful when examining test scores, especially the scores for the NJCBSPT. The NJCBSPT is designed to yield information along a limited range. Since the test is designed to determine whether a student might benefit from special assistance before enrolling in regular college-level courses, the test scores provide the most useful measurement along the lower range where the most accurate measurement is needed to assess the extent of a student's skills deficiencies, if they exist.

Most tests are designed to distribute results over the entire scale. Thus, the results of most standardized tests are designed to approximate the familiar "bell-shaped" curve. Because the NJCBSPT is designed to measure most accurately along the lower range of the scale, it does not produce such a curve.

Compare the theoretical normal distribution in Figure 1 with the NJCBSPT distribution in Figure 2. The important question that the NJCBSPT is intended to help answer is whether an incoming student will profit more from placement in the regular first-year program or from placement in the classes or program that the college is offering to prepare students for the regular program. In order to increase the reliability of this decision, the NJCBSPT is designed to arrange scores so that the most useful measurement is provided in the range where the decision is likely to be made. Note that in Figure 2 the scores do not fall in a symmetrical pattern above and below the mean of 65; they spread out in the score ranges where measurement is most needed, as defined by the purposes of the test.

It is important to remember one of the oddities of measurement in interpreting the scores on the NJCBSPT. Because the test is designed to measure across a limited range, the scores are distributed across the lower range of the scale where accurate measurement is needed for placement decision. However, while the NJCBSPT distributes the scores across the lower range, it does not distribute them as widely across the upper range. This phenomenon is a property of tests such as the NJCBSPT and is known as the "ceiling effect" wherein scores can go only so high on the scale and then the "ceiling" inherent in the test prevents them from going higher. Thus no student, even one who answers every question correctly, can receive a scaled score as high as 95, as Figure 3 demonstrates.

While the reading, writing, and computation sections of the test are distributed as illustrated in Figure 2, the results of the Elementary Algebra section of the test reveal that most students do not perform adequately on a relatively easy test of elementary algebra. Figure 3 gives the distribution of scaled scores for the Elementary Algebra section of the test. These scores show that surprisingly large numbers of students entering college have not mastered the most fundamental principles of elementary algebra. It is important to note also that 5,150 students did not attempt the Elementary Algebra section of the test; since they did not receive scores, they are not included in Figure 3. If these students had been included, the curve in Figure 3 would probably show an even greater cluster of scores to the left.

When examining Figures 2-3, and all results of the NJCBSPT, it is important not to confuse the term mean with the term median. The median scaled score is the one above which half the scores lie and below which the other half lie. The mean scaled score of a group is the numerical average of all the scores in that group; it is not necessarily identical with the median. Thus, the mean score does not imply that half of the students taking the test scored above that score and half below.

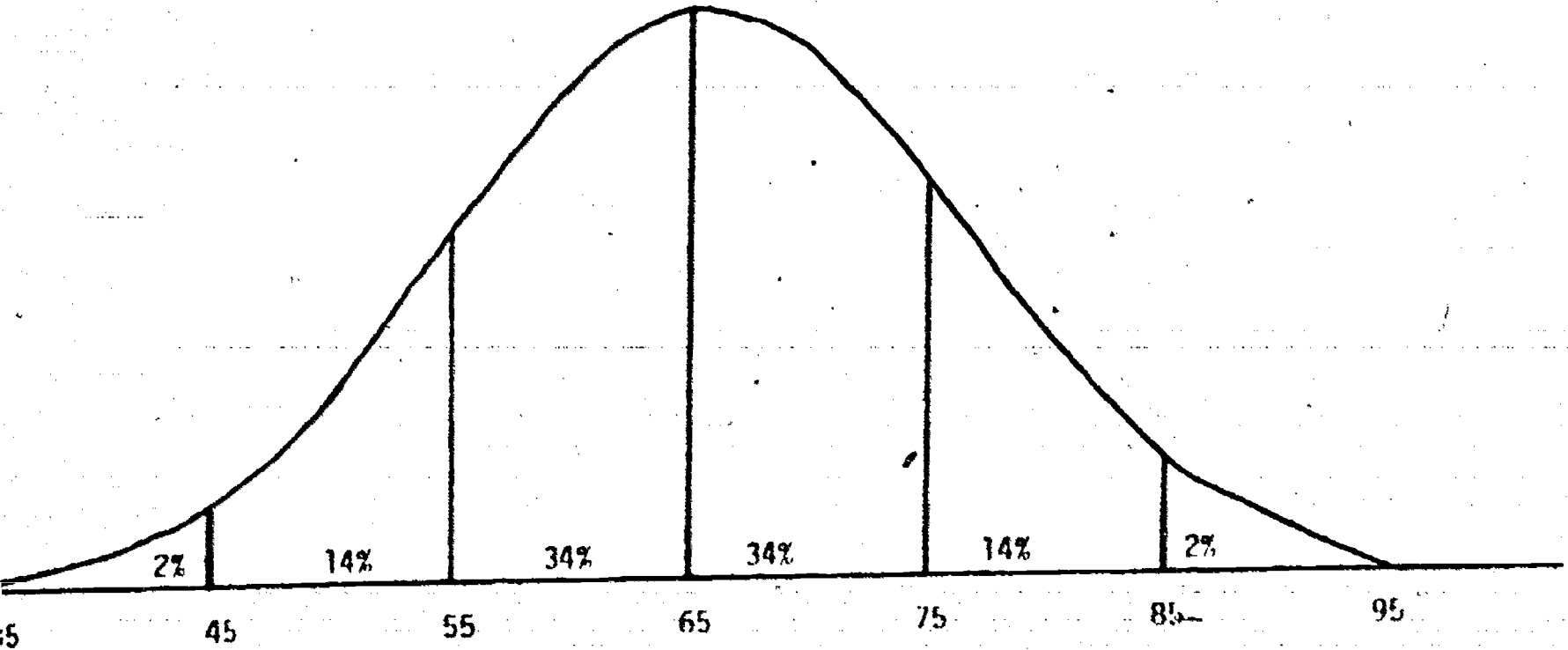
### 3. Test Reliability

The reliability index used for the multiple-choice sections of the NJCBSPT is one of internal consistency, or the extent to which the items on the test are measuring the same abilities. The most common estimate of internal consistency reliability is the Kuder-Richardson Formula 20 (KR-20), which is being used for assessing the reliability of the NJCBSPT. The following reliabilities and mean r-biserials have been computed for the NJCBSPT:

<u>Section of the Test</u>	<u>Reliability</u>	<u>Mean r-biserial</u>
Reading Comprehension	.906	.55
Sentence Structure	.880	.57
Logical Relationships	.919	.60
Computation	.915	.67
Elementary Algebra	.935	.64

Figure 1

A Theoretical Normal Distribution of Scores



Theoretical Scores

Figure 2

Approximate Distribution for these  
NJCBSPT Scores:

Reading Comprehension  
Sentence Structure  
Logical Relationships  
Composition  
Total English  
Computation

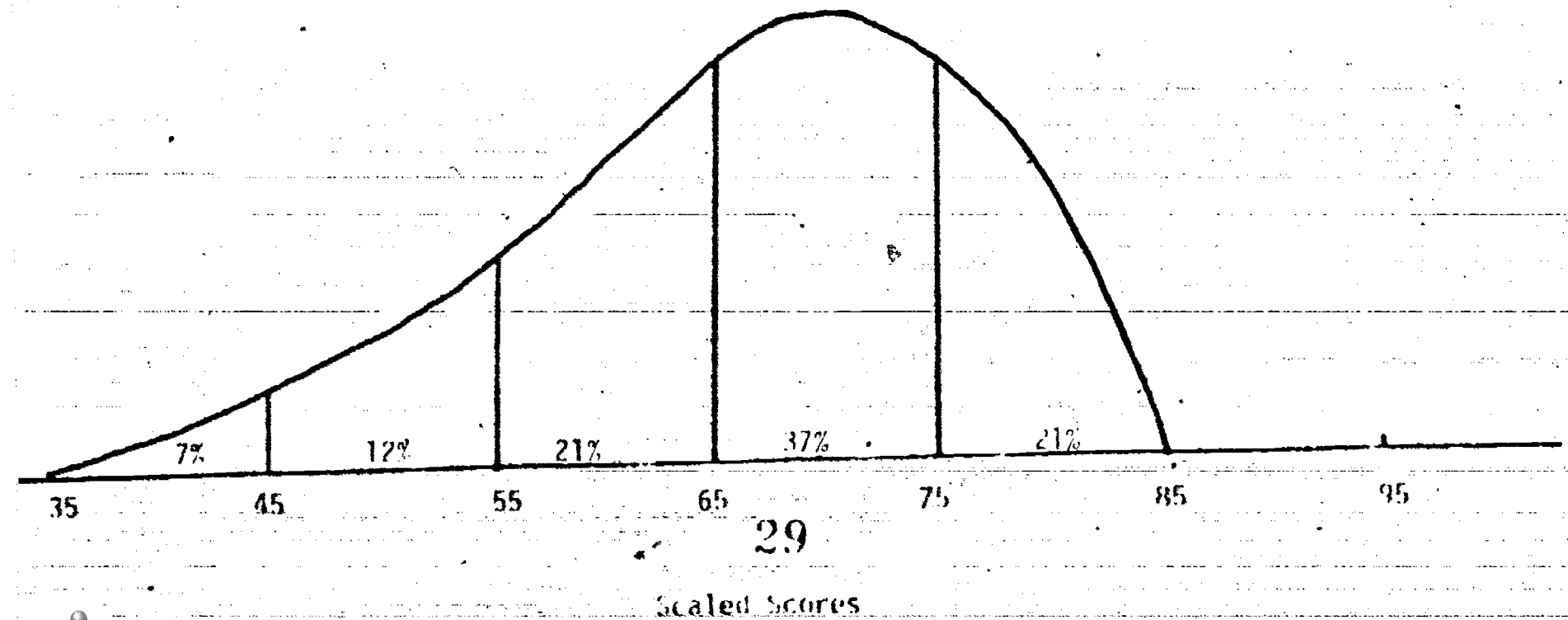
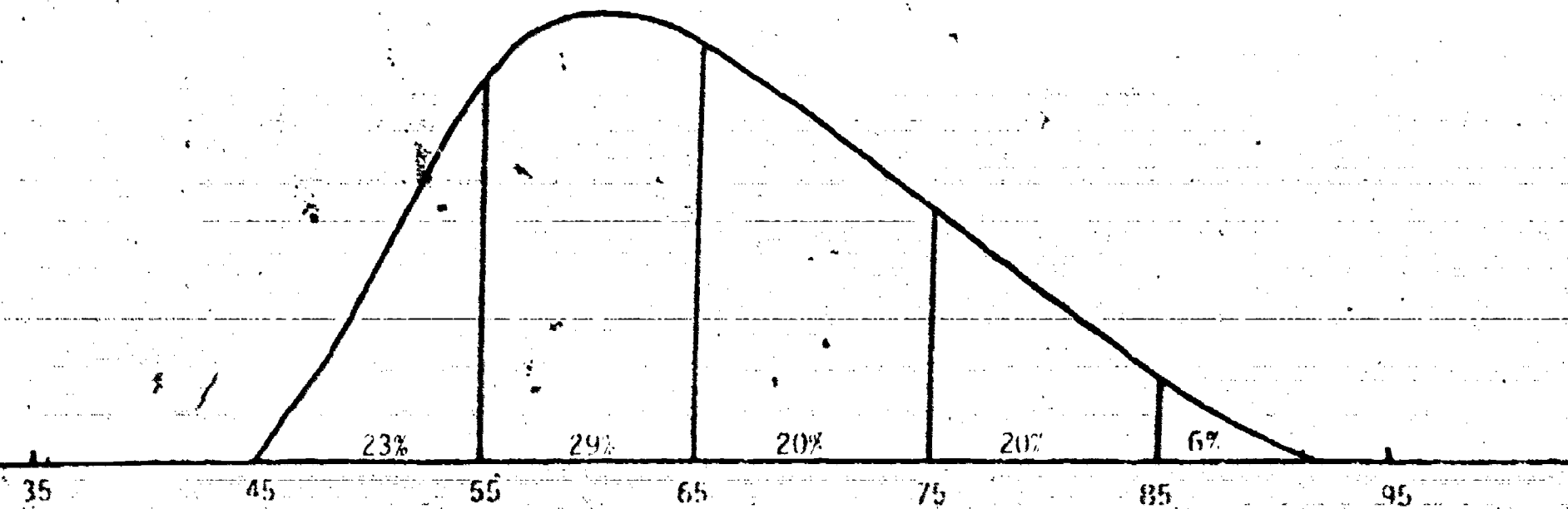


Figure 3

Approximate Distribution of  
NJCBSPT Elementary Algebra Scores



30  
scaled scores

## Appendix B

SOME TESTING TERMS

- Mean:** One indicator of the "central tendency" of a distribution, it is the sum of the scores in a distribution divided by the number of scores in the distribution.
- Median:** Another indicator of the "central tendency" of a distribution—it is that point in the distribution above which half the scores lie and below which half the scores lie.
- Raw Score:** A score which is simply the number of items right on a test.
- r-biserial:** A correlation coefficient relating performance on a test question and performance on the measure used as a criterion, such as the total test score. It is an index of discrimination measuring the extent to which examinees who score high on the measure used as the criterion tend to get the question right and those who score low tend to get it wrong.
- Reliability:** The degree to which a test is consistent in its measurements.
- Scaled Score:** The score on a test when the raw score has been converted to a number or position on a standard reference scale.
- Standard Deviation:** Unlike the mean or median, which are indicators of the "central tendency" of a score distribution, the standard deviation is an indicator of the "variability" or "dispersion" of the scores.

SELF-REPORTED STUDENT BACKGROUND INFORMATION

Appendix C:  
1 of 3



	Two-Year Colleges		State Colleges		NJIT		Rutgers University		State Total	
	Number	%	Number	%	Number	%	Number	%	Number	%
Total number tested	27,230		11,487		650		7,700		47,725	
	23,390		10,840		690		7,322		42,984	
Full-time students	19,935	73	10,213	89	592	91	7,093	92	38,455	81
	18,445	79	10,128	93	676	98	6,799	93	36,783	85
Part-time students	6,984	26	1,215	11	5	.8	561	7	8,776	18
	4,589	20	681	6	12	2	474	6	5,761	13
Graduated from high school in 1979	13,268	49	8,999	78	557	86	6,578	85	29,943	63
	12,253	52	8,959	83	647	94	6,379	88	28,848	67
Graduated from high school before 1979	12,022	44	2,392	21	39	6	1,028	13	15,567	33
	9,359	40	1,807	17	38	5	866	12	12,198	29
Completed a G.E.D. certificate or did not graduate	1,536	6	23	.2	0	0	39	.5	1,607	3
	1,255	5	35	.3	4	1	22	1	1,317	3
*Completed academic high school program	13,247	49	8,915	78	542	83	6,892	90	30,066	63
*Completed general high school program	6,814	25	1,566	14	34	5	471	6	8,986	19
*Completed career high school programs	5,959	22	795	7	14	2	255	3	7,076	15



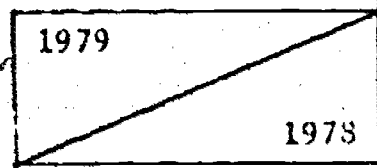
1979	1978
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SELF-REPORTED STUDENT BACKGROUND INFORMATION

	Two-Year Colleges		State Colleges		NJIT		Rutgers University		State Total	
	Number	%	Number	%	Number	%	Number	%	Number	%
*Ranked in highest 5th of high school graduating class	3,923	14	2,672	23	283	44	4,447	58	11,461	24
*Ranked in second 5th of high school graduating class	5,818	21	3,333	29	207	32	1,913	25	11,440	24
*Ranked in middle 5th of high school graduating class	12,587	46	4,218	37	98	15	1,075	14	18,233	38
*Ranked in fourth 5th of high school graduating class	2,767	10	563	5	7	1	106	1	3,497	7
*Ranked in lowest 5th of high school graduating class	877	3	111	1	0	0	41	.5	1,033	2
Studied mathematics for three or more years	17,151	63	9,145	80	588	90	7,113	92	34,468	72
	14,158	60	8,552	79	680	99	6,744	93	30,674	71
Consider themselves above average in mathematical ability	8,791	32	4,717	41	520	80	5,123	67	19,380	41
	6,907	29	4,324	40	564	82	4,602	64	16,601	39
Consider themselves average in mathematical ability	13,441	49	5,443	47	72	11	2,135	28	21,399	45
	11,567	49	5,167	48	117	17	2,183	30	19,400	45
Consider themselves below average in mathematical ability	4,304	16	1,210	11	2	.3	358	5	5,965	13
	4,282	18	1,261	12	4	1	443	6	6,155	14
*Want help to improve mathematics	10,905	40	3,962	35	176	27	2,230	29	17,490	37

\*Data available only for 1979. 34





SELF-REPORTED STUDENT BACKGROUND INFORMATION

	Two-Year Colleges		State Colleges		NJIT		Rutgers University		State Total	
	Number	%	Number	%	Number	%	Number	%	Number	%
Studied English for three or more years	23,932	88	11,147	97	591	91	7,507	97	43,795	92
	20,782	89	10,573	98	684	99	7,154	98	39,921	93
Consider themselves above average in written expression	11,257	41	6,237	54	362	56	5,322	69	23,514	49
	9,162	39	5,818	54	369	54	4,781	66	20,483	48
Consider themselves average in written expression	13,346	49	4,762	42	210	32	2,106	27	20,688	43
	11,748	50	4,762	42	288	42	2,236	31	19,152	43
Consider themselves below average in written expression	1,823	7	339	3	21	3	164	2	2,379	5
	1,914	8	388	4	28	4	210	3	2,593	6
*Want help to improve writing	6,300	23	2,663	23	161	25	1,920	25	11,244	24
*Want help to improve reading	4,210	16	1,608	14	102	16	1,065	14	7,085	15
*Want help to improve study habits	9,174	34	3,916	34	194	30	2,103	27	15,637	33

\*Data available only for 1979

FREQUENCY OF SCALED SCORE INTERVALS  
READING COMPREHENSION

Appendix D  
1979  
1978

Two-Year  
Colleges

State  
Colleges

NJIT

Rutgers  
University

State  
Total

	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
90-95	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
80-84	453	2	252	2	20	3	352	5	1,087	2
	353	2	193	2	19	3	284	4	864	2
75-79	3,908	14	2,324	20	208	32	2,643	34	9,202	19
	3,204	14	2,026	19	202	29	2,355	32	7,888	18
70-74	4,968	18	2,955	26	206	32	2,210	29	10,491	22
	4,328	19	2,820	26	202	29	2,107	29	9,630	22
65-69	4,361	16	2,226	19	91	14	1,151	15	7,949	17
	4,145	18	2,125	20	124	18	1,291	18	7,829	18
60-64	3,310	12	1,406	12	48	7	552	7	5,386	11
	3,167	14	1,432	13	67	10	592	8	5,374	13
55-59	2,514	9	805	7	32	5	291	4	3,701	8
	2,343	10	845	8	31	4	276	4	3,575	8
50-54	1,911	7	520	5	13	2	190	2	2,683	6
	1,793	8	518	5	14	2	173	2	2,533	6
45-49	1,497	5	323	3	11	2	124	2	1,978	4
	1,280	5	323	3	13	2	188	1	1,762	4
40-44	1,612	6	335	3	12	2	107	1	2,103	4
	980	4	213	2	8	1	61	1	1,280	3
35-39	2,558	9	340	3	9	1	78	1	3,004	6
	1,739	8	339	3	10	1	75	1	2,235	5
Not Attempted	133	1	1	0	0	0	2	0	141	0
	8	0	1	0	0	0	0	0	9	0

Scaled score range for Reading Comprehension is 35-80. For a complete explanation of the score scale, see Appendix A.

Appendix E  
 1979  
 1978

SENTENCE STRUCTURE

Two-Year  
Colleges

State  
Colleges

NJIT

Rutgers  
University

State  
Total

	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
90-95	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
80-84	800	3	667	6	45	7	947	12	2,496	5
	493	2	439	4	33	5	596	8	1,589	4
75-79	1,970	7	1,620	14	133	20	1,767	23	5,570	12
	2,554	11	2,035	19	164	24	2,204	30	7,090	16
70-74	4,518	17	3,023	26	195	30	2,239	29	10,101	21
	3,892	17	2,675	25	186	27	2,306	31	8,943	21
65-69	4,682	17	2,409	21	142	22	1,330	17	8,704	18
	4,108	18	2,074	19	149	22	1,185	16	7,660	18
60-64	4,081	15	1,549	13	66	10	635	8	6,431	13
	2,341	10	1,041	10	54	8	421	6	3,926	9
55-59	3,265	12	885	8	33	5	369	5	4,623	10
	3,056	13	1,053	10	49	7	393	5	4,645	11
50-54	2,634	10	560	5	12	2	191	2	3,448	7
	2,443	10	656	6	26	4	236	3	3,417	8
45-49	2,066	8	394	3	15	2	113	1	2,620	5
	1,877	8	408	4	11	2	143	2	2,467	6
40-44	1,112	4	154	1	1	0	56	1	1,334	3
	1,401	6	275	3	12	2	66	1	1,779	4
35-39	1,961	7	222	2	8	1	51	1	2,251	5
	1,208	5	182	2	6	1	42	1	1,448	3
Not Attempted	141	1	4	0	0	0	2	0	147	0
	17	0	2	0	0	0	0	0	20	0

Scaled score range for Sentence Structure is 35-81. For a complete explanation of the score scale, see Appendix A.



25  
Appendix F  
1979  
1978

LOGICAL RELATIONSHIPS

	Two-Year Colleges		State Colleges		NJIT		Rutgers University		State Total	
	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z
90-95	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
	283	1	153	1	11	2	202	3	657	2
75-79	4,136	15	2,552	22	203	31	2,962	38	9,986	21
	2,896	12	1,724	16	172	25	2,031	28	6,927	16
70-74	5,478	20	3,307	29	221	34	2,447	32	11,609	24
	4,565	20	3,127	29	207	30	2,615	36	10,711	25
65-69	3,534	13	1,809	16	91	14	894	12	6,424	13
	4,220	18	2,198	20	152	22	1,203	16	7,895	18
60-64	3,725	14	1,513	13	56	9	569	7	5,963	12
	2,631	11	1,113	10	50	7	464	6	4,347	10
55-59	2,288	8	729	6	28	4	263	3	3,366	7
	2,663	11	983	9	45	7	347	5	4,120	10
50-54	2,423	9	636	6	23	4	246	3	3,372	7
	1,996	9	622	6	18	3	218	3	2,921	7
45-49	1,943	7	388	3	12	2	155	2	2,531	5
	1,233	5	313	3	14	2	85	1	1,675	4
40-44	1,190	4	204	2	5	1	74	1	1,489	3
	1,232	5	302	3	9	1	78	1	1,645	4
35-39	2,366	9	344	3	11	2	88	1	2,835	6
	1,653	7	302	3	12	2	69	1	2,054	5
Not Attempted	142	1	5	0	0	0	2	0	150	0
	18	0	3	0	0	0	10	0	32	0

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Scaled score range for Logical Relationships is 35-79. For a complete explanation of the score scale, see Appendix A.



FREQUENCY OF ESSAY SCORES

1979
1978

Two-Year Colleges

State Colleges

NJIT

Rutgers University

State Total

	Two-Year Colleges		State Colleges		NJIT		Rutgers University		State Total	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
8	391	1	254	2	16	2	335	4	1,015	2
	495	2	415	4	23	3	319	4	1,272	3
7	1,543	6	1,094	10	56	9	1,197	16	3,956	8
	1,652	7	1,279	12	85	12	1,139	16	4,218	10
6	7,221	27	4,038	35	254	39	3,234	42	14,979	31
	6,128	26	3,580	33	220	32	3,170	43	13,365	31
5	6,148	23	3,011	26	161	25	1,694	22	11,179	23
	5,511	24	2,704	25	195	28	1,588	22	10,203	21
4	7,241	27	2,301	20	126	19	948	12	10,747	23
	5,746	25	2,016	19	120	17	883	12	8,919	21
3	2,298	8	473	4	13	2	182	2	2,999	6
	2,027	9	507	5	33	5	152	2	2,745	6
2	2,190	8	296	3	24	4	102	1	2,622	5
	1,699	7	323	3	13	2	60	1	2,102	5
0	84	0	9	0	0	0	2	0	96	0
	41	0	7	0	0	0	6	0	54	0
Not Attempted	114	0	11	0	0	0	6	0	132	0
	91	0	9	0	1	0	5	0	106	0

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FREQUENCY OF SCALED SCORE INTERVALS  
COMPOSITION

1979
1978

Two-Year  
Colleges

State  
Colleges

NJIT

Rutgers  
University

State  
Total

	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z
90-95	0	0	0	0	0	0	0	0	0	0
85-89	29 17	0 0	19 0	0 0	0 0	0 0	38 15	0 0	87 44	0 0
80-84	665 569	2 2	458 477	4 4	37 33	6 5	698 475	9 6	1,891 1,572	4 4
75-79	2,731 2,205	10 9	2,068 1,711	18 16	135 142	21 21	2,384 2,099	31 29	7,420 6,257	16 15
70-74	4,584 3,810	17 16	2,926 2,608	25 24	215 182	33 26	2,096 2,198	27 30	9,962 8,986	21 21
65-69	4,468 3,981	16 17	2,380 2,170	21 20	136 147	21 21	1,165 1,203	15 16	8,260 7,629	17 18
60-64	3,961 3,567	15 15	1,476 1,476	13 14	56 79	9 11	580 616	8 8	6,184 5,860	13 14
55-59	3,168 2,855	12 12	878 929	8 9	26 52	4 8	300 307	4 4	4,438 4,207	9 10
50-54	2,458 2,223	9 10	502 619	4 6	18 21	3 3	210 199	3 3	3,230 3,115	7 7
45-49	1,775 1,549	7 7	350 334	3 3	10 18	2 3	109 105	1 1	2,270 2,039	5 5
40-44	1,330 1,115	5 5	210 240	2 2	7 9	1 1	69 40	1 1	1,631 1,414	3 3
35-39	1,812 1,419	7 6	205 237	2 2	10 6	2 1	45 50	1 1	2,079 2,079	4 4
Not Attempted	249 110	1 0	15 11	0 0	0 1	0 0	7 15	0 0	273 138	1 0

Scaled score range for Composition is 35-85. For a complete explanation of the score scale, see Appendix A.

FREQUENCY OF SCALED SCORE INTERVALS  
TOTAL ENGLISH

28  
Appendix A  
1979  
1978

	Two-Year Colleges		State Colleges		NJIT		Rutgers University		State Total	
	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z
90-95	0	0	0	0	0	0	0	0	0	0
85-89	0	0	1	0	0	0	1	0	2	0
80-84	605	2	396	3	32	5	633	8	1,695	4
75-79	2,951	11	2,126	19	161	25	2,556	33	7,904	17
70-74	4,608	17	3,024	26	213	33	2,162	28	10,154	21
65-69	4,370	17	2,335	20	119	18	1,087	14	8,216	17
60-64	3,814	14	1,478	13	57	9	516	7	5,973	13
55-59	3,015	11	809	7	24	4	299	4	4,310	9
50-54	2,236	8	468	4	17	3	194	3	2,954	6
45-49	1,691	6	344	3	10	2	122	2	2,191	5
40-44	1,273	5	243	2	8	1	69	1	1,621	3
35-39	2,212	8	248	2	9	1	54	1	2,538	5
Not Attempted	255	1	15	0	0	0	7	0	279	1
	111	0	11	0	1	0	15	0	139	0

Scaled score range for Total English is 35-84. For a complete explanation of the score scale, see Appendix A.



FREQUENCY OF SCALED SCORE INTERVALS  
COMPUTATION

Appendix-J  
1979  
1978

Two-Year  
Colleges

State  
Colleges

NJIT

Rutgers  
University

State  
Total

	Two-Year Colleges		State Colleges		NJIT		Rutgers University		State Total	
	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z
90-95	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
75-79	3,865 2,752	14 12	2,955 2,261	36 21	476 406	73 59	4,282 3,287	56 45	11,674 8,806	24 20
70-74	3,603 3,649	13 16	2,366 2,532	21 23	109 195	17 28	1,420 1,904	18 26	7,584 8,387	16 20
65-69	3,540 3,347	13 15	1,880 1,944	16 18	35 58	5 8	752 883	10 12	6,282 6,334	13 15
60-64	3,463 3,145	13 13	1,374 1,311	12 13	16 15	2 2	437 498	6 7	5,306 5,162	11 12
55-59	3,357 3,866	16 12	1,360 1,044	12 10	7 11	1 2	383 296	5 4	6,199 4,401	13 10
50-54	3,096 2,866	11 12	717 791	6 7	5 1	1 0	181 248	2 3	4,965 4,971	8 9
45-49	2,590 2,329	10 10	463 362	4 5	2 2	0 0	139 119	2 2	3,228 3,054	7 7
40-44	1,911 1,573	7 7	276 233	2 2	0 2	0 0	89 57	1 1	2,299 1,888	5 4
35-39	700 724	3 3	81 66	1 1	0 0	0 0	16 18	0 0	803 813	2 2
Not Attempted	203 37	1 0	15 6	0 0	0 0	0 0	2 12	0 0	325 163	1 0

Scaled score range for Computation is 35-79. For a complete explanation of the score scale, see Appendix A.



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Appendix F  
1979  
1978

FREQUENCY OF SCALED SCORE INTERVALS  
ELEMENTARY ALGEBRA

Two-Year  
Colleges

State  
Colleges

NJIT

Rutgers  
University

State  
Total

	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z	Frequency	Z
90-95	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
85-89	452	2	560	5	204	31	1,663	22	2,897	6
	334	1	413	4	146	21	1,062	15	1,976	5
80-84	1,181	4	1,372	12	252	39	2,025	26	4,870	10
	945	4	1,031	10	263	9	1,738	24	4,016	9
75-79	1,171	4	1,220	11	83	13	1,034	13	3,540	7
	1,042	4	1,154	11	118	17	1,127	15	3,288	8
70-74	2,041	7	1,691	15	73	11	981	13	4,855	10
	1,904	8	1,743	16	105	15	1,204	16	5,023	12
65-69	1,800	7	1,230	11	26	4	504	7	3,626	8
	1,918	8	1,375	13	34	5	686	9	4,083	10
60-64	3,455	13	1,772	15	11	2	537	7	5,875	12
	3,276	16	1,992	18	19	3	647	9	6,535	15
55-59	4,352	16	1,510	13	0	0	386	5	6,347	13
	4,177	18	1,604	15	3	0	377	5	6,271	13
50-54	5,137	19	1,447	13	1	0	378	5	7,065	15
	4,172	18	1,193	11	2	0	216	3	5,702	12
45-49	2,032	7	337	3	0	0	100	1	2,786	5
	1,337	6	176	2	0	0	74	1	1,608	4
40-44	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
Not Attempted	5,606	21	348	3	0	0	91	1	6,156	11
	3,785	16	159	1	0	0	91	1	4,147	10

Scaled score range for Elementary Algebra is 45-88. For a complete explanation of the score scale, see Appendix A.

SELF-REPORTED YEARS OF ENGLISH AND  
MATHEMATICS STUDIED IN HIGH SCHOOL  
BY MEAN SCALED SCORES

	Reading Comprehension	Essay*	Composition	Computation	Elementary Algebra
Studied For Four Years English (N=36,814) Mathematics (N=15,121)	66	5.1	66	68	71
Studied For Three Years English (N=3,861) Mathematics (N=14,967)	60	4.6	60	64	64
Studied For Two Years English (N=2,036) Mathematics (N=8,336)	57	4.2	56	59	57
Studied For One Year English (N=924) Mathematics (N=2,276)	51	3.6	50	59	54

\*Range for essay scores is 2-8. For a full explanation of scaled scores, see Appendix A.